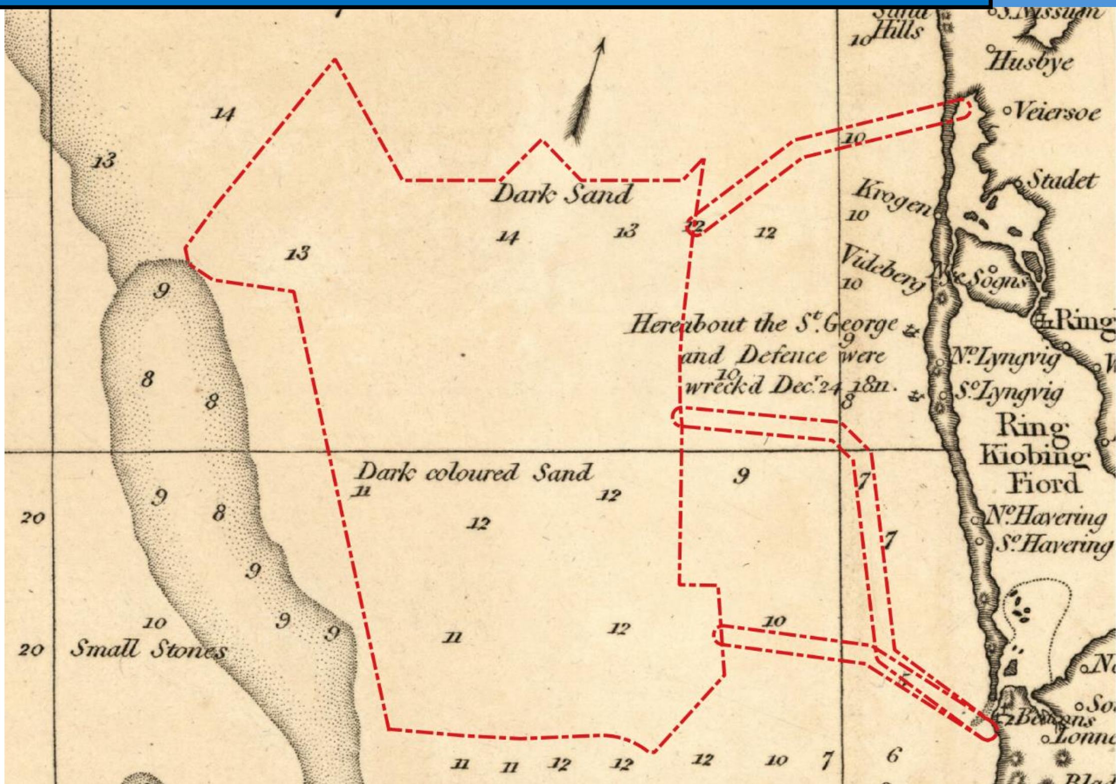
2024

North Sea I Area I Offshore Wind Farm and Export Cable Routes Geoarchaeological Analysis



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Editor: Daniel Dalicsek
Marinarkæologi Vestdanmark (MAV)
15-12-2024

Resumé

Marinarkæologi Vestdanmark (MAV) har udarbejdet nærværende geoarkæologiske analyse for Energinet med henblik på at kortlægge potentielle kulturhistoriske interesser på havbunden for den planlagte havvindmøllepark Nordsøen I Delområde 1 og kabelruterne til ilandføring. Den geoarkæologiske rapport vurderer risici for fortidsminder fra stenalderen i forbindelse med anlægsarbejdet. Dette gøres ved at genskabe stenalderslandskaberne som de så ud inden de blev oversvømmet og udpege de områder som vurderes at have særligt stort arkæologisk potentiale (såkaldte arkæologiske hotspots). Det er ligeledes blevet identificeret hvor disse hotspots er tilgængelige (bevaret) og hvor de i dag er borteroderet og/eller ikke berøres af anlægsarbejdet.

På baggrund af analyserne konkluderes det at der er begrundet formodning om at der kan findes beskyttede fortidsminder fra stenalderen i projektområdet. MAV anbefaler på denne baggrund at der laves en marinarkæologisk forundersøgelse i syv udvalgte områder for at skabe klarhed om det arkæologiske potentiale i områderne. Det anbefales at SLKS, MAV og bygherre i fællesskab udarbejder et konkret plan for udførelsen af forundersøgelsen.

Rapporten har også til formål at identificere de vrag og rester af skibslaster der er i området. I analysen er der derfor også blevet udpeget anomalier på baggrund af de af Energinet leverede geofysiske data. Vurderingerne og udpegningerne er mere konkret blevet baseret på side-scan sonar data, magnetometer data, multibeam data og diverse kulturhistoriske registre.

Gennemgangen og analyserne af de geofysiske data fandt potentielt syv skibsvrag og tilknyttede vragrester. Listen over mål for primær inspektion omfatter syv skibsvrag, 22 SSS-mål vurderet til at have arkæologisk potentiale og 92 MAG-anomalier på 50nT eller højere P2P-værdier. De 22 SSS targets og deres associerede MAG uregelmæssigheder bør inspiceres visuelt (ROV-dyk, høj opløsning MBES). Hvis uregelmæssighederne ikke inspiceres yderligere, anbefales en udelukkelseszone på mindst 50 m radius omkring lokaliteterne. Udelukkelseszonen for steder, der er identificeret som vrag, skal have en radius på mindst 100 m. Det anbefales at arkæologer fra MAV deltager på en UXO/EOD-inspektions- og bortskaffelseskampagne, såfremt sådanne finder sted.

Det er Slots- og Kulturstyrelsen (SLKS), der har til opgave at beslutte hvilke af de udpegede anomalier, som skal besigtiges og eventuelt friholdes som et led i en forundersøgelse. Det er ligeledes SLKSs rolle at fastsætte eventuelle friholdelseszoner omkring vrag og anomalier mm. Nærværende rapport kan således betragtes som en museal anbefaling, hvorfra SLKS kan træffe deres afgørelse.

Abstract

Marinarkæologi Vestdanmark (MAV) has conducted a geoarchaeological analysis for A1 of the North Sea 1 OWF project and the export cable routes. The Stone Age potential has been assessed, in the whole project area, as part of the analysis. The analysis was performed by recreating the Stone Age landscapes as they looked before they were flooded and identifying the areas which are considered to have particularly high archaeological potential (so-called hotspots). Secondly it was identified where these hotspots are accessible (preserved) and where they are now eroded away or considered not to be affected by the construction work. Based on the analyses, it is concluded that there is a reason to believe that there are protected Stone Age sites/material in the project area. MAV therefore recommends that archaeological surveys are conducted in seven areas in order to determine the archaeological potential within the project area. It is recommended that SLKS, MAV and the developer jointly prepare a specific plan for carrying out the survey.

The review and analyses of the geophysical survey data potentially found seven shipwrecks and associated shipwreck debris. The list of targets for primary inspection includes 6 shipwreck sites, 22 SSS targets judged to have archaeological potential and 92 MAG anomalies of 50nT P2P values or greater. If these anomaly sites are not inspected further, an exclusion zone of at least 50m radius is advised around the locations. The exclusion zone for sites identified as wrecks should be at least 100m radius. It is advised that MAV archaeologists partake in the UXO/EOD inspection and removal campaigns, if such take place.

It is the responsibility of the Agency for Culture and Palaces (SLKS) to decide which of the above-mentioned anomalies should be inspected and possibly protected as part of an archaeological pre-survey. It is also the role of SLKS to define exclusion zones around wrecks and anomalies etc. The following report should therefore be regarded as the museum 's recommendation from which SLKS can make their decision.

Cover picture 1 The North Sea 1 OWF and ECR area projected onto a British nautical chart from the 19th century

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MOESGAARD MUSEUM

De Kulturhistoriske Museer
Holstebro Kommune

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List of abbreviations and definitions

BC	Before Christ
BH	Borehole
BSU	Base Seismic Unit
cal	Calibrated
CE	Current Events
CPT	Cone Penetration Test
DKM	De Kulturhistoriske Museer i Holstebro
ECR	Export Cable Route
EfS	'Efterretninger for Søfarende', Notices to Mariners.
EI	Energy Island
EOD	Explosive Ordnance Disposal
FFM	Fund og Fortidsminder, the Danish Sites and Monuments Record
GEUS	Geological Survey of Denmark and Greenland
GIS	Geographic Information System
HF	High Frequency
LF	Low Frequency
Loa	Length over all
MAG	Magnetometer
MAJ	Marinarkæologi Jylland (predecessor to MAV)
MAV	Marinarkæologi Vestdanmark
MASL	Meters Above Sea Level
MBES	Multibeam Echo Sounder
MMO	Man Made Object
MOMU	Moesgaard Museum
NKM	Nordjyllands Kystmuseum
nT	Nanotesla
oa	Over all
OWF	Offshore Wind Farm
P2P	Peak to peak
ROV	Remotely Operated Vehicle
SBP	Sub-Bottom Profiler
SLIP	Sea Level Index Point
SLKS	Slots- og Kulturstyrelsen, Danish Agency for Culture and Palaces
SOW	Scope Of Work
SSS	Side Scan Sonar
uncal	Uncalibrated
UXO	Unexploded Ordnance
WWI	World War One
WWII	World War Two

1. Introduction

1.1. Project background

Energinet is conducting investigations ahead of the establishment of an offshore energy area known as North Sea I. The project encompasses an OWF area of 1373 km^2 and 3 associated cable routes covering 136 km^2. North Sea 2 will be described in a geoarchaeological study that is submitted in 2025.

The OWF and the tree cable routes may impact maritime archaeological find locations. Furthermore, anchoring and jacking-up of vessels used during construction work can damage cultural heritage in the affected areas. The work could potentially endanger maritime archaeological objects such as shipwrecks, wreckage and Stone Age find locations.

Energinet has asked the maritime archaeological museums in the collaboration MAV to carry out a Phase I and Phase II desk based cultural heritage impact assessment of the proposed construction area of the two cable routes to evaluate the extent to which this project will affect objects and areas protected by Section 28 of the Danish Museum Act. This analysis seeks to determine the presence of cultural heritage, such as traces of human activity from the Palaeolithic and Mesolithic periods or cultural-historical objects such as shipwrecks.

1.2. Administrative and other data

Accountable museum:	Marinarkæologi Vestdanmark (MAV)
Museum contact:	Mette Klingenberg, Peter Moe Astrup
Report responsibility:	Bo Ejstrud, Peter Moe Astrup, Kristine Fischer, Daniel Dalicsek
Report finish date:	15-12-2024
Participating archaeologists:	PMA (MOMU), AJ (DKM), KRF (MOMU/GEOSCIENCE), BE (DKM), DD (MOMU)
Stone Age responsibility:	PMA, KRF
Historical archaeology responsibility:	BE
Name of site:	North Sea 1 Area 1 OWF + ECR
FFM Systemnr.	255270
Site and location number (FFM):	400110c-159
MAV collaboration case no.:	MAV2023-45 North Sea 1 OWF + ECR
Date of approval of budget:	04.07.2023
Type of budget:	Geoarchaeological analysis – voluntary agreement
Period of investigation:	2024
Date of project description	29.11.2023
Contractor name	Energinet
Contractor address	Tonne Kjærsvej 65, 7000 Fredericia
Contractor type	Public
Contractor CVR no.	28980671
Coordinates:	X: 412636 Y: 6215214
Geographic coordinate system:	Euref89 UTM zone 32N
Water depth:	0m-33,51m
Area of investigation:	OWF 1373 km^2 + ERC 136 km 2

1.3. Project goals

The goal of the geoarchaeological analysis is to analyse, identify, locate and map wrecks and wreckage on or buried underneath the seafloor, as well as prehistoric landscapes, meaning also locations of potential archaeological interest, such as submerged coastal zones, that could have served as prehistoric settlement sites. Furthermore, the geoarchaeological analyses has as its goal to judge the potential for preservation of possible finds and find locations.

The geoarchaeological analysis, according to best practice, follows the geological surveys and is followed by maritime archaeological surveys, if deemed necessary, in the project chronology.

1.4. Scope of work

The geoarchaeological analysis is conducted in the period March 2023- December 2024. The deadline for the report is 15th December 2024. The report covers the entire planned offshore wind farm area and export cable routes and includes all available data and resources.

1.4.1. Deviations from Scope of Work

The scope of work has been changed from separate reports for North Sea I OWF A1 and North Sea I ECR to one combined geoarchaeological report.

1.5. Reference documents

Document	Title	Author
Nordsøen I Havvindmøllepark og kabelruter – Arkæologisk analyse		DKM/MAV
Arkivalsk kontrol Havmøllepark Nordsøen 1		DKM/MAV
Bilag 1 – 2023-02-01 MH2030. Marinarkæologi.pdf		ENERGINET
Tidsplan milepæle.xlsx		ENERGINET
ACTION LIST.xlsx		ENERGINET
22/02940-14	Scope of Services – Lot 4	ENERGINET
16/03737-3	Best Practice – Marinarkæologi incl. Appendices	ENERGINET/SLKS
GEUS Rapport 2023/15	Screening of seabed geological conditions for the offshore wind farm area North Sea I and the adjacent cable corridor area	GEUS
104287-ENN-OI-SUR-REP-LOT4WPCA1	Geophysical Site Survey Report Danish Offshore Wind 2030 LOT 4, Work Package C, Area 1	Ocean Infinity
Danish Offshore Wind 2030 Geotechnical Investigations	DOW2030 NSA_OPS_report_Offshore_survey_Geotechnical	GEOxyz
Aftale om levering af geoarkæologisk analyse for Mere Havvind 2030 – Nordsøen I		ENERGINET/MAV

2. Submerged Stone Age potential

2.1. Registered cultural heritage artefacts

“Doggerland” is the designation given to the now submerged landscape between England, Denmark, and the Netherlands. Some of the first evidence that sea levels in the North Sea were once lower came in the form of tree stumps and peat layers in the tidal zone along the English coasts (Reid 1913). Based on these observations, Reid produced some of the first maps of how the area might have appeared during the Stone Age. In 1931 a fisherman made one of the first archaeological finds that confirmed humans had once lived in the area that is now the North Sea when he recovered a 10,000-year-old, fine-toothed bone point in a clump of peat ca. 25 km from the English coast at Norfolk (Coles 1998). This type of evidence convinced archaeologists that the North Sea area was once occupied by people and since then investigation of these submerged landscapes has proceeded apace. Geophysical data produced by the oil industry provided the basis for interdisciplinary projects such as the Palaeolandscape Project (Gaffney, Thomson, and Fitch 2007) and Lost Frontiers (Gaffney et al. 2017), which aimed to reconstruct the submerged landscapes and clarify their archaeological potential.

In recent years multiple investigations have been conducted in Danish parts of the North Sea in conjunction with raw material extraction and the construction of offshore wind parks and gas pipelines (e.g., Viking Link (MAJ2016-13); Baltic pipe (MAJ2017-03), Thor (2029-21) and the Energy Island project MAJ2021-50 +MAJ2022-38). Knowledge of the inundated Stone Age landscapes and their contemporary coastlines has progressively increased as a direct result of especially the geological surveys and the geoarchaeological analysis. However, it is still unclear what the coasts were like during the Stone Age. Were there broad exposed sandy beaches (like those at the Danish west coast today), or were they more sheltered resembling those of the inner Danish waters? And to what extent was the coasts inhabited? Presumably, the area holds great archaeological potential, even though investigations are still in their early stages and have not yet produced in situ archaeological remains.

There are no registered prehistoric finds in the central register of Danish culture-historical properties (Fund og Fortidsminder) in the area proposed for the North Sea I. However, a Danish fisherman brought up a worked antler tool from a depth of 30-40m, dated to around 7,040-6,700 BC. The precise findspot in the eastern North Sea is unknown (Andersen 2005). A water-rolled flint blade was also found during sand pumping near Horn’s Reef, though its precise find location is also unknown. Objects such as amber beds have been found along the west coast of Jutland and most likely these come from submerged and eroded settlements or, for example, votive offerings in prehistoric bogs or the sea. Several Stone Age finds including antler axes and amber beads are also registered from the coast bordering the project area. These finds that wash up on the beach do not inform about the location of sites in the affected areas, so it is not possible to point to areas where the wind farm construction work poses a high risk of disturbing cultural remains. However, these isolated finds do show that the area was occupied and therefore there is a real risk that the work will encounter archaeological finds that are protected by the Danish Museum Act.

2.2. Topographic potential for traces of early Stone Age activity

A thick layer of ice covered large parts of Denmark during the Late Pleistocene. But ca. 20,000-18,000 years ago the ice began to retreat, partly because of melting due to increasing temperatures and partly because of glaciers calving icebergs into the sea. Enormous quantities of glacial meltwater were released into the world's oceans throughout the Mesolithic period that ended about 6,000 years ago. Studies have shown that the global sea level has risen 130m since the Late Glacial Maximum ca. 20-18,000 years ago (Fairbanks 1989; Lambeck et al. 2014). Peat layers in the project area is also evidence of lower sea levels. However, sea-level changes are still not precisely described for the North Sea I region. A central question to address for the geoarchaeological analysis of the North Sea I area is therefore the archaeological potential of the deepest and least investigated areas of the project, which are furthest from the modern coast. Based on water depths it is clear that any possible preserved Stone Age sites can date to the Late Palaeolithic or Early Mesolithic. The Late Palaeolithic dates to ca. 12,800 – 9,500 BC, while the Mesolithic dates to ca. 9,500-4,000 BC (see Figure 1).

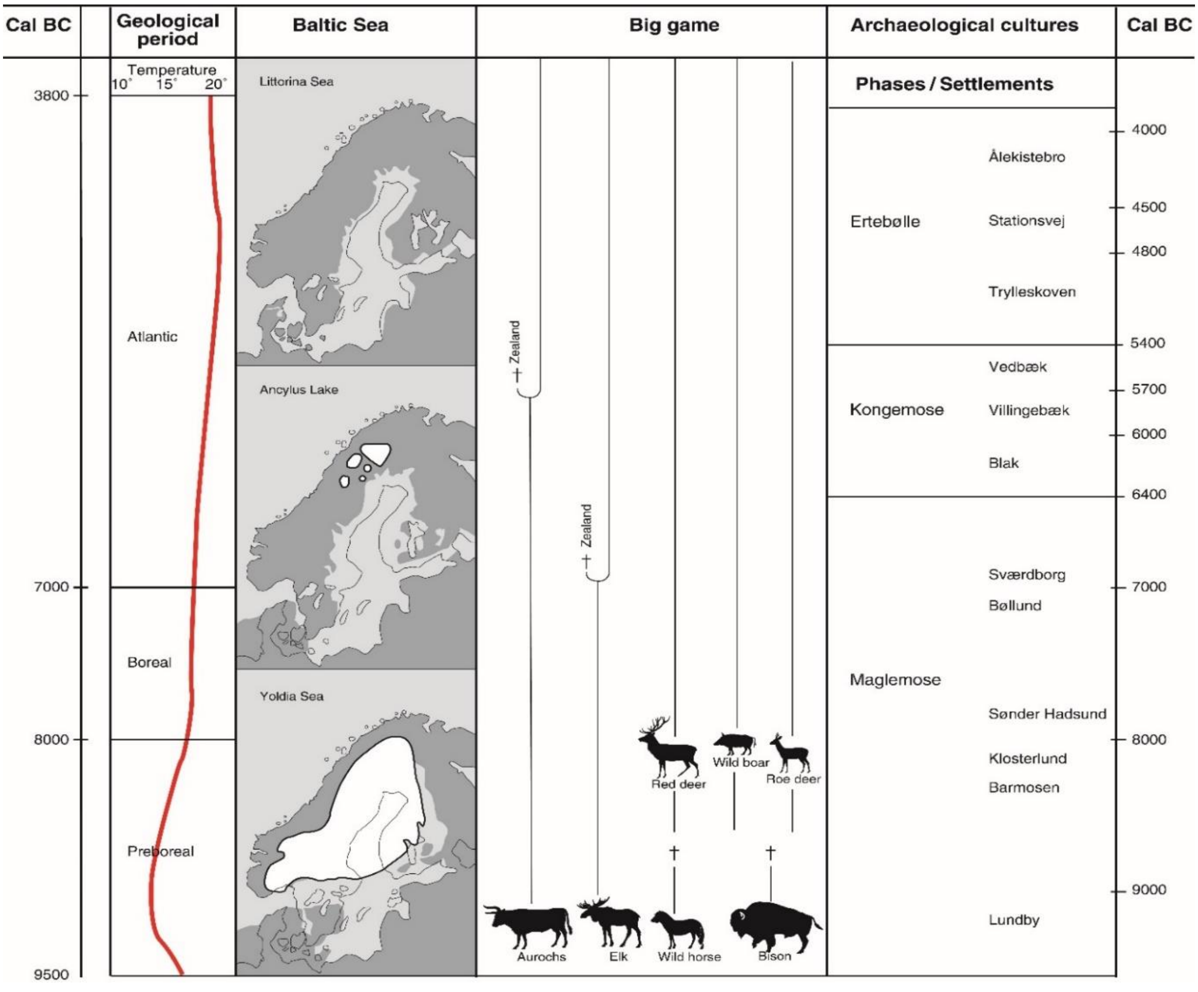


Figure 1 Schematic of cultural and natural developments in South Scandinavia in calibrated years BC. (Astrup 2018)

Many years of archaeological investigations have shown that Stone Age people did not randomly occupy landscapes. Rather, they chose their locations strategically based on a range of parameters to secure access to necessary resources, cultivate social networks, and maintain demographic viability. By reconstructing the now submerged landscapes as they appeared at various points in the past, it is possible to pinpoint areas that were better suited than others to obtain the necessary conditions for prehistoric lifestyles. Creating a detailed picture of the prehistoric landscape(s) is therefore vital to understanding where the coming construction work is at highest risk of destroying potential archaeological localities. Evaluating an area's potential to have Stone Age settlements is typically based on topographic variables like the presence of lakes, streams, and coasts. However, in practice, different periods varied widely in their requirements for specific natural features and their accompanying resources. While most of the material for our understanding of prehistoric hunter-gatherers in Denmark in the millennia prior to the Neolithic comes from coastal settlements, as of this writing it is unclear to what extent Late Palaeolithic and Early Mesolithic people also prioritized these areas.

In the area to be occupied by the North Sea I, potential Stone Age settlements are now on the sea floor – a location that is both difficult and expensive to survey. It is precisely here, however, that the last years of underwater archaeology has shown there is potential for making major scientific advances in the field of stone age research. This is primarily due to two factors that can be characterized as "Preservation" and "Knowledge lacunae" (see below).

2.2.1. Preservation

Conditions of preservation on submerged settlements are renowned for being extremely good for organic materials such as wood and bones (see examples in Andersen 2013). This is the result of continuously rising sea levels that inundated coastal settlements. In the process, the archaeological layers and materials were enclosed in anoxic surroundings that have remained that way to the present day. Because of the special environment in these submerged cultural layers, oxygen was not present in sufficient amounts to allow the onset of decay, creating a sort of time capsule. Previous investigations of submerged settlements from the Kongemose- and Ertebølle cultures have provided completely new insights into the types of wooden implements used in the Stone Age. This provides the example for the huge scientific potential that submerged and buried Stone Age sites in the North Sea could hold.

2.2.2. Knowledge lacunae

Submerged Stone Age landscapes on the sea floor represent one of the last unexplored areas in the Danish archaeological milieu. Because of this, they likely contain information that can fill some gaps in our knowledge that have remained unanswered by archaeological investigations since recognition of the various periods of the Stone Age. It is still unknown, for example, what role coasts played in the Maglemose culture (9,500-6,400 cal. BC), as the subsistence economy of that period is almost exclusively known from archaeological remains found at inland sites far from them. Targeted investigations along former coastlines are needed for resolving important research questions such as:

- How widespread was coastal settlement in the Late Palaeolithic and Maglemose cultures?
- How important a role did marine resources play in subsistence and what methods were used to collect them?
- Were coastal settlements occupied longer than those inland? Did the same people use both types of sites, or were there some groups who occupied the coast while others remained inland?

The above points serve to illustrate that there is much we still do not know about life along the coasts in the Maglemose culture (And particularly in the North Sea basin). Thus, it is a difficult task to decide where in the landscape people settled. However, this does not change the fact that it is crucial to have as detailed an understanding of the landscape as possible, since it formed the basis of life for the people who lived in what is now going to be a construction area. Considering this, the next section of the report aims to step-by-step recreate a detailed picture of the now submerged cultural landscape within the project area. The goal is to be able to evaluate which areas that have the greatest potential for prehistoric settlements and to determine whether they will still contain preserved remains. In concrete terms this means constructing a model of past sea levels and using the geophysical data to identify relevant archaic terrain.

2.3. Geological developments in the North Sea 1 OWF A1 and ECR sites

This section presents the geological development in the North Sea 1 area from the Palaeocene to Holocene period. Over time, a range of environmental processes have taken place, resulting in the landscape we recognize today in the North Sea. Especially during the late Glacial to Holocene period, shifts in the geology created conditions that are particularly beneficial to potential archaeological discoveries in the North Sea.

2.3.1. Pre-Quaternary geology

During the Middle Jura the North Sea basin was formed due to the rifting and trenching of the Atlantic (Ziegler, 1993). These rift systems can still be found as deep elongated depressions beneath the seabed. During the Cenozoic, the North Sea Basin experienced substantial subsidence, leading to the accumulation of thick sediment successions. In certain areas of the basin, particularly the Central Graben up to 3 km of sediment was deposited (Arfai 2012). The North Sea 1 site is located at the margin of the basin, and therefore, a thinner sediment package is expected to have been deposited here.

During the Palaeocene to Pleistocene the Baltic Sea was gradually drained towards the North Sea by a fluvial system (Cohen et al. 2014). In time, this fluvial system prograded into the North Sea, resulting in deposition of marine and fluvial sand at the site (Gibbard & Lewin, 2016).

2.3.2. Quaternary geology

2.3.2.1. Pleistocene geology

The Quaternary period is known for the oscillating temperatures and varying climate (e.g. Knudsen & Sejrup (1993), Lowe & Walker (2014)). As a consequence of the varying temperatures, multiple glacial and interglacial periods have occurred in the North Sea in the Quaternary period. Generally, three major glaciations are recognized. The Elster glaciation (480-410 kyr BP), the Saalian glaciation (370-135 kyr BP) and the Weichselian glaciation (117-11.7 kyr BP) (e.g. Ehlers et al. (2011); Houmark-Nielsen et al. (2011); Cohen (2012). These glaciations had a significant impact on the geology and geomorphology of the North Sea. In the Elster and Saalian glaciation the study site was covered by ice sheets, which resulted in the formation of subglacial tunnel valleys in the North Sea (Huuse et al. 2001) and other landforms such as eskers and moraines. The tunnel valleys are now buried and submerged. Thrust complexes have also been found near the study site, suggesting that glaciotectonic processes have taken place during the glaciations (Nielsen et al. 2008). The interstadial periods were characterized by retreating ice, which allowed for the deposition in marine and fluvial environments. The Weichselian glaciation followed the Eemian interglacial. The study site was, however, not covered with ice sheets in the Weichselian (Petrie et al. 2024). As the North Sea 1 site lies relatively close to the front of the Weichselian ice sheets (40 km south and 100 km west), it is expected to have been influenced by associate processes, which include meltwater river systems (e.g. Andresen et al. 2022).

2.3.2.2. Holocene geology

The end of the Weichselian glaciation marked a major transition as temperatures rose, which resulted in ice sheets melting, and leading to a rise in sea level and gradual flooding of what is now known as the North Sea. Doggerland is the name now used to describe the landmass that once connected England, Denmark, and mainland Europe before it was submerged. The sediments deposited in this period were mainly terrestrial and fluvial. In the Weichselian period hunter-gather populations are expected to have lived in Doggerland (Bailey & Jöns (2020)), which makes this area interesting from an archaeological point of view. During the Holocene period sea levels continued to rise and that resulted in a large deposition of marine sediments and the burial of the land, which has preserved submerged landscapes and potential archaeological sites and artefacts. According to Walker et al. (2020), the area was fully flooded around 8,200 years BP.

2.4. Vibrocore data

GEO conducted a preliminary analysis and interpretation of vibrocore samples taken from the North Sea 1 OWF site and the associated cable route areas in the form of logs. This investigation included descriptions of 89 vibrocores in total. Of these, 10 vibrocores were collected from the North Sea 1 OWF site solely for archaeological purposes, while the remaining 79 were taken from the cable route areas. Preliminary logs have been compiled, including the vibrocore data along with interpreted soil types. The lengths of the vibrocores from the North Sea 1 site range from approximately 5 to 6 meters, limiting the analysis to the shallow subsurface geology. For the cable routes, vibrocores extend between 1 and 7 meters. Given the relatively big area of the North Sea 1 site (approximately 140 hectares) the geology can vary significantly. A map of the 79 vibrocore borehole positions can be seen in Figure 2.

2.4.1. Vibrocore data from the North Sea 1 OWF site

10 vibrocores were made and provided to MAV for geoarchaeological purposes within the OWF area. MAV determined the exact positions of the vibrocores on the basis of the former landscapes that were revealed in the available horizons. At the North Sea 1 site, the vibrocore samples predominantly consist of sand with varying amounts of silt and clay. Considerable distances between the sampling locations result in variability in the data. The clay and silt deposits suggest deposition in a low-energy marine or lagoon environment, where finer sediments could settle. The south-western vibrocores (001, 002, 006) reveal relatively thick sand layers (4-6m), with gravel present within the top 50 cm of core 002. These were identified as postglacial marine deposits, potentially corresponding to Holocene marine sands which was later confirmed by the radiocarbon dates. The north-eastern vibrocores (003, 005) contain a 3-4 m thick layer of well-sorted medium sand, dated to the Cretaceous period and associated with meltwater deposits. This is overlain by 1-2 meters of medium to fine silty sand, indicating marine postglacial deposition. The remaining five samples generally comprise fine to medium sand with varying amounts of silt, clay, shell fragments, and plant remains, all indicative of postglacial marine deposits. Notably, sample 010 contains a layer of peat at a depth of 5.05–5.25 m below the modern seabed, suggesting a former terrestrial environment. This peat layer was initially interpreted by GEO as a glacial washdown deposit overlain by silty sand. However, new data indicates that the peat dates to 9720 uncal BP, making it a postglacial sediment instead. Traces of marine sand within the peat suggest that it may have been inundated by rising sea levels, with this horizon representing the final terrestrial stage before the flooding. This is further supported by the layers of marine sediments found above the peat in the core, indicating a transition from terrestrial to marine conditions as the area became submerged.

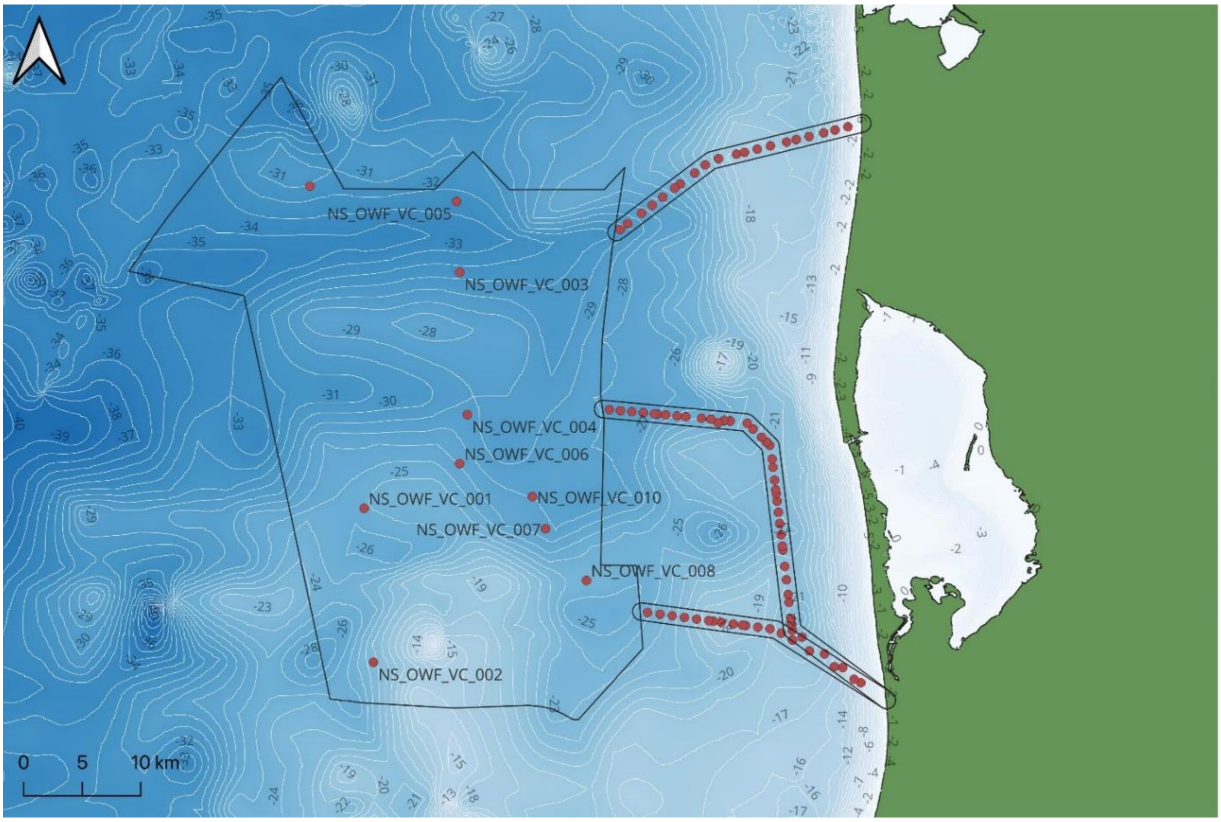


Figure 2 Vibrocore positions and names from North Sea I OWF. Contour lines show the modern bathymetry below sea level. Unnamed dots represent vibrocore locations in the ECR area.

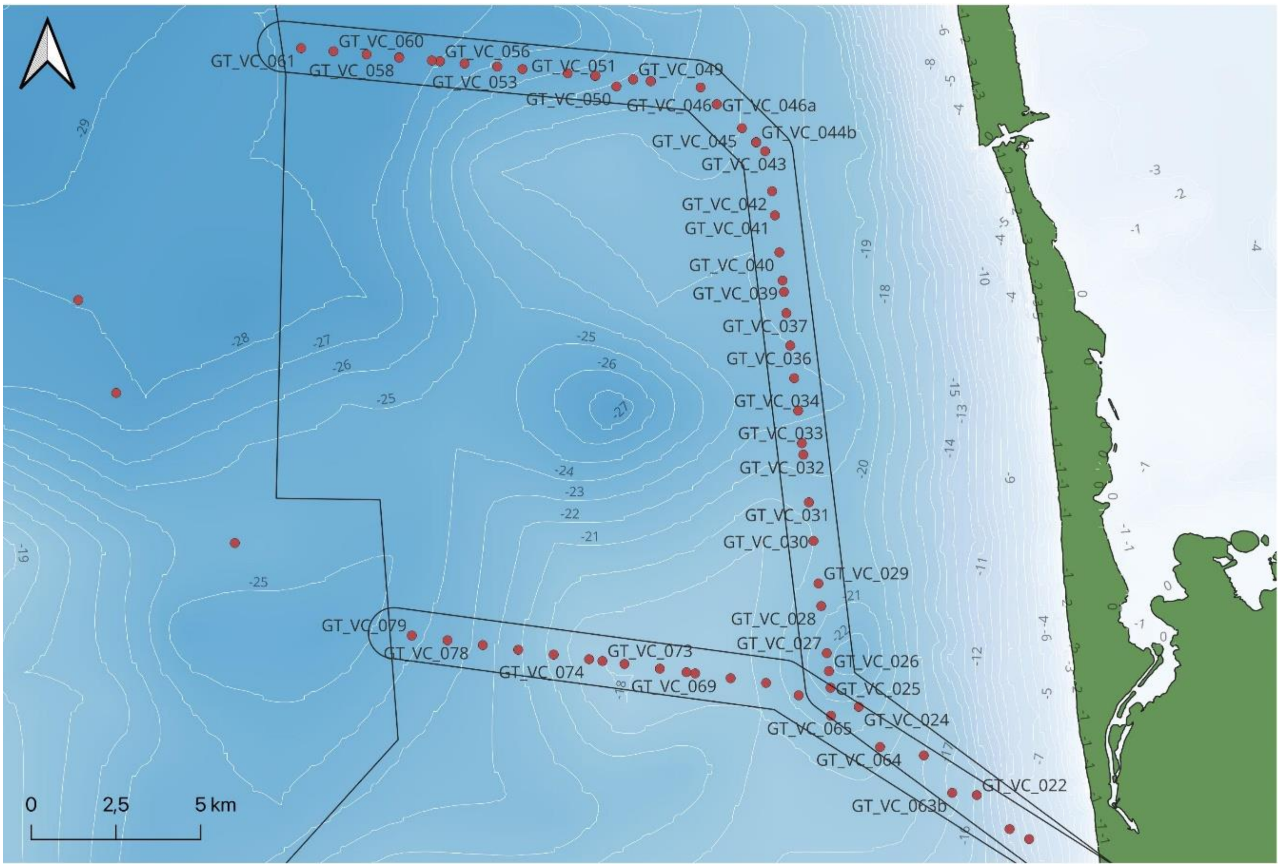


Figure 3 Vibrocore positions and names from the southern cable routes. Contour lines show the modern bathymetry below sea level.

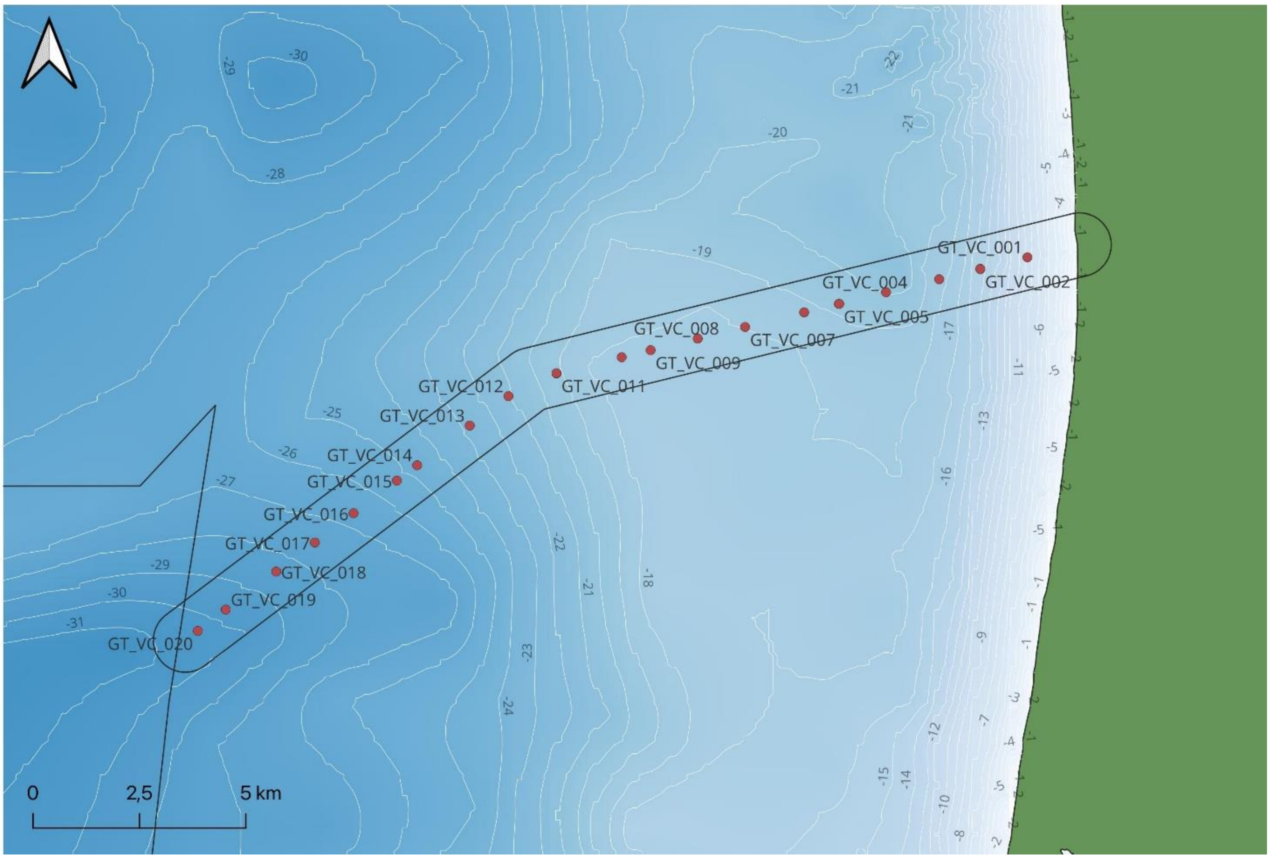


Figure 4 Vibrocore positions from the northern cable route. Contour lines show the modern bathymetry below sea level.

2.4.2. Vibrocore data from the cable routes

Generally, the vibrocores along the cable routes show a similar trend going out from the coast. The following description is based on the vibrocores VC 001–020, which represent the northernmost section of the cable route, VC 048-061, which represent the middle section of the cable route, and VC 021-025 and VC 062-079, which represent the southernmost section of the cable route. These vibrocores extend offshore, with the smallest numbers being closest to the coast and vice versa. The preliminary logs generally indicate the presence of postglacial marine sands at the top of the cores, underlain by Cretaceous sands, glacial peat, or glacial clay in some vibrocores closer to the coast. The marine sand layer generally thickens moving farther offshore, which makes sense due to the progressive accumulation of marine sediments in deeper, offshore environments as sea levels rose during the Holocene. Peat samples have been dated to 43,500 uncal BP (VC 004), 9340 uncal BP (VC 010), 8920 uncal BP (VC 019), 8300 uncal BP (VC 056a), 6930 uncal BP (VC 071), 10830 uncal BP (VC 078) and 10930 uncal BP (VC 079). We expect the peat layers to be representative of former terrestrial land surfaces. Therefore, they can be used to tell about the time that the area was flooded. Dating of marine shells in VC 071 and VC 072 revealed an age of approximately 8,600 years BP. Since these vibrocores are situated closer to the coast than VC 078 and VC 079, this suggests that the area between these samples experienced inundation sometime between 10,930 uncal BP and 8,600 years BP. The remaining vibrocores (VC 026-047) are located parallel to the Danish west coast. These vary in sediment from sand to clay to gyttja. The upper 1-6 m generally comprises marine postglacial sediments but are in some samples underlain by 1-2 m of Cretaceous sand or clay layers. Peat samples for VC 038 have been dated 37340 uncal BP predating the glacial maximum.

By determining the lithology of the borehole's samples, and correlating these to the geophysical data, the geological development of the area can be presented. This is interesting as the geology can reveal periods of terrestrial environments, which is interesting for the potential of archaeological finds. Peat is found in a few cores and when peat is found in the right unit (or horizon with terrestrial traces), it could indicate an environment, where potential hunter-gather populations lived.

Table 1 Core samples from the Noth Sea I project that have been radiocarbon dated

X-nr	Core name	Depth in core (m)	Sample ID	Sediment	Lab code	Dated material	C14 Age uncal. BP
1	GT_VC_010	0,4	P2	PEAT	FTMC-IA24-1	Wood	9090±44
2	GT_VC_019	2,85	P2	GYTTJA	FTMC-IA24-2	Shells, cardium	9349±45
3	GT_VC_019	3.35-3-50	P2	PEAT	FTMC-IA24-3	wood	8830±42
4	GT_VC_020	1,65	2.4D	SAND	FTMC-IA24-4	Shells, cardium	9479±43
5	GT_VC_030	4,35-4.55		CLAY	FTMC-IA24-5	Shells	38375±364
6	GT_VC_033	2,05	P1	GYTTJA	FTMC-IA24-6	Shells, cardium	8805±42
7	GT_VC_035	3,35	4.2D	SAND	FTMC-IA24-7	Wood, branch	45698±1374
8	GT_VC_037	0,50-0,63	P1	CLAY	FTMC-IA24-8	Shells	4304±34
9	GT_VC_037	1,55-1,65	P2	GYTTJA	FTMC-IA24-9	Shells, blue mussel,cardium	56245±2614
10	GT_VC_037	1,55-1,65	P2	GYTTJA or PEAT	FTMC-IA24-10	Wood, branch	45299±1286
11	GT_VC_038	0,9	2.3D	SILT	FTMC-IA24-11	Shells	2497±31
12	GT_VC_056a	0,7-0,9	P2	PEAT	FTMC-IA24-12	Wood, branch	8593±43
13	GT_VC_056a	1,8-1,95	P2	PEAT	FTMC-IA24-13	Wood, branch	9959±46
14	GT_VC_064	0,9-1,10	P2	SAND	FTMC-IA24-14	Shellls	2247±31
15	GT_VC_068	5,4	6.2D	CLAY	FTMC-IA24-15	Shells	36134±316
16	GT_VC_071	4,1	P2	PEAT	FTMC-IA24-16	Wood, branch	7102±38
17	GT_VC_071	4,25	P3	PEAT	FTMC-IA24-17	Wood, branch	6757±38
18	GT_VC_071	4,25	P3	PEAT	FTMC-IA24-18	Shells	8594±40
19	GT_VC_072	3,95-4,10	5.2D	CLAY	FTMC-IA24-19	Shells, blue mussel	8623±41
20	GT_VC_078	1,1	P1	PEAT	FTMC-IA24-20	Peat	10613±45
21	GT_VC_079	0,8	P1	PEAT	FTMC-IA24-21	Peat	10622±46
22	NS_OWF_VC_002	2,80-3,00	P2	SAND	FTMC-IA24-22	Shells	7170±38
23	NS_OWF_VC_002	4,20-4,35	P4	SAND	FTMC-IA24-23	Shells	6950±38
24	NS_OWF_VC_002	4,20-4,36	P4	SAND	FTMC-IA24-24	Wood fragments	7740±41
25	NS_OWF_VC_003	1,25-1,40	P2	SAND	FTMC-IA24-25	Shells (marine)	2505±32
26	NS_OWF_VS_004	5,15-5,35	P2	SAND	FTMC-IA24-26	Shells	5066±35
27	NS_OWF_VC_005	1,95-2,15	P1	SAND	FTMC-IA24-27	Shells, cardium,	3209±32
28	NS_OWF_VC_006	5,8-6,0	P2	SAND	FTMC-IA24-28	Shells	5928±35
29	NS_OWF_VC_007	3,55-3,75	P3	SAND	FTMC-IA24-29	Shells	5362±35
30	NS_OWF_VC_008	4,0-4,2	P3	GYTJJA	FTMC-IA24-30	Shells	7912±39
31	NS_OWF_VC_009	2,75-2,95	P1	SAND	FTMC-IA24-31	Shells	6397±36
32	NS_OWF_VC_009	5,55-5,70	P2	SAND	FTMC-IA24-32	Shells	7502±38
33	NS_OWF_VC_010	2,3-2,5	P1	SAND	FTMC-IA24-33	Shells	3758±35
34	NS_OWF_VC_010	4,85-5,05	P2	SAND	FTMC-IA24-34	Shells	6648±37
35	NS_OWF_VC_010	5,05-5,25	P3	PEAT	FTMC-IA24-35	Shells	5973±36
36	NS_OWF_VC_010	5,05-5,25	P3	PEAT	FTMC-IA24-36	Peat	9720±43

2.5. Modelling sea levels

2.5.1. Collection of data

It is vital to understand the development of the landscape in a given region to be able to identify the parts of a project area that have the greatest archaeological potential. One might be tempted to think that it is a simple task to reconstruct archaic coastlines in the North Sea region. However, this is not the case, and one of the most important reasons is that the extent of glacial isostatic rebound throughout the area is not yet fixed. Because of differences in the rate at which land has rebounded in the North Sea basin from when it was pressed down by the weight of glaciers, coastline studies/curves should be based on local sea-level index points. From the North Sea I area there are so few dated samples that more dated SLIPs were needed to improve the accuracy of sea level models. It is therefore vital to develop a shoreline displacement curve on local data from the cable route area. In order to determine relative prehistoric sea levels, it is crucial to have access to well-dated material. We have compiled an overview of dated samples from the North Sea judged to be representative of the project area (See Appendix 5.5 and Table 1). This involves samples that were either directly above or below the sea surface during the Late Palaeolithic and Mesolithic and can thus be used to bracket sea levels and coastlines at various points in the past. At some depth and age intervals there were so few points that can be used to determine sea levels. To rectify this, an agreement was reached between Energinet and MAV to date 36 samples from the Nort sea I to enable poorly covered intervals to be addressed with much greater precision.

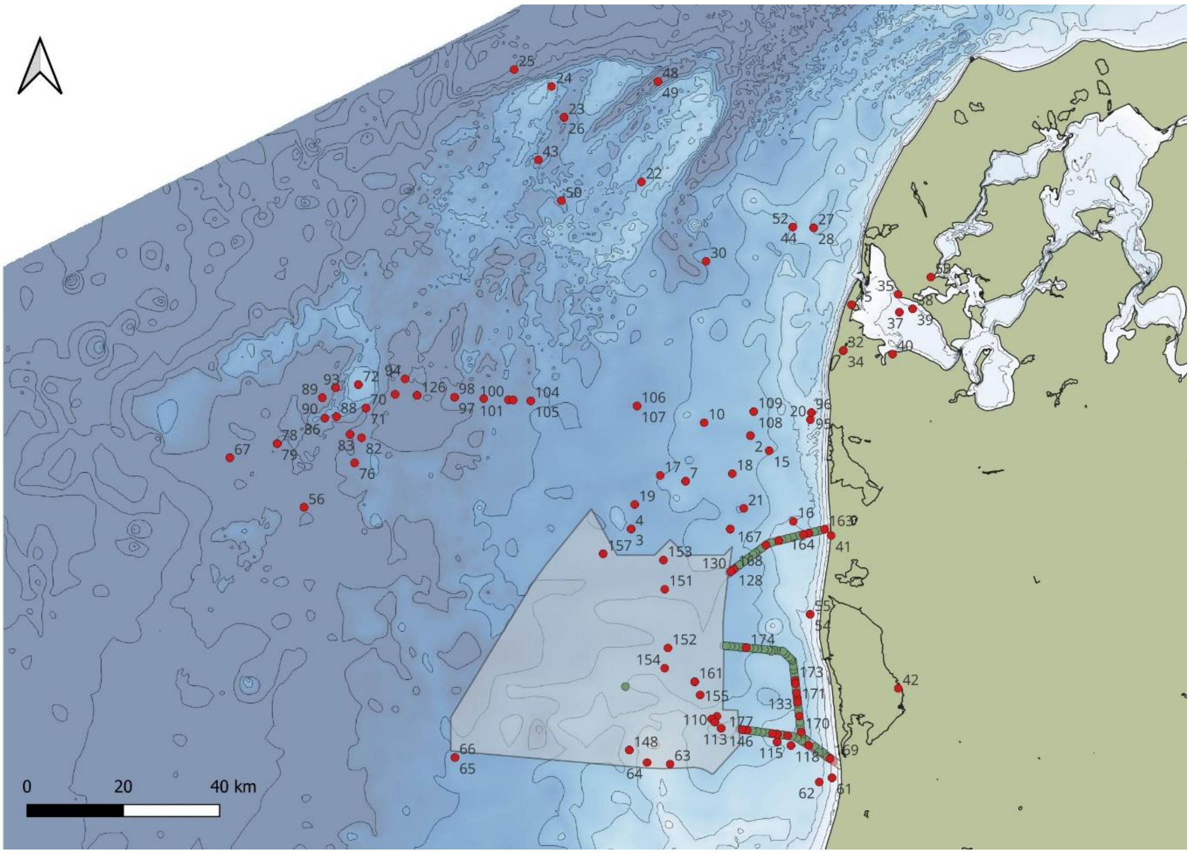


Figure 5 Core positions from which material has been radiocarbon-dated (shown in red). Numbers refer to ID number in Appendix 5.5 and sea-level curve in Figure 6.

89 new borings have been made and described as a part of the North Sea 1 project. All core logs have been reviewed to identify samples from various depths for dating that are needed to produce a new shoreline displacement curve. MAV requested sediment samples from either marine or terrestrial layers based on the core logs. The selected samples were sent to Moesgaard Museum where they were sieved with the goal of recovering material suited for radiocarbon dating (i.e. Wood, peat, shells etc). From the marine samples, primarily marine molluscs were chosen for dating, while from the peat layers it was either peat or wood (preferable small branches). All the shells were photographed before they were sent for rapid dating to subsequently determine whether the shells come from marine, brackish, or freshwater environments. It was ascertained that the dated specimens were exclusively marine molluscs, which suggests their findspot was below sea level at the time of deposition.

On 19th September 2024, MAV delivered 36 samples to the Vilnius radiocarbon centre and the museum received the results of these on the 14th October 2024 (see Table 1). In addition to the 36 samples submitted by the museum, MAV also received the results of 16 dates from the area provided by GEO. All available samples from the eastern north have been listed in Appendix 5.5.

2.5.2. Modelling sea levels – creating a shoreline displacement curve

A shoreline displacement curve shows relative sea levels at various points in time in relation to the current level. The curve that was made for this project is based on both existing dated samples (for example, those produced in connection with the Thor offshore windmill project) and others collected specifically for the Energy Island and Nort Sea I project. In order for samples to be included in the analysis, they must meet the following criteria: 1) they should provide information about prehistoric sea levels, 2) be recovered in a secure context, (in-situ), 3) have vertical placement information, and 4) be absolutely dated (e.g. with radiocarbon dating). Table 1 shows the result of the radiocarbon dates from the planned cable route areas sent for dating in connection with the geoarchaeological analysis. Additional contextual information about the dated samples can be found in Appendix 5.5. while Figure 5 shows the distribution of radiocarbon dated samples that has been included to develop a new sea-level curve.

14C ages are reported in conventional radiocarbon years BP (before present = 1950) in accordance with international convention (M. Stuiver & H.A. Polach: Discussion of reporting 14C data. Radiocarbon 19 (3) (1977) p. 355). Thus, all calculated 14C ages have been corrected for fractionation so as to refer the result to be equivalent with the standard δ13C value of -25‰ (wood). δ13C values have been measured by AMS only and are not reported since the values obtained here are not as precise and therefore only indicative regarding association with the terrestrial/marine/freshwater food chains.

A shoreline displacement curve was created by entering the uncalibrated C14 dates and vertical placement information (masl) into an Excel spreadsheet, after which it was imported into the computer program OxCal and calibrated. The dates were modelled in OxCal after age and vertical location using the depth model function. Samples are calibrated in the shoreline displacement curve with a 95.4% confidence interval. Marine shell samples were corrected for reservoir effect by removing 400 years before they were calibrated with the IntCal 20 curve (Reimer et al. 2020). All dates are plotted together in a depth according to their vertical location and age.

The sea-level curve shows samples from marine deposits in blue (e.g. marine shells), terrestrial samples in green (that is samples from terrestrial deposits), and grey is used for samples that come from sand layers that could come from the coast or a lakeshore. All the fixed points on the curve were assigned a number (R_Data) that can be referenced in Appendix 5.5 (column “id”) and Table 1 so it is possible to find additional information about the individual samples that are dated.

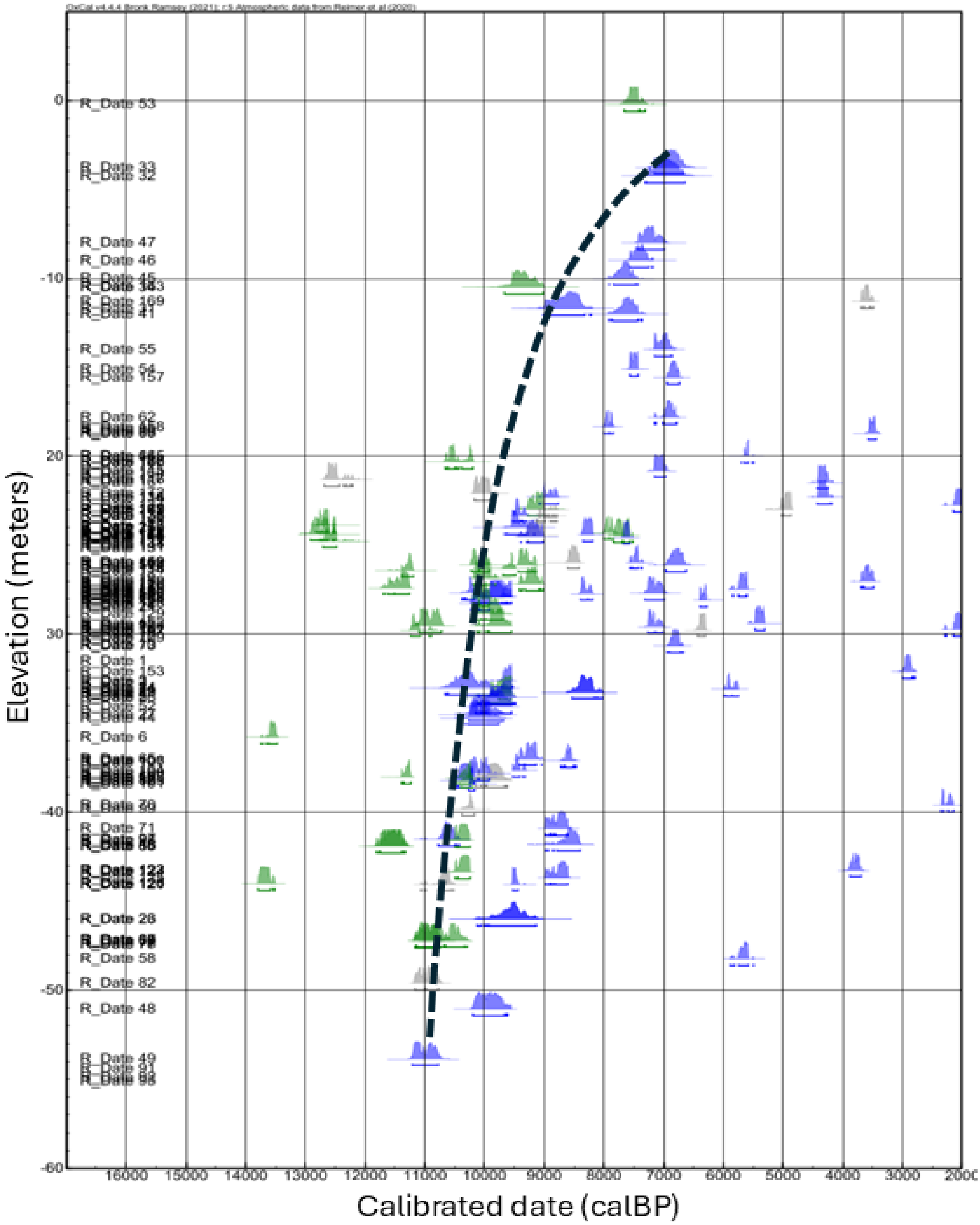


Figure 6 Shoreline displacement curve where the dashed line gives the hypothesized sea level in the planned cable route area during the Holocene. Marine samples are shown in blue whereas terrestrial samples are shown in green.

Figure 6 shows the shoreline displacement curve where the dashed line gives the hypothesized sea level in the planned cable route area in the Holocene. Furthermore, Table 2 summarizes the sea-levels at different times as they appear on the curve. It can be seen from the curve that there is a relatively good correlation between the marine- and terrestrial samples with the latter typically situated above the marine. A poor correlation between the elevations of some marine samples and peat layers is however observed around 8000 cal BP (at a depth around –24m below sea-level). The dated sample from a peat layer is approximately 1000 years younger than expected which might indicate that the terrestrial layer is not peat, but gyttja, or redeposited peat that deposited at a lower elevation.

It is not possible to determine sea levels more precisely than ± 5m because the samples' vertical reference does not typically correlate precisely with that in the past. On top of that is the uncertainty associated with dating shells and peat, combined with the still long intervals where there are few dates to determine sea- levels. Another issue that affects the shape of the curve is the isostatic rebound that has changed the vertical position of the samples used in the shoreline displacement reconstructions. In general, lands to the NE of the OWF area and cable routes have been lifted more than those to the SW. Thus, it is problematic to include points from a wide geographic area. Because the degree of difference in rebound within the area is not known precisely, it is not corrected for in this curve.

The new sea-level curve shows a rapid Holocene sea-level rise that can be followed back to approximately 11.000 cal BP. At this time sea-level was c. 50m lower than present. Over the next 2000 years sea-level rose from –50 m to –13,0 m corresponding to an average rise in sea-level of c. 1.85m/century. Sea-level rise and transgressions were not a liner process but characterised by periods with rapid and slower sea-level rise and maybe even periods with stagnation or fall. However, it is difficult to see these fluctuations in the sea-level curve and determine what caused them. Sea-level rise typically causes the shoreline to shift landward and the horizontal velocity of this transgression is a function of the rate of sea-level rise and the gradient of the local topography. Sea-level did therefore cause enormous horizontal displacement of the coast in the flattest lowest laying areas, whereas sloping areas are less severely affected. Sea-level rise would therefore not necessarily have been perceived as a continues process.

Table 2 Sea-levels estimated from the sea-level curve. Measured sea-levels at various times is used to define sea-levels on the coastline models presented in Figure 10 to Figure 16

Time cal. BP	**Sea-level**
8000	-6,0 m
8500	-8,5 m
9000	-13,0 m
9500	-18,0 m
10000	-26,0 m
10500	-36,0 m
11000	-50,0 m

2.5.3. Sub-bottom seismology and landscape correction

Two reports with interpreted horizons and units were available for this report. The Report no 2, 2D UHRS Survey Geomodel Integrated with CPT Data, Full site (2024) provided by Fugro presented 11 seismic surfaces/horizons (a conceptual model of interpreted horizons and units can be seen in Figure 8). The Geophysical Site Survey Report by Ocean Infinity identified six horizons with the deepest horizon corresponding to deposits from the Weichselian age. Horizons represent the boundaries between different sediment layers in the subsurface, with each layer corresponding to a specific depositional environment. The seismic horizons have been used to identify seismic units. By analyzing a sequence of units, the geological development can be reconstructed. Together with available geological literature from the area, the depositional environment, seismic facies and soil type of the units were interpreted. See Figure 7 for an overview of the interpreted seismic horizons and unit. Understanding these units and horizons is essential for coastal geology, as varying sediment types impact erosion and sedimentation, influencing historical coastline positions.

Unit	Horizon [Colour*]		Seismic Character	Soil Type†	Depositional Environment‡	Age‡	Stress History×
	Base	Internal					
U10	H10 [LightYellow]		Acoustically transparent with point reflectors	Medium dense to very dense sand to silty sand with shells and shell fragments	Marine	Postglacial	A
U20a	H20 [Orange]		Stratified to acoustically transparent; locally forms channel infill	Loose to dense silty sand with shells and shell fragments	Freshwater to Marine	Postglacial	A
U20b				■ Low to high strength clay locally with shells and shell fragments ■ Locally with beds of peat and/or organic rich clay, especially at the base of the unit			
U30a	H30 [DeepSkyBlue]		Complex – stratified to chaotic, with locally internal erosion surfaces and high amplitude positive polarity internal reflectors	Loose to very dense silty sand and sand, locally gravelly and with gravel beds	Meltwater	Glacial (Weichselian)	B1
U30b				Locally a bed of high to very high strength clay at the base	Freshwater		
U35	H35 [LightOrchid]		Complex with locally internal erosion surfaces and high amplitude positive polarity internal reflectors; locally forms channel infill	Loose to very dense silty sand and sand, locally gravelly and with gravel beds, locally clay beds	Meltwater	Glacial (Weichselian)	B1
U36	H36 [Maroon]		Stratified, locally with clinoforms	Loose to very dense silt to sand	Marine	Glacial (Weichselian)	B1
U50a	H50 [Blue]		Acoustically transparent; locally forms stratified channel infill	■ Medium to very high strength clay in the east, locally with beds of peat and/or organic rich clay, especially at the base of the unit ■ Clay and/or sand in the west	Marine	Interglacial (Eemian)	B1
U50b				Sand			
U60	H60 [Violet]		Complex – with internal erosion surfaces and high amplitude positive internal reflectors; locally forms channel infill	Medium dense to very dense sand, locally silty, locally gravelly and with gravel beds	Meltwater	Glacial (late Saalian)	B2
U65	H65 [MediumAquaMarine]		Variable from acoustically transparent, stratified to acoustically complex with internal erosion surfaces and inclined stratification	Sand, clay, gravel and till	Marine Freshwater Meltwater Glacier	Glacial (Saalian)	C1
U70	H70 [DarkGreen]	H69 [DarkCyan]	Well stratified above internal horizon H69, acoustically chaotic below H69. Forms tunnel valley infill	Interbedded till, gravel, sand, silt and clay	Marine Freshwater Meltwater Glacier	Interglacial (Holsteinian) and Glacial (Elsterian)	C2
U90	H90 [DarkMagenta]		Complex – chaotic to stratified (horizontal and inclined reflectors), with internal erosion surfaces	Silty sand to sand, with beds of clay and/or peat	Meltwater to freshwater	Glacial (Pre-Elsterian)	C2
BSU	N/A [Dark Blue]		Well stratified, locally the stratification is less well defined	Clay and sand	Marine	Miocene	D

Notes
* - Colour nomenclature follows Kingdom project.
† - Soil type based on available seabed CPT data. Data from Horns Rev Offshore Wind Farm (Jensen et al., 2008), Thor Offshore Wind Farm Zone (COWI, 2021), 3GW Project Area (Fugro, 2023a) were checked and considered as well.
‡ - Depositional Environment and Age according to the Danish Standard (Larsen et al., 1995).
× - A: Normally consolidated; B: Possibly overconsolidated as a result of subaerial exposure; C: Overconsolidated as a result of glacial loading; D: Pre-Quaternary, therefore possibly lithified; Number is the number of subaerial exposures or number of periods with ice cover.

Figure 7 Seismostratigraphic interpretation, displaying the mapped horizons and the interpreted seismic units in part 2. Figure from Report no 2 by Fugro (2024)

2.5.4. Interpreted horizons and units

As mentioned by Report no 2 by Fugro (2024), the ages of the horizons involve uncertainties and are relative to each other, as the precise age cannot be determined from seismic data. The deepest six units in the Fugro report date from the Miocene to Eemian ages and are not relevant to the archaeological analysis in this report, which focuses on the Late Glacial to Holocene period.

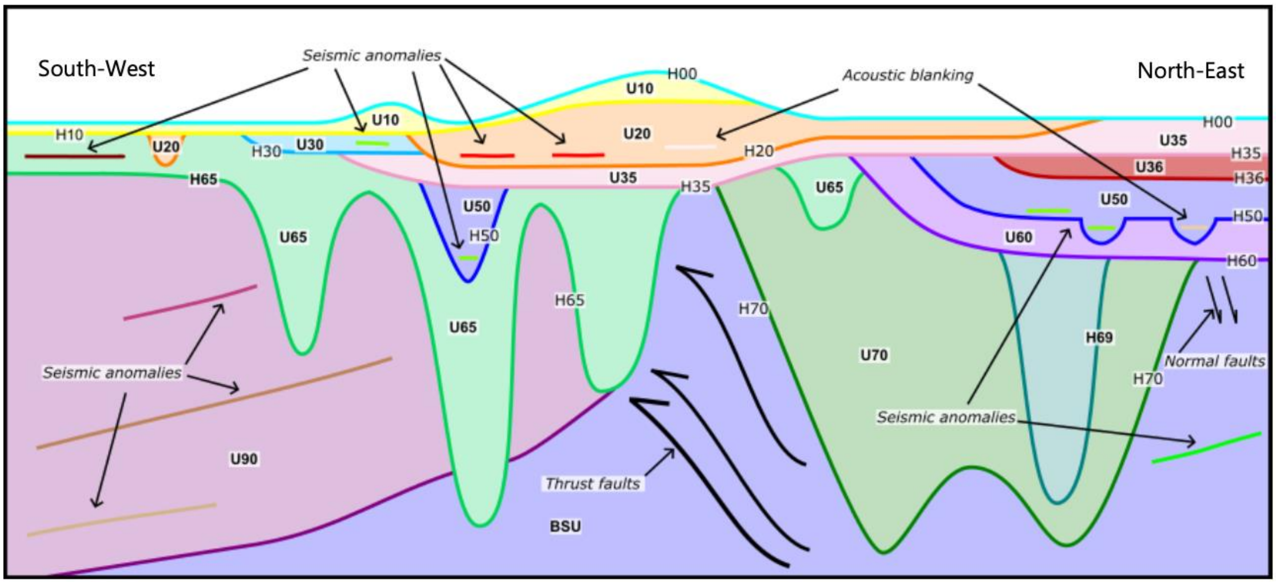


Figure 8 Conceptual model of interpreted horizons and units in the top 200 m. Figure from Report no 2 by Fugro (2024).

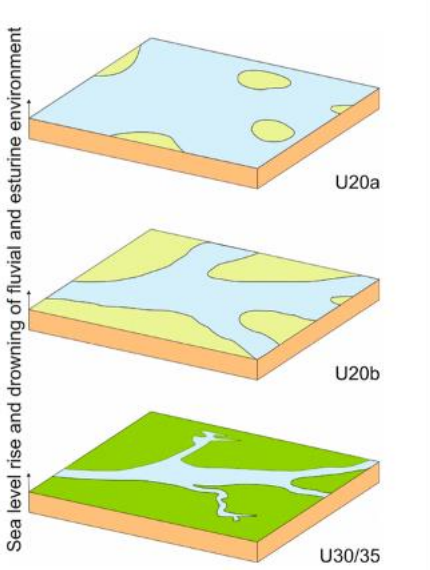


Figure 9 The figure illustrates the sea-level rise during the Holocene, beginning with the inundation of the lowest areas, such as river systems, and progressively covering the rest of the terrestrial environment. Figure from Report no 2 by Fugro (2024).

In the report by Fugro, three units have been interpreted as Weichselian in age: U36, U35, and U30. Of these, Unit U36 is the oldest and is interpreted to range from the Late Eemian to Early Weichselian age. This unit is present only in the eastern part of the North Sea 1 OWF and is considered a transitional layer between the marine clay of Unit U50 and the meltwater sand of Unit U35. Unit U36 comprises silt and sand. Overlying Unit U36 is Unit U35 (refer to Figure 7). Unit U35 is found in the northern and eastern parts of the North Sea 1 OWF (see Figure 8). It is typically around 5 meters thick but locally reaches a thickness up to 30 meters. This unit is dominantly composed of sand, with a base that is flat to undulating and locally channelized. The depositional environment for Unit U35 is interpreted as a meltwater/braided glacio-fluvial system, deposited during the Weichselian glacial period. In the Geophysical report by Ocean Infinity, unit U30 is widespread across the North Sea 1 site (see Figure 8). It consists of sand, with localized occurrences of silty and clayey sand. The thickness of the unit ranges from 0.6 to 14.5 meters. It is interpreted as a glaciofluvial meltwater deposit (Report no 2 by Fugro, 2024) and dated to the Late Weichselian age. The terrestrial units are particularly relevant for archaeology, as it might contain preserved archaeological material. Given that Unit U35 and U30 are interpreted to have been deposited in a meltwater/braided glacio-fluvial environment, these are considered the primary terrestrial units. The horizon that marks the bottom of the units are H35 and H30 and these horizons have been used for reconstructing the paleo coastlines.

According to the report by Ocean Infinity U20 is present in the western part of the North Sea 1 OWF. The thickness ranges from 0 to 3.5 m. The unit is interpreted to be deposited in an estuarine to marine environment, when the site was inundated in the period that followed the LGM (Report no 2 by Fugro, 2024) (see Figure 8). Therefore, the basal reflector of the unit is associated with an erosional surface, resulting from the transgressive events that affected the area. Unit U10 is present in almost the whole North Sea 1 site (Geophysical report by Ocean Infinity, 2024). The unit is 0 to 4.5 m thick. Unit U10 consists of sand. It is interpreted to represent the postglacial marine sands deposited in the Holocene (Report no 2 by Fugro, 2024). This unit is also associated with large sand banks and ridges.

The geophysical surveys in the cable routes were made with 2D seismic (which does not penetrate as deeply as the method used in the OWF area). Therefore, only the upper horizons, H5, H10 and H20, are mapped in the cable routes. For each of the three cable routes, it was a priority to use the horizon that has the greatest coverage. For ESR 1 it was decided to use H5 and For ESR 2 and ESC 3 it was decided to use H10. These were subsequently compiled into one model with H30 and H35 in OWF area using the virtual raster function in QGIS.

2.6. Coastline models

When correcting for the changes (sediment transport, erosion/accumulation) that have occurred in the North Sea 1 OWF cable routes since the Stone Age it is vital to use the most suitable horizon. If there are, for example, traces of buried valleys/lakes in a horizon it is crucial to correct. Alternatively, there is a risk of giving these areas a misleading influence on the results (and lead possible marine archaeological investigations to the wrong places). The Fugro report and the Ocean Infinity report considers horizon H30 and H35, to be the last terrestrial horizon in the Late Glacial and Holocene period. These two horizon grids (tiff´s) are therefore considered a better representation of the prehistoric terrain compared to the modern seabed/bathymetry. We chose to use various horizons across the OWF and cable routes to map the former coastlines because the extend of one horizon not covered the whole area. Where H35 is not present we have typically used the lowest available post glacial horizon because this is considered more representative of the Stone age terrain than the modern bathymetry. The different coastlines are thus all drawn to follow a certain depth in a horizon grid that is considered the most representative of the old land surface. The coastline models were drawn using the raster calculator in QGIS by selecting cell values within the compiled horizon models that were below the sea level of the time. The sea-level used for the different models were chosen based on Table 2, where estimated sea-levels from the sea-level curve are shown. The areas below sea level (in different points in time) were subsequently transformed from raster to polygons.

Figure 10 Modelled coastline at ~11000 years BP, showing no inundation of the area. Contour lines outside the OWF site and cable routes represent modern bathymetry below sea level. Red dots indicate the locations of OWF vibrocores.

Figure 11 Modelled coastline at ~10500 years BP, showing inundation of the lower channel systems. Contour lines outside the OWF site and cable routes represent modern bathymetry below sea level. Red dots indicate the locations of vibrocores.

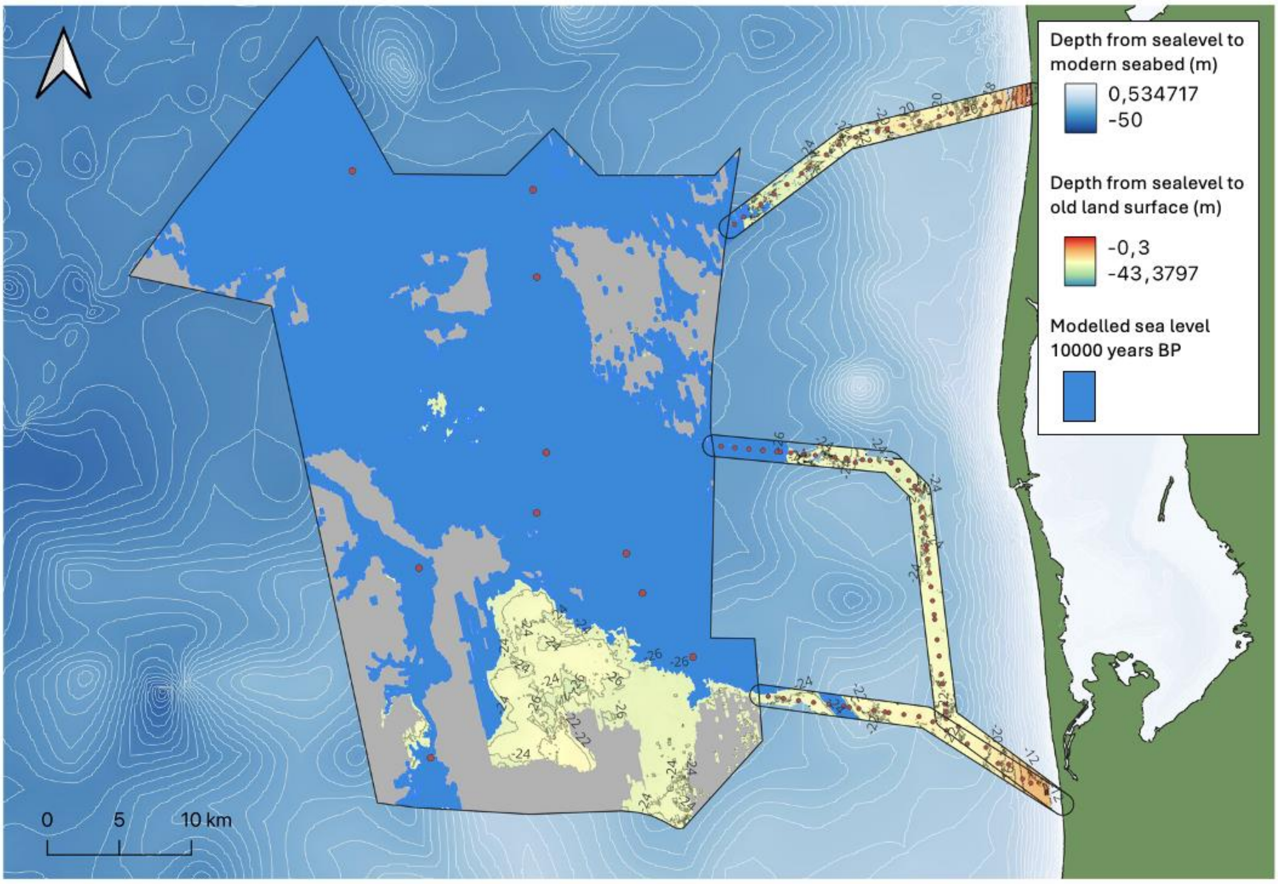


Figure 12 Modelled coastline at ~10000 years BP, showing inundation across the site, but not advanced in the cable routes and southern part of the site. Contour lines outside the OWF site and cable routes represent modern bathymetry below sea level. Red dots indicate the locations of vibrocores in the OWF project area.

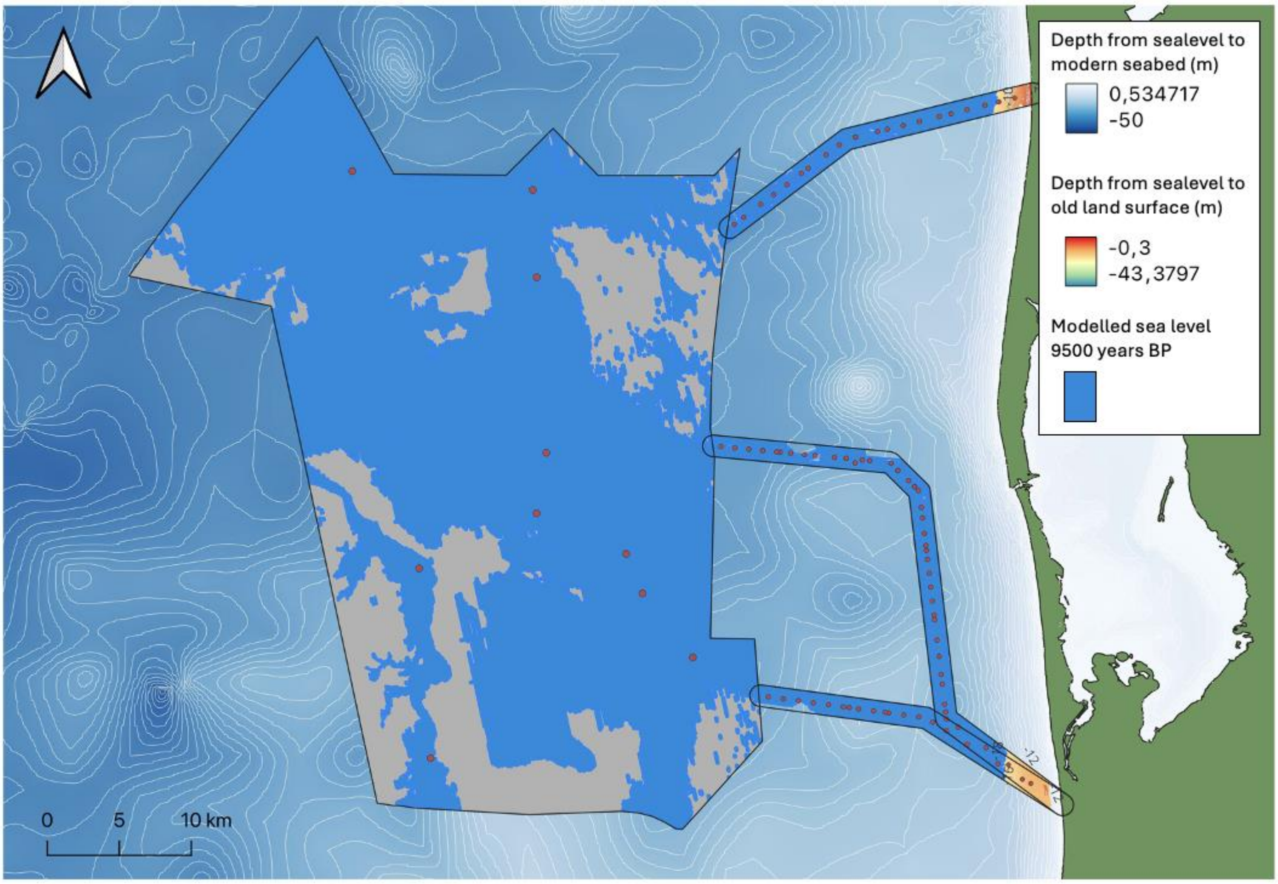


Figure 13 Modelled coastline at ~9500 years BP, showing inundation across both the OWF site and the cable routes. Only small area to the east in the northern and southern cable route remain a land surface. Contour lines outside the OWF site and cable routes repre sent modern bathymetry below sea level. Red dots indicate the locations of OWF vibrocores.

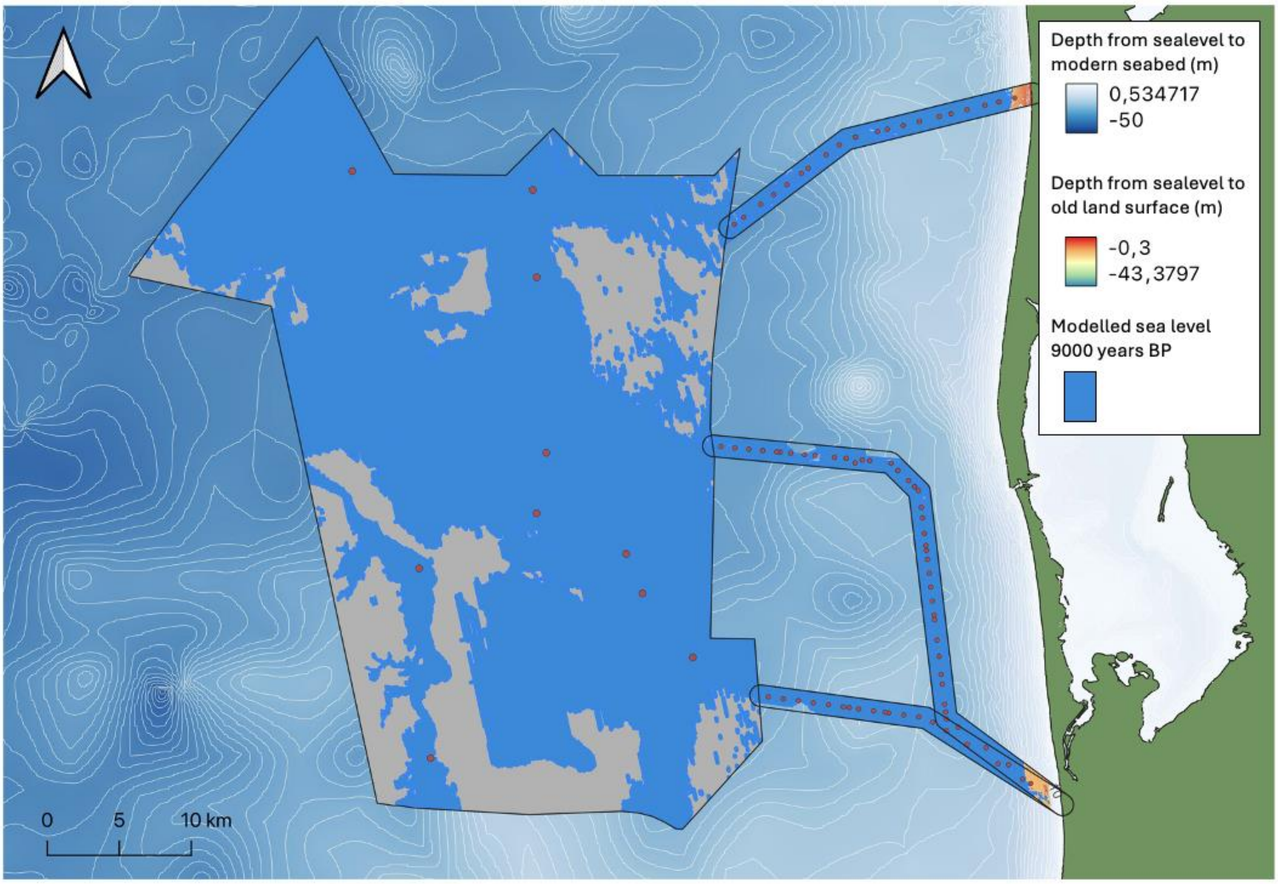


Figure 14 Modelled coastline at ~9000 years BP, showing inundation across both the OWF site and the cable routes. Only small area to the east in the northern and southern cable route remain a land surface. Contour lines outside the OWF site and cable routes represent modern bathymetry below sea level. Red dots indicate the locations of OWF vibrocores.

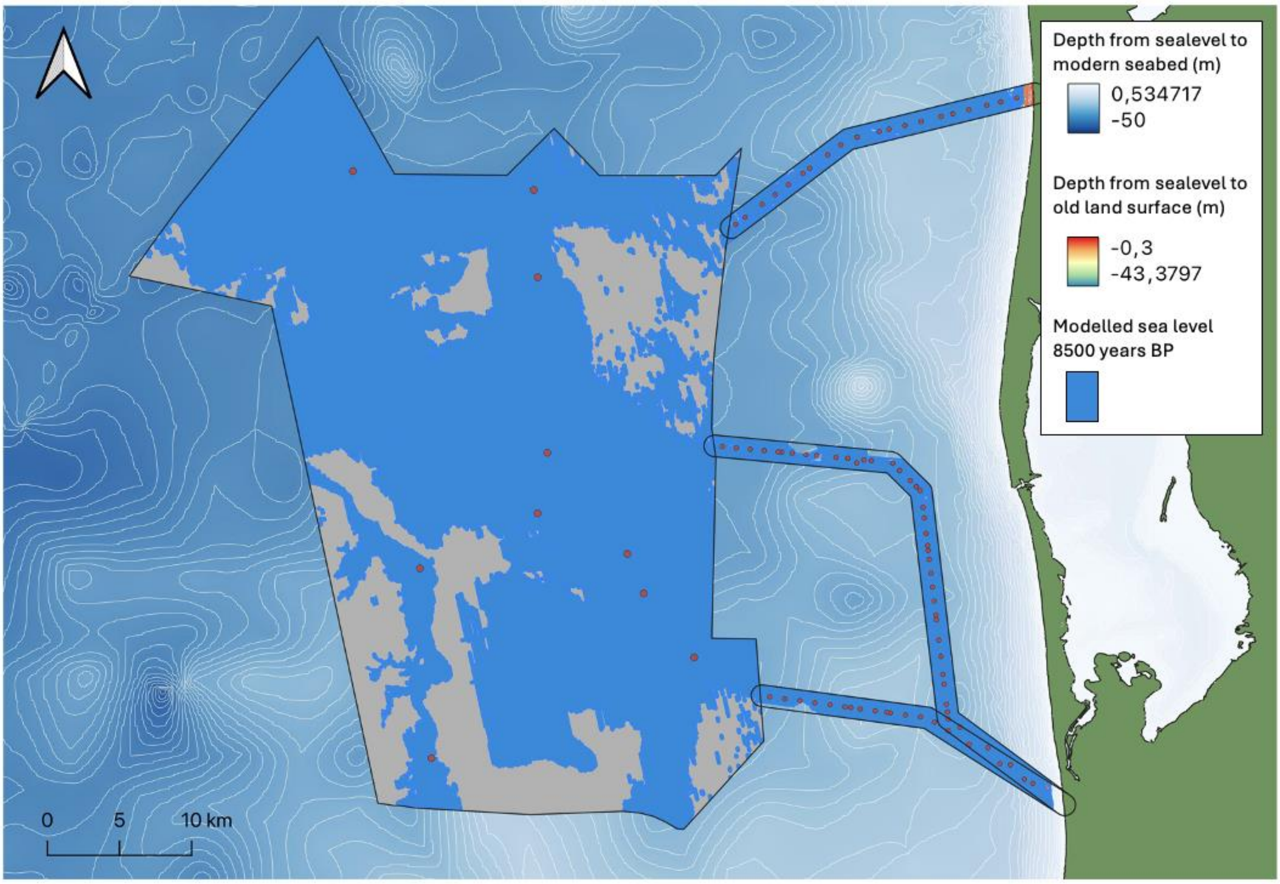


Figure 15 Modelled coastline at ~8500 years BP, showing inundation across both the OWF site and the cable routes. Only a small area to the east in the northern cable route remain a land surface. Contour lines outside the OWF site and cable routes represent modern bathymetry below sea level. Red dots indicate the locations of OWF vibrocores.

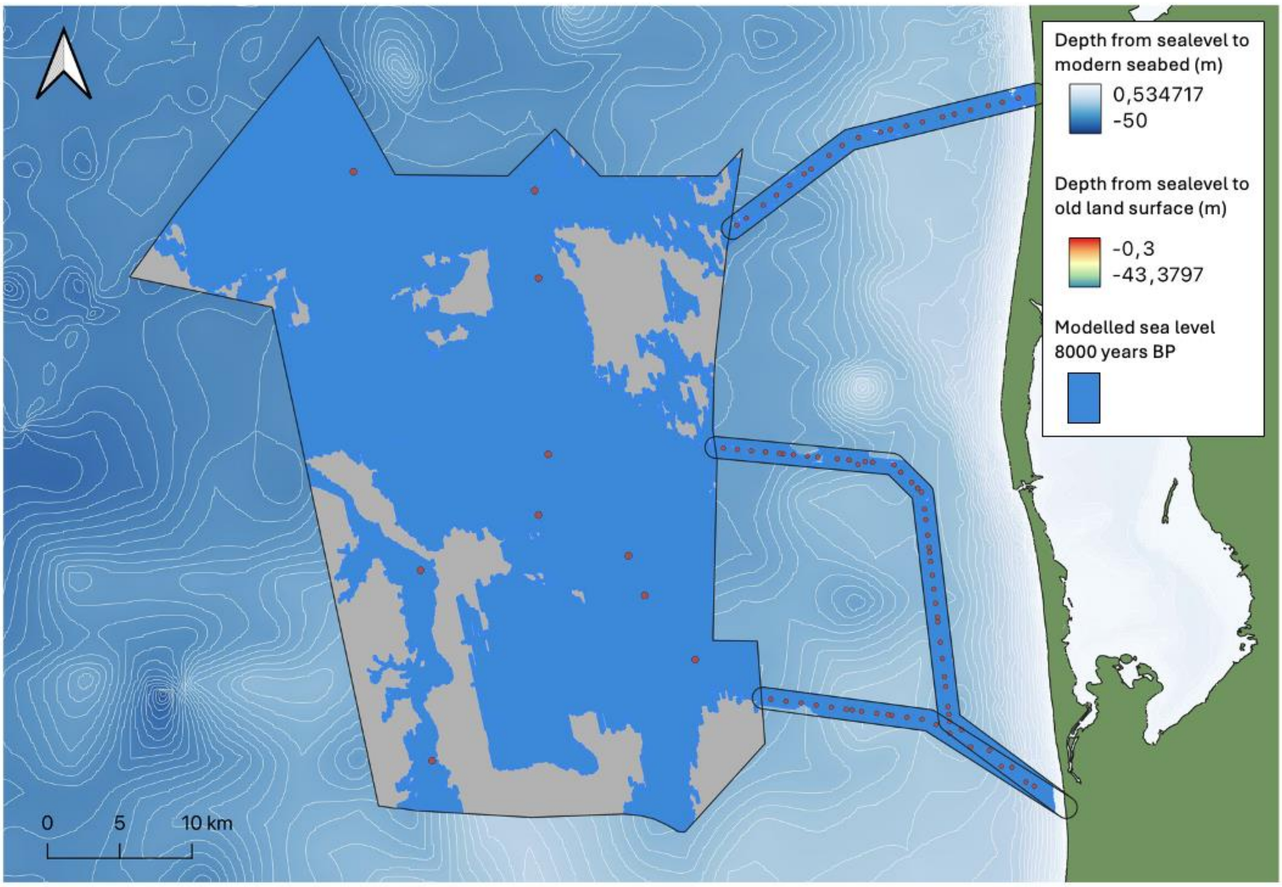


Figure 16 Modelled coastline at ~8000 years BP, showing inundation both across the OWF site and the cable routes. Contour lines outside the OWF site and cable routes represent modern bathymetry below sea level. Red dots indicate the locations of OWF vibrocores.

The sea had not yet reached the area around 11,000 BP and the entire area was therefore dry land. Only 500 years later (10,500 BP) the water entered the northwestern part of the area, forming a fjord-like estuary. Another fjord system also formed in the middle of the area at approximately the same time, but it is difficult to determine the exact outline of this water system since the horizons in this area are not so well defined. Both fjord systems were formed as an extension of the river systems that are visible in the former land areas. A large part of the OWF area was subsequently flooded in only 500 years between 10,500 BP and 10,000 BP due to a sea-level rise of approximately 10 m from - 36 to -26 m. It meant that after 10,000 BP, the two fjord-like systems disappeared in the OWF area. A small fjord system may also have existed in the southern cable route, but this could potentially also be a freshwater river system. Most of the former land areas in the three cable routes were transgressed between 10,000 and 9,500 BP and around 9.500 BP sea-level had reached a point 3-4 km from that of present day in the two cable routes.

The models have shown that it was not possible to settle in the OWF area after approx. 9,500 BP. Potential Stone Age material would therefore have to come from Upper Palaeolithic cultures and/or the Maglemose culture. Only the innermost parts of the cable areas close to land would have been habitable in the Kongemose- and Ertebølle cultures.

2.7. Areas of archaeological interest

2.7.1. Former coastlines and river outlet areas

Normally in a georarchaeological analysis, the reconstructed landscape is used with topographic models (e.g., the fishing site model for coastal areas) to designate areas that is believed to have especially high likelihood of human presence. However, any archaeological sites in the OWF area will have to predate 9,500 BP where little is known about the extent to which people lived along the coasts in the area. Research projects from other parts of Denmark imply that the coastlines are likely to have been places where people preferred to position their habitation sites. For this reason, we have decided to attribute greater archaeological potential to coastal areas suitable for fishing (e.g. areas near fjords, streams, etc.) compared to former inland areas that were not in the immediate vicinity of lakes and streams. In addition, we attach greater value to the areas where the rivers flowed/mixed into the sea. The reason being that these river outlet areas are considered to have been particularly rich in resources. It is also in such areas that many of the largest sites from the Kongemose- and Ertebølle cultures have been found. It should be said, however, that the coastlines were only habitable for a short period of time before the coast had moved again. This had a direct impact on the amount of archaeological material that could be deposited in a given coastal area within the North Sea I area. It is therefore difficult to detect sites in some areas just because it was not possible to have as many repeated settlements/habitations in area that witnessed rapid sea-level rise compared to a stable coastline.

2.7.2. Former lake and river environment

The dated peat layers are important because they are evidence of old land surfaces. While there is no guarantee that the peat layers contain archaeological remains, they show where old land surfaces are preserved and where we can expect areas with excellent preservation conditions for organic material (wood, bone etc.). Traces of the early Mesolithic societies in southern Scandinavia have so far primarily been located along former lakes and rivers systems that later changed to bogs. There are equally good reasons to believe that people also favoured wetland resources in the North Sea I area. In case that the channels functioned as rivers in the early Mesolithic it would probably be a good place to expect activity given that it is in such environments most of the pre-boreal sites in Denmark have been found. The moraine plateau and outwash plains of southwestern Jutland contain (compared with the rest of Denmark) relatively sparse amounts of archaeological material that can be dated to the early Mesolithic period (9,500-6,400 BC). It is not known whether to expect the same pattern (and density) of settlement in the North Sea area as in western Jutland or if there were more sites in proximity to the coasts. A few, but very large, Maglemose settlements have nevertheless been found in the area around Esbjerg in recent years. These sites have been found in areas that differ from the topography that is usually considered typical of the Maglemose period (given that they are not located near wetland areas). If areas, such as those that characterize the settlements found near Esbjerg, would also have to be highlighted in the predictive models almost all areas in the North Sea I project area would have had to be included. However, we believe that the areas around the lakes, streams and coasts of the time should be given greater value than the typical inland areas. The same areas along the rivers and lakes were also habitable longer than the coastal areas. It can be difficult to locate settlements that were located around freshwater basins (lakes and streams) since these are often at risk of being buried under thick layers of younger sediments. Fortunately, Ocean Infinity/Energinet has provided grids and core logs that show the minimum distance from the modern seabed to layers with Stone Age potential. The isopach grids show where it is difficult to reach layers with archaeological Stone Age potential and where it is unlikely that cables etc. will cause any damage to Stone Age sites. The designation of areas for archaeological phase III test surveys are all planned in areas that were suited for settlement in the past and where sedimentation allows such investigations without extreme difficulty in accessing the layers. Ocean Infinity/Energinet´s isopach models can thus be used to prioritise areas with a thin sediment cover (less than 3-4m) on top of H30 and H35.

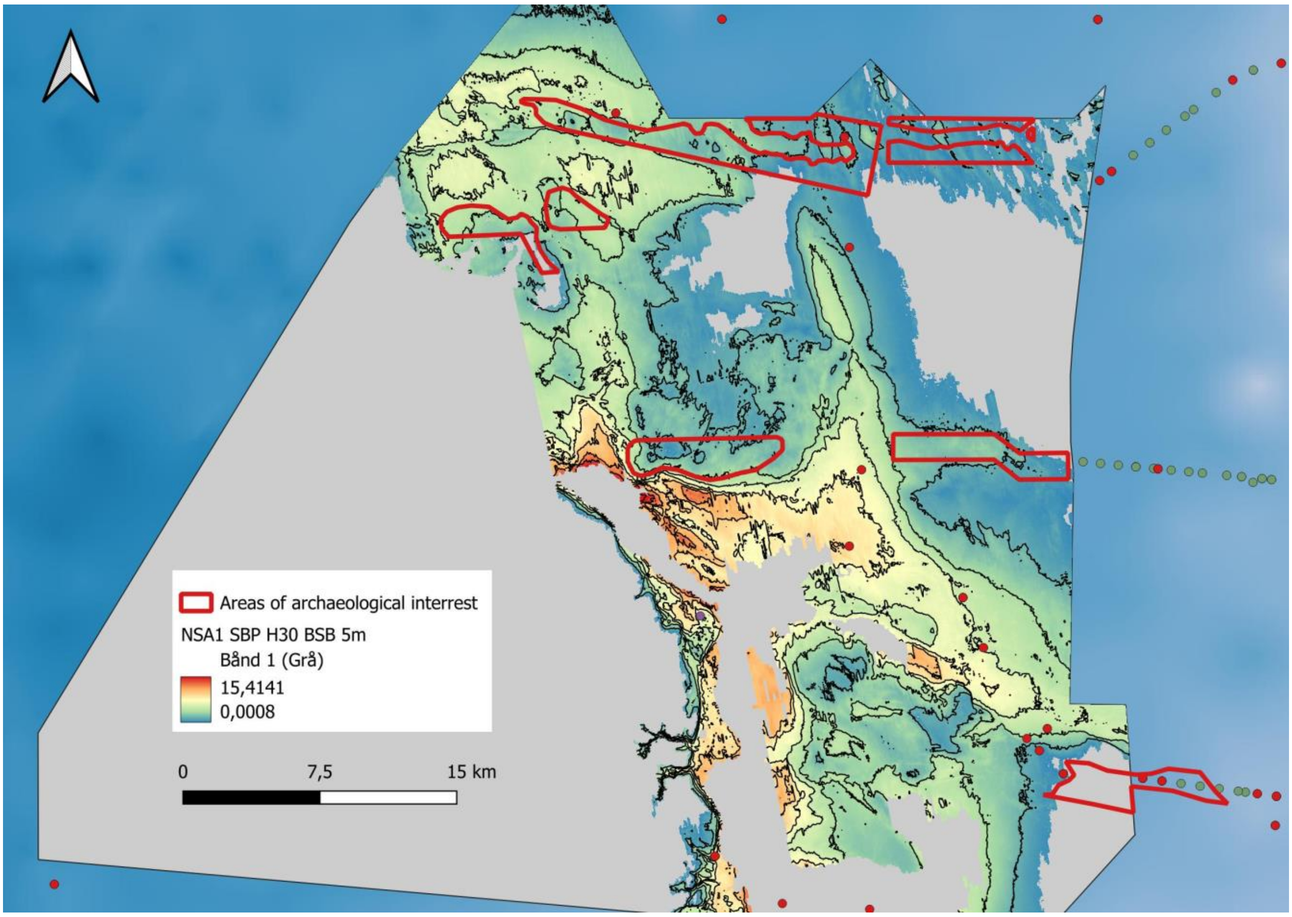


Figure 17 BSB isopach model of H30 in the North Sea I OWF area. Contour lines are made with 2m elevation difference.

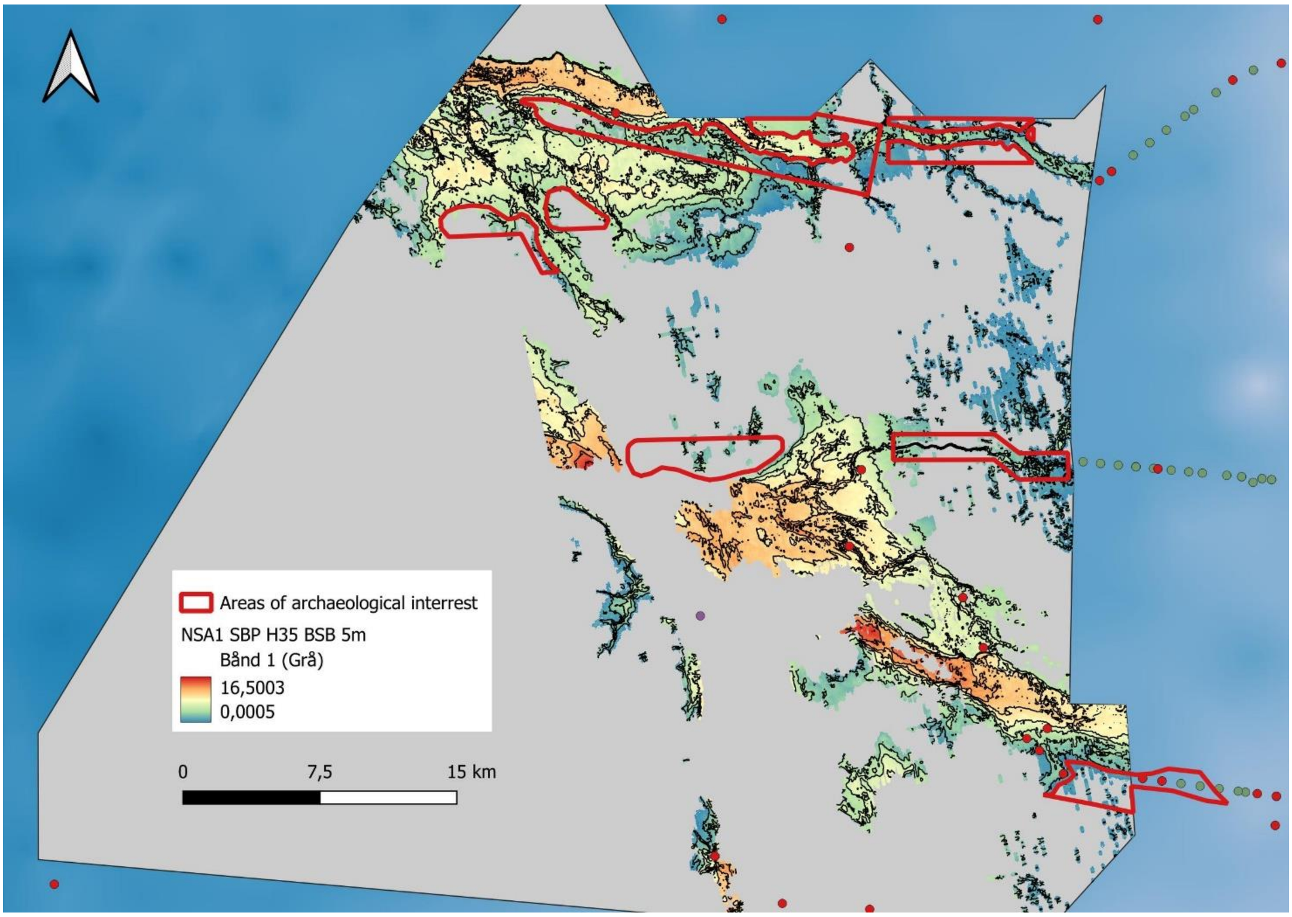


Figure 18 BSB isopach model of H35 in the North Sea I OWF area. Contour lines are made with 2m elevation difference.

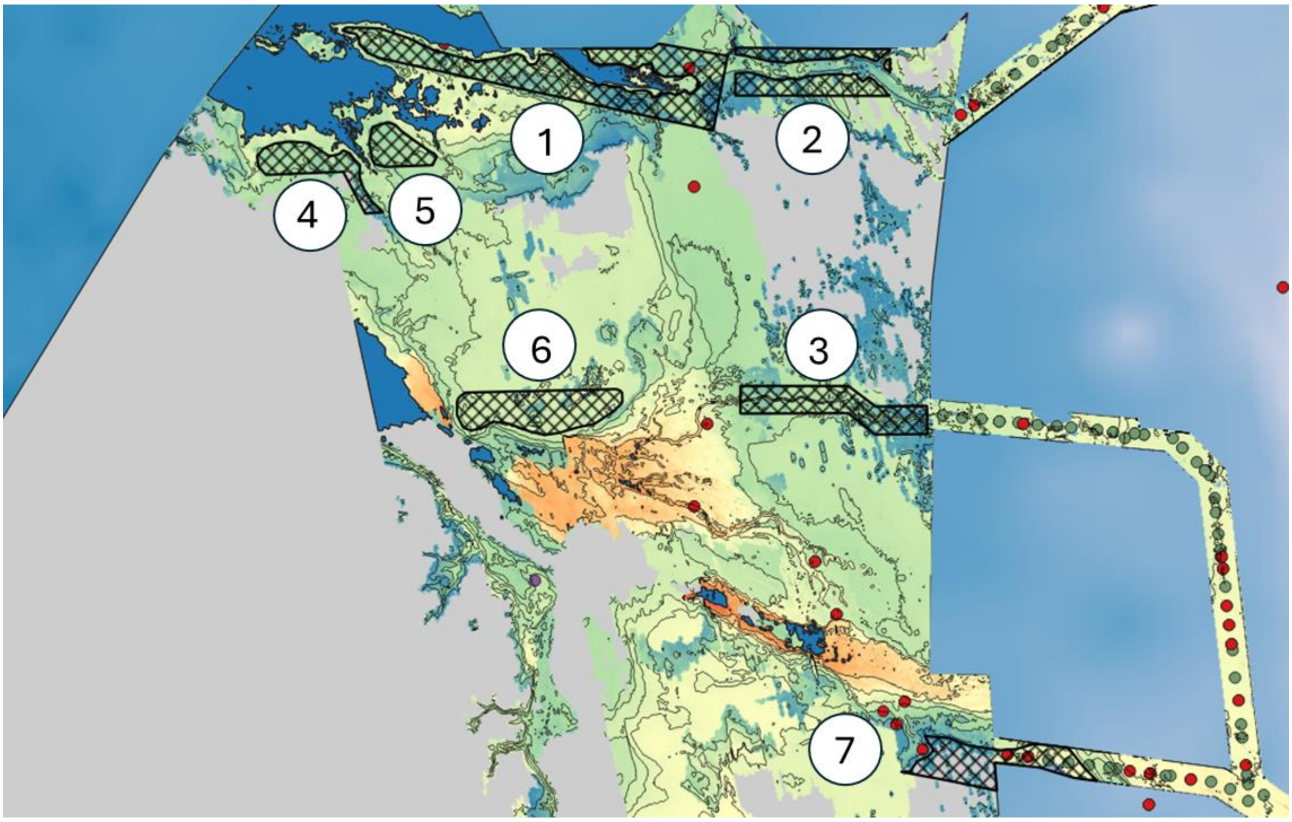


Figure 19 Areas of increased archaeological potential.

2.8. Recommendations regarding submerged Stone Age archaeology

It is rare that enormous landscapes that existed thousands of years ago appear with an incredible amount of details. That is nevertheless exactly what has happened in North Sea I project. The scale of the project allows us to present a coherent picture of a landscape that once consisted of forests, rivers, lakes, fjords and hunter-gatherers. The landscape provides a good starting point for selection areas with archaeological potential and therefore it is recommended that seven areas in this landscape should be examined in a subsequent phase III survey. Our rationale for the selection of these areas can be summarized as follows:

Area 1: Is selected because of its topography that is thought to have provided favourable conditions for the exploitation of a wide combination of marine- and terrestrial resources. The area was situated next to a tunnel valley until it was inundated by the sea and therefore it might also have been suitable for the late palaeolithic reindeer hunters. A fjord system developed around 10,500 BP and if people also exploited marine resources, we believe that this was an ideal place to place potential habitation sites. A larger river system ran into the eastern part of the fjord system. Such areas are known to have been very attractive in the late Mesolithic and we think that the opportunity it gave to exploit a mix of resources from a river and the ocean could have been equally favourable around 10,500 cal BP as in the late Mesolithic.

Area 2: Is selected because it provided favourable conditions for the humans to exploit resources in a nearby river and forest. Sites in similar environments are known from many places in Denmark where they cluster along former rivers and lakes.

Area 3: As with area 2 this area provided favourable conditions for the humans to exploit resources in a nearby river and forest. Sites in similar environments are known from many places in Denmark where they cluster along former rivers and lakes.

Area 4 and 5 are selected because they are located close to a fjord system. From these two areas it was possible to exploit a combination of marine- and terrestrial resources around 10.500 cal BP. A small stream also seems to have had its outlet between the two areas making this area of special interest for the same reasons as explained in area 1.

Area 6 is selected for two reasons. First of all it was located near an area were several streams meet before the area was transgressed. Such areas are likely to have been rich in freshwater resources because people could exploit resources from more than one stream/river at the same place. The areas of interest would ideally have been slightly towards south where the streams meet. However, the amount of sediment that has been deposited in this area is so massive (see Figure 17 and Figure 18) that it is considered too complex to reach and investigate. The other reason why area 6 is considered of particular interest is because it was located close to the coast from approximately 10,000 cal BP, but with the streams still within reachable distance. A study from Vendsyssel (Astrup 2018) indicates that people preferred such areas in the early Mesolithic.

Area 7 is selected because it is located close to a former fjord system. From this area it was possible to exploit a combination of marine- and terrestrial resources around 10,000 cal BP. A small stream or fjord also seems to have existed in the east of the area making this area of special interest because such areas are likely to have offered more resources.

2.9. Conclusions regarding submerged Stone Age archaeology potential

The geoarchaeological analysis concludes that construction works pose a threat to prehistoric settlement sites in North Sea I OWF and cable route areas. These conclusions warrant a phase III-based survey in seven deliberately selected areas.

The North Sea I (area 1) project covers an enormous area of approximately 1373 km^2. We would strongly recommend that an archaeological test survey is made to examine if archaeological sites/material can be identified in the seven areas mentioned above. Due to the water depths in the area, it will probably be necessary to carry out such a survey by suctioning up material. The various areas have been selected because of their topographical characteristics and features (e.g. the fishing site model) and because potential archaeological material is considered to be accessible within these specific areas because of a limited sediment cover. It is suggested that an agreement is made between the developer, the Danish Agency for Culture and Palaces and MAV as to how (and how many) positions that should be examined in a subsequent archaeological test excavation survey.

3. Submerged historical archaeology

3.1. SSS- and MBES-data processing methods

As part of the geo-archaeological analysis, the SSS, MBES and MAG data were analysed. The SSS data as with corrected navigation were analysed with the software SonarWiz 8, and then subsequently exported to QGIS for further analysis. Here, the data was screened systematically by a team of archaeologists at DKM with experience in geophysical data analysis. In this process, targets already found by the geophysics team were also reviewed. The work was organized by survey blocks, as outlined in the Geophysical site survey report (Ocean Infinity 2024). The result of this screening process was then reviewed further by a maritime archaeologist. It is due to this double review process that the sites are not numbered consecutively below.

Relatively recent wrecks can often be spotted in SSS data. But wrecks, which have lain exposed to the North Sea over a longer period, cannot easily be identified. Wrecks will be so degraded that they are difficult to identify or, even if well-preserved, they may be covered by bottom sediments. The migration of sediments will conceal and then occasionally uncover wrecks and remains temporarily (Figure 20).

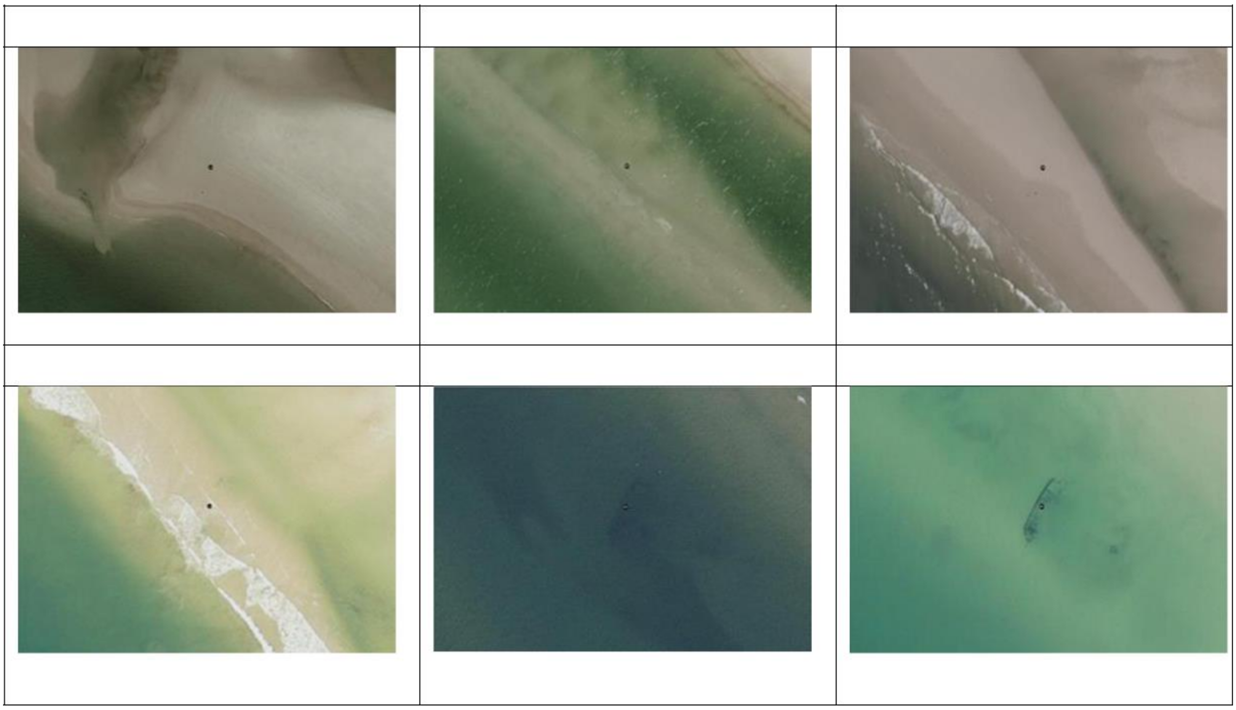


Figure 20 Aerial photos of the gradual exposure of an unidentified wreck at Esperance Bay, Skallingen.

Apart from possible wrecks, larger debris such as shipping containers are also listed in the following, as they represent large man-made objects, although not protected by historical considerations. This to provide the best possible foundation to assess the work. Where applicable there are also cross refences to the SSS targets and MAG anomalies provided by Energinet, and to FFM. For easy comparability, the maps of SSS and MBES data are shown in scale 1:1000, unless stated otherwise. The MBES data are shown from the GeoTIFF files provided with the data.

While several well-preserved wrecks are found in the SSS data, a few of the sites designated below show a very diffuse scatter of debris. This may happen if the ship was torn apart by some violent event. Most notably this has been seen in the wrecks from the Battle of Jutland: The stern section of the HMS INDEFATIGABLE was located by MBES survey in 2016 (Figure 21). It was found 500 m from the main section of the hull, the stern forming a scatter of debris. Events of this type would be rare, but some targets have been included, as they may belong to this type of site formation.

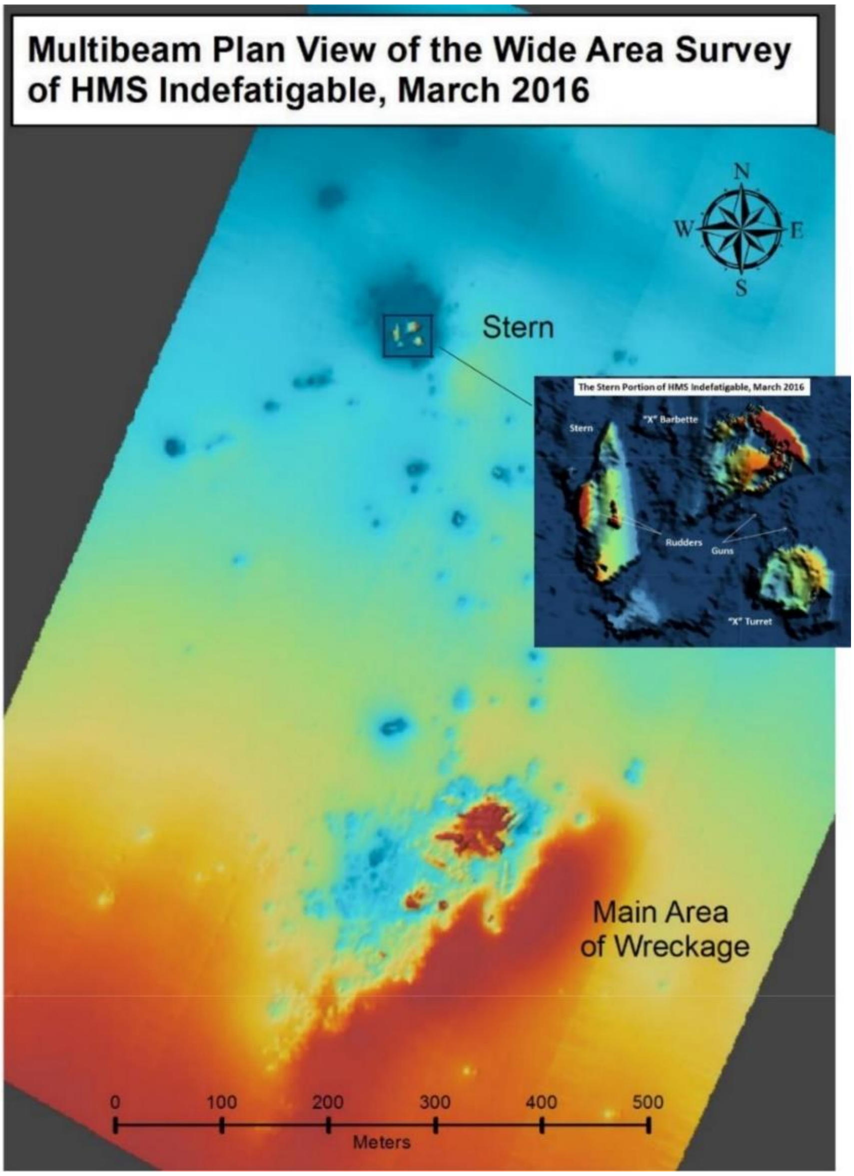


Figure 21 Debris area from HMS Indefatigable. MBES data from 2016 with insert detail of the stern section. From: McCartney 2017, fig. 5 and 6.

Due to delays, only preliminary data from the cable routes were available at the deadline of this report. Therefore, there are no references to SSS or MAG targets selected by the survey company in this section.

In the preliminary data set available, SSS data were not present for the NNW-SSE connection between ECR2 and ECR3. MBES were available for all areas, and a hill shaded version of these data were used in lieu of SSS data. The routes were characterized in parts by a heavily rippled seabed, strongest c. 5-8 nm off the coast. Here, observation of smaller pieces of debris is difficult.

Using the area density of SSS targets in Area 1, the expected number of targets in the three cable routes is c. 2. This area is different from Area I, though. The littoral is a high energy zone, which may mean that wreck sites are likely to have been strongly damaged upon grounding. It may, however, also mean that the remains are quickly covered in sediment, and therefore are well preserved beneath the seabed (cf.Figure 20). In both cases the sites would hardly appear in SSS data.

3.2. Wreck databases

3.2.1. Wreck databases for the OWF Area I

The SSS data will thus only show the situation at the time of survey. Other important sources are the existing databases of wrecks. These are Fund og Fortidsminder the Danish National Sites and Monuments Record (FFM), as well as Vragdatabasen, a database of wrecks maintained by recreational divers. These data have been presented in previous reports (A. Jensen 2023: *Arkivalsk kontrol havmøllepark Nordsøen 1* and A. Jensen 2023: *Nordsøen I Havmøllepark og kabelruter – Arkæologisk analyse).* Insofar that the wrecks registered here are not visible in the SSS data, they were most likely covered by sediment at the time of surveying but are still present in the seabed.

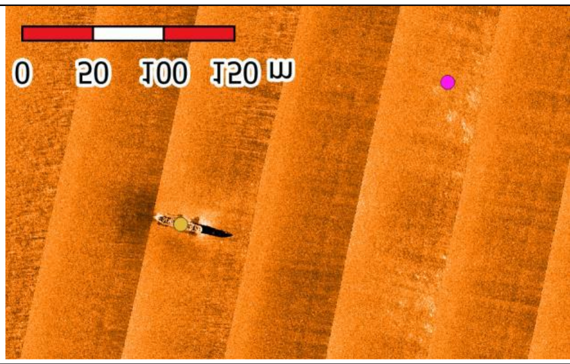
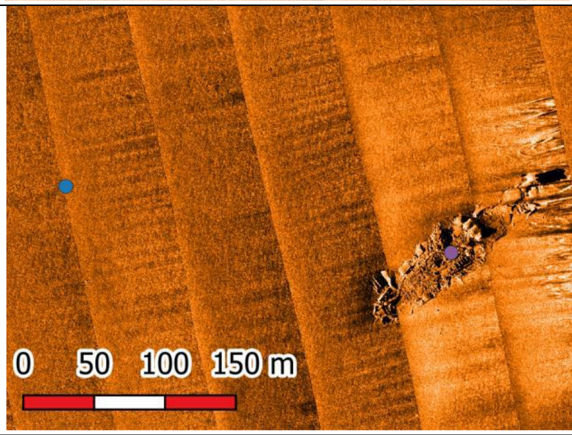
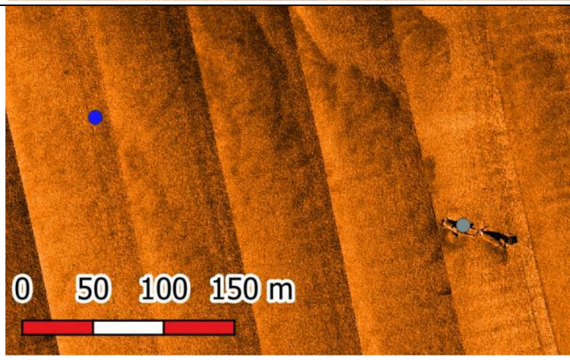
It must be made clear that the positions recorded in these databases often are inaccurate. Some of the data stem from the Danish Maritime Authorities, where for instance a ship would for instance have been reported to have sunk '5 miles SW of Borbjerg'. While a geographical point can be set at that exact position, it is obviously not a precise location for this wreck. It is also worth noting, that this exact description exists in the material below, and that the location set by the authorities is nowhere near any measure of 5 miles from Bovbjerg.

In other cases, ships have only been recorded to have vanished in a broad water area. In these cases, the recorded position is in the centre of the area: Vessels lost 'at Dogger Bank' with no further positional information are placed in the geographical centre of the water Dogger Bank. Such 'administrative' positions act as a placeholder to mark that wrecks are somewhere in the general area. It is for this reason that a full 15 wrecks are placed at the exact same position within in the northern of the three cable transects. These ships all beached in the period 1860-1902, and detailed records were not immediately available to place them. Through further investigation, typically through local official og newspaper records, they can sometimes be placed more precisely. But mostly the available information is not sufficient.

An important source behind the registered wrecks are fishermen reporting snagged fishing gear, or authorities reporting sunk vessels. The positions reported are not always very precise, and they stem from a long period of time, using very different navigational techniques, from dead reckoning to GNSS. Only few of these reported wrecks can be seen on the SSS or MBES data. They must be assumed to have been fully covered in sediment at the time of data recording, although some have also been fully salvaged. Vessels from the database that are confirmed salvaged are not listed below.

Not least considering that the Danish Museum Act requires a protection zone around significant wreck sites, the imprecision of the locational information poses a palpable challenge. To gauge the nominal precision of the recorded wrecks, the position of wrecks identified in the SSS data in Area 1 have been compared to the position given in the databases, where they can reasonably be assumed to refer to the same wreck. This gives an estimate of the precision. As seen in Figure 9, three such connections can be found (of six positively identifiable wrecks). Two of those, however, are remarkably similar with distances of 276-278 m and bearings from SSS target to FFM point at 255-260°. As the measurements will vary with the exact placement of the points, it almost seems as if some systematic error has been introduced in the georeferencing of these sites. Attempts were made at reverse engineering a set of coordinate conversions, which would reproduce this discrepancy, but no convincing results were found. It must be noted, though, that the original positional data may very likely have been given just as DD°SS’. Hence positional precision cannot be expected beyond nominally 1 nm, and at these latitudes factually around 1 km, i.e. ±500 m.

Table 3 In three cases can registered wrecks from FFM (red dot) be identified in the SSS data. Scale of maps: 1:5000.

Site	Site and location number (FFM)	Distance (m)	Bearing °	Image
BM05_001 Unidentified wreck	400110c-68 Reported as snag by fishing vessel	214	116.9	
BM08_002 *SIERRA CORDOBA*	400110c-126 Identified	276	261.4	
BM11_002 Unidentified wreck	400110c-41	278	254.6	

In terms of geographical precision, the databases of wrecks are the weakest data. The position has been shown above to be off by op to 300 m from a confirmed wreck site, and technically may be off by up to ± 500 m. Oppositely these data are strong in terms of evidence, as they often build on archival material, in which case the identification and age of the wreck is certain. Some wrecks in the databases have later been salvaged, and thus removed from the following.

The two main databases are the Danish SMR, Fund og Fortidsminder (FFM), and the sport divers' wreck database, Vragguiden. Both have geographical positions. Other databases without positional information have been consulted for reference.

These sites are generally covered in sediment, and thus not visible in the other data. In cases, where they can plausibly be linked with SSS og MAG targets, they have already been listed above, and thus not repeated below. The confidence is generally set to 2 – 'Medium', as the exact position of the wrecks is uncertain, although much confidence can be placed in the identification and year. With the potential discrepancies in registered and actual position, it is difficult to advice on a suitable protection zone. However, as remains of these wrecks may still exist below the seabed, they are important to include here. Caution must be shown when working in the general area surrounding these positions.

Table 4 Sites from Fund og Fortidsminder in Area 1.

ID	Site and location nr. (FFM)	Easting	Northing	Confidence	Significance	Year lost	Description	Recommended Action
BM03_015	400110c-17	420953.78	6208587.78	2	2	1898	Wreck 2 masts seen above water in 1898. EfS 5/1889. GENTJEK BM03_006-009.	Caution
BM03_016	400110c-93	422994.79	6208587.78	2	1		Airplane. Reported by fishing vessel. Not seen on SSS MAG nor MBES. Potential war grave.	Caution
BM04_016	402103-48	412919.78	6225392.66	3	2	1897	Wreck, wrong position? Original record says, '5 miles SW of Borbjerg'. The distance from this point to Borbjerg Fyr is 50,400m. This does not fit (pre-metric) 5 Danish nm (9,256m) nor 5 Danish miles (37,660m).	None
BM04_017	400110c-40	415800.79	6216144.72	2	2		Wreck Reported by fishing vessel. No further data.	Caution
BM04_018	400110c-122	420787.82	6195788.86	2	2	1911	Wreck Pilot cutter, Nicolaus, sunk 1911. Same year 'neutralized', probably by explosives. Not mentioned in 'Dansk Søulykkesstatistik 1911'.	Caution
BM05_013	400110c-53	410179.79	6226004.64	2	2		Wreck. Reported by fishing vessel. No further data.	Caution
BM06_009	400110c-108	408466.79	6228375.62	2	2		Wreck. Reported by fishing vessel. No further data. NB: Position c. 250 m N of Area 1.	Caution
BM06_010	400110c-118	411564.84	6228375.62	2	2	1921	Mast sighted 1921. EfS 905/1921. No further data.	Caution
BM06_011	400110c-28	413470.87	6193957.85	2	2	1921	Wreck sighted 1921. EFS 1020/1921. No further data	Caution
BM08_009	400110c-130	406327.88	6205169.76	2	2	1897	Wreck. Observed 1897. EfS 27/812 1897. No further data.	Caution

ID	Site and location nr. (FFM)	Easting	Northing	Confidence	Significance	Year lost	Description	Recommended Action
BM09_027	400110c-120	396645.85	6235084.54	3	2	1900	Wreck. Observed 1900. Not found by later search. EfS. 939/1900. No further data.	Caution
BM09_028	40010c-71	407662.92	6188607.87	2	2		Wreck. Reported by fishing vessel. No further data.	Caution
BM10_006	400110c-56	393729.87	6231727.56	2	2		Wreck. Reported by fishing vessel. No further data.	Caution
BM10_007	400110c-8	397201.26	6215215.08	1	none	1984	Fishing vessel Mikkel T-100. Sunk 1984 due to collision with M/S Eva Oden (6950 dwt Ro-Ro)	None
BM10_008	400110c-25	403438.94	6192243.83	3	2	1896	Wreck 2 masts seen above water in 1898. EfS 5/1889. GENTJEK BM03_006-009.	Caution

3.2.2. Wreck databases for the ECR areas

For the cable routes, there are a total of 19 wreck sites registered, 15 in the northern corridor, and four just outside the southernmost corridor (Jensen 2023). The 19 wrecks are registered in only two positions, all obviously being 'administrative' or placeholder positions in lieu of the actual, but unknown positions. While some of these positions can be improved, there are still several wrecks in the general area, which we cannot locate. These wrecks all fall under the 100-year protection of the Danish Museum Act. They are thus protected, even if their position cannot be ascertained in a desk-based study. Due diligence must therefore be exercised during the construction phase, as protection under Danish heritage laws is not formally conditioned on previous discovery.

3.2.2.1. ECR Northern group

In the northern group of 15, one ship can immediately be excluded from this study, as the historical record shows it to have been salvaged and towed off for repairs (FFM 402102-10). The rest are very difficult to place precisely. In some cases, the placenames can give clues to the approximate position. For instance, one position is given as 'Fjand' (FFM 402102-2). This is too far north to be relevant to the present area, no matter the exact position.

Comparing to placenames on the topographical maps of the early 20th century, the northern Cable Route (ECR1) seems to reach land at Vedersø Klit. Therefore, the ship stranded here (FFM 402102-13) is likely to be found within or at least near the cable corridor. 'Husby Klit' is placed S of Vedersø Klit, while the village Husby is N of it. On the earliest topographical map, from the late 19th century, the stretch called 'Husby Klit' is here named 'Husby Strand', and there is no mentioning of Vedersø Klit. This means that references to 'Husby' are difficult to place along the entire stretch of coast, both N and S of the landfall of ECR1. A geographical reference to "*Off Herning customs chambers district*" ("*Herning Toldkammers jurisdiktion*", FFM 402102-51) is also not very helpful in this context.

For these reasons, there is very little information to aid in assessing whether these wrecks could appear in the northern cable transect. They are a useful reminder of the density of wreck sites along the Jutland North Sea coast, as also demonstrated on the section of Hohlenbergs map on Figure 22. Due diligence must be shown for construction in these areas. It is a standard provision for permissions that in case of accidental finds during construction works the relevant museum and the Agency for Culture and Palaces (SLKS) will be informed, and the works stopped immediately. The relevant registered wrecks are shown in Table 5.

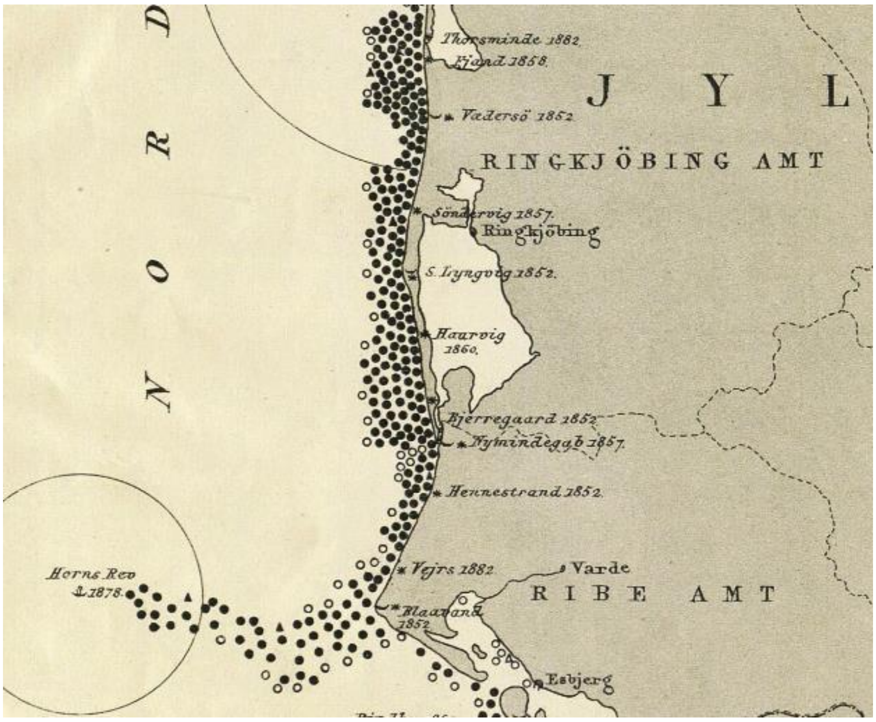


Figure 22 Section of map showing the strandings on the west of Denmark from Horns Reef to Thorsminde from January 1st 1858, to December 31st 1885 (Hohlenberg 1887).

Table 5 Sites from Fund og Fortidsminder in the Northern Cable transect.

Site and location nr. (FFM)	**Year lost**	**Description**	**Rec. action**
402102-1	1860	Wreck. Beached. Wreck sold at auction	Caution
402102-3	1889	Wreck. Beached and wrecked.	Caution
402102-4	1863	Wreck. Beached. Wreck sold at auction.	Caution
402102-5	1898	Wreck. Grounded and destroyed.	Caution
402102-6	1862	Wreck. Beached, apparently salvaged.	Caution
402102-7	1902	Wreck. Grounded c. 600 m [‘1000 El’] from land.	Caution
402102-8	1853	Wreck. Beached. Cargo salvaged and wreck sold at auction.	Caution
402102-9	1860	Wreck. Beached at the outer shoal.	Caution
402102-11	1903	Wreck.	Caution
402102-12	1902	Wreck. Grounded, sunk and wrecked.	Caution
402102-13	1863	Wreck. Declared destroyed at beaching. Wreck sold at auction.	Caution
402102-14	1882	Wreck. Schooner Caledonia in ballast towards Britain. Wreck sold and broken up.	Caution
402102-51	1857	Wreck. Total loss.	Caution

3.2.2.2. ECR Southern group

The four southern wrecks with a 'placeholder' position are all located just south of the southernmost cable route corridor, but within 1 nm of the corridor. These are four German armed trawlers, which was hunted onto the beach by eight British destroyers on Sep. 1st 1917. The destroyers formed the 15th destroyer flotilla attached to the Grand Fleet and was there as part of a sweep off the Danish Coast. The trawlers escorted two German submarines, which escaped the attack by diving.

The registered position is clearly a placeholder, and quite far away from the actual. The approximate position of these wrecks can be deducted from an eyewitness account by P.C. Dahl (2007), at the time a 15-year-old resident of the farm Gl. Bjerregård. The two southernmost trawlers, CREFELD and HEINRICH *Bruns*, were stranded straight west of Gl. Bjerregård, the boats separated by only 50m. The northernmost, ADMIRAL VON SCHRÖDER, was 4000 ell (Danish 'alen', c. 2,500m) N of this, while the RINTELEN was just off Bjerggård hamlet, and thus south of ADM. V. SCHRÖDER. Based on this account, they can be put more correctly on the map (Figure 23).

Dahl also records that many British 4" shells fell on land, into the fjord and onto 'Tipperne', the salt meadows further inland. The latter area would have been off target by up to 4 km, or more. Given the range of c. 10.6 km of the QF 4" Mk. IV, which armed these destroyers, that is less than impressive gunnery. Or possibly the British tried to shell the potential escape routes of the shipwrecked German mariners, sending numerous broadsides into neutral Danish territory.

The distance from the one recorded position in FFM, and to the southernmost of the four ships in these new positions is almost exactly 7 km in a NN. These four wrecks, if remains are still present, are thus not affected by the current cable project.

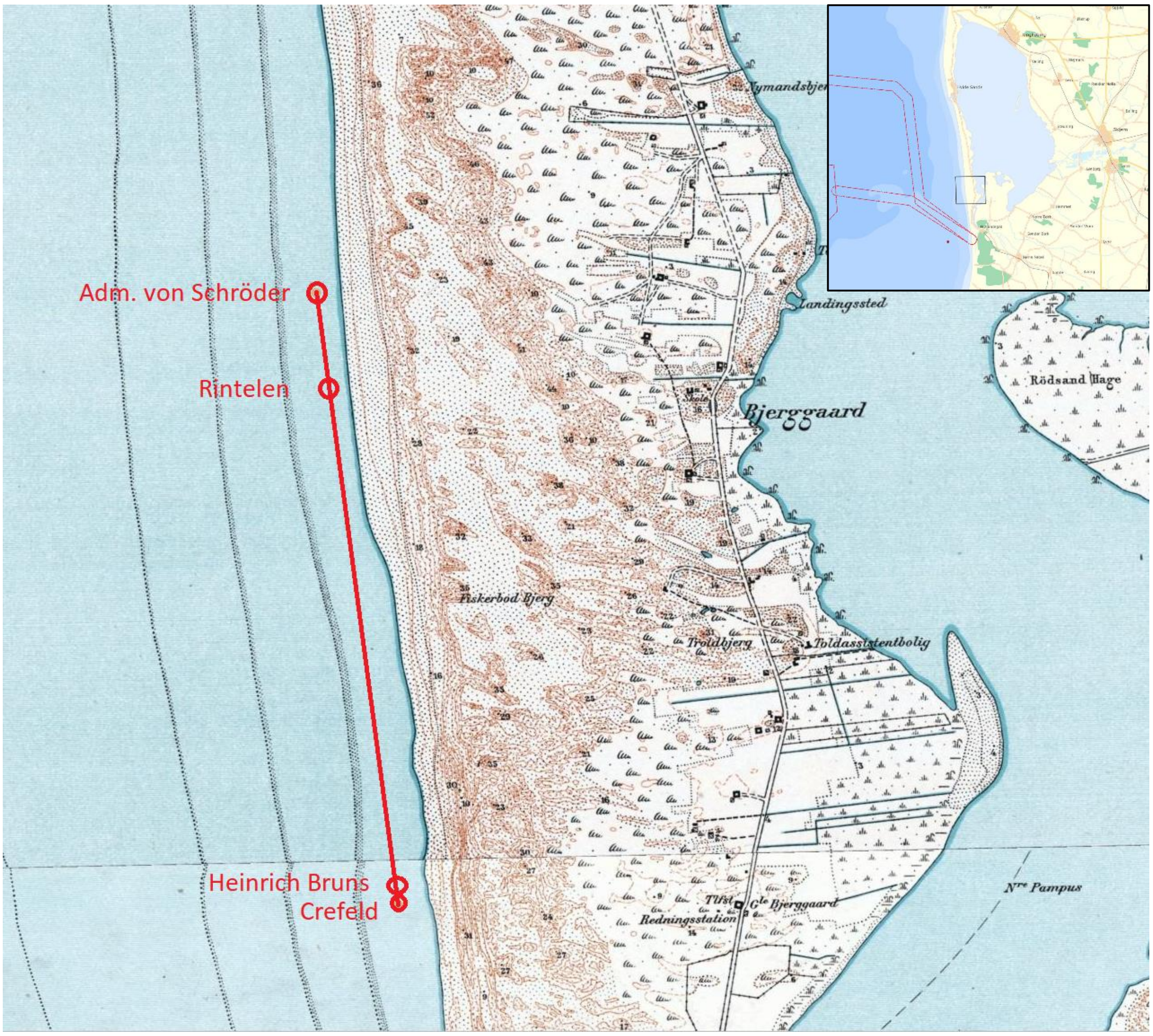


Figure 23 The four German armed trawlers lost in the neutrality violation on Sep. 1, 1917, can be placed roughly from eyewitness accounts. The event happened at the southern end of Ringkøbing Fjord, along the c. 2.5 km stretch of coast marked by the red line. The approximate position of the ships is marked with circles. Insert map is an overview, showing the southern cable routes (ECR2, ECR3). Background map: 'Lave målebordsblade'/'Skærmkort', Dataforsyningen, Klimadatastyrelsen. Not to scale.

3.3. MAG-targets

The SSS anomalies were also cross-checked with the MAG targets provided by Energinet. As older wrecks in the area will most likely be covered by sediment, the original MAG data (CSV format) were also reviewed. Minor anomalies can be explained by debris being lost or dumped from vessels, and thus are less important here. Larger anomalies, in nT values or in spatial extension, are highly likely to represent wrecks.

These data were delivered without P2P values. Therefore, the original data has been used in the following. These data give a residual value in nT from the background for each measured point. An internationally accepted standard in maritime archaeology to identify wrecks from magnetometry data is a P2P value of 50 nT. In this case we have set a more restrictive threshold or either +50 nT or -50 nT. Nominally this gives a P2P threshold of more than 100nT, but in practice both peaks are not always seen clearly in the data. This depends on the distance and orientation of the target to the survey line. As such a more restrictive approach makes sense in this context to only target the strongest signals: Those, where a substantial ferrous object is buried beneath the seabed.

Due to the use of a single sensor setup, the sampling rate is high along the survey lines but is distanced c. 70 m between the lines. As such MAG data cannot pinpoint the location of a wreck (cf. the Best Practice document). But with the use of protection zones around the centre of the strongest signals, it is possible to prevent hidden wrecks from being damaged during construction. It is obviously not possible to assess with certainty whether these signals represent wrecks, nor if they are older than 100 years.

Illustrating the potential MAG responses to a target relative to the survey transect, Holt (2019) demonstrates how a transect right along the wreck (track C) will produce the classical + - anomaly in the data, while other courses may give only positive or only negative responses. In fact, a transect right at the border between positive and negative anomaly will hardly any have response at all. These situations are all reflected in the actual data from North Sea I.

In the following, the MAG anomalies are shown with red as positive (> 50nT) and blue as negative (< 50nT), with the MAG point Targets delivered from Energinet shown in yellow. For clarity these anomalies are shown against the SSS data, with a standard scale of 1:1000, unless otherwise is stated with the map. For nomenclature, these point clusters are called ‘MAG anomalies’, while the single points delivered by Energinet are called ‘MAG Targets’ and referenced below. This method makes it visually easier to assess the MAG anomalies, compared to the single points of the interpreted MAG points.

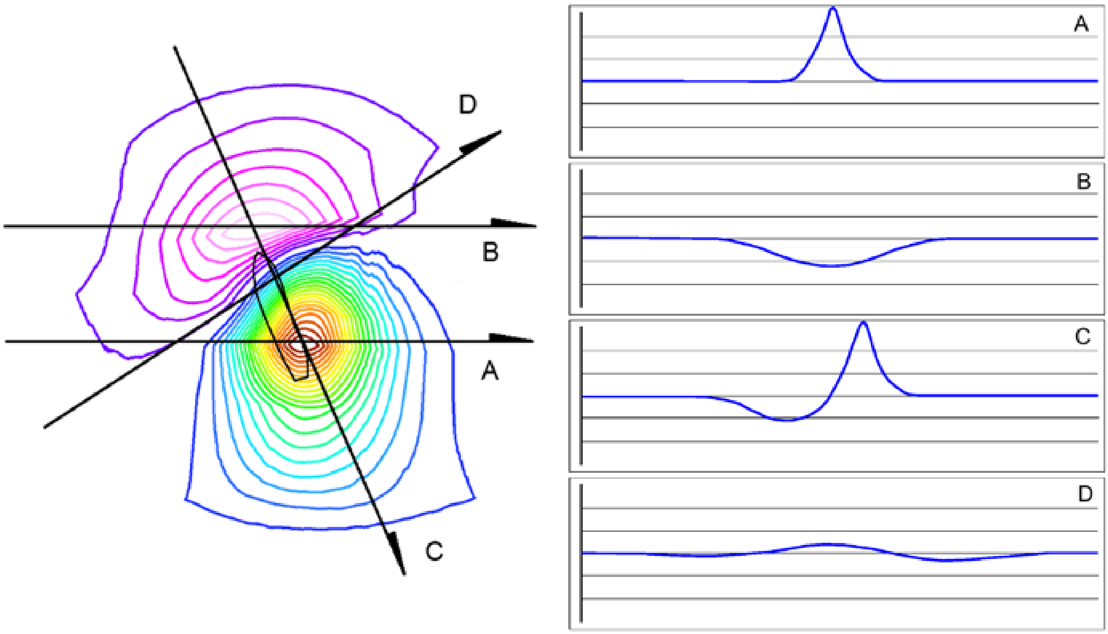


Figure 24 Armed trawler HMT Elk (L×B: 31.1 × 6.4 m, mined 1940). The magnetic field model, and examples of the resulting magnetic response at various curses through the magnetic field. After Holt 2019: Fig. 8.

3.4. Confidence, significance and recommendations

All designated targets in the following have been assigned a confidence level from 1 (High) to 3 (Low). This assessment describes how certain the description and identification of the remains is.

All targets have also been assigned a significance level, again from 1 (High) to 3 (Low), but also with a level of '-' (None), meaning that the remains are not protected under the Danish Museum Act. This category especially applies to wrecks or larger debris which is obviously new: Shipping containers, pipes etc. Such targets have been included here for completeness.

These values are set by individual assessment for the SSS targets, where the target can be seen and assessed. The Confidence represent how easy this assessment is, while the Significance denotes how historically important this site it, given the confidence.

Wreck databases generally have high confidence in the historical information level, but low in their position. Hence the confidence is rarely higher than 2: 'Medium'. The significance is set according to the description given, and to the criteria given in the Danish Museum Act.

By default, MAG targets will have both 'Low' Confidence and 'Low' Significance. This is a function of there being no other evidence: In cases where a clear SSS target can be seen with the MAG response, the confidence may be high, but in that case, it is listed with the wreck site as a SSS target. In a few cases, e.g. where the MAG response is characteristically strong or long, the confidence is set to 'Medium'.

It is the role of SLKS to define exclusion zones around wrecks and anomalies etc. The recommendations given in this report should therefore be regarded as the museum's initial recommendation from which SLKS can make their decision.

3.4.1. Most significant finds in the OWF Area 1

The German SIERRA CORDOBA (BM08_002) is the largest vessel found, with an original length of 155 m, and a somewhat longer debris field. It had previously been damaged by fire and bombing, when it was lost in tow in 1948. Although not formally protected by the 100-year limit, we highly recommend that it is still protected during this project.

A small vessel with a high L:B ratio has previously been identified as a small freighter by JD- contractors (BM11_002). It is partly turned upside down which gives it a seemingly high L:B ratio. No further is known on the ship, including its identity.

Three unidentified wrecks of somewhat similar dimensions are BM03_002, BM05_001 and BM06_001. They have the size and shape of typical steel trawlers of the late 19th to the early 20th century, although BM06_001 has a fuller, more rounded bow, and is more likely later than the other two. As such they can have employed either in fishing, or as mine warfare vessels and patrol craft during WWI and WWII. With the vast number of trawlers lost during the wars, as well as those lost during fishing operations in peace time, they are challenging to identify without close examination.

A smaller steel vessel (BM04_003) is seemingly a double ender, or at least have a narrow stern. It can also be interpreted as a fishing vessel. Alongside the trawlers, smaller drifters were also employed in naval work during the world wars. Hence, both interpretations are possible.

Even if they stay unidentified after further investigation, these six well preserved wrecks should be protected in future development.

3.5. Summary and recommendations for historical archaeology in OWF Area 1

In all 76 positions are registered within Area 1. Some of these positions are included for completeness, as they stood out clearly in the data, although they are clearly not protected. For these locations, the recommended action is stated as ‘None’.

The SSS data produced 19 targets, of which 6 are clearly well-preserved wrecks. Others are more indistinct debris, for which a protection zone is recommended. Depending on the extent of the target, we have recommended protection zones of 100 m (8 sites) or 50 m (7 sites). This means that 5 targets are mentioned, but no action is deemed necessary.

Of the 42 MAG anomalies with unusually high deviations from the background (± 50nT), two could be excluded for stemming from recently dropped cargo, in the form of pipes. For the other 39, protections zones are recommended. The radius recommended is either 50 m or 150 m depending on the size of the anomaly, with a threshold of 10 m length of anomalous data.

7 historically recorded wreck positions in FFM are protected by the Danish Museum Act, all being more than 100 years old, while another 6 are positions reported by fishing vessels, and thus potentially protected, as the age is unknown. For all these sites, there is a risk that they are preserved in the sediment, and therefore special care must be takes in the areas surrounding them. One historical position seems to be erroneous, while one position is given for a recent wreck. In both cases no action is warranted.

The total number of positions for which action must be considered is therefore 67.

All 77 sites are attached in SHP format, Euref89 UTM32N :

- A_Area1_Archaeology_Historical_Potential.SHP

3.6. Summary and recommendations for historical archaeology in the ECR areas

A total of 58 positions are registered with in the three cable routes. Unlike for Area 1, no wreck sites from historical databases have been included in this count, as even their approximate position cannot be determined.

The SSS data produced 4 targets, of which one is interpreted as a wreck site. For this site (ECR3_002) we recommend a further ROV/diver survey. Another target (ECR3_002) seems more like concretions, but has a high MAG reading, and is located close to the possible wreck, and could be investigated with ECR3_001). The other two targets may well be modern debris. We have recommended a protection zone of 50 m for these sites.

The remaining 54 targets are MAG anomalies with high deviations from the background (± 50nT). For these, protections zones are recommended. The radius recommended is either 50 m or 100 m depending on the size of the anomaly, with a threshold of 10 m length of anomalous data. The vast majority of these sites have a limited size, and thus a 50 m zone is recommended for 48 of these sites.

All 58 sites are attached in SHP format, Euref89 UTM32N :

- A_ECR_Archaeology_Historical_Potential.SHP

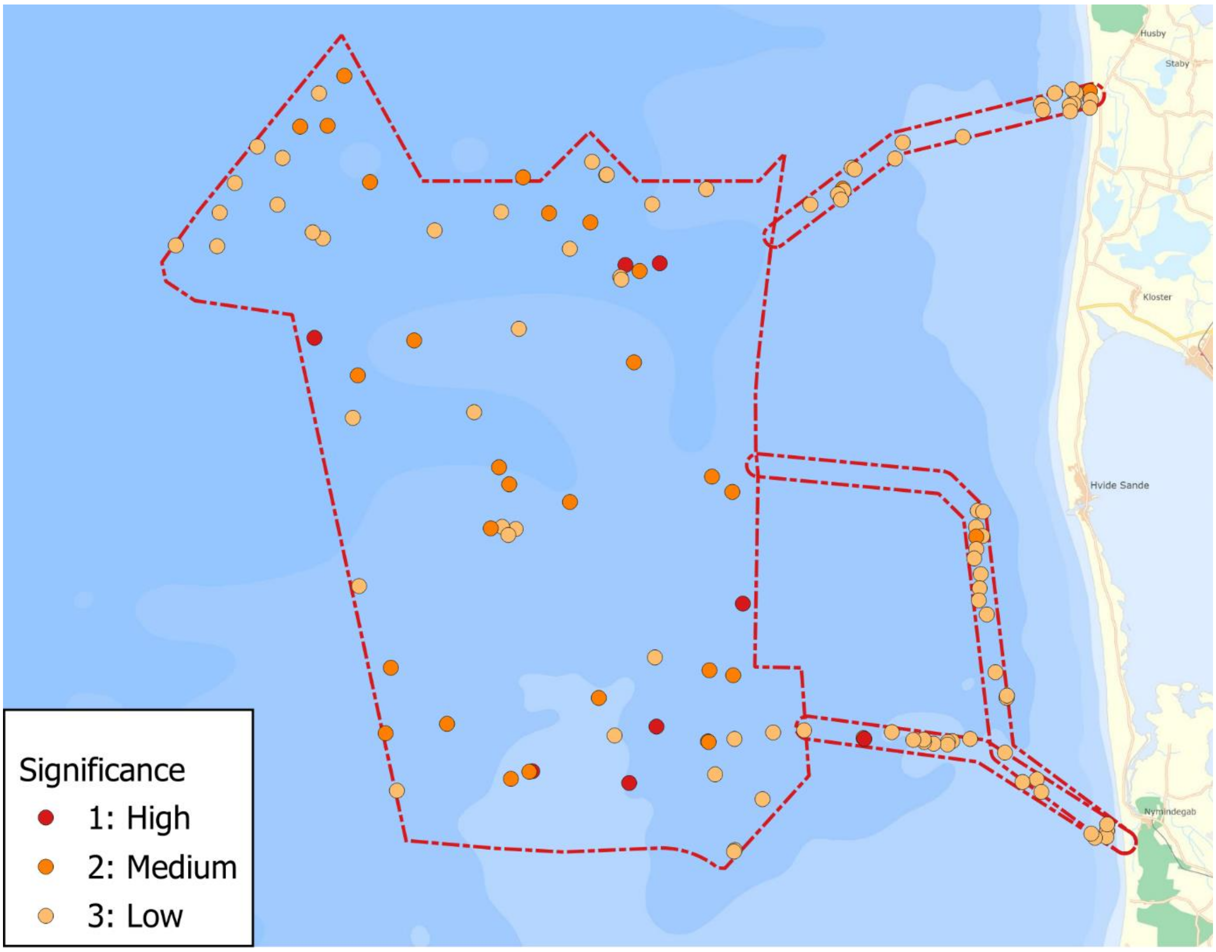


Figure 25. Overview of sites in Area 1 and the cable corridors with significance 3 or higher. Scale 1:500,000. Background map: 'Skærmkort', Dataforsyningen, Klimadatastyrelsen.

3.7. Target investigation

If avoidance is not possible or proves impractical, the target should be investigated to identify whether it is of archaeological character. Target investigation is generally conducted by deploying divers or ROV's or a combination of both. Consideration needs to be given as to whether the target is located on the surface or buried and additionally to the visibility on site.

Work class ROV's are considered a safe and practical way to investigate targets as they can be equipped with cameras and survey equipment and with dredge pumps for excavation.

If ROV's are to be used, MAV recommends the following equipment/requirements should be met during any investigation, as a minimum:

- Work Class ROV as a minimum
- Capable of operating within the following conditions:
    - significant wave height min 2.5 m
    - wind 12 m/s
    - 2 knots current, fully laden (i.e. all equipment operating)
- ROV HD camera system (2 per ROV)
- Inertial Nav System (INS)
- Doppler velocity log
- Digital Edge HD recording system (or equivalent)
- Adequate manipulators and grinders to conduct the required operations
- Depth sensor accurate to +/- 1 m
- Ability to carry out excursions at least 150 m from the vessel
- Obstacle avoidance sonars
- USBL system, IXSea Gaps or equivalent
- Dredge pump capable of efficiently excavating sediments given the seabed conditions
- Metal detector (e.g. innovatum/gradiometer (7pin) or TSS pipe tracker (2 m array minimum)) for target relocation

Optional:

- High Resolution Sub-Bottom Imager (e.g. Pangeo SBI)
- ARIS Sonar (or equivalent)

The configuration of the camera system should allow for variations in view, strobe orientation and focal length in order to maximise data quality with respect to the prevailing conditions. A method of determining scale for the field of view should be evident in the video frame. The video should be supplied with its own source of illumination, which will be no less than 100 W (equivalent) and suitable to provide colour-balanced scene illumination at depth. The video shall be digitally recorded on board the vessel with a means to review, replay, capture and extract data digitally immediately after acquisition.

Due to certain factors the use of divers can be advantageous. The divers would use hand-held locators (metal detectors) to relocate the target and diver operated air lifts to expose buried objects. However, if targets are buried deeply i.e. more than 1 m then it may be preferable to use remote operated excavation equipment due to the safety implications of diving near excavations and the risk of hole collapse.

If divers are to be used, MAV recommends the following equipment to be deployed during the investigations as a minimum, but in accordance with the client´s operating procedures on underwater works:

- Divers must have archaeology familiarisation and search training/experience
- Surface Supplied Diving (as opposed to SCUBA). If SCUBA is proposed, justification for this method should be provided
- Diver to surface communications
- Diver to vessel live and recordable video link, via the diver's helmet
- Diver held metal detectors capable of detecting to 2 m below seabed
- Digital Edge HD recording system (or equivalent)
- USBL system (IXSea Gaps or better)

A method of determining scale for the field of view should be evident in the video frame. The video should be supplied with its own source of illumination, which will be no less than 100 W (equivalent) and suitable to provide colour-balanced scene illumination at depth. The video shall be digitally recorded on board the vessel with a means to review, replay, capture and extract data digitally immediately after acquisition.

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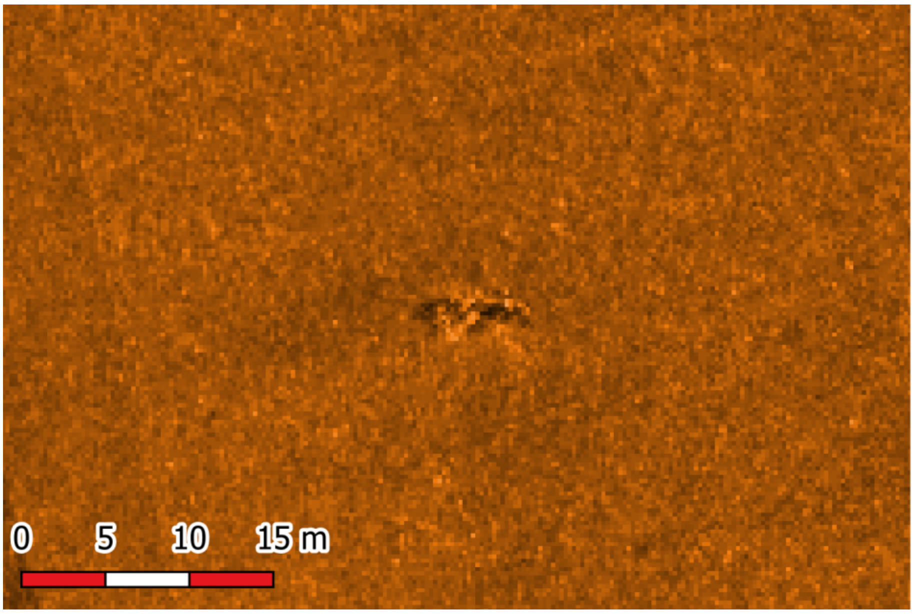
5. Appendices

5.1. SSS-targets in the OWF Area 1

<table>
<tr><td rowspan="3">BM01_001
Debris?

Confidence Level: 3
Significance level: 2

Age uncertain</td><td>Position:
422302.57E 6207577.75N</td><td>Target: S_NM_BM01_0048
F&F: N/A</td></tr>
<tr><td colspan="2">NB: Scale 1:500.

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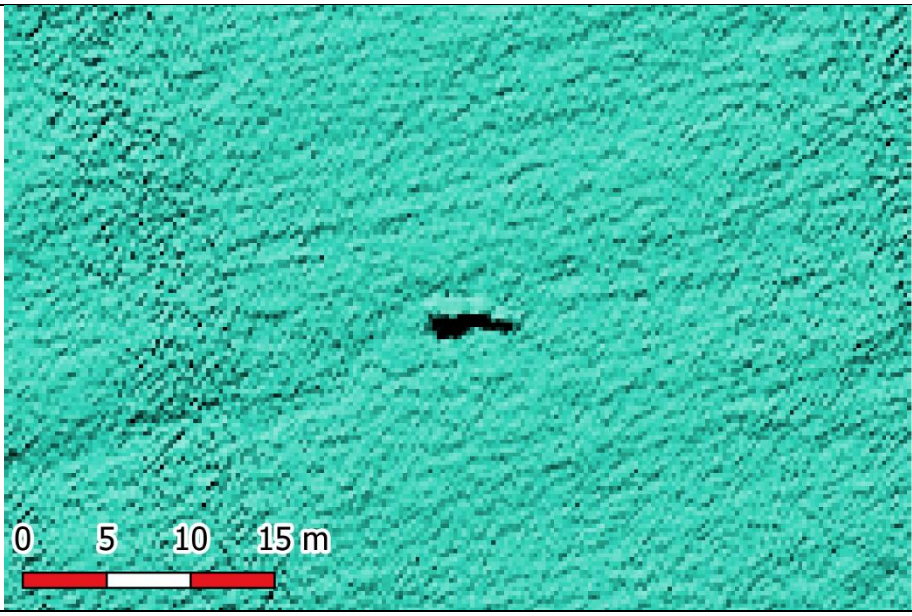
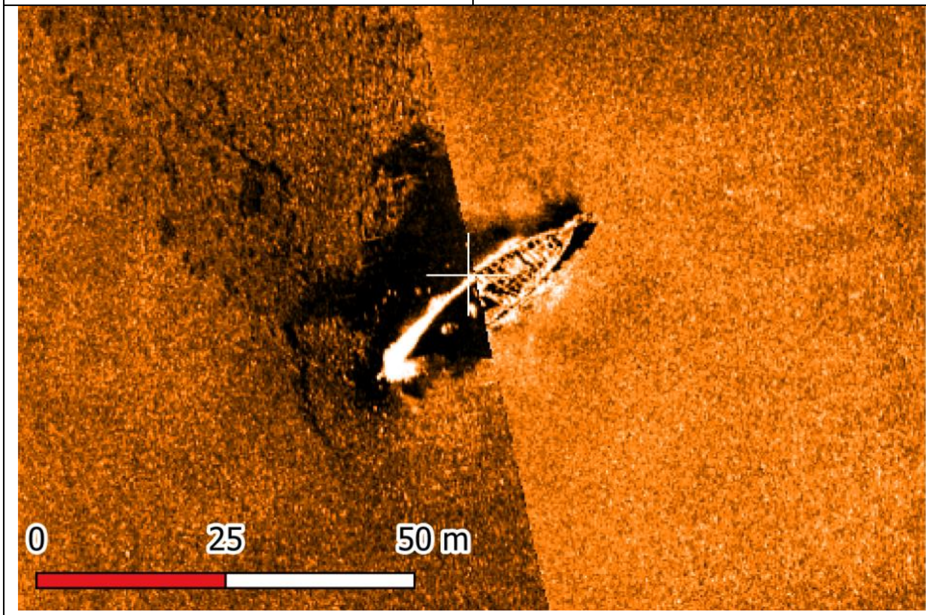
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Debris. On the SSS data seemingly shaped like a half-covered hull, with more diffuse debris immediate S. Length c. 7.5 m. The signal could also be interpreted as a small boat, c. 22-24'. Position is 12 nm W of Hvide Sande.
The MBES signal is more indistinct.
No MAG response.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

<table>
<tr><td rowspan="3">BM03_003
Unidentified wreck

Confidence Level: 1
Significance level: 1

19th-20th cent.</td><td>Position:
417502.85E 6222694.23N</td><td>Target: S_NM_BM03_0358
F&F: N/A</td></tr>
<tr><td colspan="2">
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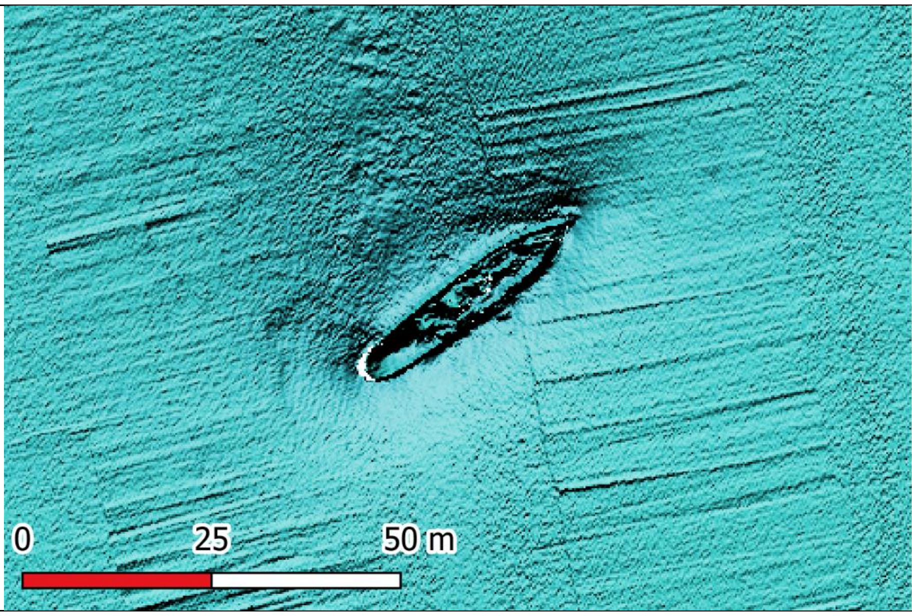
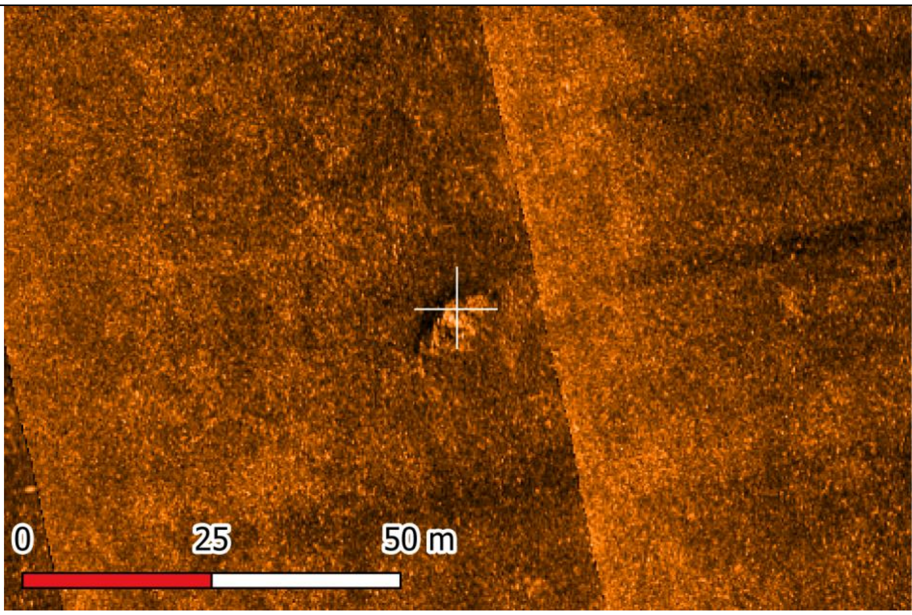
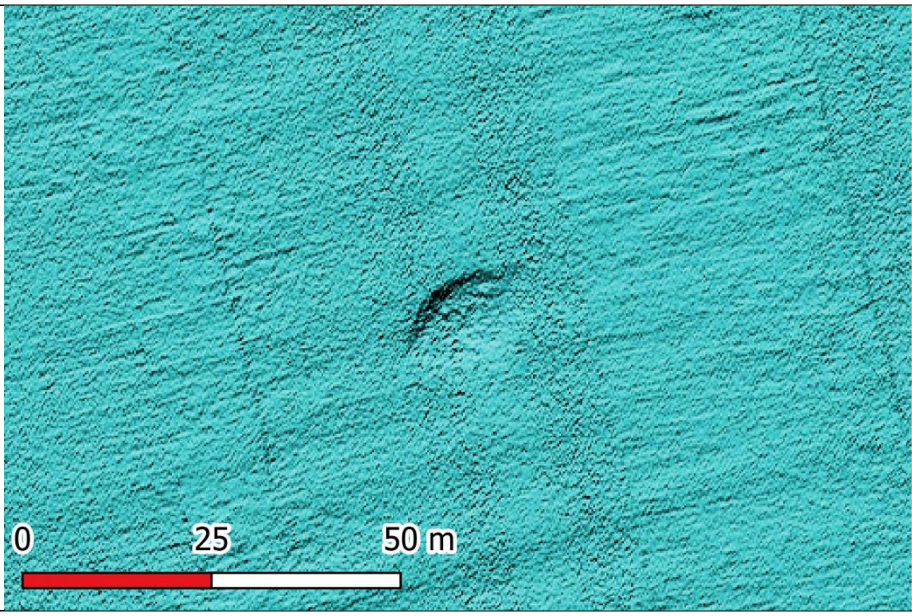
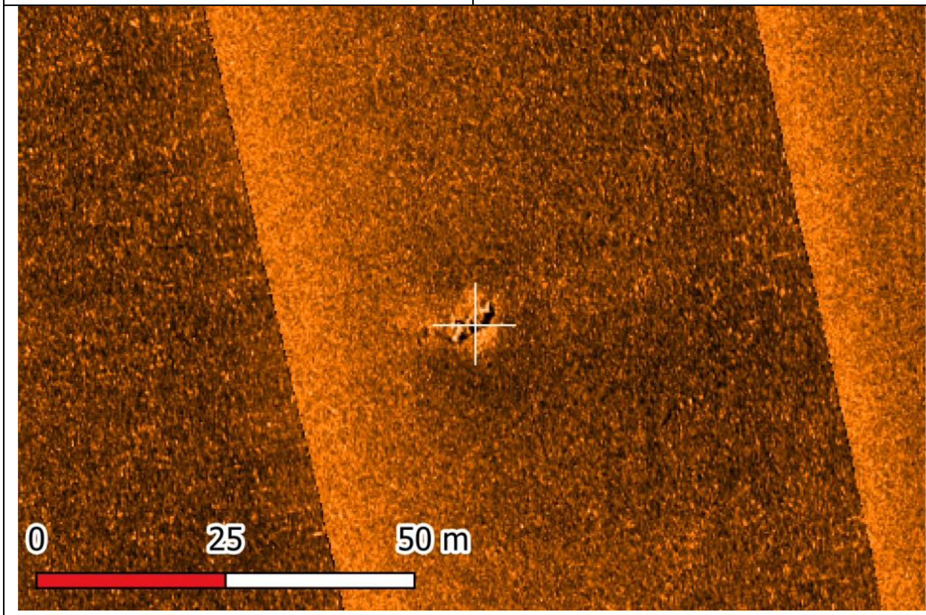
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Unidentified wreck. Presumably a steel trawler. Length c. 33.5 m. Beam: c. 6.5 m. Building period uncertain. However, the rounded stern may suggest a primary period from the 19th into the first half of the 20th centuries. The time of sinking cannot be estimated.
Strong MAG response (M_NM_BM03_0218)</td></tr>
<tr><td>Recommended action:</td><td colspan="2">ROV/diver to identify/ascertain the age. Protection zone 100m.</td></tr>
<tr><td>BM03_004
Unidentified debris</td><td>Position:
416169.43E 6222183.23N</td><td>Target: S_NM_BM03_0698
F&F: N/A</td></tr>
</table>

Confidence Level: 3 Significance level: 2 Age uncertain	
	
Description:	Unidentified debris. Elliptical shape, c. 13.5×3.5 m: Substantial piece, although difficult to identify. No MAG response.
Recommended action:	Protection zone 50 m.

<table>
<tr>
<td rowspan="3">BM03_010
Debris

Confidence Level: 2
Significance level: none

Probably recent</td>
<td>Position:
423450.75E 6197022.39N</td>
<td>Target: S_NM_BM03_0115
F&F: N/A</td>
</tr>
<tr>
<td colspan="2">
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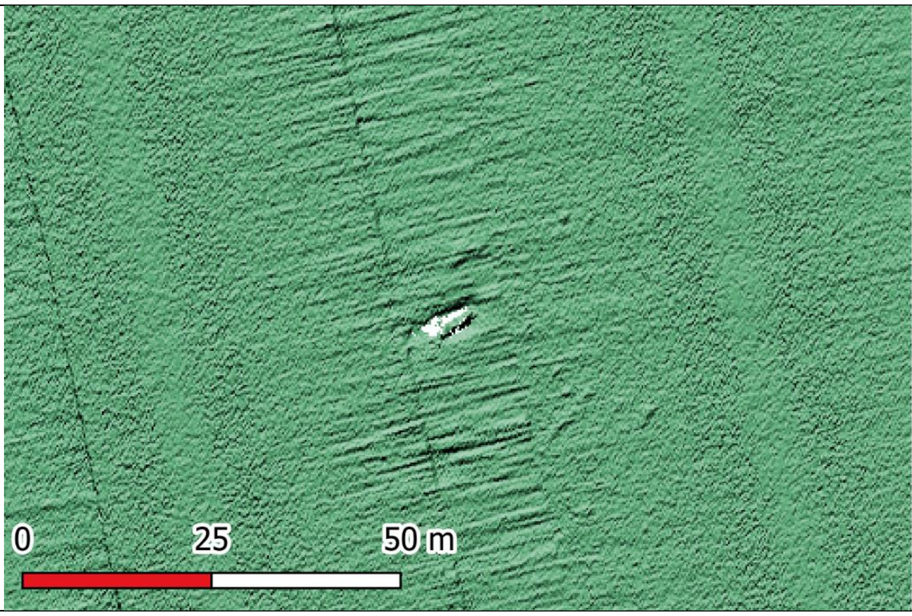
<td colspan="2">
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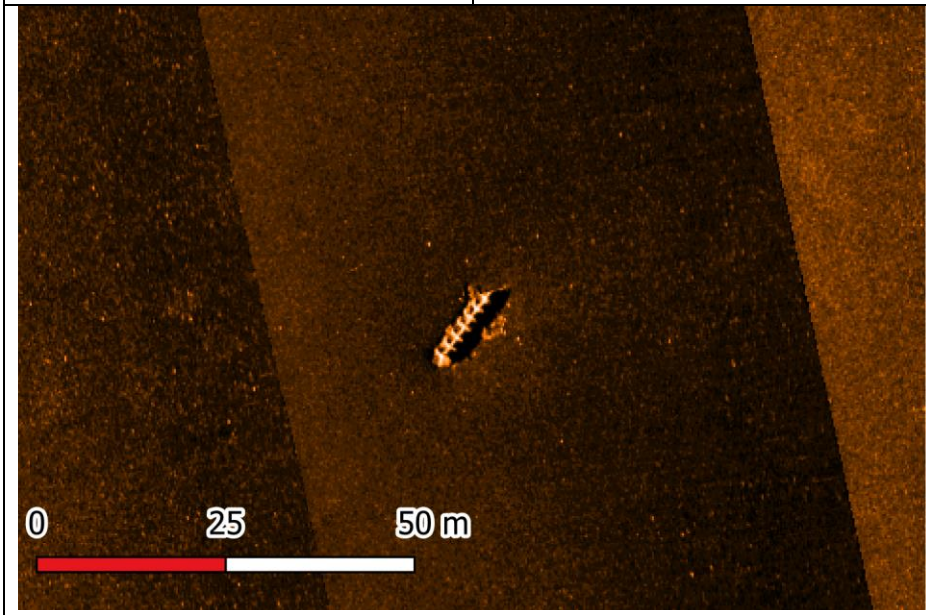
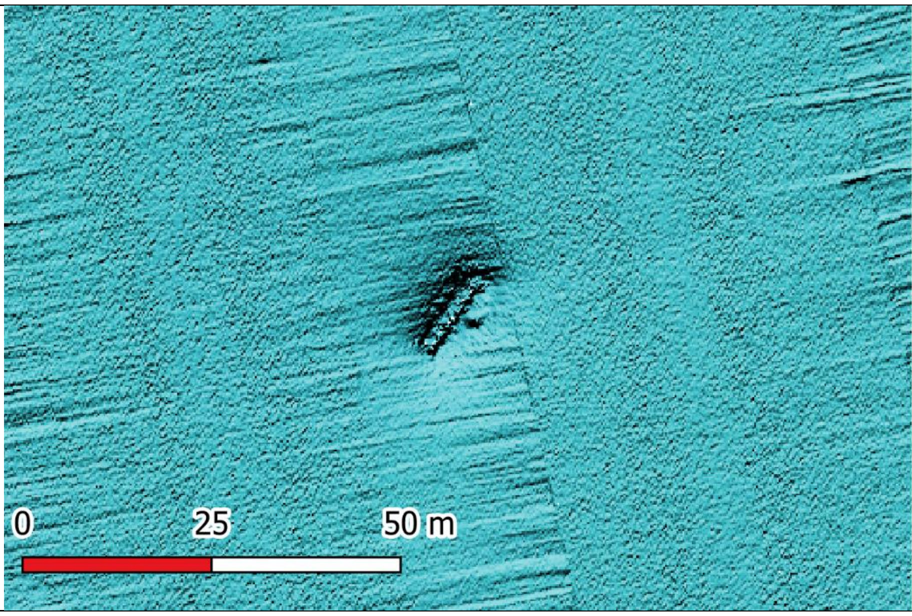
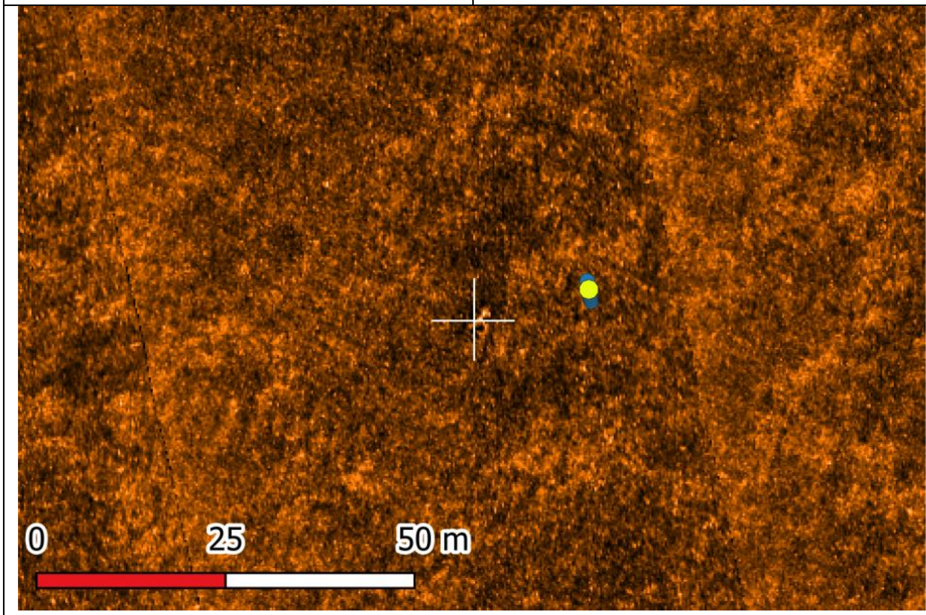
</tr>
<tr>
<td>Description:</td>
<td colspan="2">Rectangular shape, c. 6 × 2.5 m. Possibly a 20’ shipping container or similar.</td>
</tr>
<tr>
<td>Recommended action:</td>
<td colspan="2">None</td>
</tr>
</table>

BM03_011 Container Confidence Level: 1 Significance level: none < 100 years	**Position:** 423450.75E 6195459.12N	**Target:** S_NM_BM03_0571 **F&F:** N/A
		
		
Description:	Rectangular target with visible transverse ribs. Length c. 12.5 m. Most likely a 40’ shipping container, especially judged from the MBES. Strong MAG response just E of the site (M_NM_BM03_0218).	
Recommended action:	None	

<table>
<tr><td rowspan="3">BM03_013
Unidentified debris

Confidence Level: 3
Significance level: 3

Unknown. Most likely
> 100 years</td><td>Position:
424294.80E 6187268.55N</td><td>Target: S_NM_BM03_0532
F&F: N/A</td></tr>
<tr><td colspan="2">
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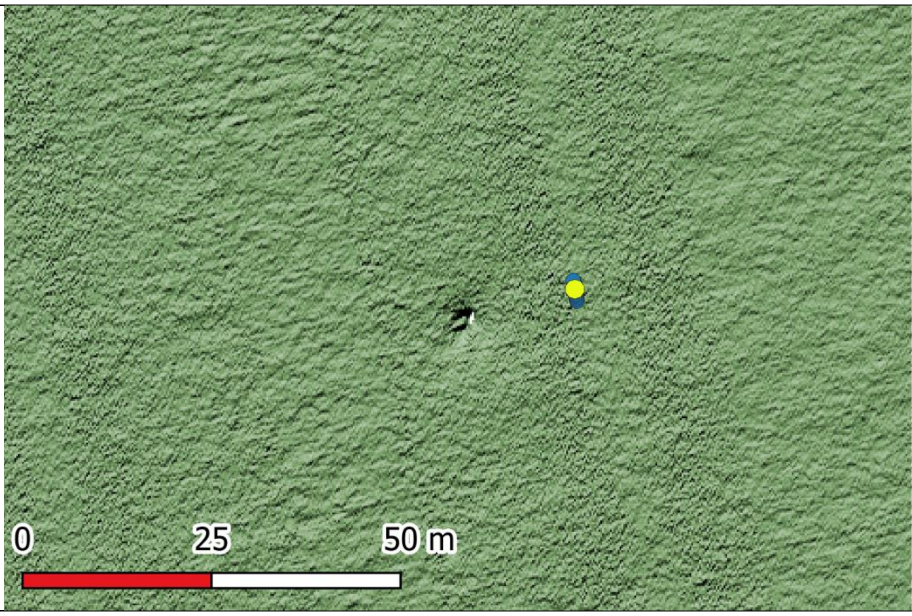
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Small piece of debris, c. 4.5 m long. Included here due to strong negative MAG anomaly just E of the piece (M_NM_BM03_0383).</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

<table>
<tr>
<td rowspan="3">BM03_014
Unidentified debris

Confidence Level: 2
Significance level: 2

Unknown age.</td>
<td>Position:
422356.38E 6195459.12N</td>
<td>Target: S_NM_BM03_0571
F&F: N/A</td>
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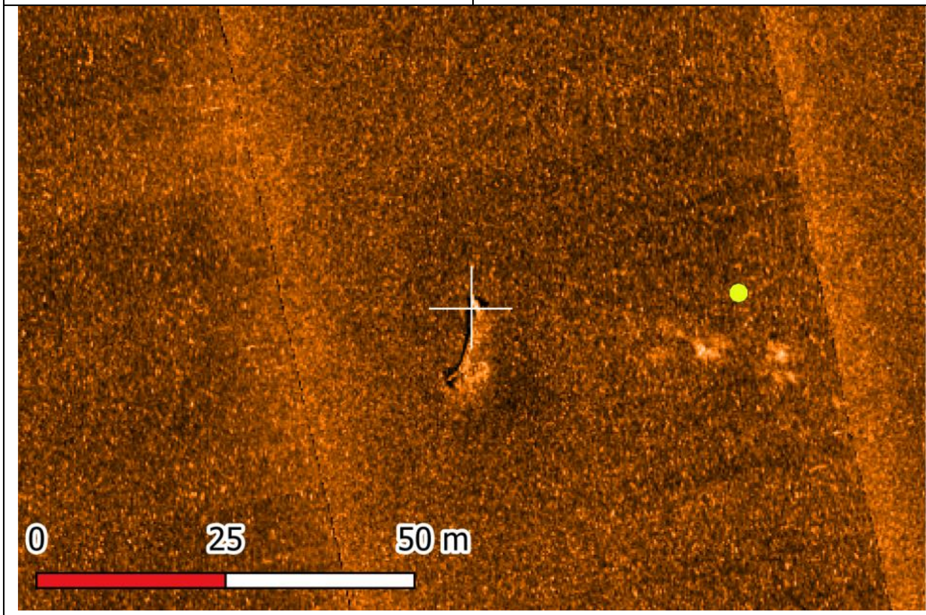
<td colspan="2">
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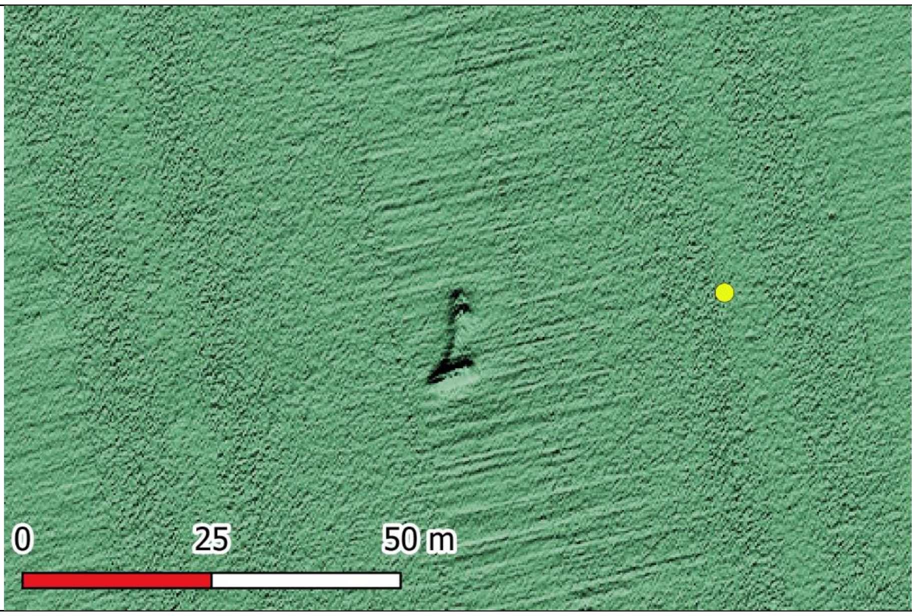
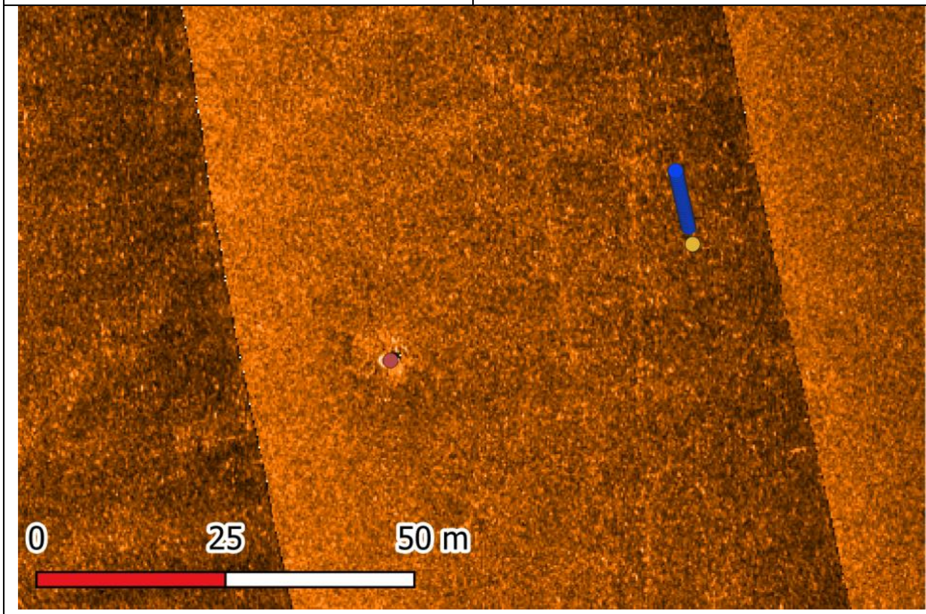
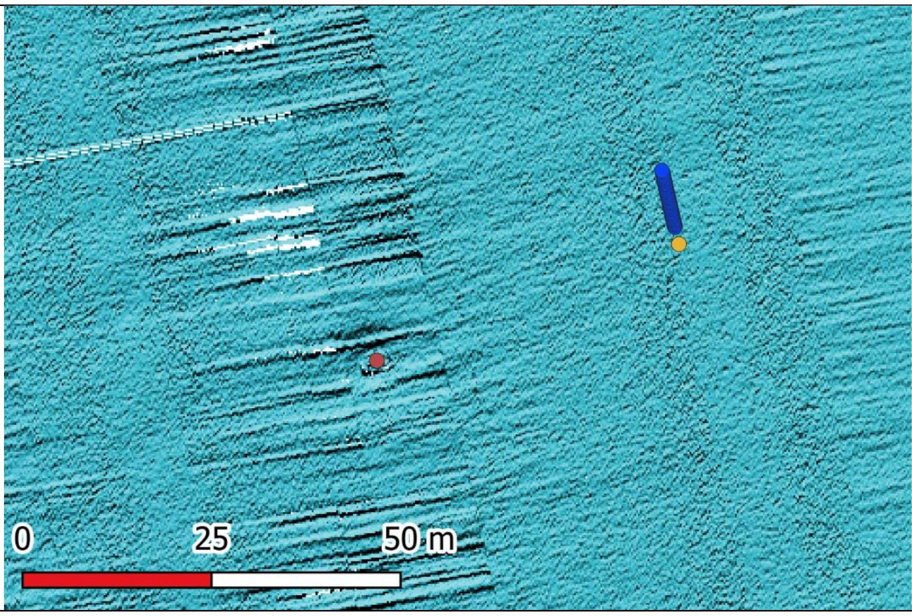
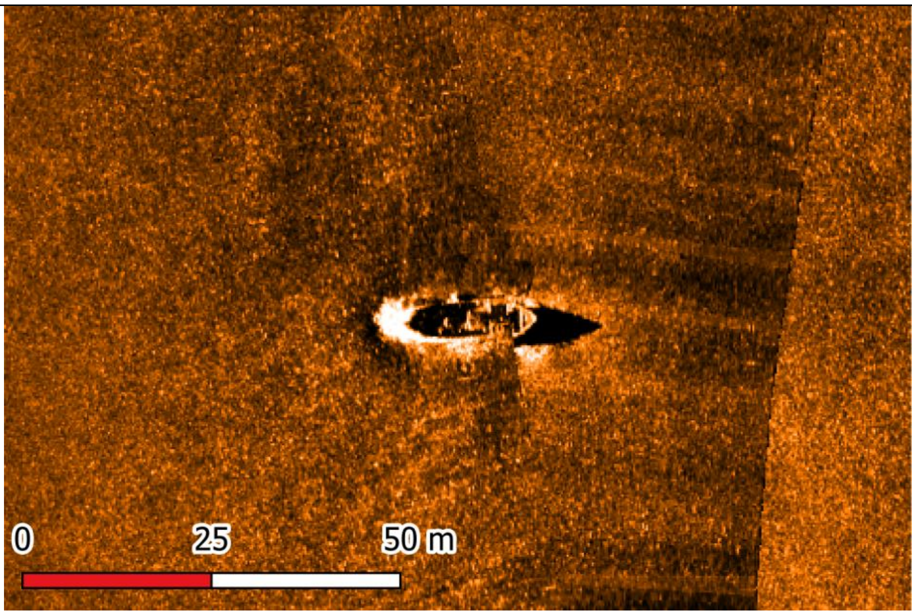
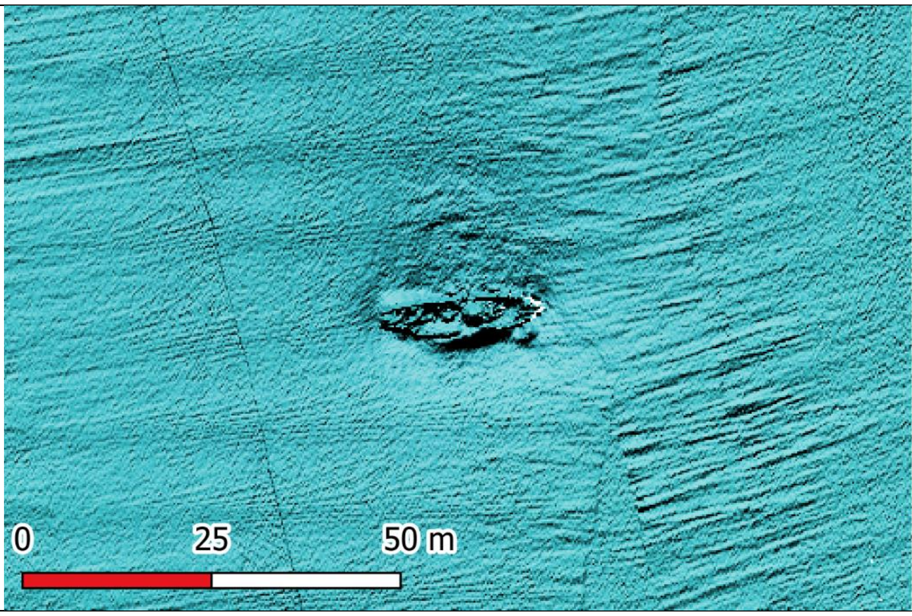
<td colspan="2">
</td>
</tr>
<tr>
<td>Description:</td>
<td colspan="2">Small piece of debris, c. 12 m long. Apparently two pieces. One curved, and another linear piece south of it.
MAG anomaly just E of the piece (M_NM_BM03_0417), but not in the nearest transect just W of the debris.</td>
</tr>
<tr>
<td>Recommended action:</td>
<td colspan="2">Protection zone 50 m.</td>
</tr>
</table>

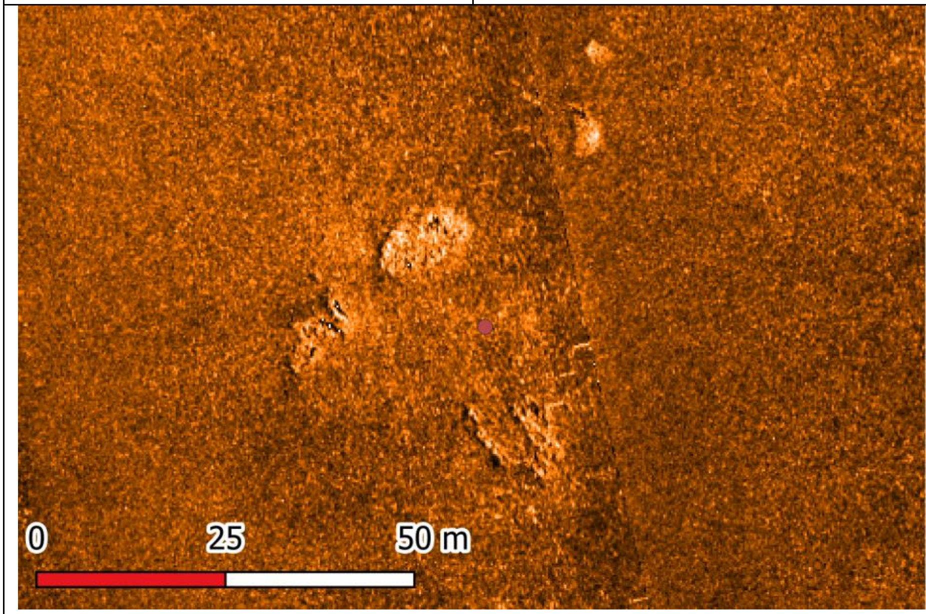
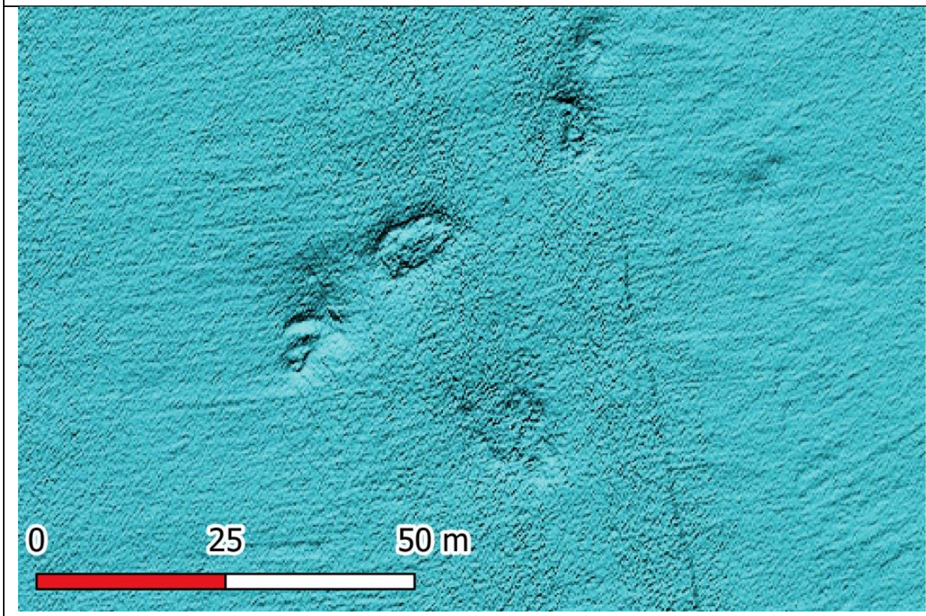
<table>
<tr><td rowspan="3">BM04_001
Debris
Confidence Level: 3
Significance level: 2

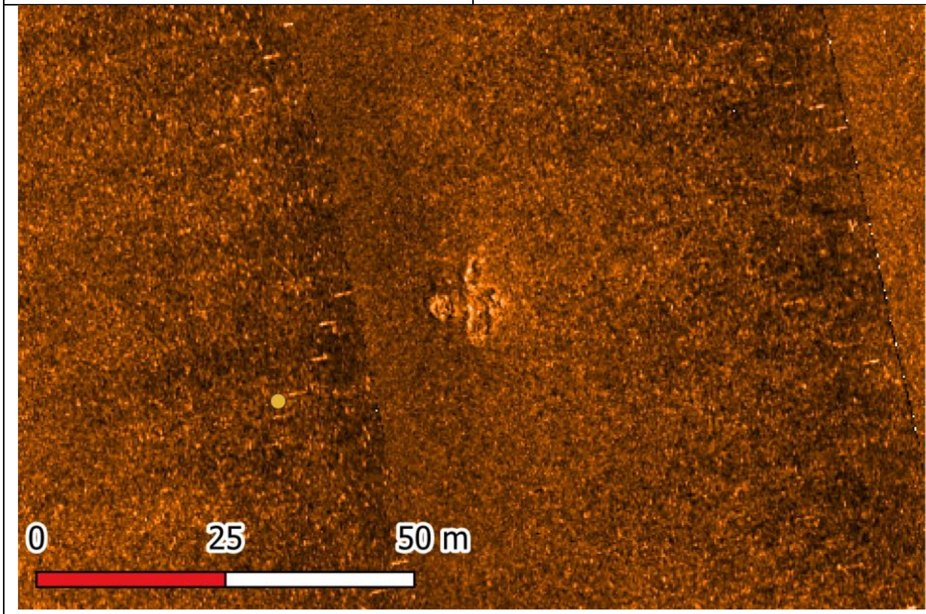
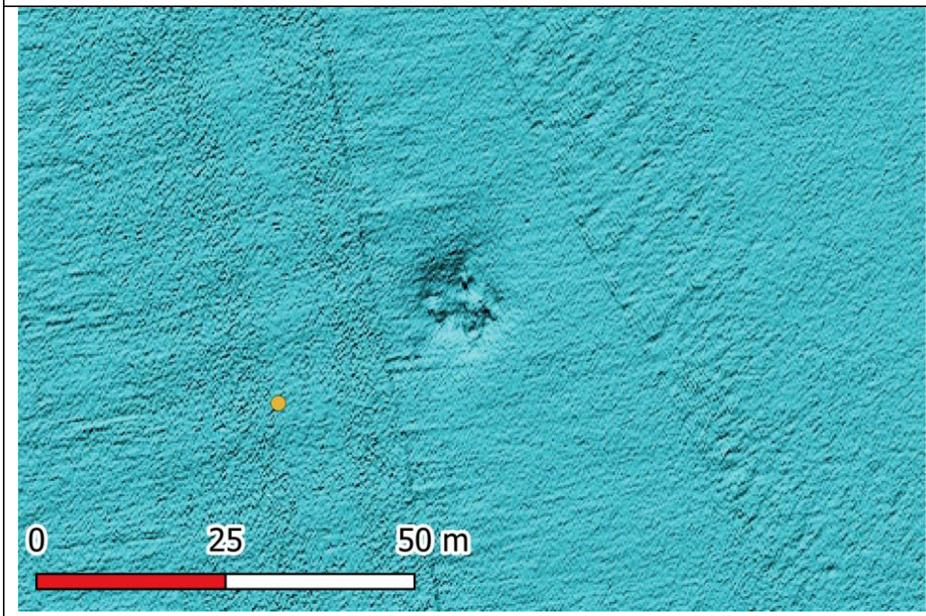
Unknown date</td><td>Position:
413961.55E 6228535.19N</td><td>Target: S_NM_BM04_0051
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Smaller piece of debris, c. 3.5 m in length. Clear scour marks. Included here because of a strong magnetic response in the next survey transect towards E (M_NM_BM04_0095). No MAG response, however, is registered in the nearest transect, just W of the debris. The SSS and MAG responses may still be related, which would make for a target of 40+ m below the seabed.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m from MAG target M_NM_BM04_0095.</td></tr>
<tr><td>BM04_003
Unknown wreck</td><td>Position:
415230.58E 6222579.12N</td><td>Target: S_NM_BM04_0120
F&F: N/A</td></tr>
</table>

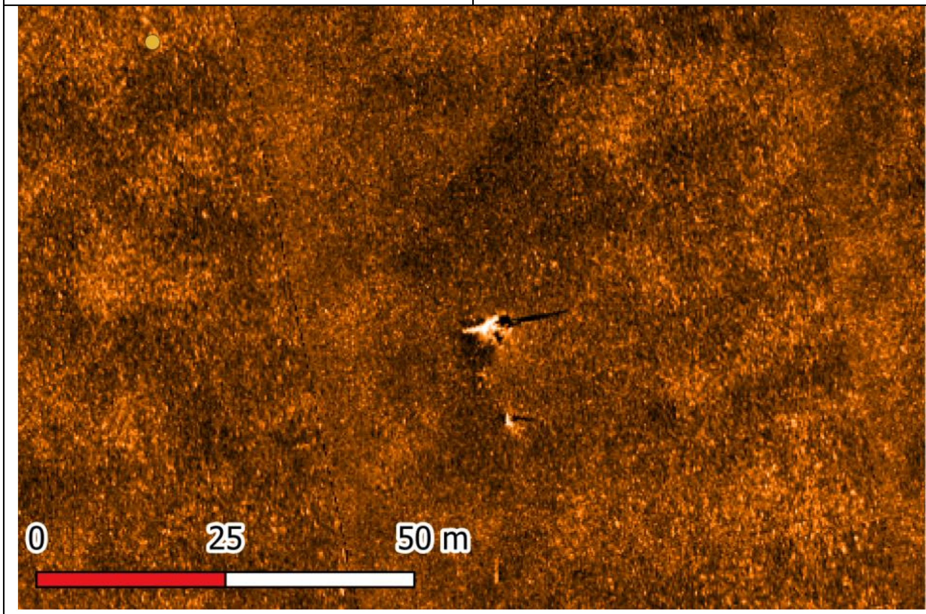
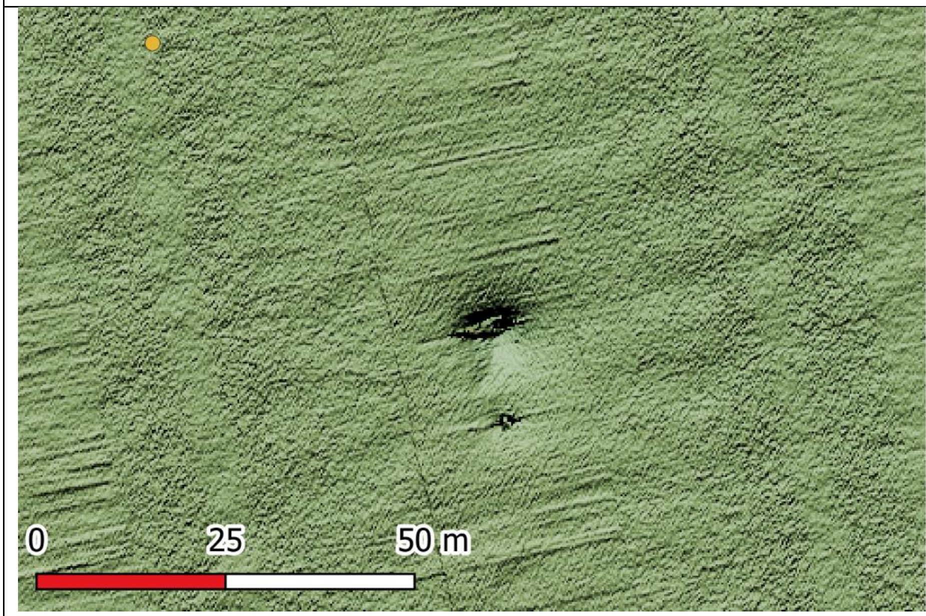
<table>
<tr>
<td>Confidence Level: 1
Significance level: 2

20th century</td>
<td>


</td>
</tr>
<tr>
<td>Description:</td>
<td>Unidentified wreck, c. 21 × 5 m. Seemingly a double ender, and probably a fishing vessel. Steering house offset towards E, roughly 2/3 of the length. No wrecks previously registered at or near the position.
Strong MAG response (M_NM_BM04_0072)</td>
</tr>
<tr>
<td>Recommended action:</td>
<td>ROV/diver for assessment and identification. Protection zone 100 m.</td>
</tr>
</table>

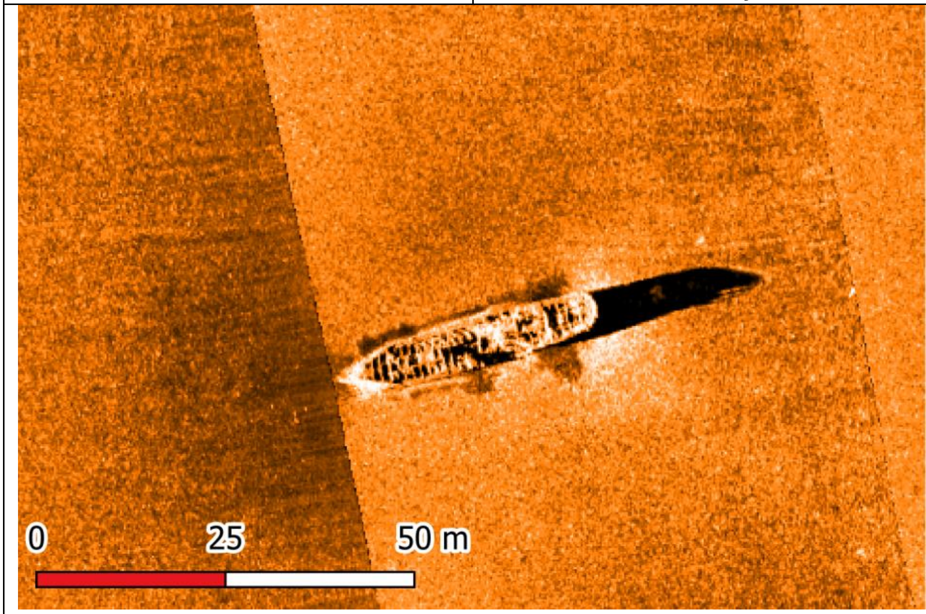
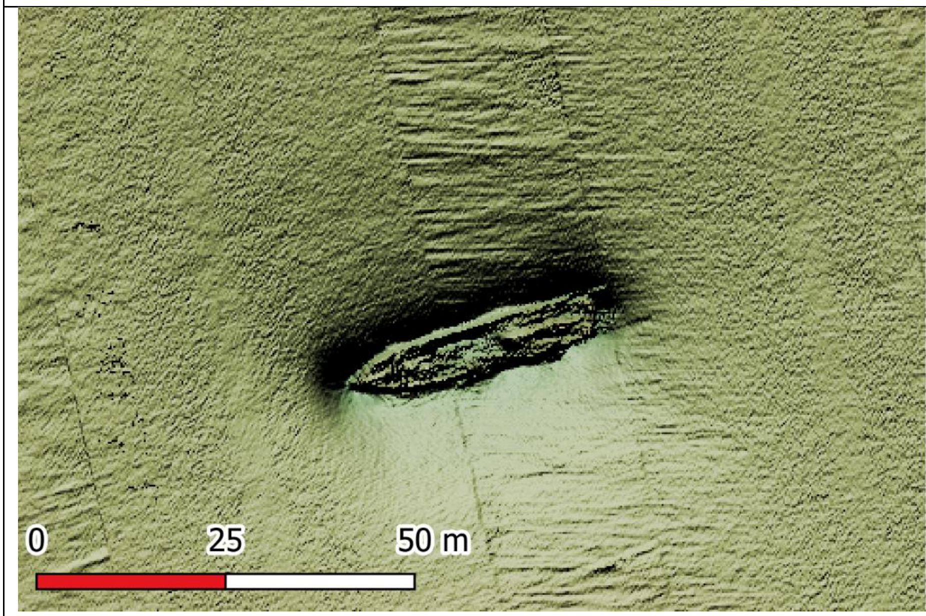
BM04_004 Possible debris field Confidence Level: 3 Significance level: 3 Unknown date	**Position:** 414890.94E 6221786.38N	**Target**: S_NM_BM04_0220, S_NM_BM04_0221, S_NM_BM04_0222, S_NM_BM04_0223, S_NM_BM04_0224 **F&F:** N/A
		
		
Description:	Scattered debris field with scour marks. Is very likely to be a natural phenomenon, such as large concretions: There is no MAG response.	
Recommended action:	None.	

BM04_005 Debris field Confidence Level: 3 Significance level: 3 Unknown date	**Position:** 414959.72E 6221615.36N	**Target**: S_NM_BM04_0207, S_NM_BM04_0208 **F&F:** N/A
	  	
Description:	Debris field. C. 11 × 12 m. MAG anomaly nearby (M_NM_BM04_0615, < 50nT, marked by yellow dot).	
Recommended action:	Protection zone 50 m.	

BM04_008 Debris field Confidence Level: 2 Significance level: 2 Unknown date	**Position:** 420734.91E 6191046.44N	**Target**: N/A **F&F:** N/A
	 	
Description:	Triangular object, ca. 6.6 m long. Also a smaller piece of debris c. 13 m S of the larger object. Magnetic anomalies towards both NW (M_NM_BM04_0370) and SE (M_NM_BM04_0354) from the target, with M_NM_BM04_0370 showing a strong response (> 50 nT). See also MAG target BM04_012.	
Recommended action:	Protection zone 100 m.	

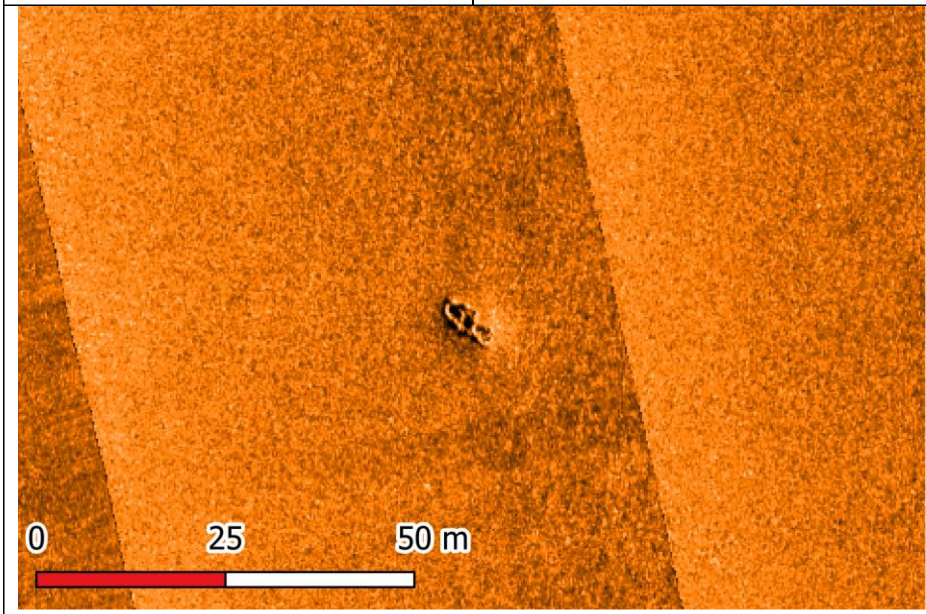
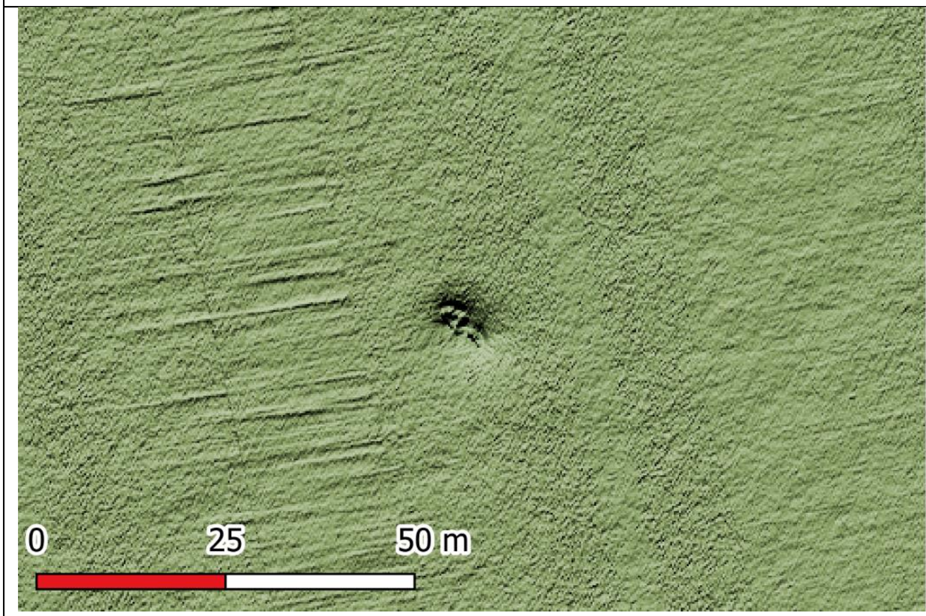
<table>
<tr>
<td rowspan="3">BM05_001
Unidentified wreck

Confidence Level: 1
Significance level: 1

19th-20th cent.</td>
<td>Position:
417285.20E 6192062.17N</td>
<td>Target: S_NM_BM05_0142
F&F: 400110c-68 / Sys No. 181060</td>
</tr>
<tr>
<td colspan="2">
</td>
</tr>
<tr>
<td colspan="2">
</td>
</tr>
<tr>
<td>Description:</td>
<td colspan="2">Unidentified wreck, presumably steel trawler. Length: c. 36 m. Beam: c. 7.5 m. Steering house just aft of centre. Rounded stern. Most likely the same wreck as F&F 40110c-68, which is a snag position reported by a fishing vessel.
Strong magnetic anomalies off both ends (M_NM_BM05_0320, M_NM_BM05_0306).</td>
</tr>
<tr>
<td>Recommended action:</td>
<td colspan="2">ROV/diver to assess age/identity. Protection zone 100 m.</td>
</tr>
</table>

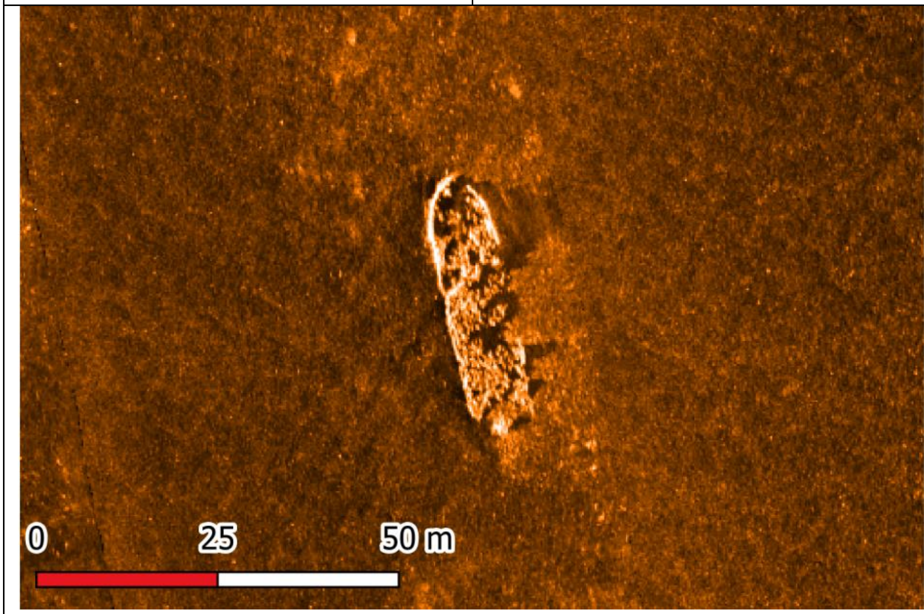
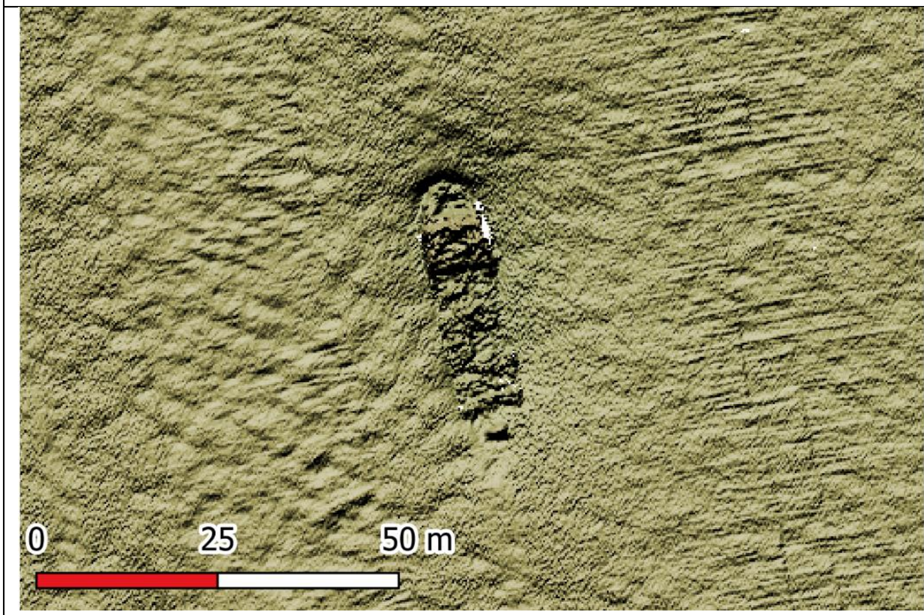
<table>
<tr><td rowspan="3">BM05_011
Debris

Confidence Level: 2
Significance level: 3

Unknown date</td><td>Position:
417182.86E 6196637.87N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Object with parallel sides and transverse partitions. Ca. 6.5 × 2.8 m. Could be a 20’ shipping container, but there are no MAG anomalies nearby. Interpretation therefore uncertain. No known wrecks are registered nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

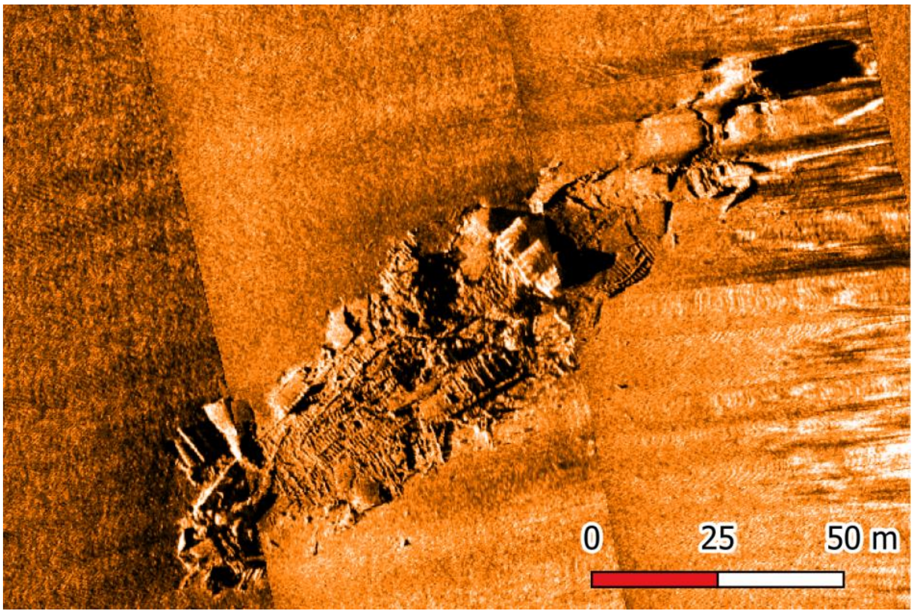
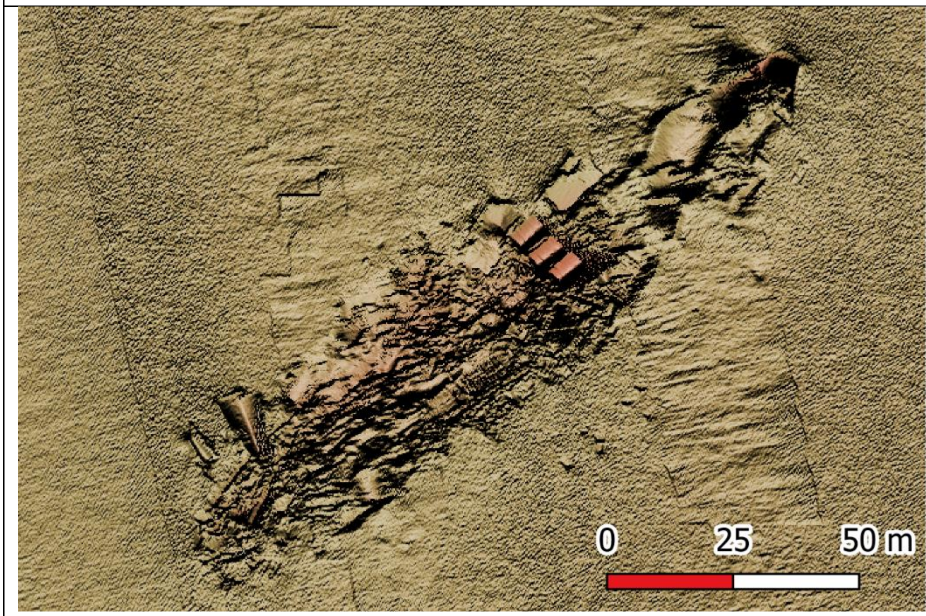
<table>
<tr><td rowspan="3">BM06_005
Wreck

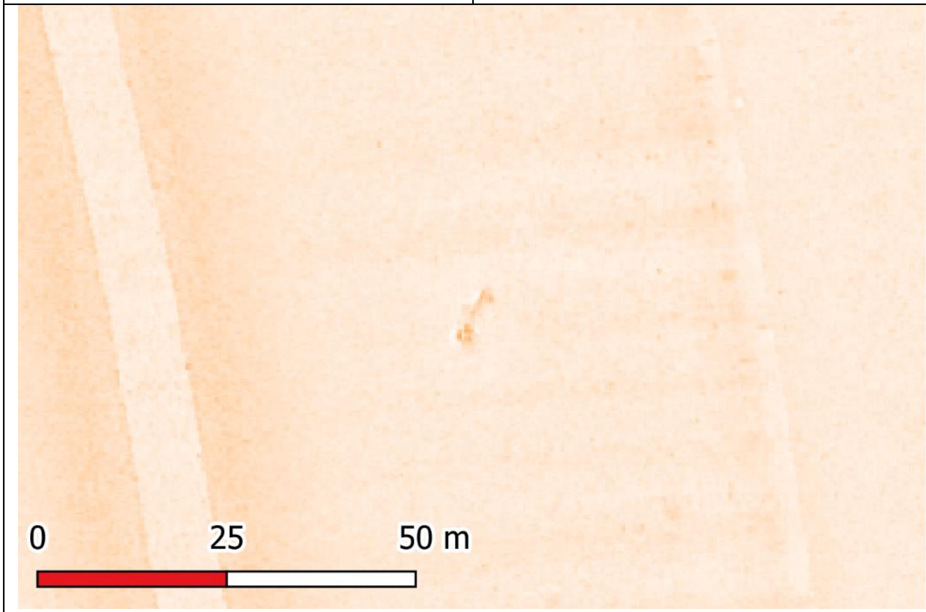
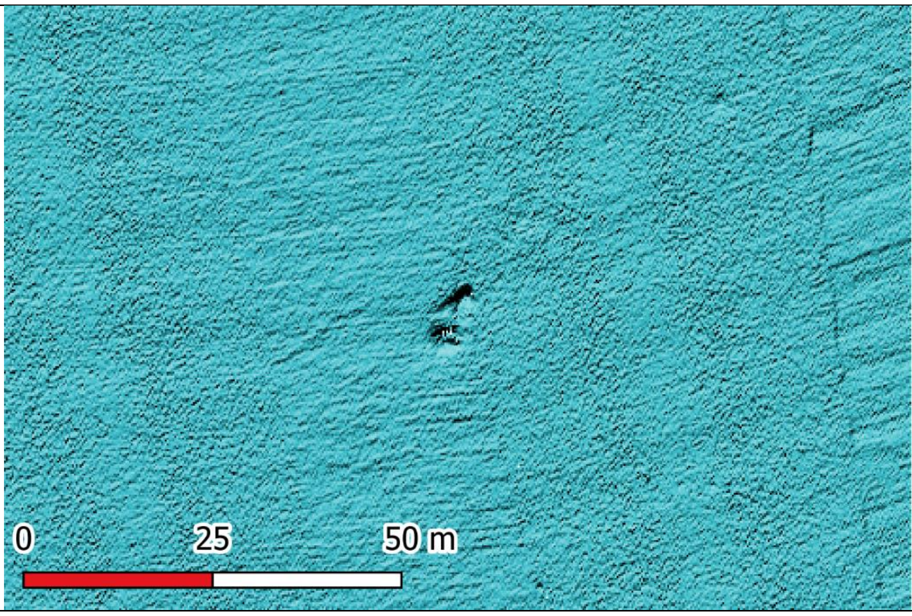
Confidence Level: 1
Significance level: 1

20th century</td><td>Position:
415480.56E 6188339.46N</td><td>Target: S_FR_BM06_0039
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Unidentified wreck. Presumably steel trawler. Length c. 36.5m. Beam c. 9 m. Wide rounded bow. The stern is also wide, possibly with transom. No wrecks previously registrered at or near the position.
Strong MAG anomaly along the wreck (M_NM_BM06_0164)</td></tr>
<tr><td>Recommended action:</td><td colspan="2">ROV/diver to assess age/identity. Protection zone 100m.</td></tr>
</table>

<table>
<tr><td rowspan="3">BM08_002
Wreck: Sierra Cordoba (1923 – 1948)

Confidence Level: 1
Significance level: 1

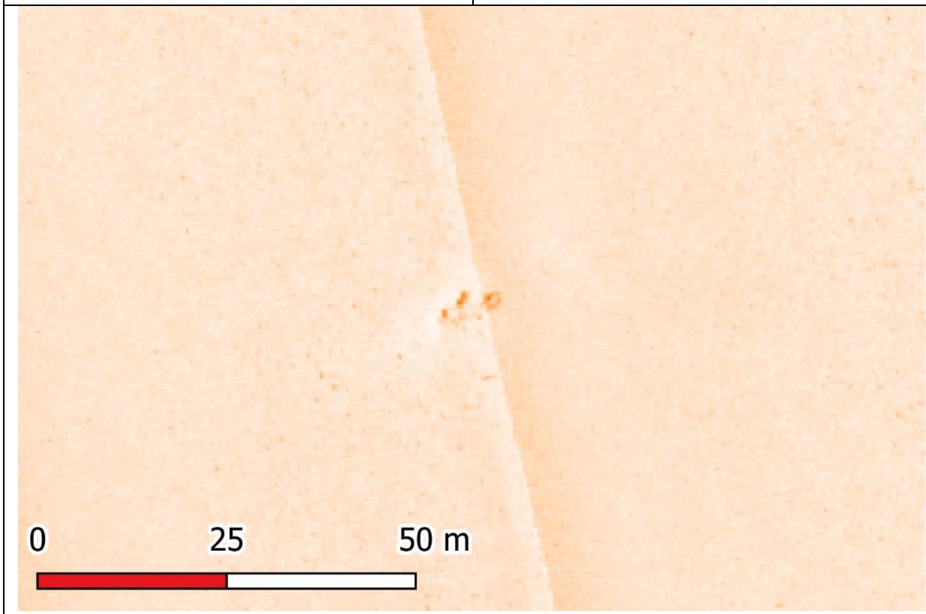
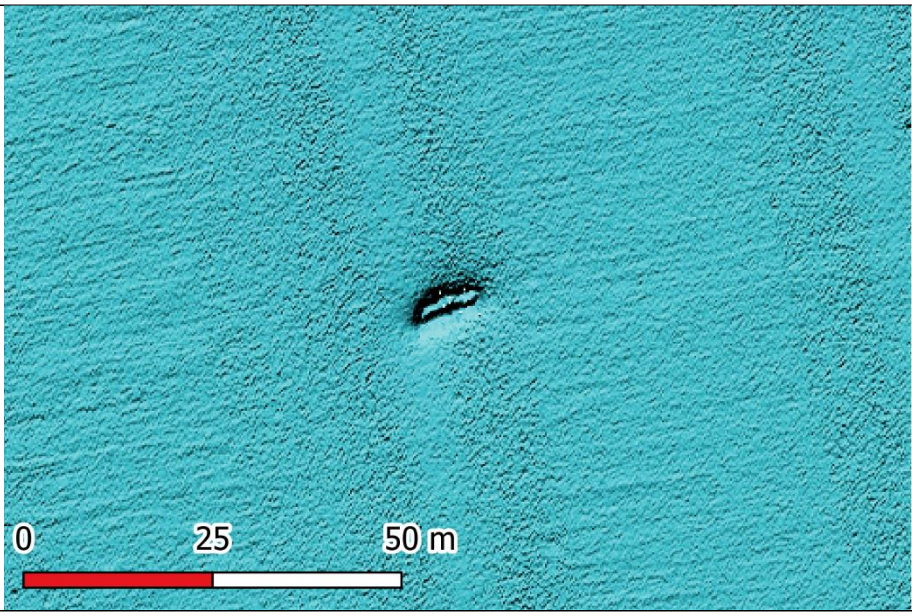
Sunk on 18 Jan. 1948
< 100 years</td><td>Position:
409071.70E 6189112.15N</td><td>Target: S_FR_BM08_0059
F&F: 400110c-126 / Sys No. 178146</td></tr>
<tr><td colspan="2">NB: Scale 1:1500.

</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Wreck, identified as Sierra Cordoba: German ship, launched Sep. 1923 and completed 20 Jan. 1924. Used for combined cargo and passenger transport for Central and South America. Later chartered for passenger cruises by Kraft durch Freude. During WW2 used by the Kriegsmarine as accomodation ship. Bombed 1944, but repaired, then burned out 1946 and lost 1948 while under tow as prize to Great Britain. Also registered in F&F, although at a different position.
Strong MAG responses around the wreck (M_FR_BM08_0306, M_FR_BM08_0307, M_FR_BM08_0370).</td></tr>
<tr><td>Recommended action:</td><td colspan="2">ROV/diver inspection to assess current state of preservation. Historically significant. Recommend protection zone 150 m, in spite of age.</td></tr>
</table>

BM10_001 Debris Confidence Level: 2 Significance level: 3 Probably modern.	**Position:** 394976.99E 6233928.92N	**Target**: S_NM_BM10_0010 **F&F:** N/A
	  	
Description:	Debris, c. 8×2 m. SSS target seems to show something similar to a boom with attachment. MBES is more indistinct. Probably modern debris. No MAG anomaly nearby.	
Recommended action:	None	

<table>
<tr>
<td rowspan="3">BM10_002

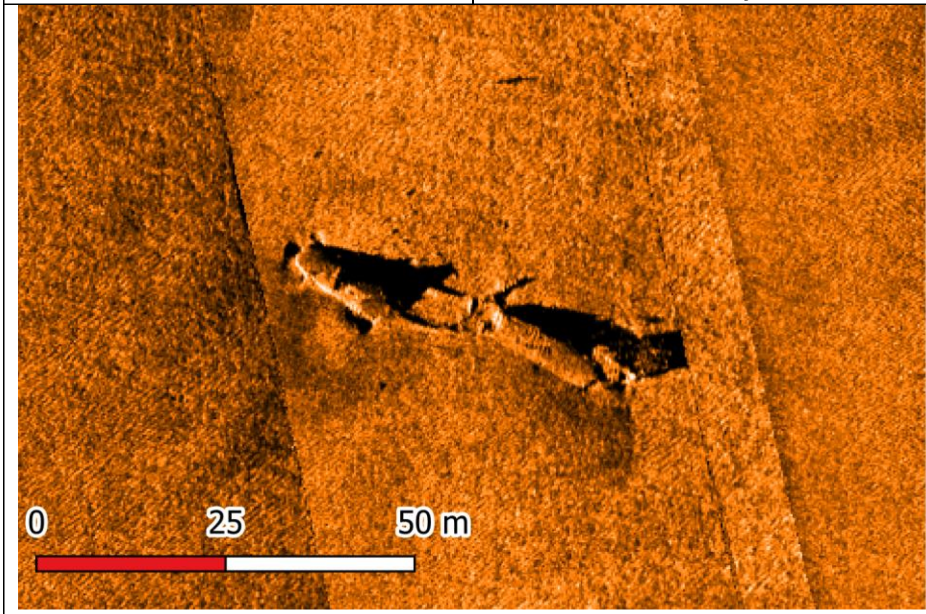
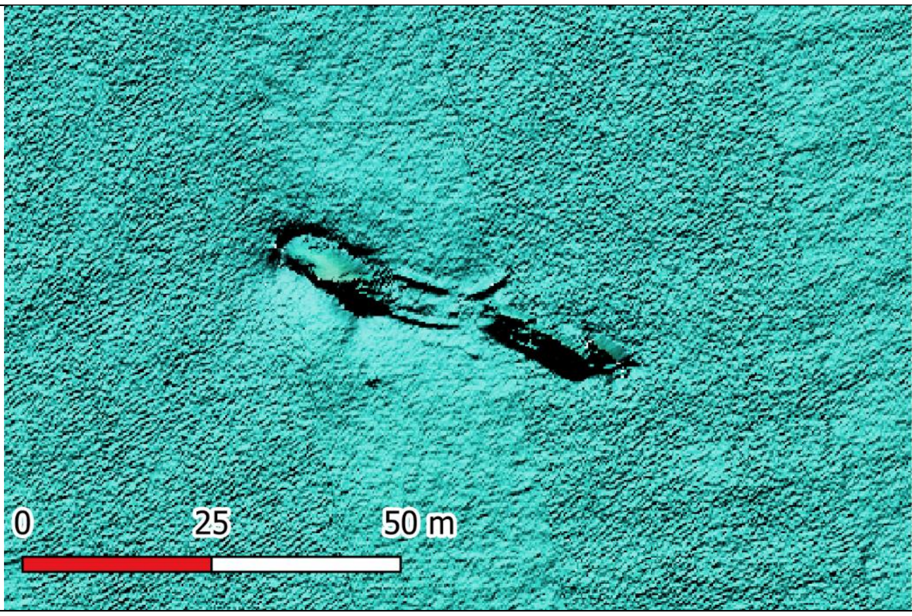
Debris

Confidence Level: 2
Significance level: 3

Probably modern.</td>
<td>Position:
395227.05E 6224338.54N</td>
<td>Target: S_NM_BM10_0379
F&F: N/A</td>
</tr>
<tr>
<td colspan="2"></td>
</tr>
<tr>
<td colspan="2"></td>
</tr>
<tr>
<td>Description:</td>
<td colspan="2">Debris, c. 9×3 m. Probably modern. No MAG anomaly nearby, though.</td>
</tr>
<tr>
<td>Recommended action:</td>
<td colspan="2">Protection zone 50 m.</td>
</tr>
</table>

<table>
<tr><td rowspan="3">BM11_002
Unidentified wreck

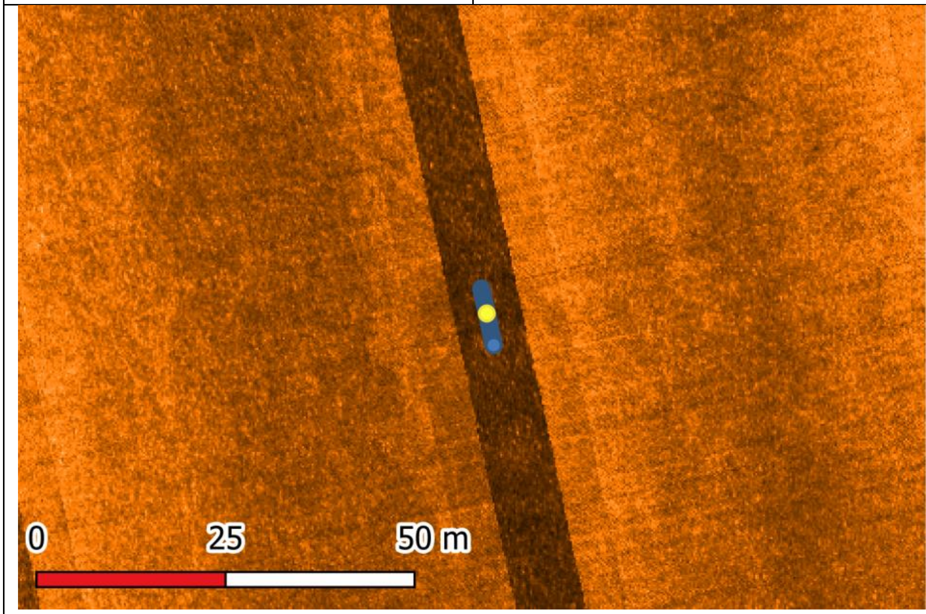
Confidence Level: 1
Significance level: 1

20th century, first half.</td><td>Position:
394673.68E 6217763.27 N</td><td>Target: S_NM_BM11_0521
F&F: 400110c-41 / SysNo. 181006</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Wreck, c. 43 m long, with a further section right off the end of the main hull towards W, adding another c. 6-7 m. Widest measurable beam c. 6 m. Broken in several pieces, with an open gap in the middle and the eastern section laying to one side.
Previously identified by JD-Contractors as a small freighter turned partly upside down.
Strong MAG anomaly E of the wreck (M_NM_BM11_0685).
F&F location were off by ~275 m at time of analysis.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">ROV/DIver survey. Protection zone 100 m.</td></tr>
</table>

5.2. MAG-targets in the OWF Area 1

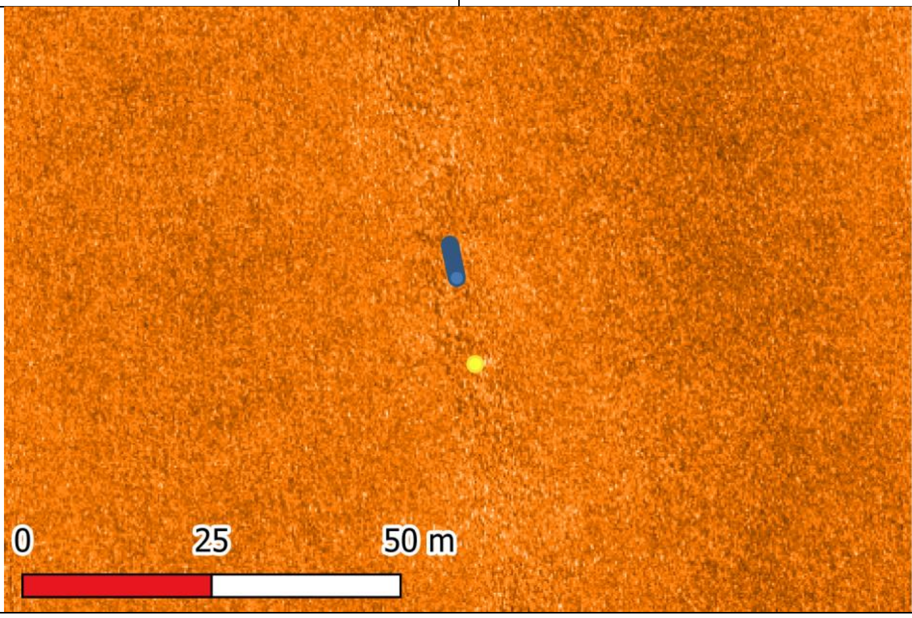
<table>
<tr><td rowspan="2">BM01_002
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
420582.96E 6227595.62N</td><td>Target: M_NM_BM01_0275
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative anomaly (<-50nT). Short stretch, c. 7.5 m. Most likely small debris.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m</td></tr>
</table>

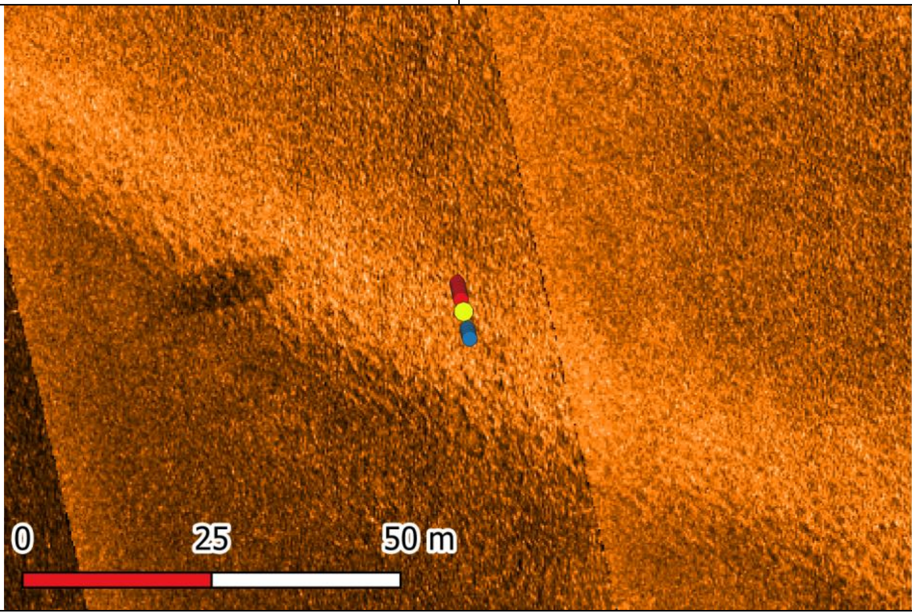
<table>
<tr><td rowspan="2">BM02_002
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

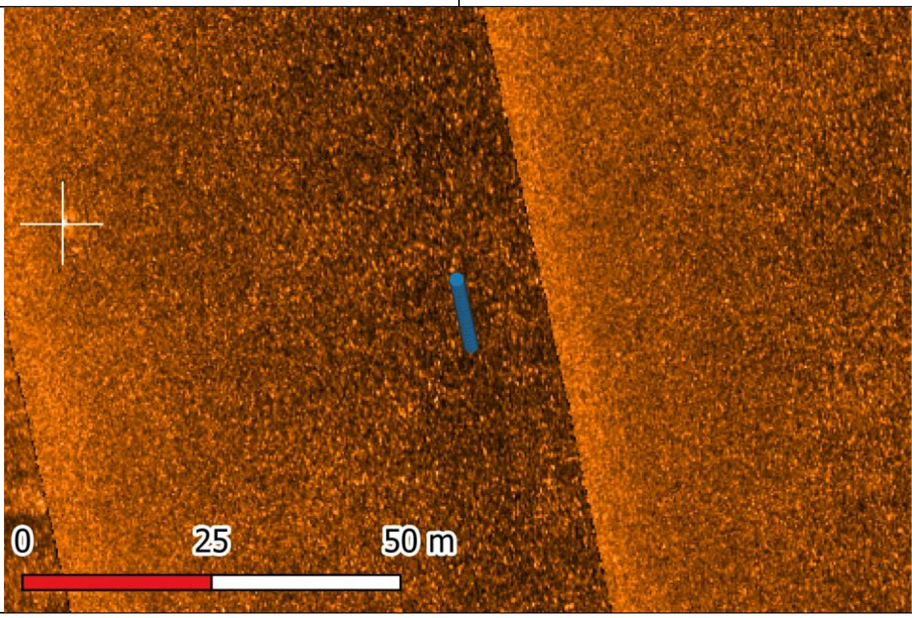
Unknown date.</td><td>Position:
426001.15E 6190969.96N</td><td>Target: M_NM_BM02_0039
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative anomaly (<-50nT). Very short stretch, c. 4.5 m. The MAG target M_NM_BM02_0039 is positioned further south, c. 11.5 m from the southernmost strong anomaly: There are corresponding positive anomalies (< 50nT) in this direction.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m</td></tr>
</table>

<table>
<tr><td rowspan="2">BM03_017
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

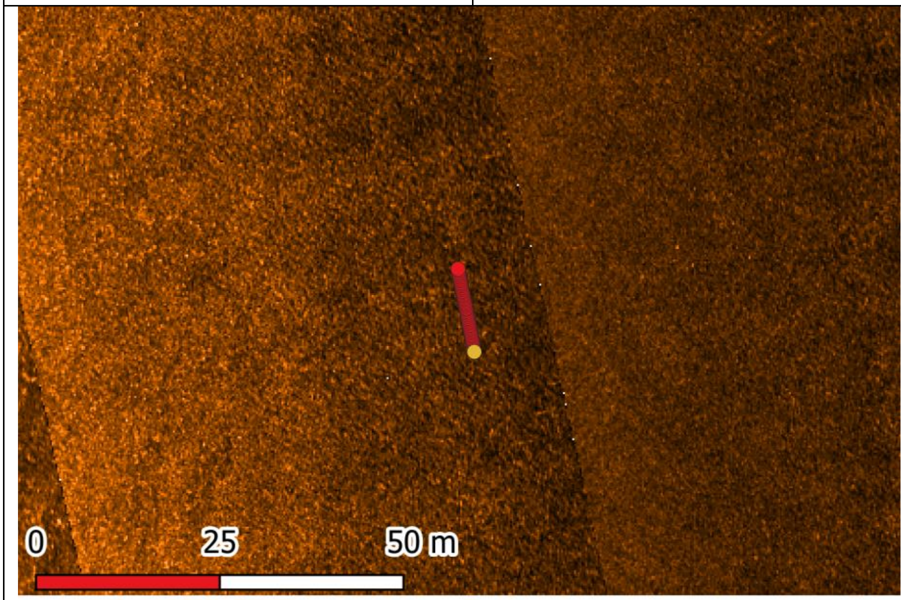
Unknown date.</td><td>Position:
417001.39E 6226598.07N</td><td>Target: M_NM_BM02_0034
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomaly, both positive and negative. Short stretch, c. 7.5 m. A shadow in the SSS data just W of the signature is most likely due to scour along a low ridge in the sea bed.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
<tr><td rowspan="2">BM03_018
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
425002.04E 6191676.98N</td><td>Target: M_NM_BM02_0034
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Short stretch, c. 8.9 m. A small rectangular piece of debris is seen c. 50 m WNWtW of MAG response (S_NM_BM03_0170). Close to an irregular string of MAG anomalies.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

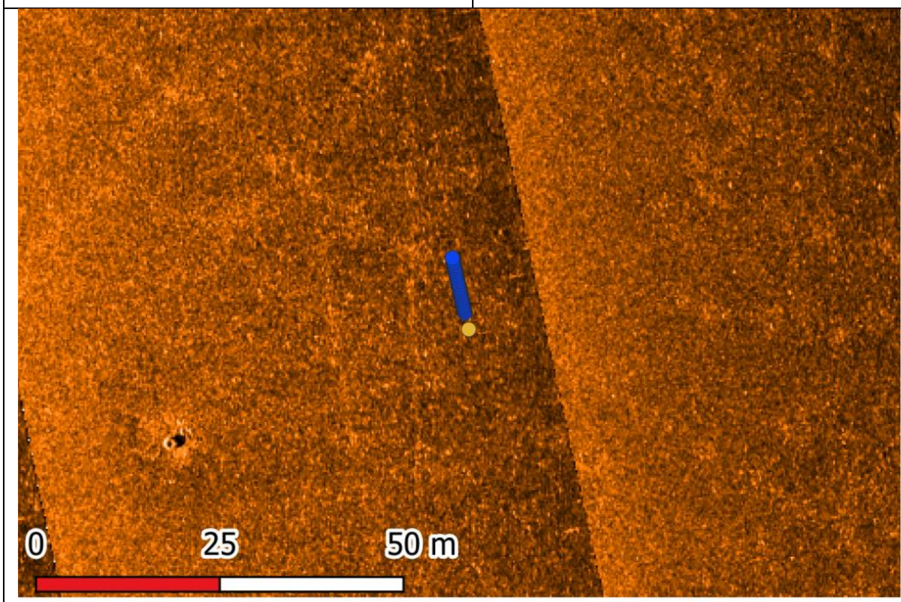
<table>
<tr><td rowspan="2">BM04_009
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
413028.69E 6229401.48N</td><td>Target: M_NM_BM04_0232
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. C. 10.5 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

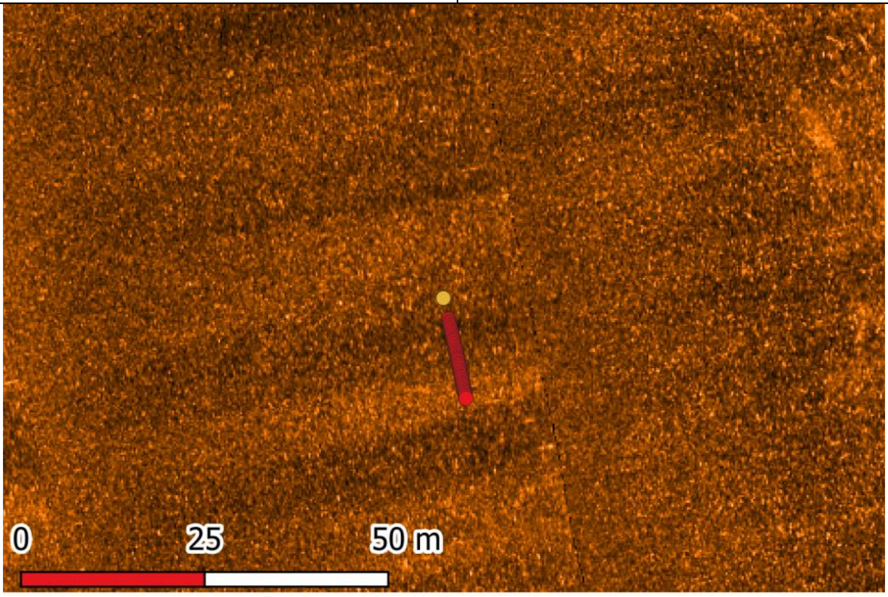
<table>
<tr><td rowspan="2">BM04_010
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
414001.46E 6228550.64N</td><td>Target: M_NM_BM04_0095
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Short stretch c. 7.5 m. A circular piece of debris is seen c. 43.5 m WSWtW of the anomaly (S_NM_BM04_0051). There is no similar MAG response to this debris in the nearer transect W of the piece.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

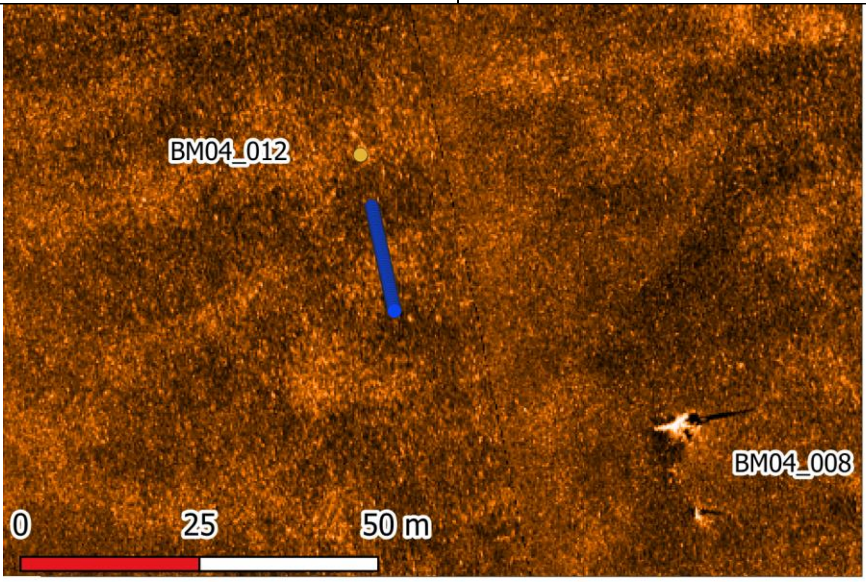
<table>
<tr><td rowspan="2">BM04_011
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
414001.46E 6228550.64N</td><td>Target: M_NM_BM04_0028
F&F: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Spans across c. 11.0 m. No debris visible nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

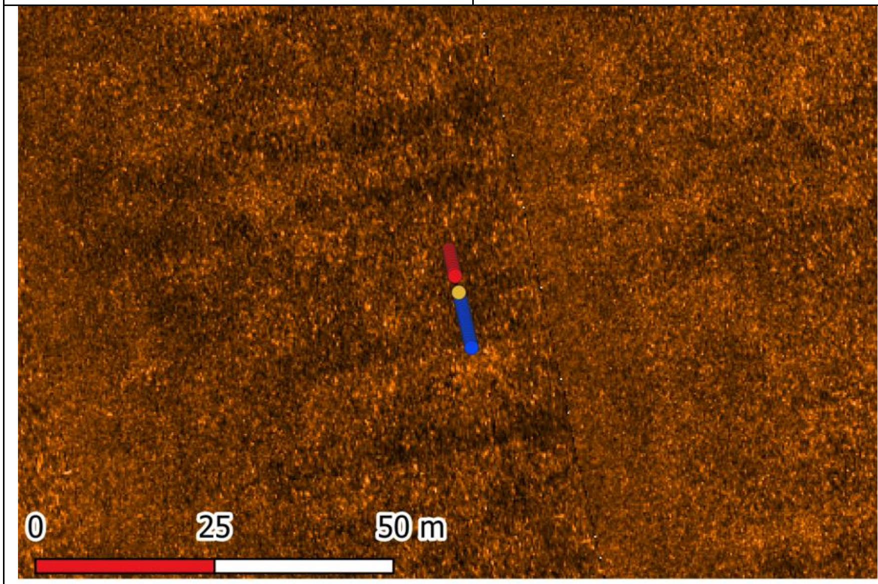
<table>
<tr><td rowspan="2">BM04_012
MAG response.
Debris.

Confidence Level: 2
Significance level: 2

Unknown date.</td><td>Position:
420690.61E 6191084.53N</td><td>Target: M_NM_BM04_0370
F&F: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Spans across c. 15.0 m, with the MAG target set further north making a total of c. 22.3 m. Is probably related to SSS target BM04_008.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">None (Protection zone covered by BM04_008).</td></tr>
</table>

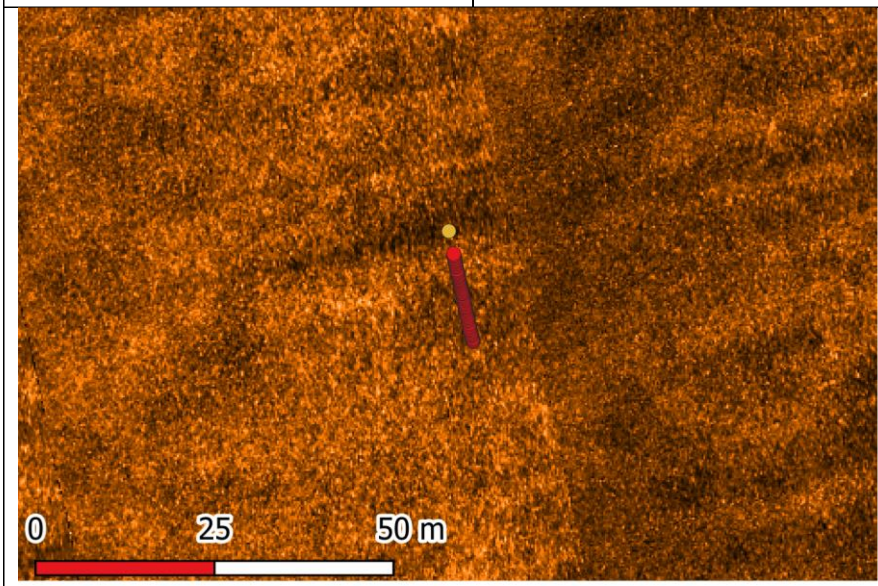
<table>
<tr><td rowspan="2">BM04_013
MAG response.
Debris.

Confidence Level: 2
Significance level: 3

Unknown date.</td><td>Position:
421162.85E 6188904.49N</td><td>Target: M_NM_BM04_0372
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomaly, both positive and negative. Spans across c. 13.8 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

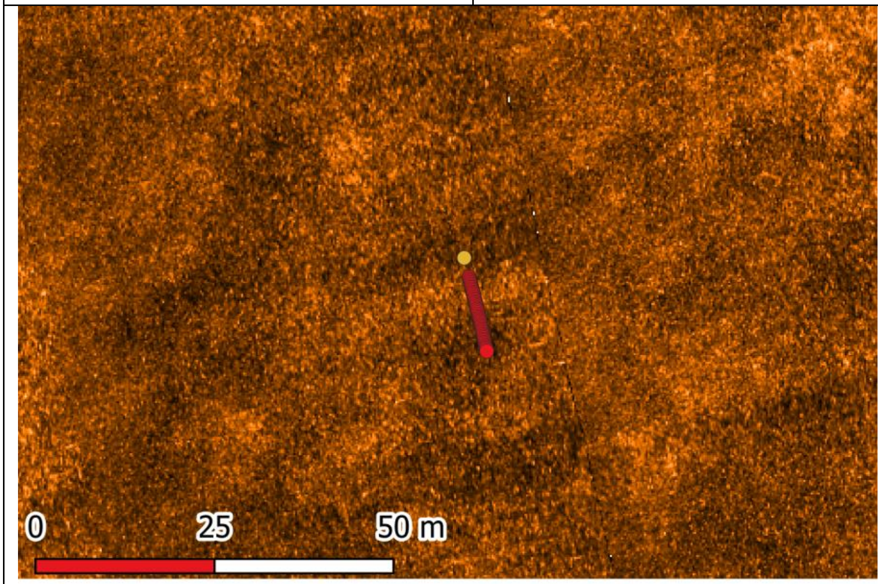
<table>
<tr><td rowspan="2">BM04_014
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
422463.07E 6183906.18N</td><td>Target: M_NM_BM04_0313
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Spans across c. 15 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

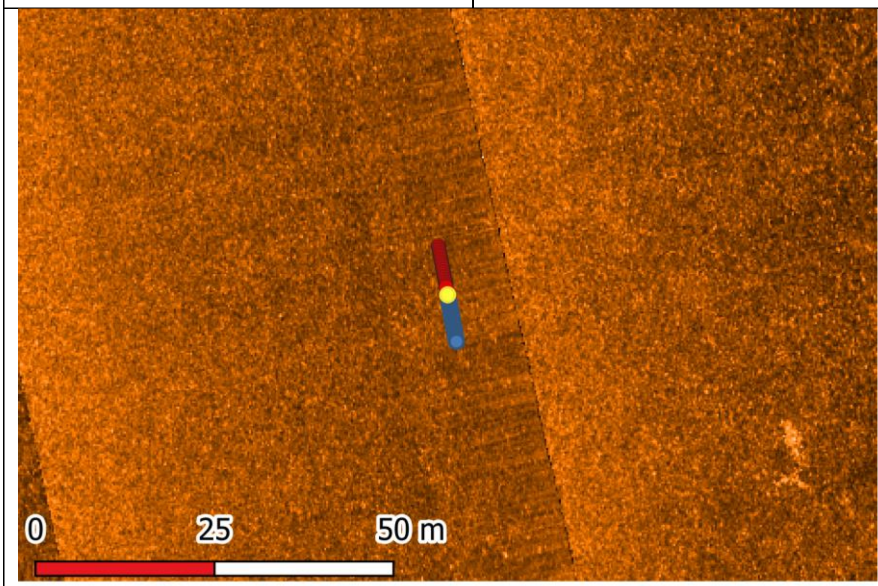
<table>
<tr><td rowspan="2">BM04_015
MAG response.
Debris.

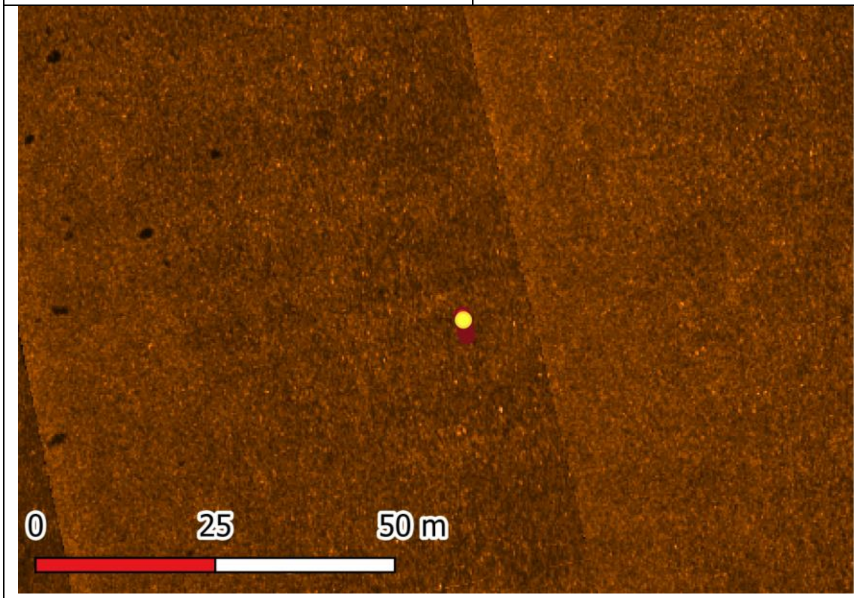
Confidence Level: 3
Significance level: 3

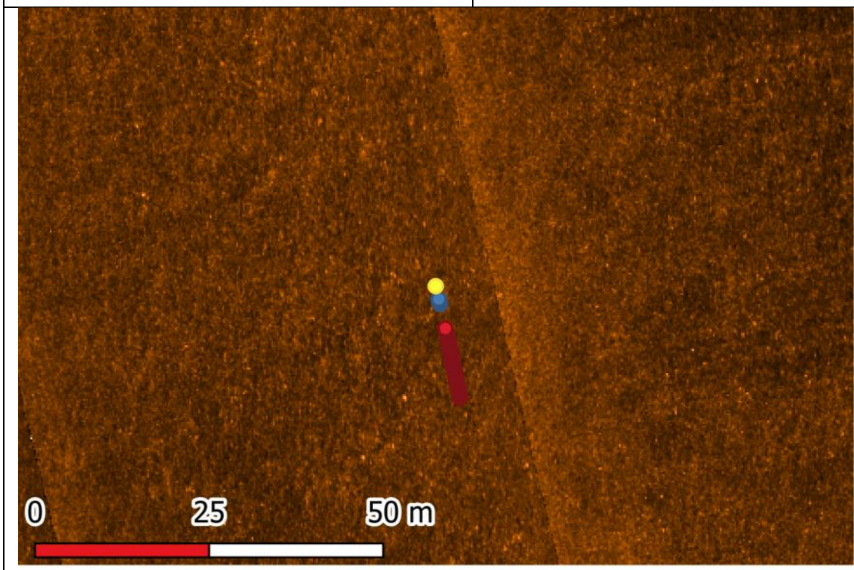
Unknown date.</td><td>Position:
422411.88E 6183801.35N</td><td>Target: M_NM_BM04_0344
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Spans across c. 14 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

<table>
<tr><td rowspan="2">BM05_012
MAG response.
Debris.

Confidence Level: 2
Significance level: 3

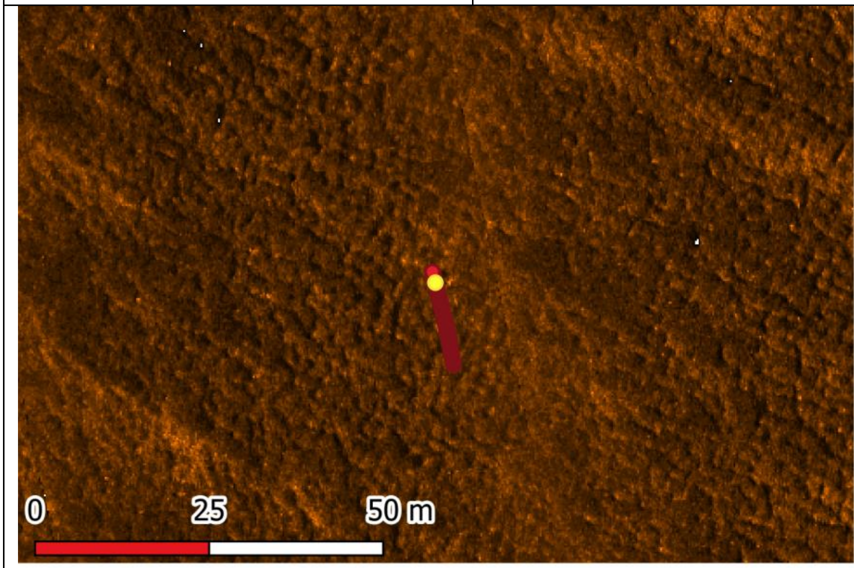
Unknown date.</td><td>Position:
411553.22E 6223650.12N</td><td>Target: M_NM_BM05_0106
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomaly, both positive and negative. Spans across c. 13.6 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

BM06_006 MAG response. Debris. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 407014.83E 6226087.96N	**Target**: M_NM_BM06_0282 **F&F:** N/A
	 	
Description:	Strong positive MAG anomaly. Very short span, c. 3.4 m. Possible scatter of debris towards NW.	
Recommended action:	Protection zone 50 m.	

BM06_007 MAG response. Debris. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 408187.95E 6218363.26N	**Target**: M_NM_BM06_0354 **F&F:** N/A
	 	
Description:	Strong MAG anomaly, both positive and negative. Spans c. 14.2 m, with MAG target (M_NM_BM06_0354) north of the highest values.	
Recommended action:	Protection zone 100 m.	

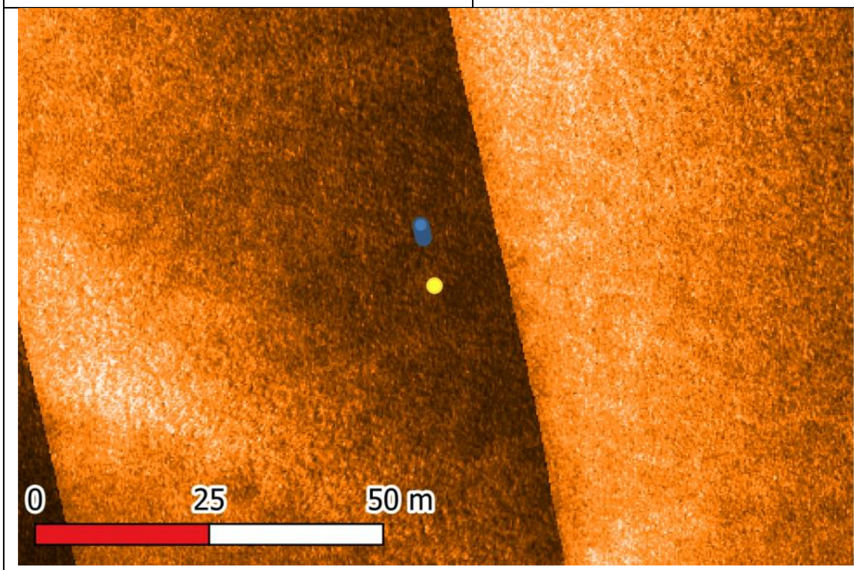
<table>
<tr><td rowspan="2">BM06_008
MAG response.
Debris.

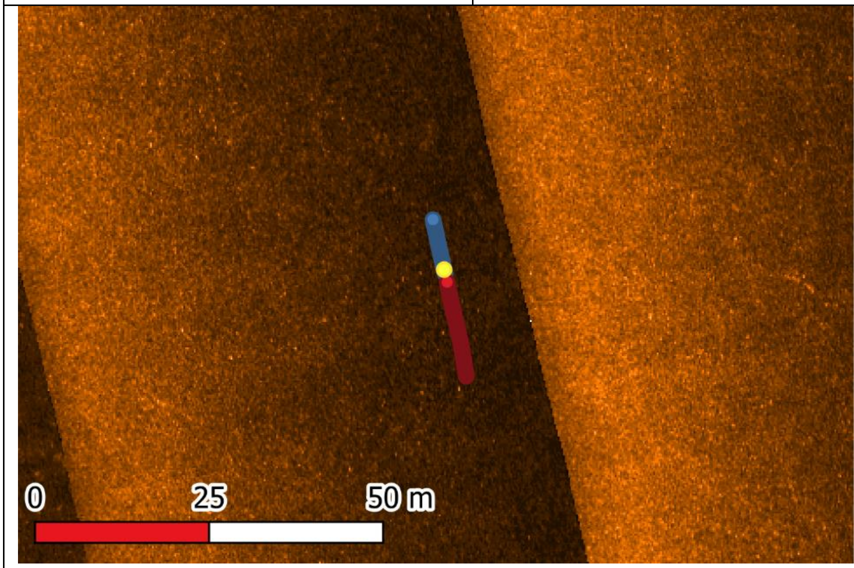
Confidence Level: 3
Significance level: 3

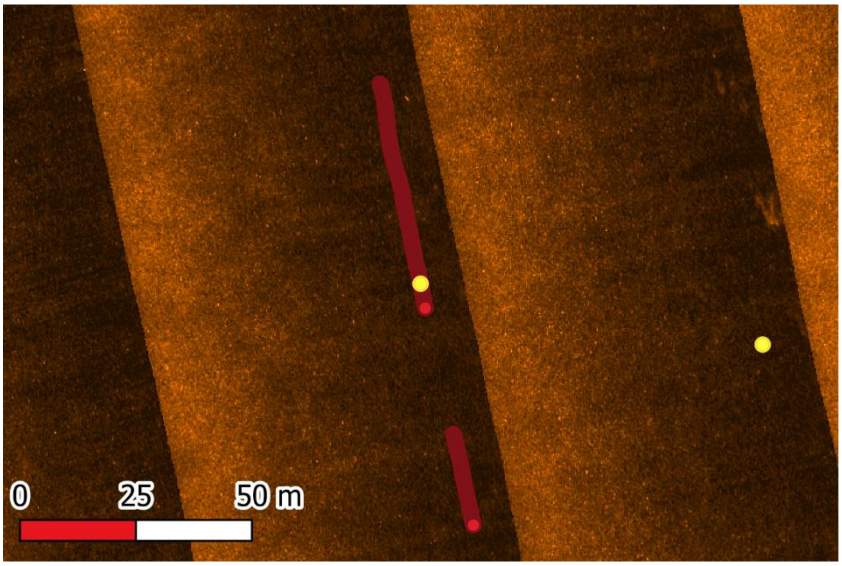
Unknown date.</td><td>Position:
414517.81E 6218363.26N</td><td>Target: M_NM_BM06_0323
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Spans c. 13.6 m. No visible debris nearby</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

<table>
<tr><td rowspan="2">BM07_001
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

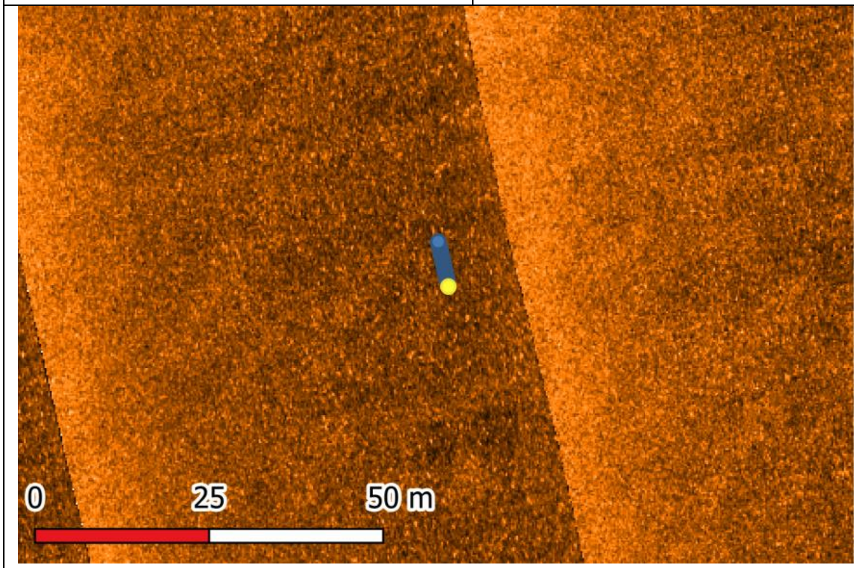
Unknown date.</td><td>Position:
407977.07E 6205123.61N</td><td>Target: M_FR_BM07_0357
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Very short span of c. 1.9 m. MAG Target further south, making a stretch of 8.9 m. No visible debris nearby</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

BM07_002 MAG response. Large target. Confidence Level: 2 Significance level: 2 Unknown date.	**Position:** 407550.41E 6208081.68N  	**Target**: M_FR_BM07_0409 **F&F:** N/A
Description:	Strong MAG anomaly, both positive and negative. Spans c. 23.0 m. No visible debris nearby. Could be large debris or small wreck.	
Recommended action:	Protection zone 100 m.	

BM07_003 MAG response. Large target. Confidence Level: 1 Significance level: 2 Unknown date.	**Position:** 406877.29E 6209208.20N **NB: Scale 1:1500.**  	**Target**: M_FR_BM07_0308 **F&F:** N/A
Description:	Strong positive MAG anomaly in two sets. Total span of c. 97.3 m. No visible debris nearby. A further MAG Target to the E (M_FR_BM07_0349). Could stem from wreck or very large debris.	
Recommended action:	Protection zone 100 m.	

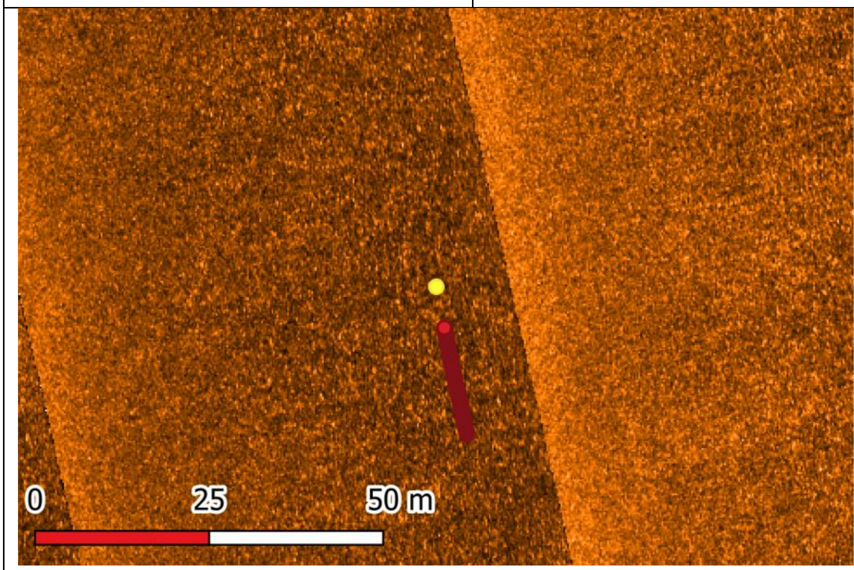
<table>
<tr><td rowspan="2">BM08_003
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

Unknown date</td><td>Position:
402621.75E 6224871.00N</td><td>Target: M_FR_BM08_0098
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Short stretch of 6.6 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

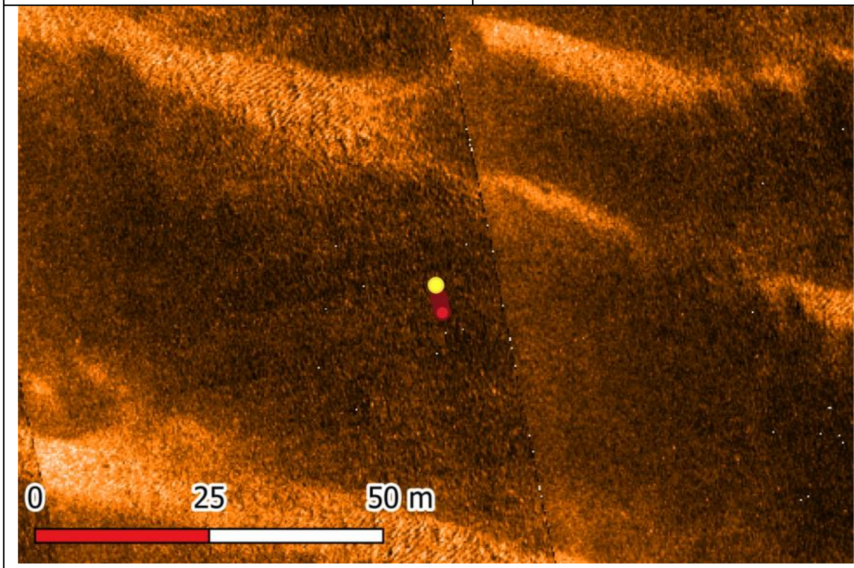
<table>
<tr><td rowspan="2">BM08_004
MAG response. Large Target

Confidence Level: 2
Significance level: 3

Unknown date</td><td>Position:
405227.63E 6212848.39N</td><td>Target: M_FR_BM08_0097
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Stretches 15.7 m, with MAG Target set further N. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

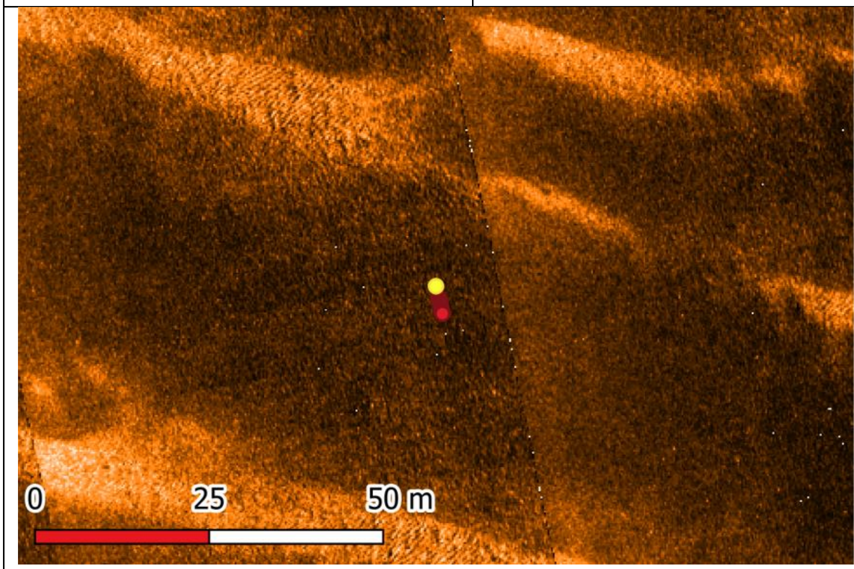
<table>
<tr><td rowspan="2">BM08_005
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

Unknown date</td><td>Position:
407087.69E 6205268.30N</td><td>Target: M_FR_BM08_0564
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 2.4 m, with MAG Target set further N. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

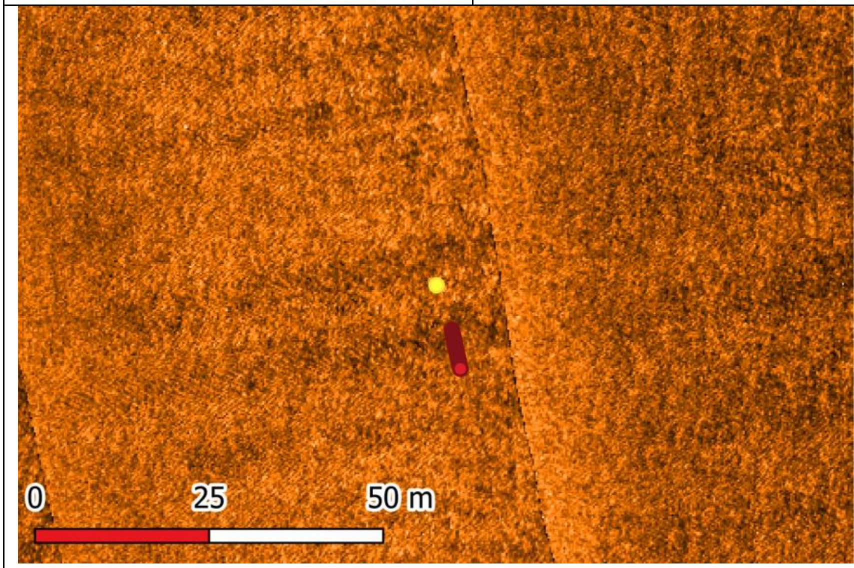
<table>
<tr><td rowspan="2">BM08_006
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

Unknown date</td><td>Position:
407490.34E 6204733.16N</td><td>Target: M_FR_BM08_0016
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 4.4 m, with MAG Target set further N. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

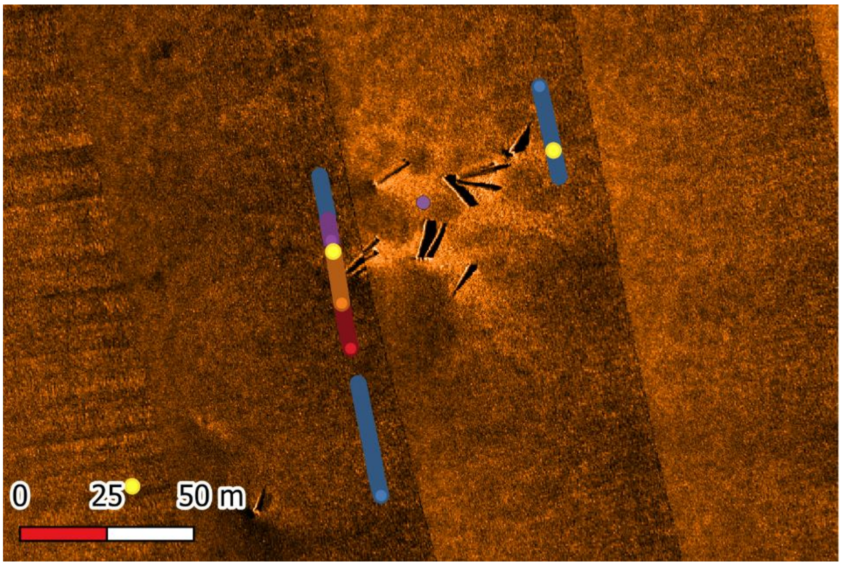
<table>
<tr>
<td rowspan="2">BM08_007
MAG response.
Debris.

Confidence Level: 2
Significance level: 2

Probably 1948.</td>
<td>Position:
408877.43E 6189079.98N</td>
<td>Target: M_FR_BM08_0371
F&F: N/A</td>
</tr>
<tr>
<td colspan="2">
</td>
</tr>
<tr>
<td>Description:</td>
<td colspan="2">Strong positive MAG anomaly. Short stretch of c. 5.7 m, with MAG Target set further N. Located 135 m W of SIERRA CORDOBA (BM08_002), and most likely representing debris from here. There are other MAG targets in this area.</td>
</tr>
<tr>
<td>Recommended action:</td>
<td colspan="2">Protection zone 50 m.</td>
</tr>
</table>

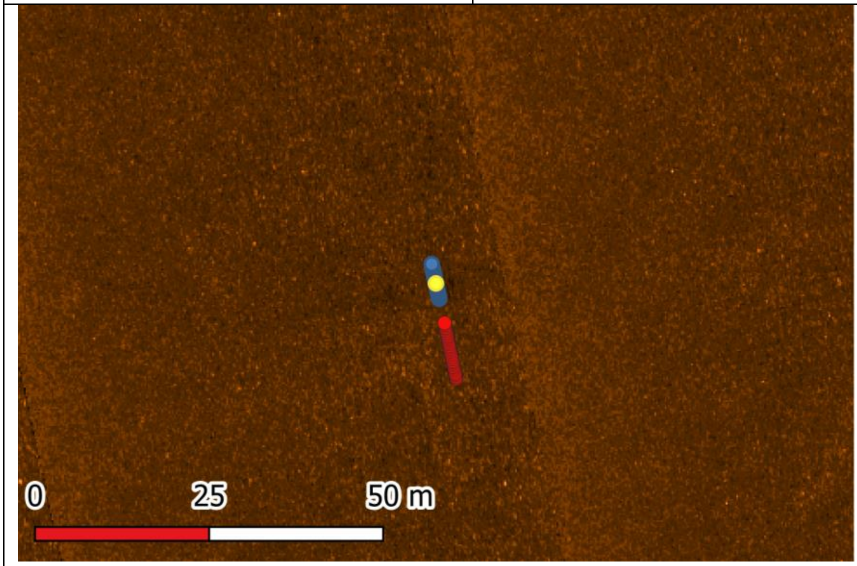
<table>
<tr><td rowspan="2">BM08_008
SSS and MAG target.
Lost cargo.

Confidence Level: 1
Significance level: none

Recent</td><td>Position:
407108.02E 6203324.23N</td><td>Target: S_FR_BM08_0004-0013, S_FR_BM08_0118, M_FR_BM08_0110, M_FR_BM08_0116, M_FR_BM08_0155, M_FR_BM08_0156
F&F: N/A</td></tr>
<tr><td colspan="2">NB: Scale 1:2000.
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong (±50nT) to very strong (±1000 nT: orange and purple) MAG anomaly across more transects. The target is several pipes, c. 11-12 m long, scattered across the area. Although also a clear SSS target, it is placed in this section for comparison with other MAG targets, since the debris is modern. Note the divergent scale of the map, though.
Evidently recent, and not protected.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">None</td></tr>
</table>

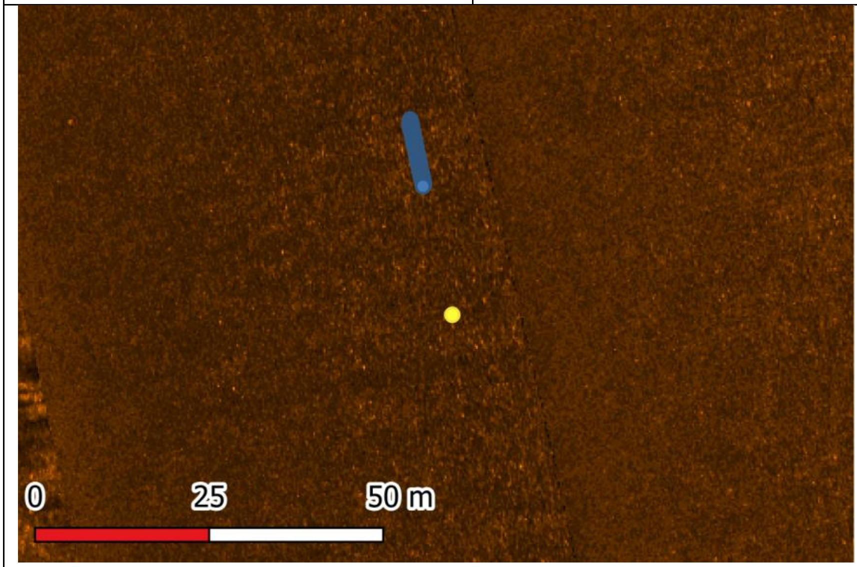
<table>
<tr><td rowspan="2">BM09_025
MAG response.
Debris.

Confidence Level: 2
Significance level: 2

Unknown date</td><td>Position:
398349.39E 6228062.06N</td><td>Target: M_GR_BM09_0032
F&F: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomaly, both positive and negative. Stretches across 16.8 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

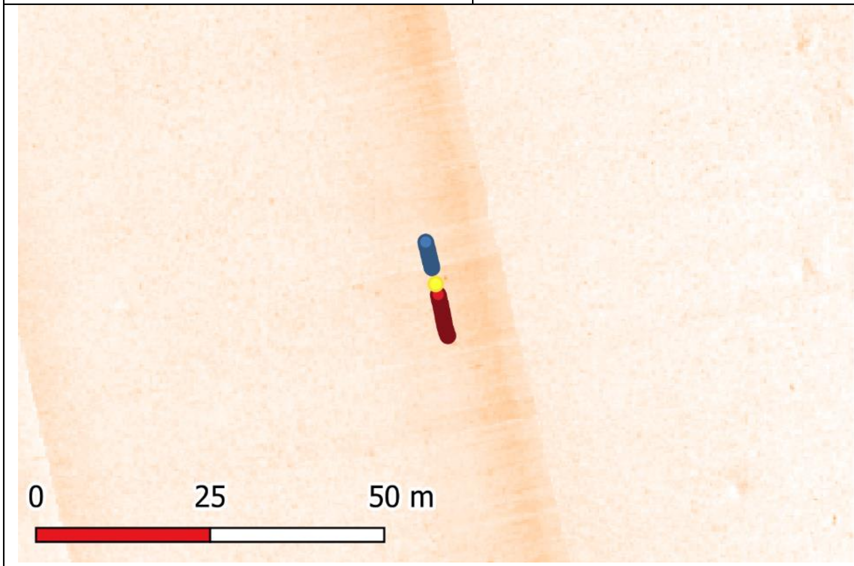
<table>
<tr><td rowspan="2">BM09_026
MAG response.
Debris.

Confidence Level: 3
Significance level: 2

Unknown date</td><td>Position:
401263.76E 6217592.19N</td><td>Target: M_GR_BM09_0169
F&F: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Stretches across 9.7 m. MAG Target set c. 19 m further S, indicating a larger target. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

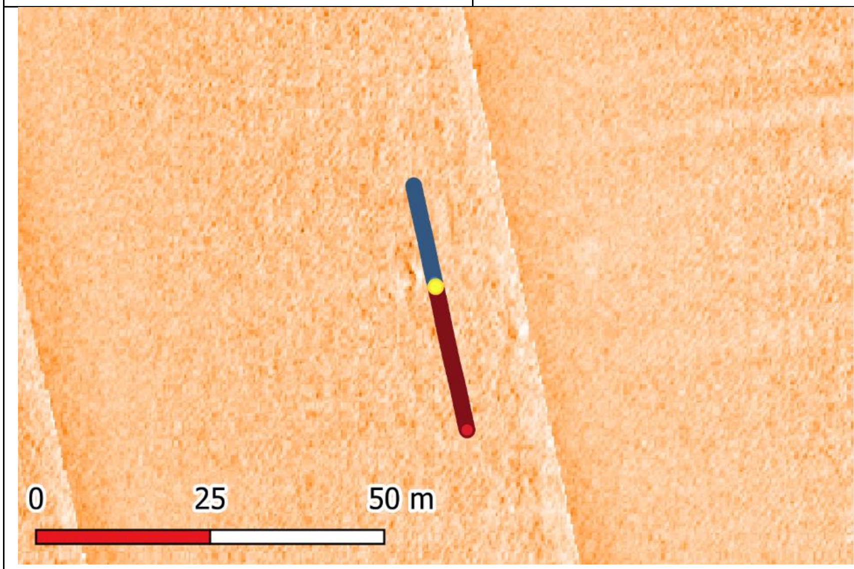
<table>
<tr><td rowspan="2">BM10_004
MAG response. Debris.

Confidence Level: 2
Significance level: 2

Unknown date</td><td>Position:
395538.45E 6231786.02N</td><td>Target: M_FR_BM10_0233
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomaly, both positive and negative. Stretches across 13.9 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

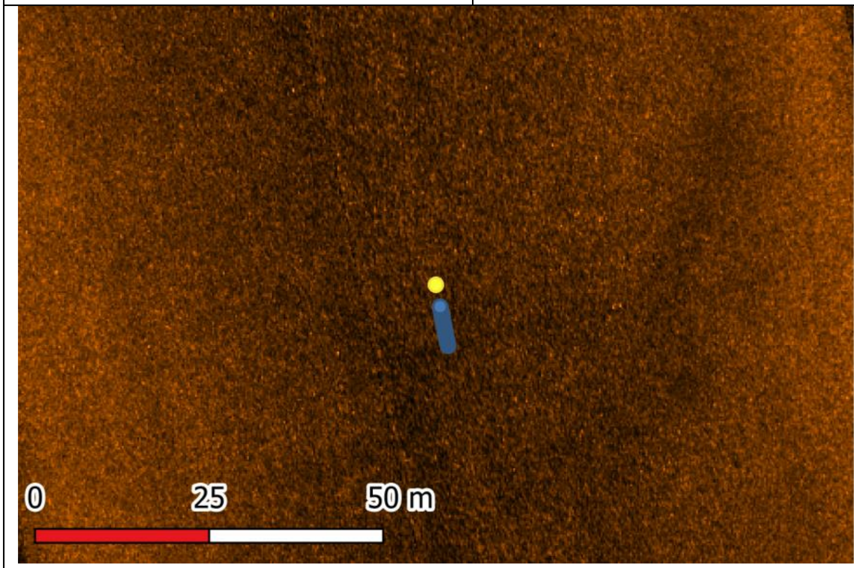
<table>
<tr><td rowspan="2">BM10_005
MAG response. Large Target

Confidence Level: 2
Significance level: 2

Unknown date</td><td>Position:
395538.45E 6231786.02N</td><td>Target: M_NM_BM10_0545
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomaly, both positive and negative. Stretches across 35.9 m. No visible debris nearby. Could be related to F&F target BM10_007?</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

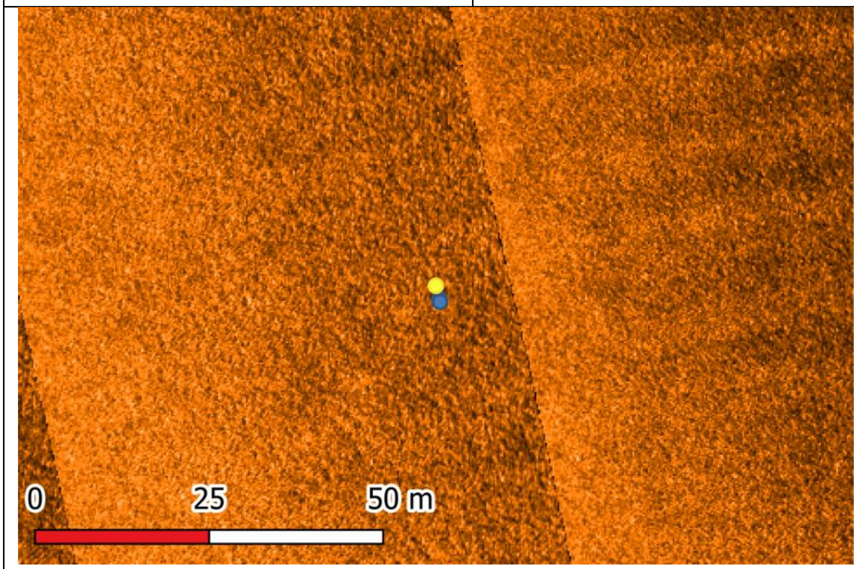
<table>
<tr><td rowspan="2">BM11_003
MAG response.
Debris.

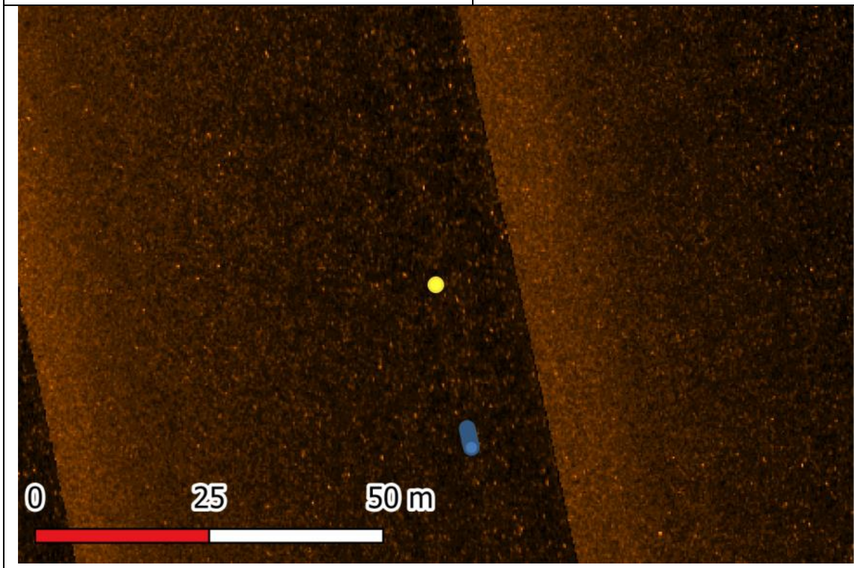
Confidence Level: 3
Significance level: 3

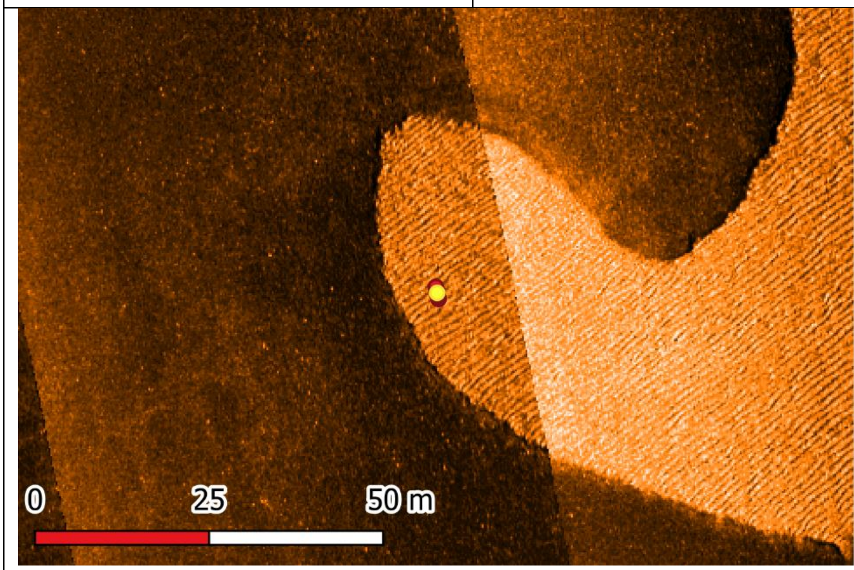
Unknown date</td><td>Position:
390891.87E 6230414.89N</td><td>Target: M_NM_BM11_0796
F&F: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Short stretch of 5.8 m. MAG Target set slightly further N. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

<table>
<tr><td rowspan="2">BM11_004
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

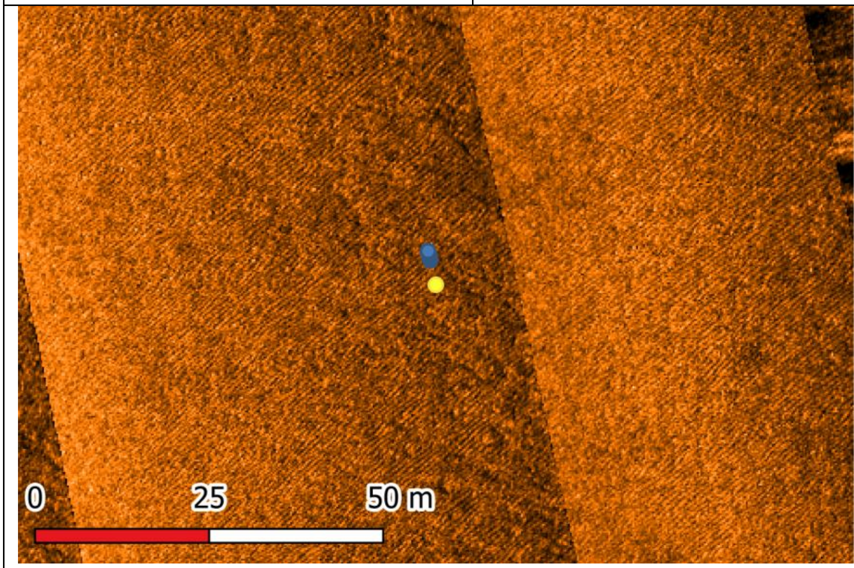
Unknown date</td><td>Position:
392560.53E 6229655.29N</td><td>Target: M_NM_BM11_0492
F&F: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of 0.5 m. MAG Target set slightly further N. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m/none.</td></tr>
</table>

BM11_005 MAG response. Debris. Confidence Level: 2 Significance level: 3 Unknown date	**Position:** 392226.03E 6226570.44N	**Target**: M_NM_BM11_0369 **F&F:** N/A
		
Description:	Strong positive MAG anomaly. Very short stretch of 2.8 m. MAG Target set 21 m further N, so probably larger target than indicated by strong signal. No visible debris nearby.	
Recommended action:	Protection zone 100 m.	

BM11_006 MAG response. Debris. Confidence Level: 3 Significance level: 3 Unknown date	**Position:** 394557.57E 6224737.37N	**Target**: M_NM_BM11_0097 **F&F:** N/A
		
Description:	Strong negative MAG anomaly. Very short stretch of 1.8 m. MAG target set at the centre of this negative anomaly. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

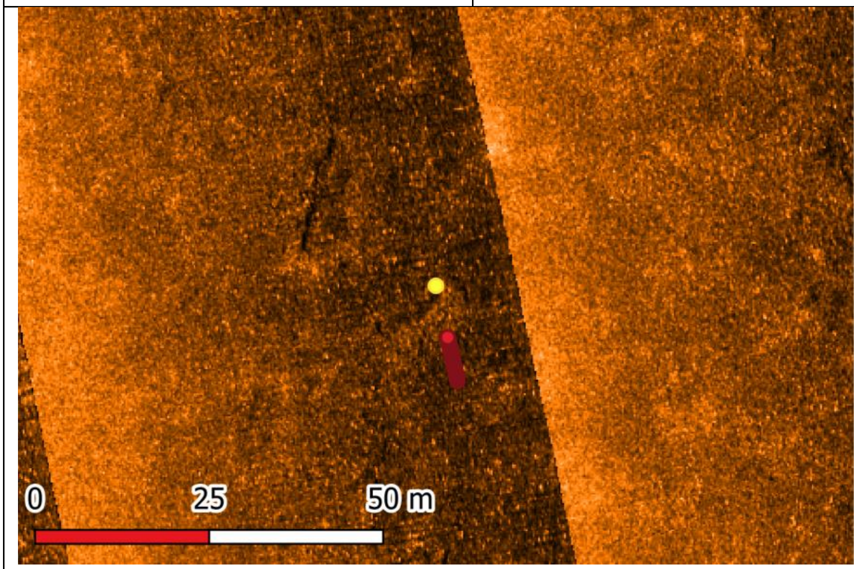
<table>
<tr><td rowspan="2">BM11_007
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

Unknown date</td><td>Position:
397214.99E 6212475.85N</td><td>Target: M_NM_BM11_0092
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Very short stretch of 1.4 m. With the MAG Target set another 3.6 m further S. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

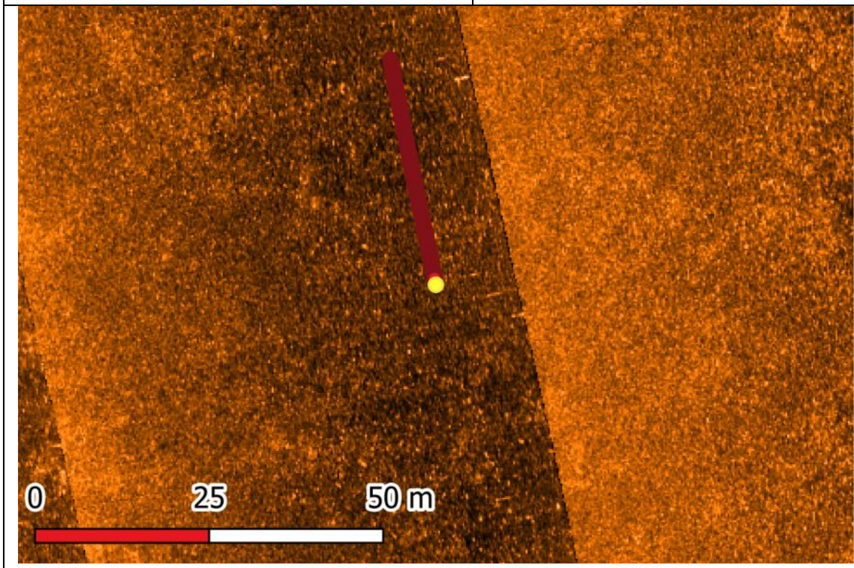
<table>
<tr><td rowspan="2">BM11_008
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

Unknown date</td><td>Position:
397621.05E 6201352.98N</td><td>Target: M_NM_BM11_0401
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Short stretch of 6.4 m. With the MAG Target set another 7.6 m further N. No visible debris nearby. Linear marks are seen in a large area around this target and cannot be interpreted as debris.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

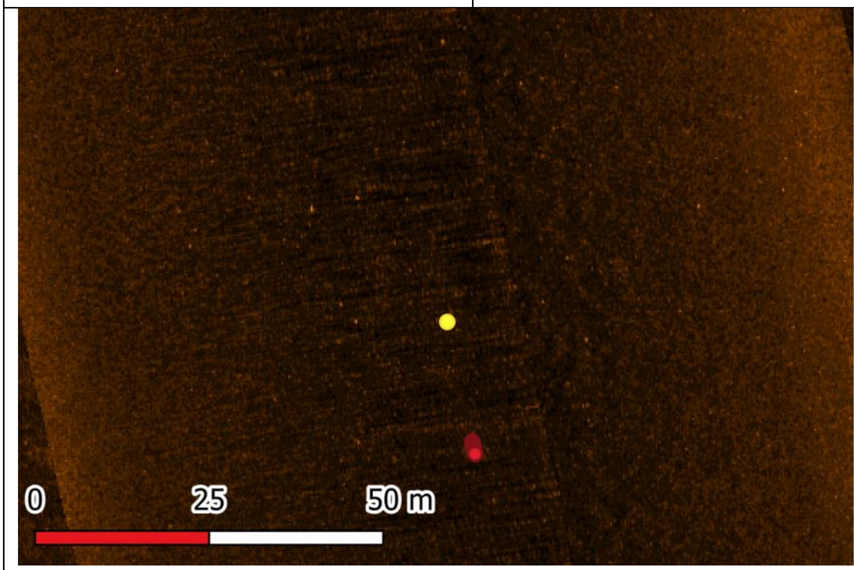
<table>
<tr><td rowspan="2">BM11_009
MAG response. Large target

Confidence Level: 2
Significance level: 2

Unknown date</td><td>Position:
399721.85E 6195955.32N</td><td>Target: M_NM_BM11_0600
F&F: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Stretches across of 32.1 m. MAG Target set immediately S of this. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

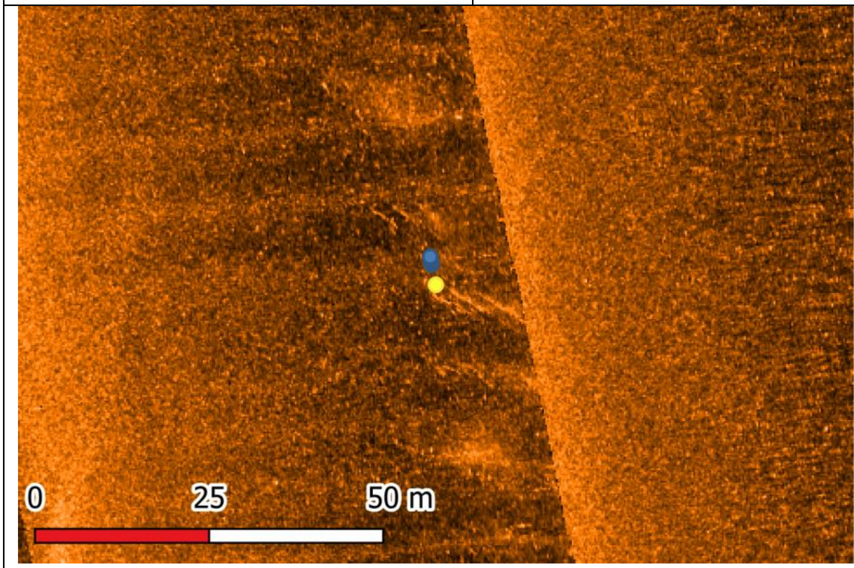
<table>
<tr><td rowspan="2">BM11_010
MAG response. Debris.

Confidence Level: 3
Significance level: 2

Unknown date</td><td>Position:
399373.35E 619621.34N</td><td>Target: M_NM_BM11_0823
F&F: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of 1.8 m. With the MAG Target set another 15.6 m further N, indicating a larger target. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

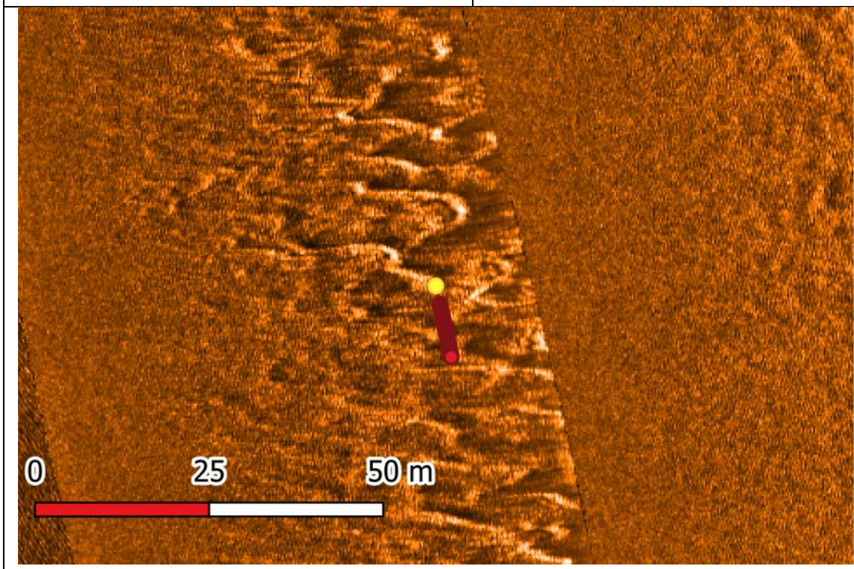
<table>
<tr><td rowspan="2">BM11_011
MAG response.
Debris.

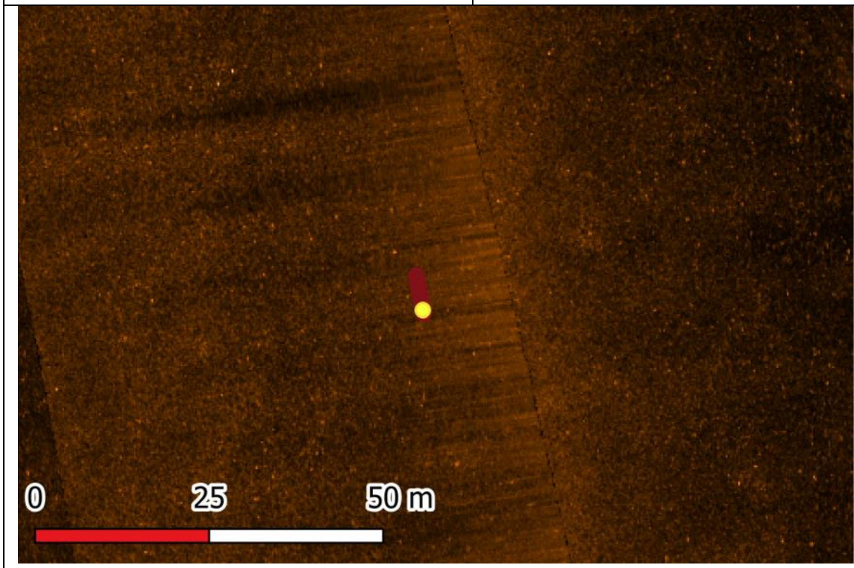
Confidence Level: 3
Significance level: 3

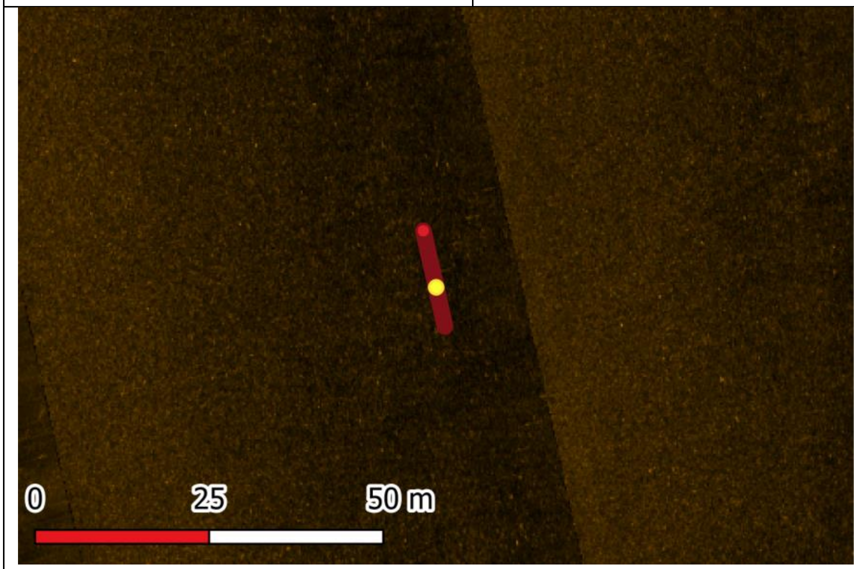
Unknown date</td><td>Position:
400123.25E 6187826.65N</td><td>Target: M_NM_BM11_0781
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Very short stretch of 1.1 m. With the MAG Target set another 3.0 m further S. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

<table>
<tr><td rowspan="2">BM12_004
MAG response.
Debris.

Confidence Level: 3
Significance level: 3

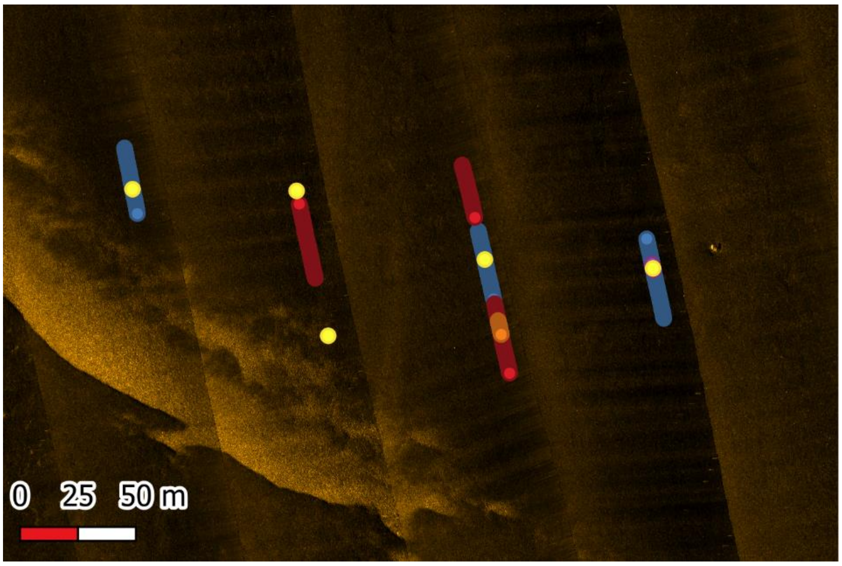
Unknown date</td><td>Position:
389410.60E 6227997.48N</td><td>Target: M_NM_BM12_0401
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Stretch of 10.6 m. MAG Target set immediately N of anomaly. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

BM13_004 MAG response. Debris. Confidence Level: 3 Significance level: 3 Unknown date	**Position:** 388402.24E 6226037.35N	**Target:** M_NM_BM13_0046 **F&F:** N/A
		
Description:	Strong positive MAG anomaly. Short stretch of 5.5 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

BM13_005 MAG response. Debris. Confidence Level: 3 Significance level: 3 Unknown date	**Position:** 388237.71E 6223822.33N	**Target:** M_NM_BM12_0147 **F&F:** N/A
		
Description:	Strong positive MAG anomaly. Stretch of 14.1 m. No visible debris nearby.	
Recommended action:	Protection zone 100 m.	

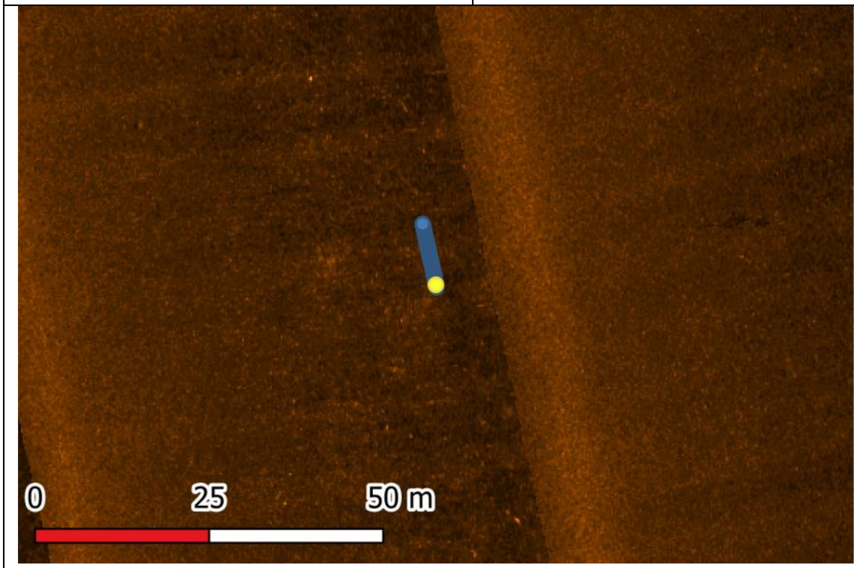
<table>
<tr>
<td rowspan="2">BM13_006
MAG response. Lost cargo.

Confidence Level: 1
Significance level: none

Recent</td>
<td>Position:
388237.71E 6223822.33N
(From F&F)</td>
<td>Target: M_NM_BM13_0250
M_NM_BM13_0303
M_NM_BM13_0304
M_NM_BM13_0369
M_NM_BM13_1380
F&F: 400110c-133/SysNo. 179352</td>
</tr>
<tr>
<td colspan="2">NB: Scale 1:3000.

</td>
</tr>
<tr>
<td>Description:</td>
<td colspan="2">Several strong to very strong MAG anomalies (>1000nT), both positive and negative. F&F has the site registered as eight steel pipes. No visible debris nearby (cf. BM08_008, where pipes are visible.). Registered in F&F in 2000.</td>
</tr>
<tr>
<td>Recommended action:</td>
<td colspan="2">None</td>
</tr>
</table>

<table>
<tr><td rowspan="2">BM14_014
MAG response.
Debris

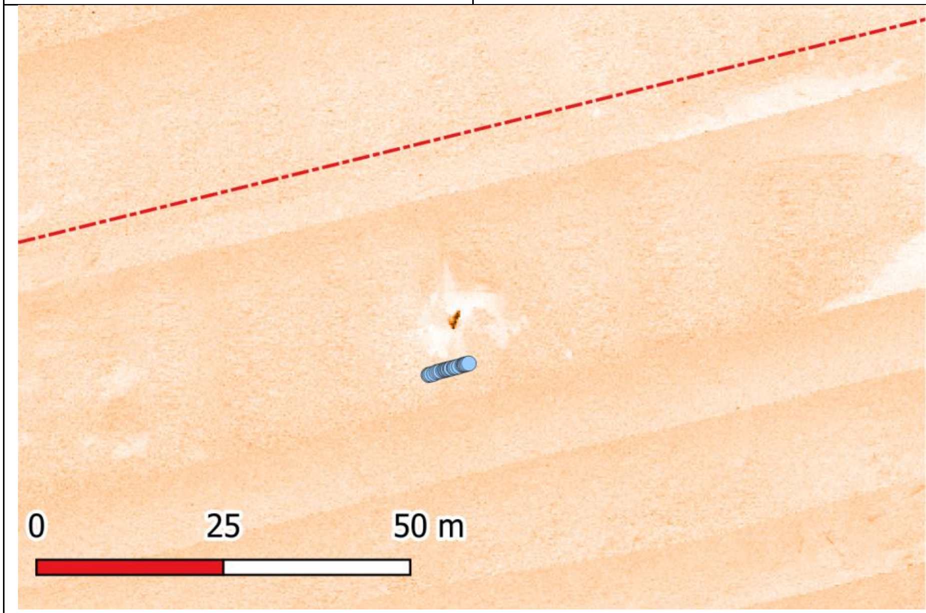
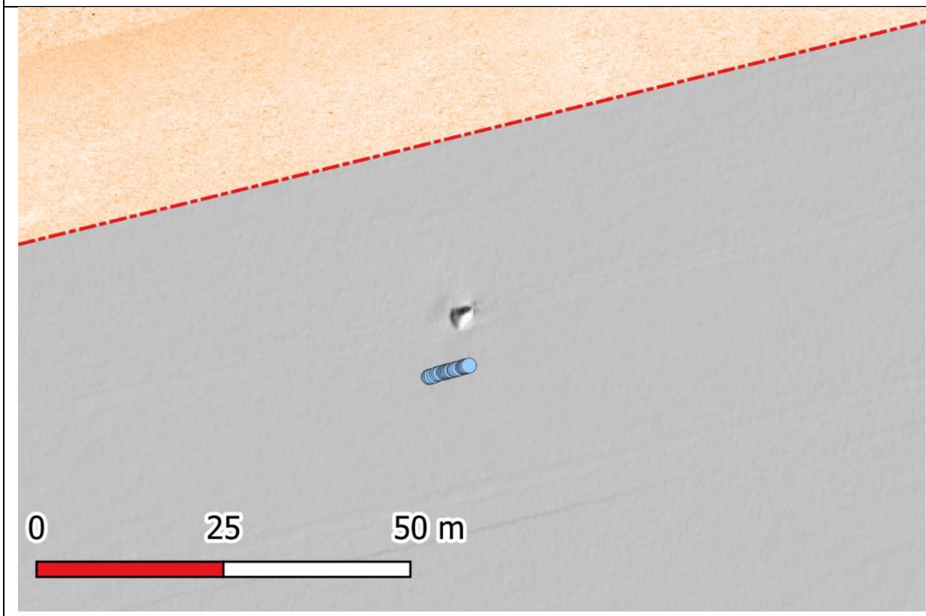
Confidence Level: 3
Significance level: 3

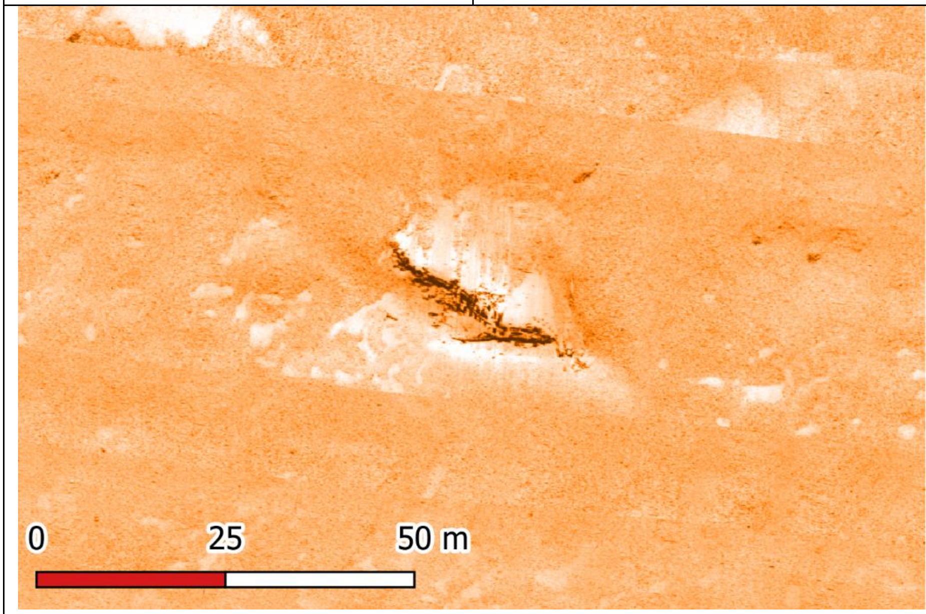
Unknown date.</td><td>Position:
385506.06E 6223877.82N</td><td>Target: M_NM_BM14_0806
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Stretch of c. 9.3 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

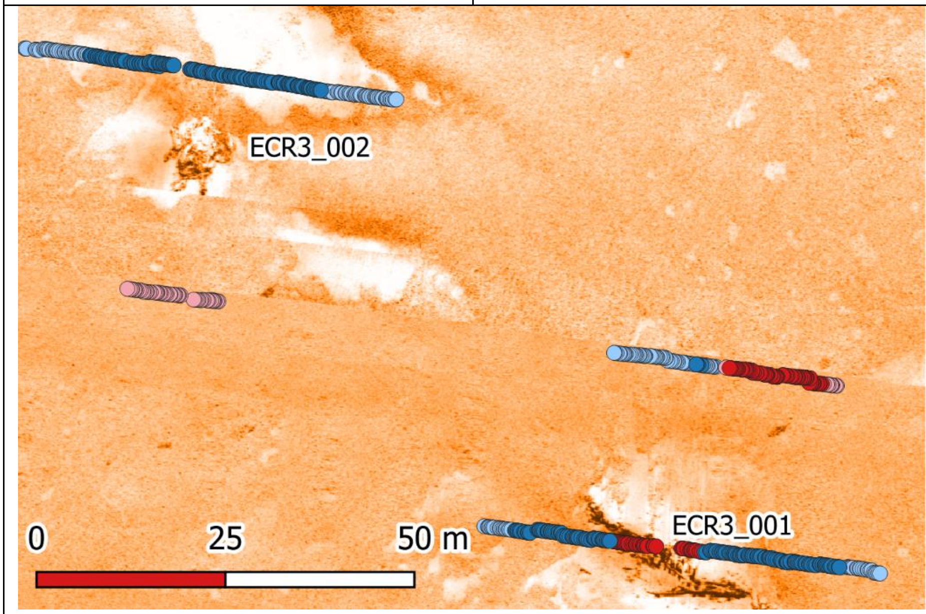
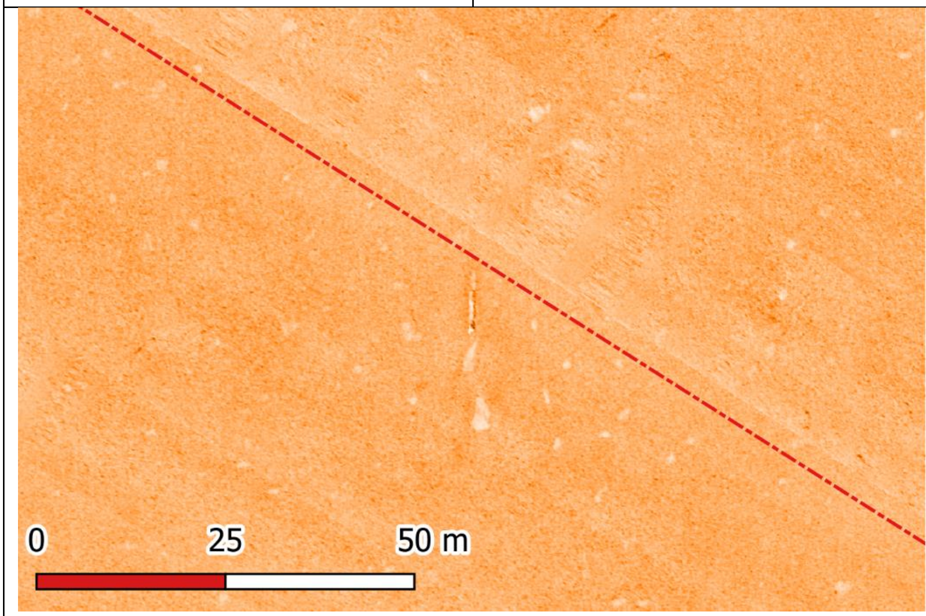
5.3. SSS-targets in the ECR areas

<table>
<tr><td rowspan="3">ECR1_002
Scour/debris

Confidence Level: 3
Significance level: 3

Unknown date</td><td>Position:
443618.75E 6233935.87N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Small scour mark. There is a moderate MAG anomaly (≤ 20nT) near it. Probably debris.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

ECR3_001 Possible wreck Confidence Level: 2 Significance level: 1 Unknown date	**Position**: 431029.79E 6191254.63N	**Target**: N/A **F&F:** N/A
		
	(No MBES data shown)	
Description:	Possible wreck site, although heavily damaged. C. 27 m long. Strong MAG anomaly across the site.	
Recommended action:	ROV/diver survey. Protection zone 100 m.	

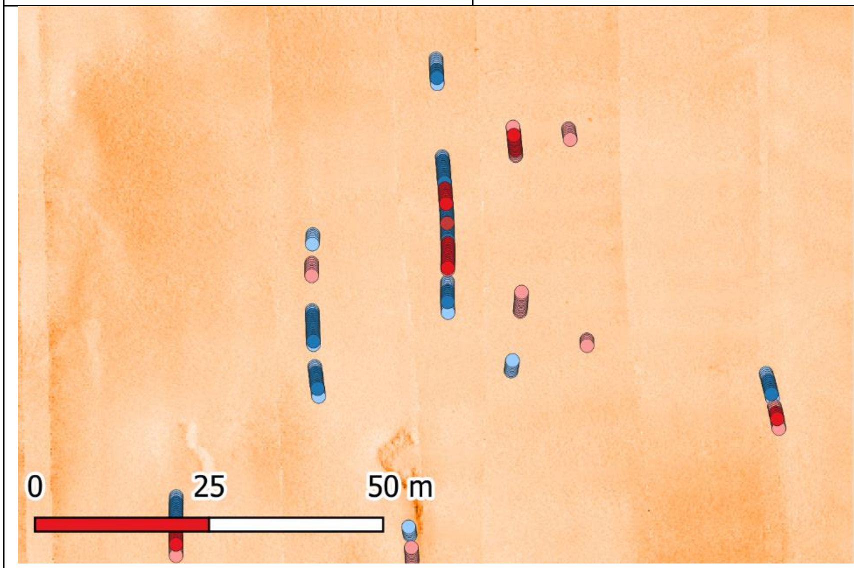
ECR3_002 Debris? Confidence Level: 2 Significance level: 3 Unknown date	**Position:** 431029.79E 6191254.63N	**Target**: N/A **F&F:** N/A
		
	(No MBES data shown)	
Description:	Debris or concretion. Circular. Strong negative MAG anomaly N of the target, with moderate positive anomaly to the S. Close to ECR3_001.	
Recommended action:	Protection zone 50 m (due to combination with ECR3_001)	
ECR3_003 Debris? Confidence Level: 2 Significance level: 3 Unknown date	**Position:** 440322.12E 6191309.76N	**Target**: N/A **F&F:** N/A
		
	(No MBES data shown)	
Description:	Linear debris, c. 5.7 m long. No MAG anomaly.	
Recommended action:	Protection zone 50 m.	

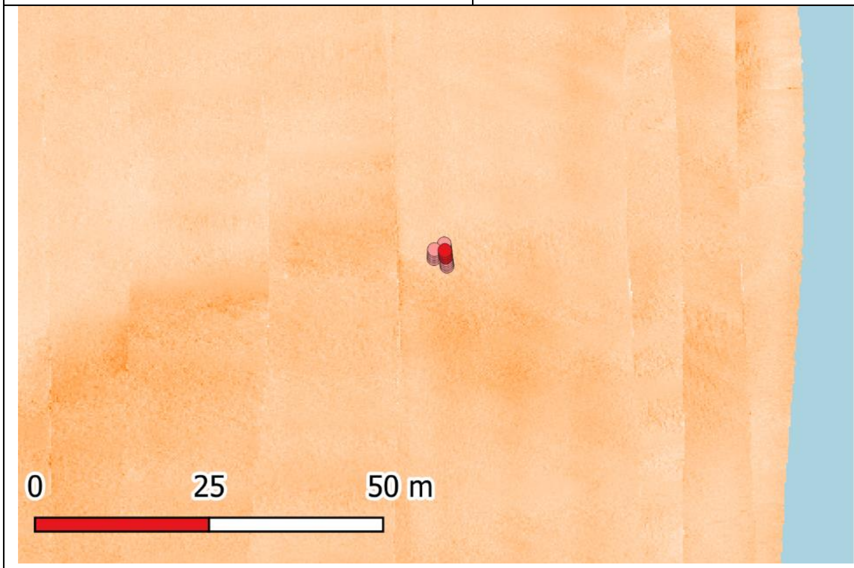
5.4. MAG-targets in the ECR areas

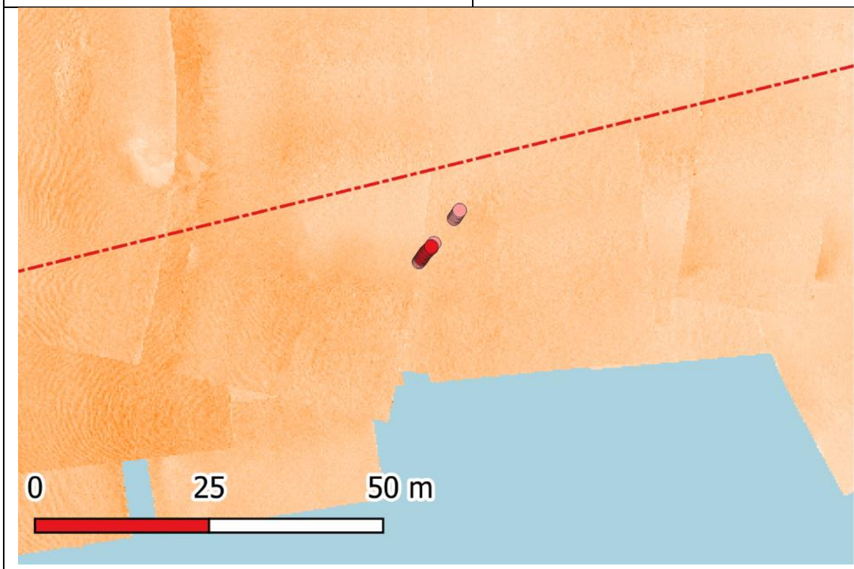
Since these was no previous review of these data by the geophysics team, the MAG data are shown with anomalies beyond ±50 nT in red and blue as above, but also above/below ± 20 nT. The restrictive criteria for selection, ±50 nT, is kept here.

<table>
<tr><td rowspan="2">ECR1_003
MAG response.

Confidence Level: 1
Significance level: 2

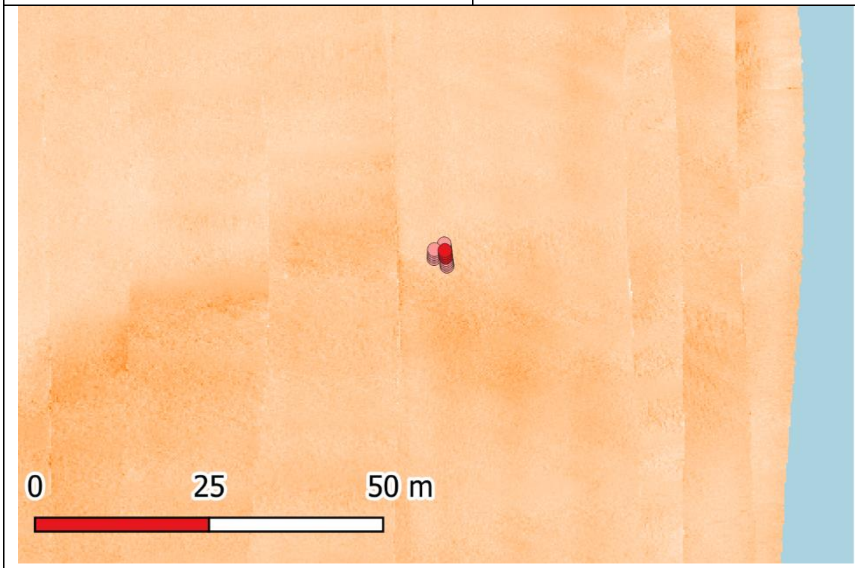
Unknown date.</td><td>Position:
445942.19E 6234075.13N</td><td>Target: M_NM_BM14_0806
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Area with strong MAG anomalies, both positive and negative. The extent indicates a large object in the seabed. The target is c. 150 m from the current shoreline. A likely interpretation is a stranded ship, although modern construction or extensive debris would produce a similar pattern (cf. BM08_008 and BM13_006).</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

ECR1_004 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 6234075.13E 6233488.68N	**Target**: N/A **F&F:** N/A
	 	
Description:	Strong positive MAG anomaly. Very short stretch of 1.0 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

ECR1_005 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 445935.05E 6232973.10N	**Target**: N/A **F&F:** N/A
	 	
Description:	Strong positive MAG anomaly, c. 2.3 m. NB: Just outside cable corridor, by 10-15 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

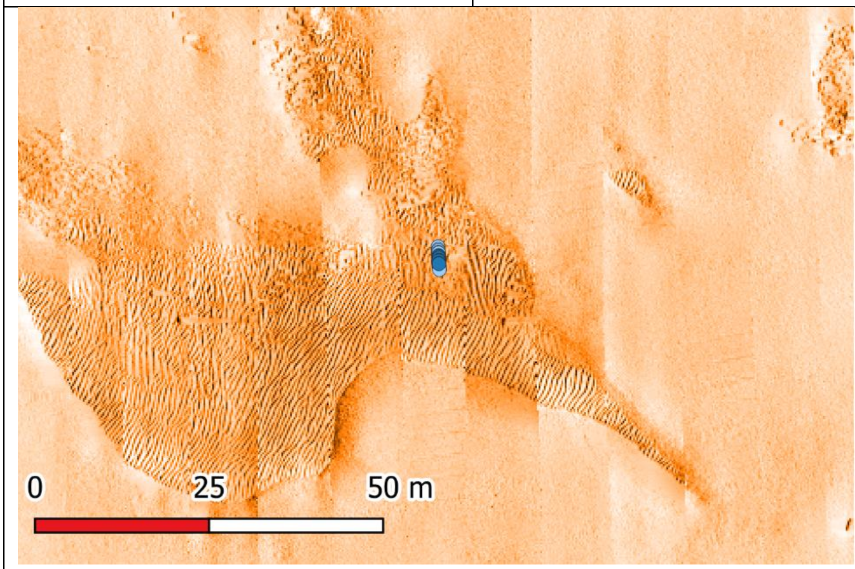
<table>
<tr><td rowspan="2">ECR1_006
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
444987.89E 6233696.40N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomaly, both positive and negative. Stretches c. 9.8 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

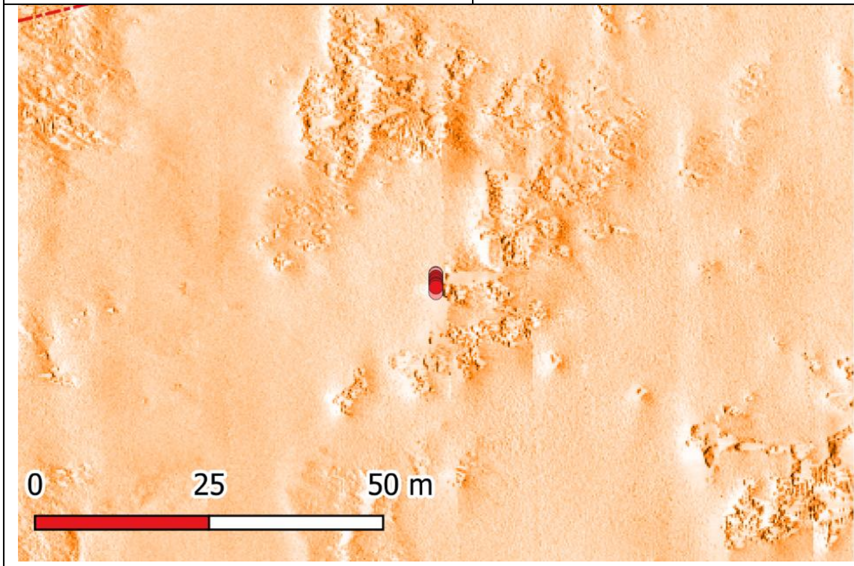
<table>
<tr><td rowspan="2">ECR1_007
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
445022.88E 6233942.40N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Very short stretch, c. 1.8 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

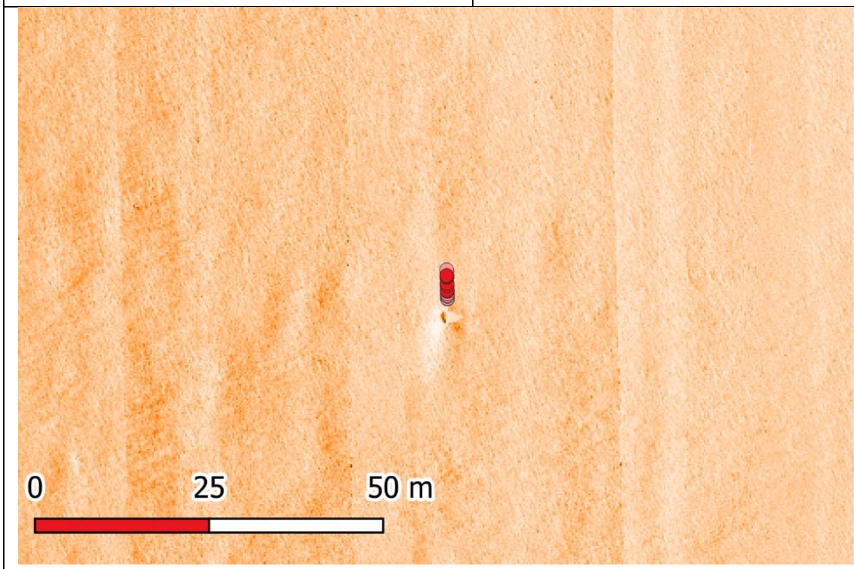
<table>
<tr><td rowspan="2">ECR1_008
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
444777.85E 6234192.28N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch, c. 1.5 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

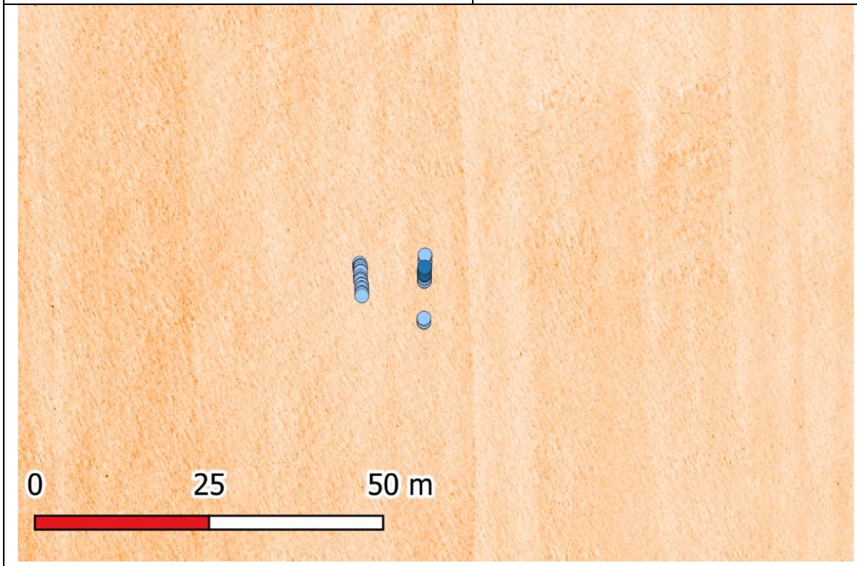
<table>
<tr><td rowspan="2">ECR1_009
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
444853.11E 6233146.95N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 2.3 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

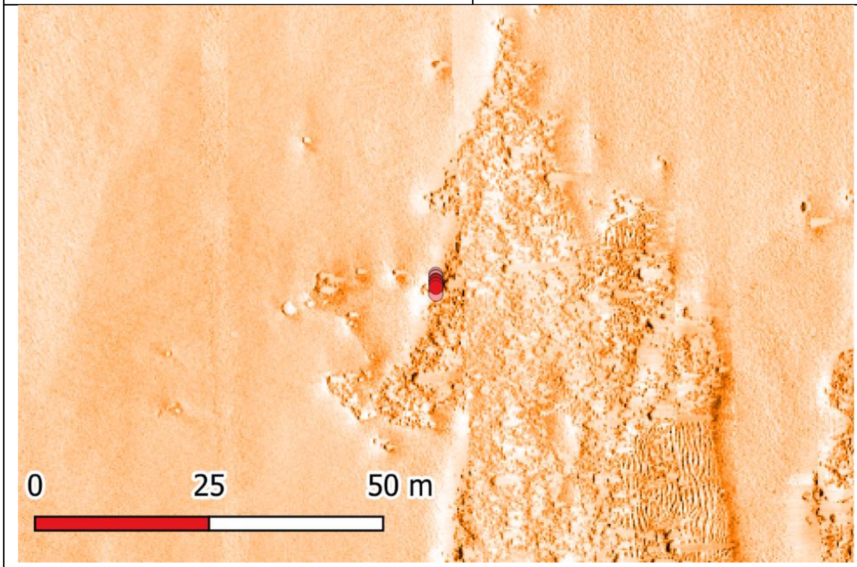
<table>
<tr><td rowspan="2">ECR1_010
MAG response.

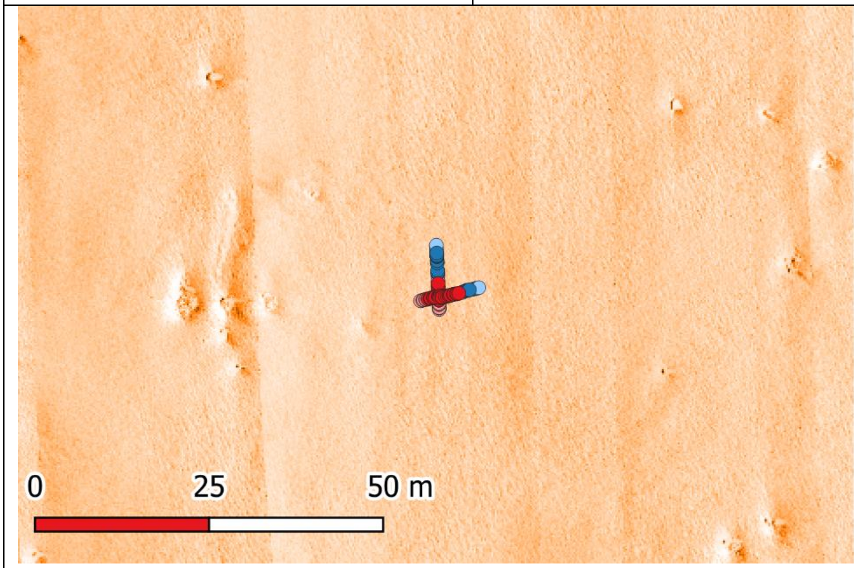
Confidence Level: 3
Significance level: 3

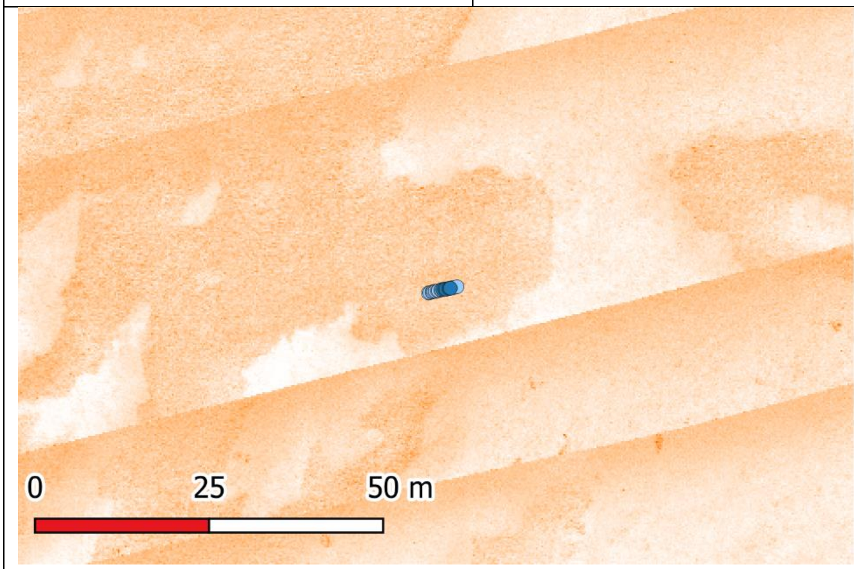
Unknown date.</td><td>Position:
444869.97E 6233233.67N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Very short stretch of c. 1.2 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

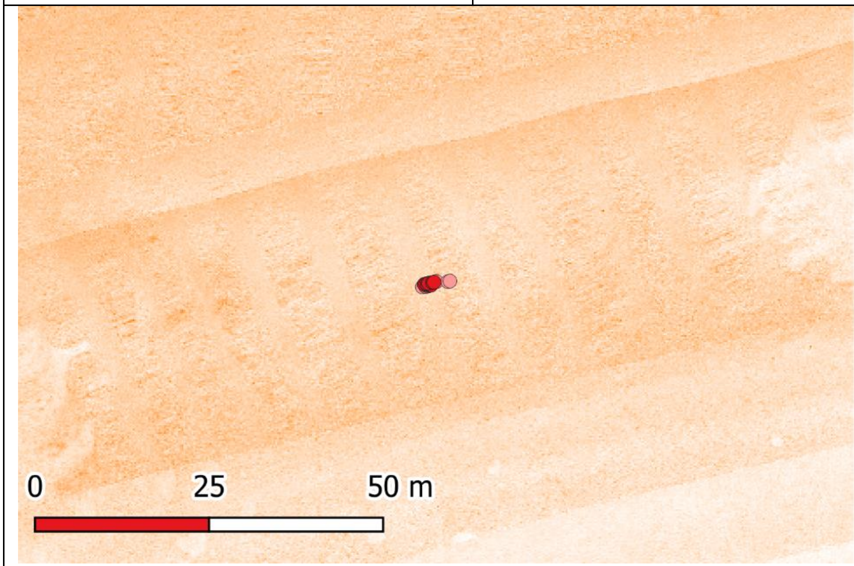
<table>
<tr><td rowspan="2">ECR1_011
MAG response.

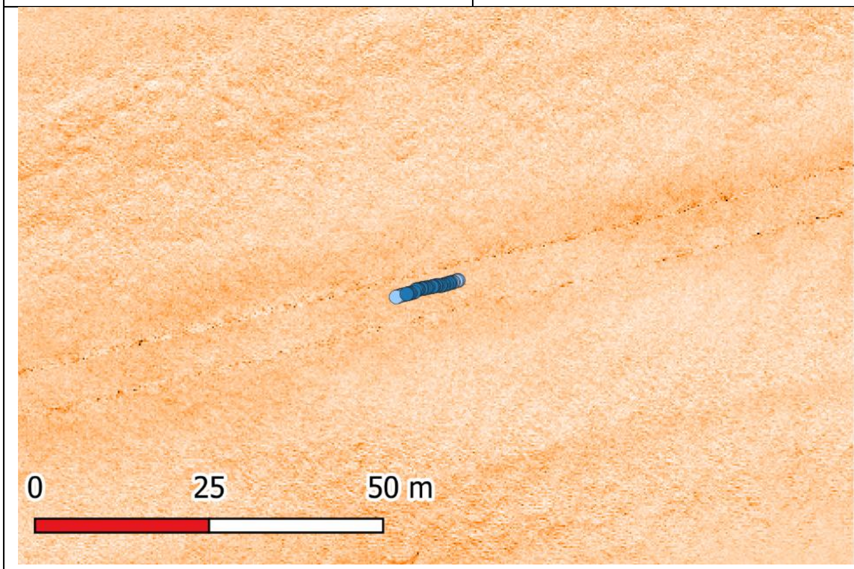
Confidence Level: 3
Significance level: 3

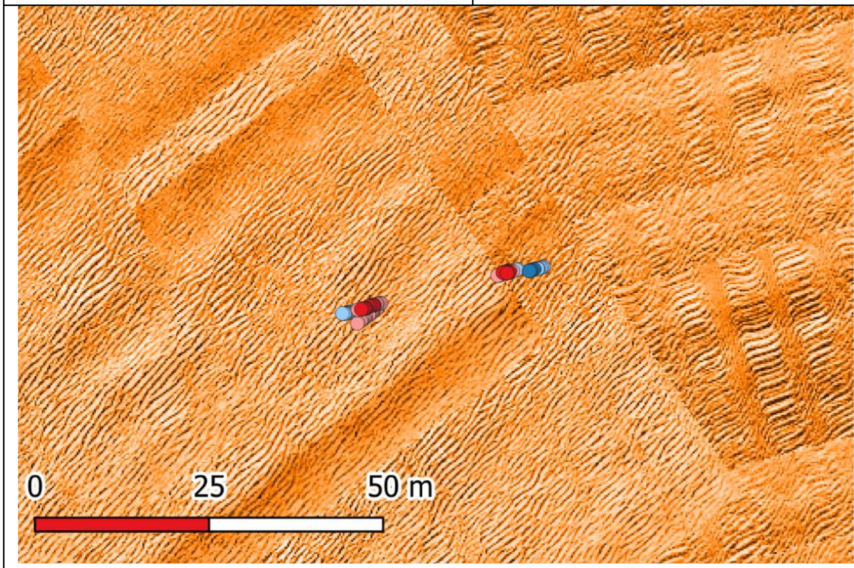
Unknown date.</td><td>Position:
444604.43E 6233117.74N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Very short stretch of c. 1.2 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

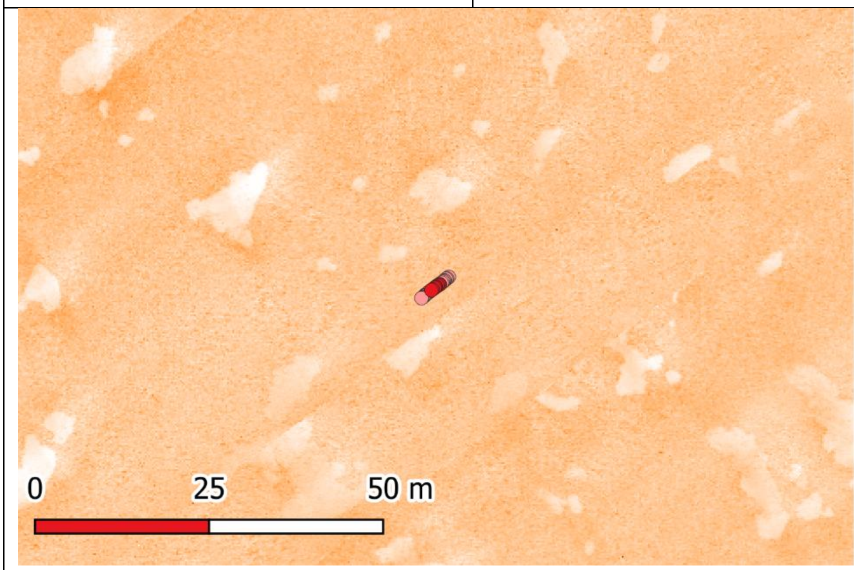
ECR1_012 MAG response. Confidence Level: 2 Significance level: 3 Unknown date.	**Position:** 444645.41E 6232733.08N	**Target**: N/A **F&F:** N/A
		
Description:	Strong MAG anomaly, both positive and negative. Seen in two tracks, both 6-7 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

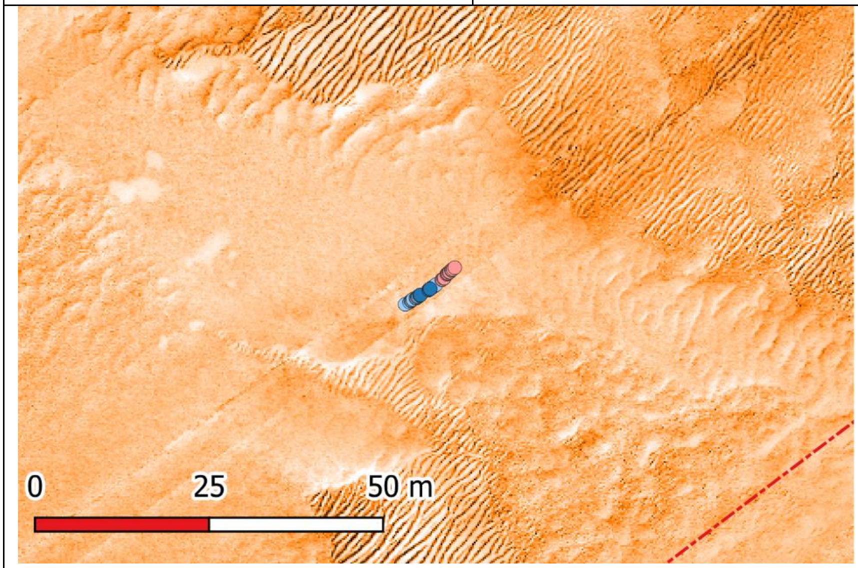
ECR1_013 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 442701.52E 6233210.10N	**Target**: N/A **F&F:** N/A
		
Description:	Strong negative MAG anomaly. Very short stretch of c. 1.1 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

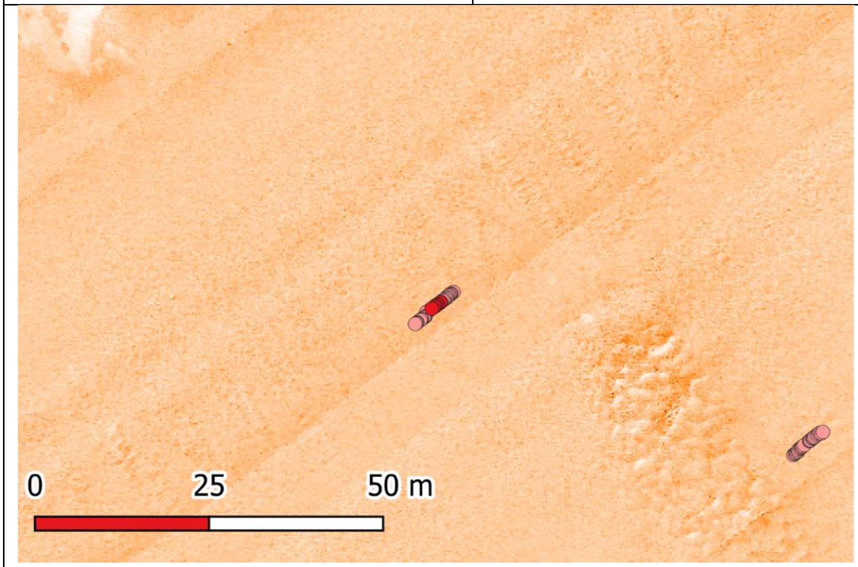
ECR1_014 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 442831.48E 6232811.39N	**Target**: N/A **F&F:** N/A
		
Description:	Strong positive MAG anomaly. Very short stretch of c. 1.5 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

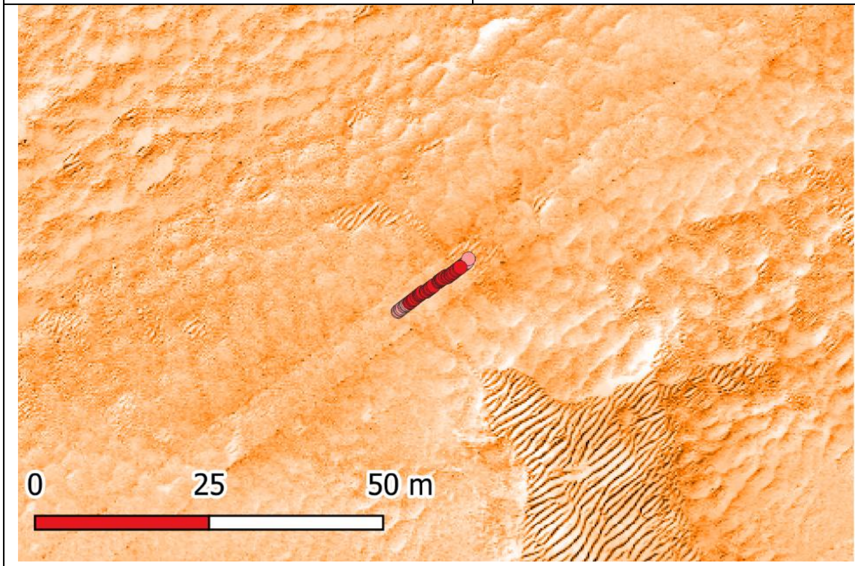
ECR1_015 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 437544.41E 6231043.11N	**Target**: N/A **F&F:** N/A
		
Description:	Strong negative MAG anomaly. Short stretch of c. 6.5 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

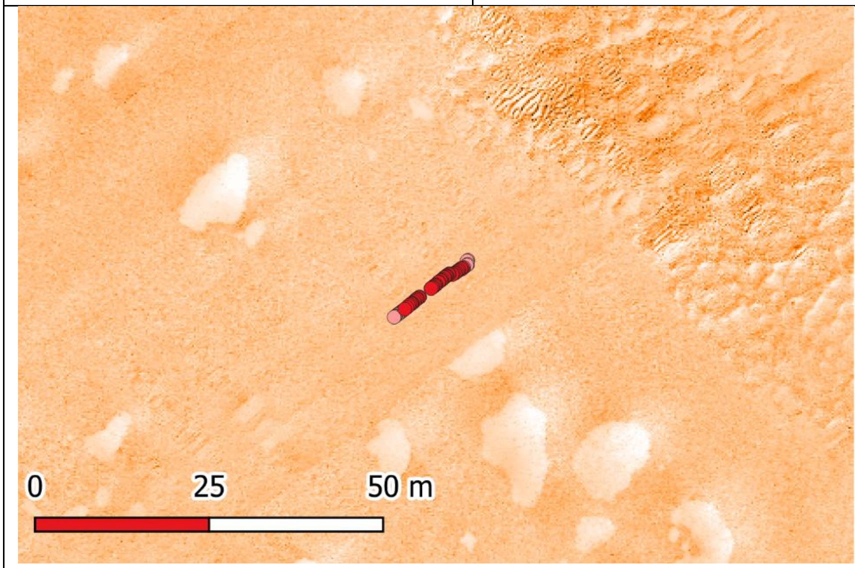
ECR1_016 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 433567.84E 6230682.66N  	**Target**: N/A **F&F:** N/A
Description:	Strong MAG anomalies, both positive and negative. Seen in two groups along the same transect. Each c. 5 m long, separated by c. 19 m. Possibly to separate targets, but protected by one zone. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

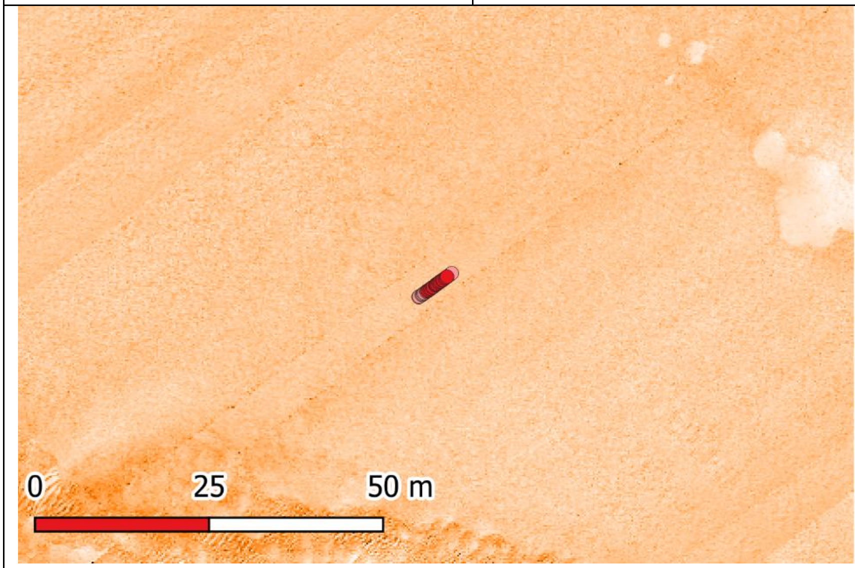
ECR1_017 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 430191.29E 6229012.20N  	**Target**: N/A **F&F:** N/A
Description:	Strong positive MAG anomaly. Very short stretch of c. 1.8 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

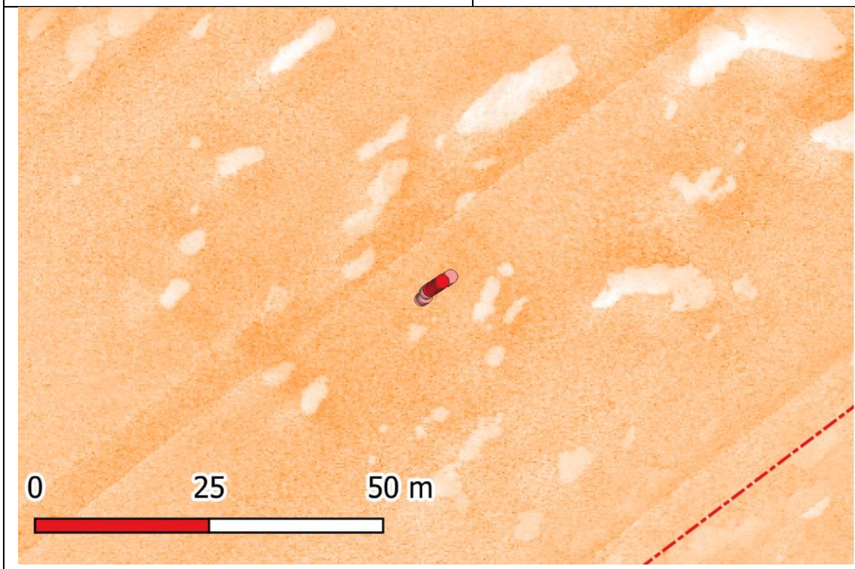
ECR1_018 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 433060.51E 6229616.36N	**Target**: N/A **F&F:** N/A
		
Description:	Strong negative MAG anomaly. Very short stretch of c. 1.8 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

ECR1_019 MAG response. Confidence Level: 3 Significance level: 2 Unknown date.	**Position:** 430383.37E 6228904.50N	**Target**: N/A **F&F:** N/A
		
Description:	Strong negative MAG anomaly. Very short stretch of c. 1.6 m. Moderate MAG anomaly towards WSW, distance c. 55 m. No visible debris nearby.	
Recommended action:	Protection zone 100 m.	

ECR1_020 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 429601.94E 6227625.80N	**Target**: N/A **F&F:** N/A
		
Description:	Strong positive MAG anomaly. Short stretch of c. 8.8 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

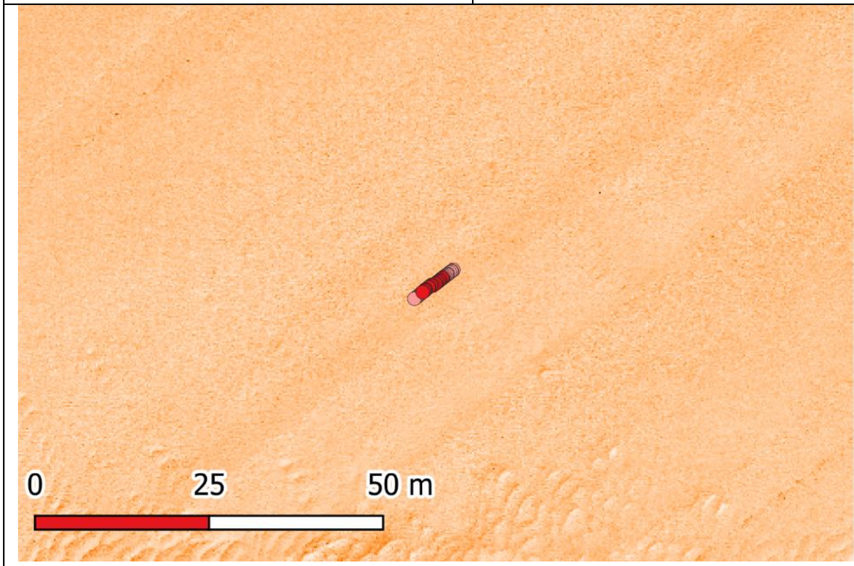
ECR1_021 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 429661.49E 6227483.70N	**Target**: N/A **F&F:** N/A
		
Description:	Strong positive MAG anomaly. Stretches c. 10.4 m. No visible debris nearby.	
Recommended action:	Protection zone 100 m.	

ECR1_022 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 429289.42E 6227264.52N 	**Target**: N/A **F&F:** N/A
Description:	Strong positive MAG anomaly. Very short stretch of c. 2.2 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

ECR1_023 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 429479.61E 6226907.20N 	**Target**: N/A **F&F:** N/A
Description:	Strong positive MAG anomaly. Very short stretch of c. 2.2 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

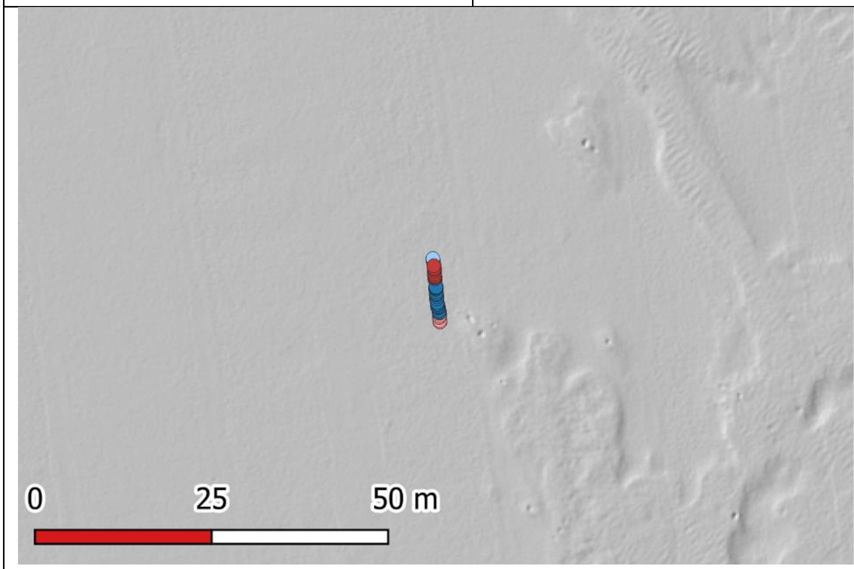
<table>
<tr><td rowspan="2">ECR1_024
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
427458.06E 6226570.33N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 3.8 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

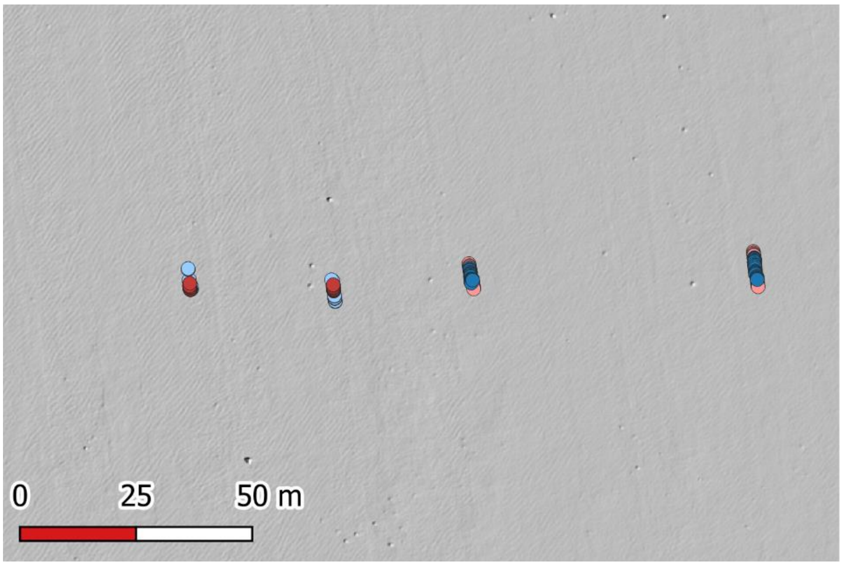
<table>
<tr><td rowspan="2">ECR2_001
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
438526.86E 6206338.96N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomaly, both positive and negative. Stretches c. 6.9 m. No visible debris nearby. (MBES data is background in the following section.)</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

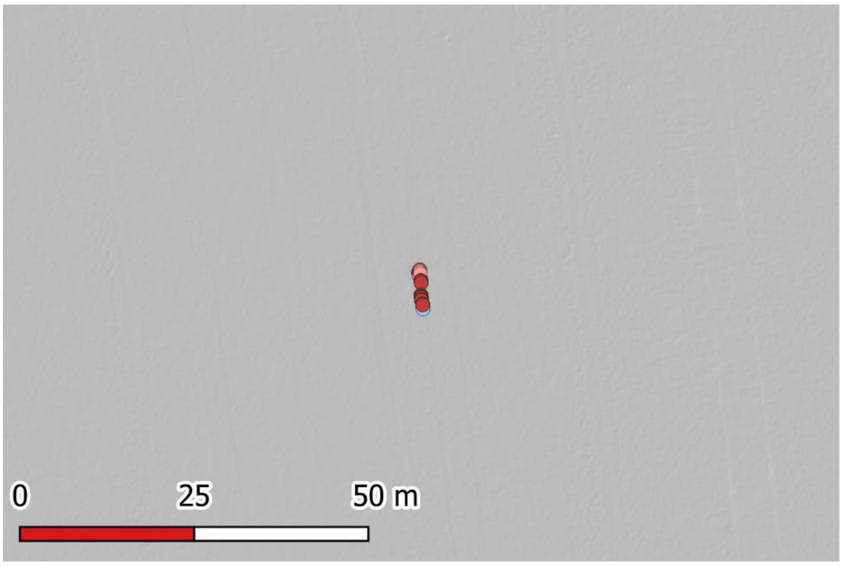
<table>
<tr><td rowspan="2">ECR2_002
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
438526.86E 6206338.96N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">NB: Scale 1:1500.

</td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomalies across several transects, although the westernmost not continuous. Stretches across c. 120 m, if one single target. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

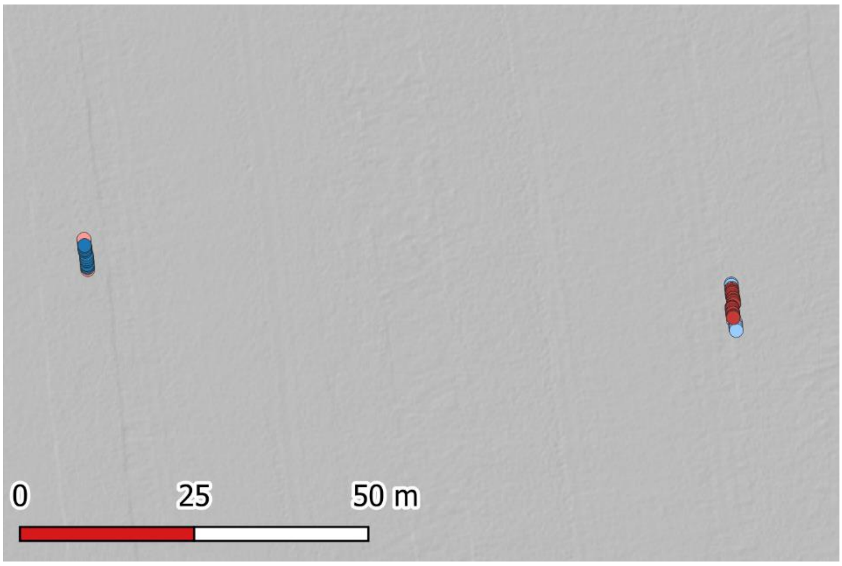
<table>
<tr><td rowspan="2">ECR2_003
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
438414.38E 6205257.74N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Stretches c. 4.1 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

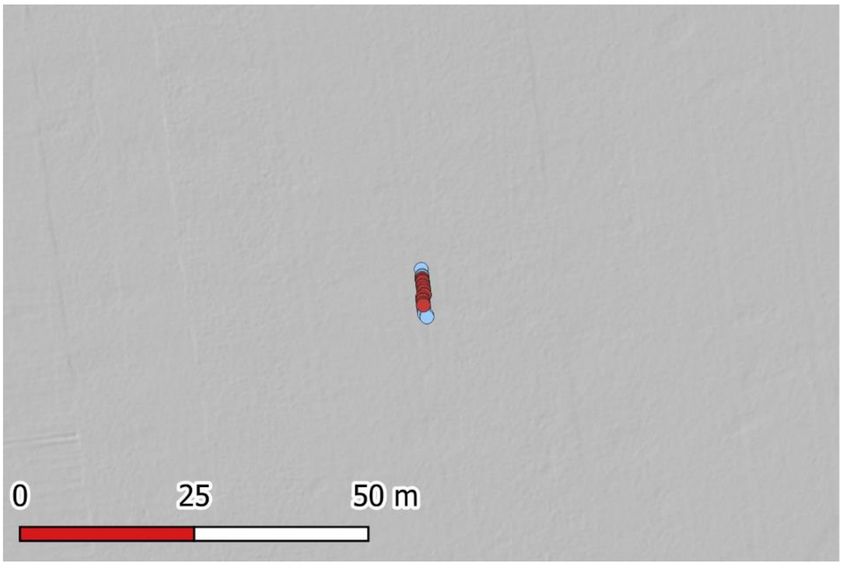
<table>
<tr><td rowspan="2">ECR2_004
MAG response.

Confidence Level: 2
Significance level: 2

Unknown date.</td><td>Position:
438832.56E 6204662.83N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomalies in two adjoining transects, one positive and one negative. Lengths c. 4-5 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

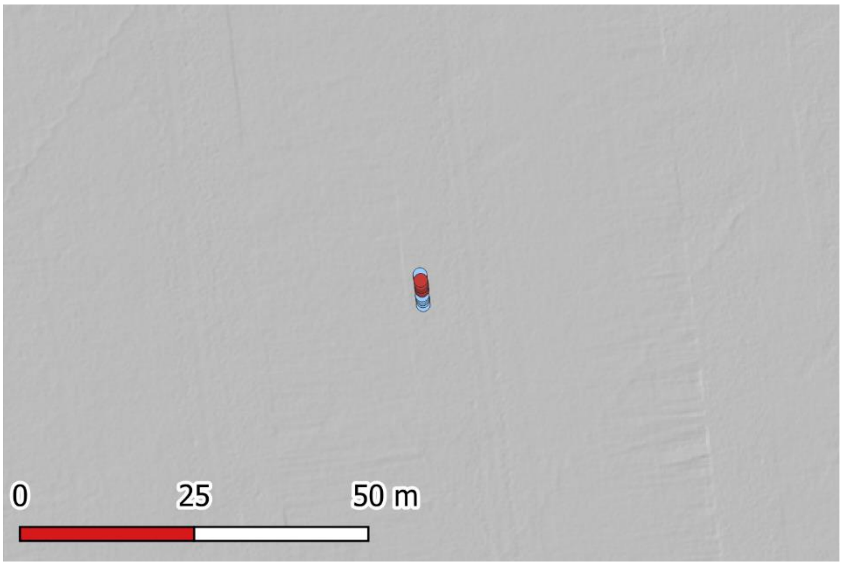
<table>
<tr><td rowspan="2">ECR2_005
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
438427.39E 6204623.71N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 3.9 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

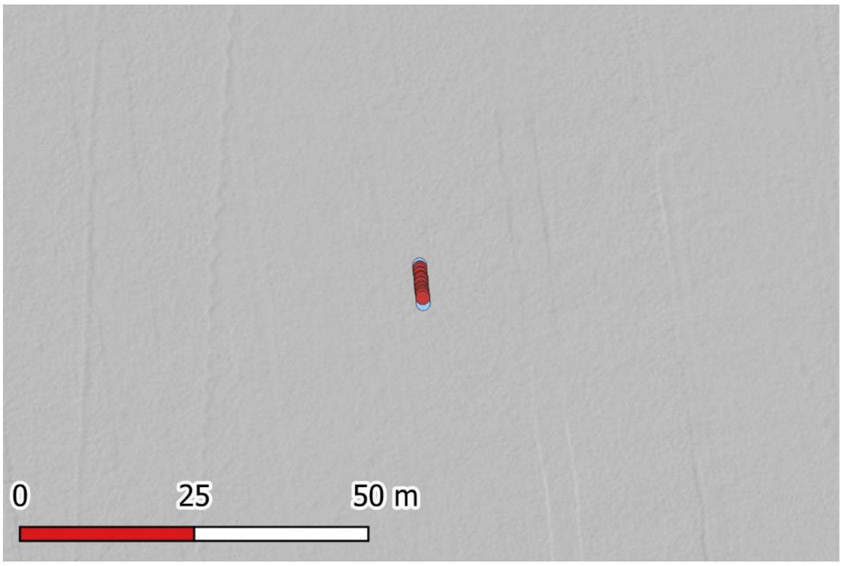
<table>
<tr><td rowspan="2">ECR2_006
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
438433.88E 6203799.39N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 1.4 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

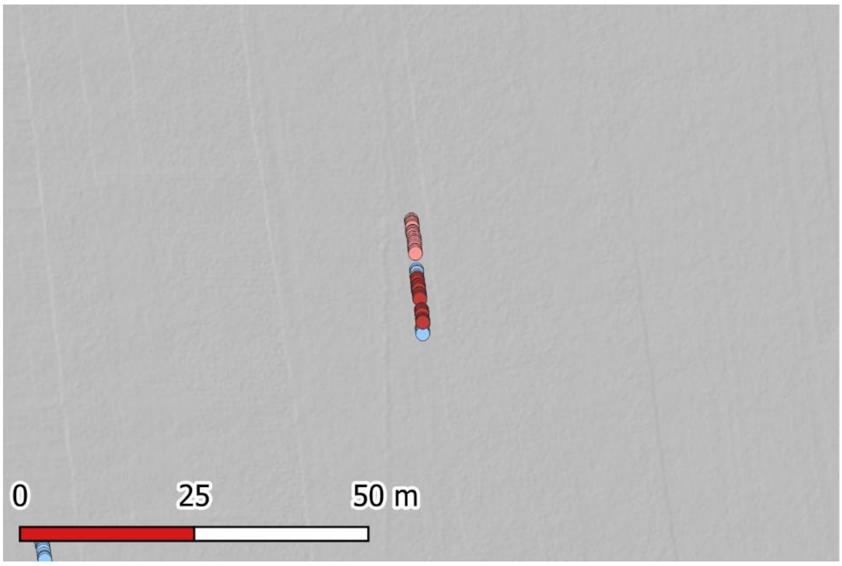
<table>
<tr><td rowspan="2">ECR2_007
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
438296.92E 6203182.55N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 4.5 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

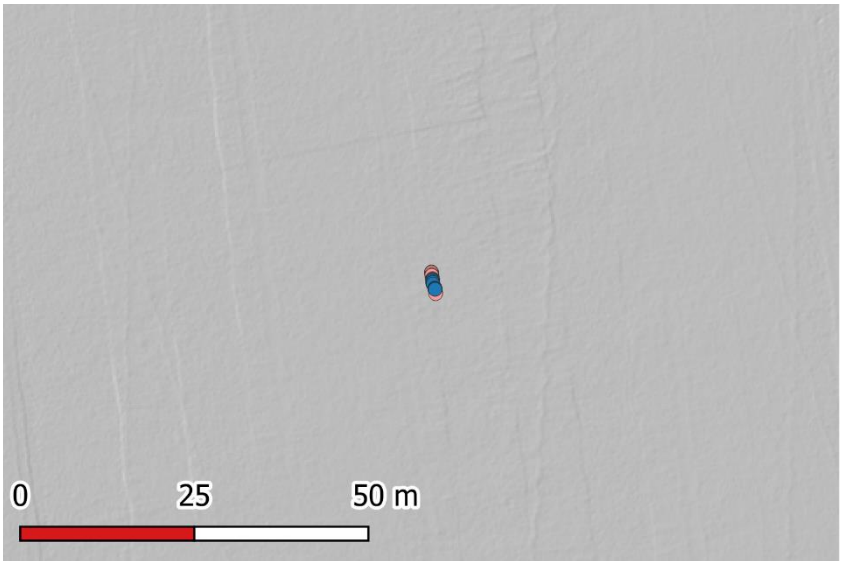
<table>
<tr><td rowspan="2">ECR2_008
MAG response.

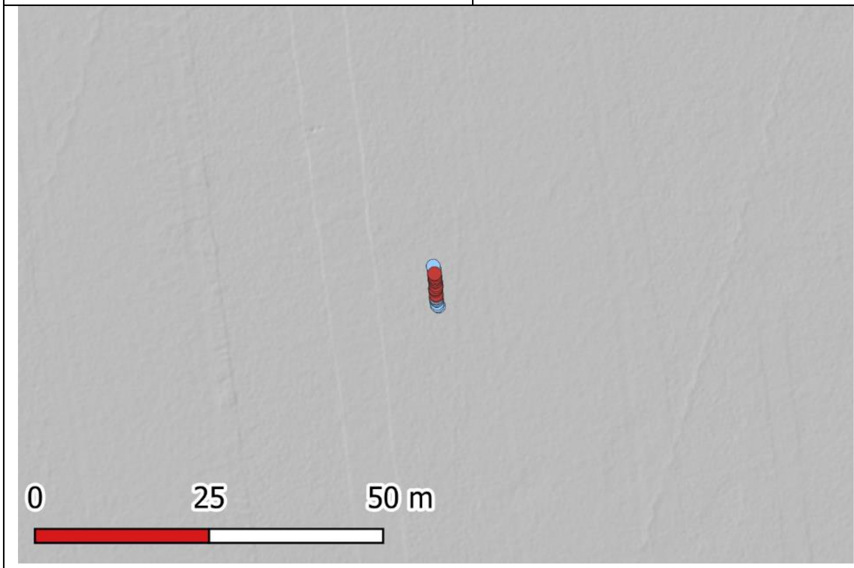
Confidence Level: 3
Significance level: 3

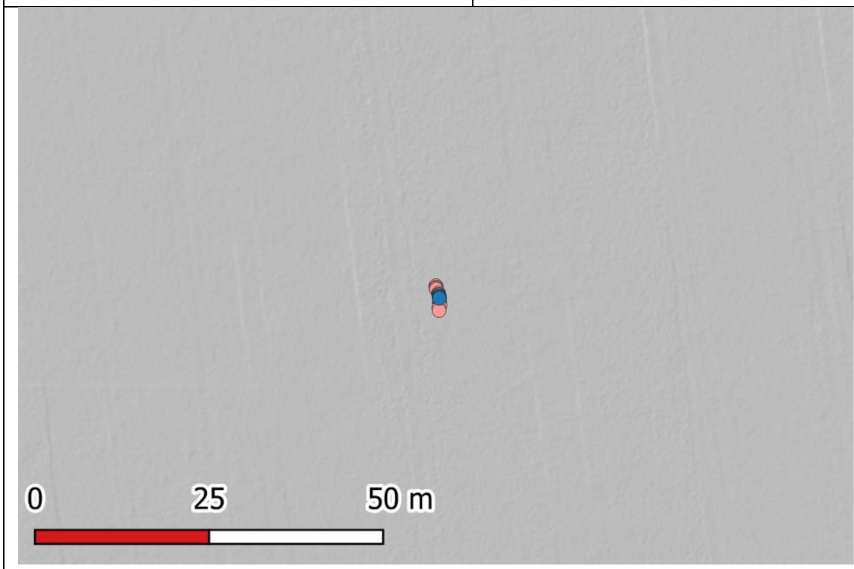
Unknown date.</td><td>Position:
438721.29E 6202144.25N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Short stretch of c. 6.7 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

<table>
<tr><td rowspan="2">ECR2_009
MAG response.

Confidence Level: 3
Significance level: 3

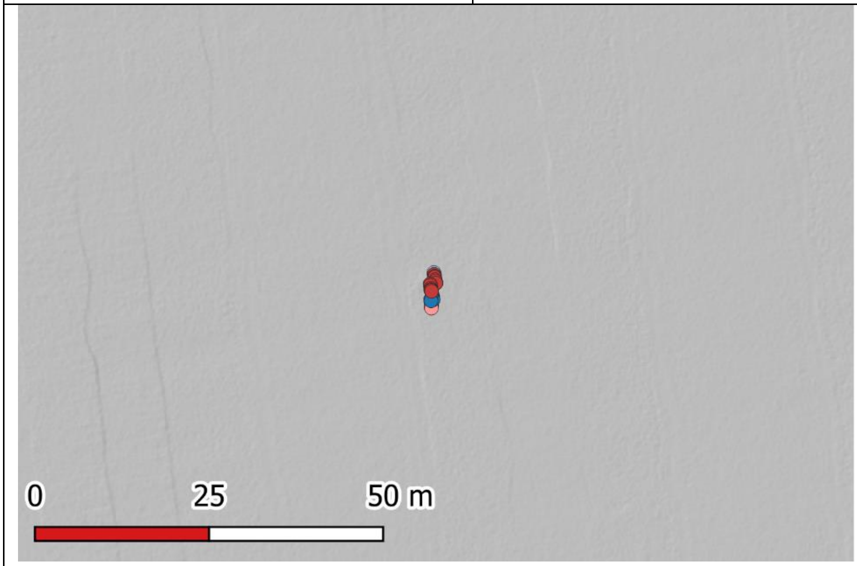
Unknown date.</td><td>Position:
438650.56E 6201212.21N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Very short stretch of c. 1.5 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

ECR2_010 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 438593.87E 6200409.82N	**Target**: N/A **F&F:** N/A
		
Description:	Strong positive MAG anomaly. Very short stretch of c. 3.2 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

ECR2_011 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 439127.80E 6199476.44N	**Target**: N/A **F&F:** N/A
		
Description:	Strong negative MAG anomaly. Very short stretch of c. 0.5 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

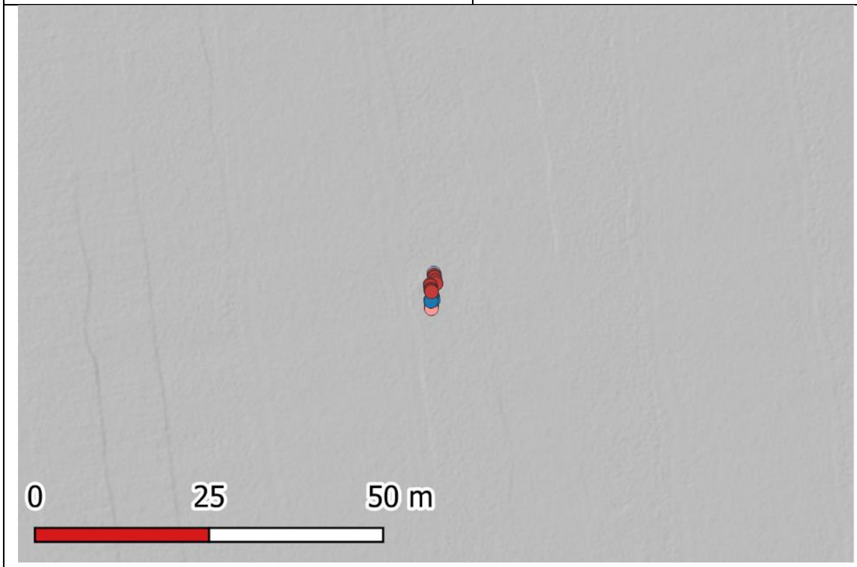
<table>
<tr><td rowspan="2">ECR2_012
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
439700.40E 6195661.41N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomaly, both positive and negative. Very short stretch of c. 3.8 m across two closely adjacent transects. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

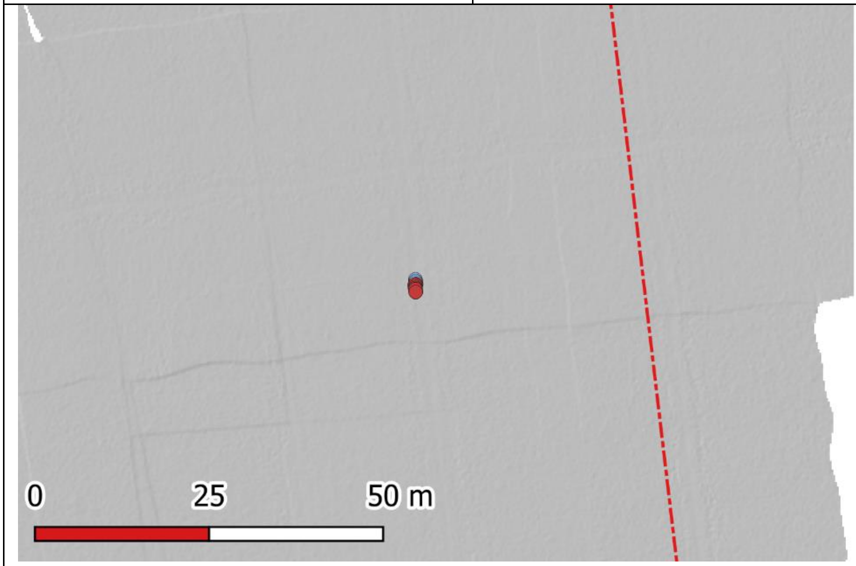
<table>
<tr><td rowspan="2">ECR2_013
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
440435.77E 6193965.84N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomaly, both positive and negative. Very short stretch of c. 0.4 m. Close to ECR2_014. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

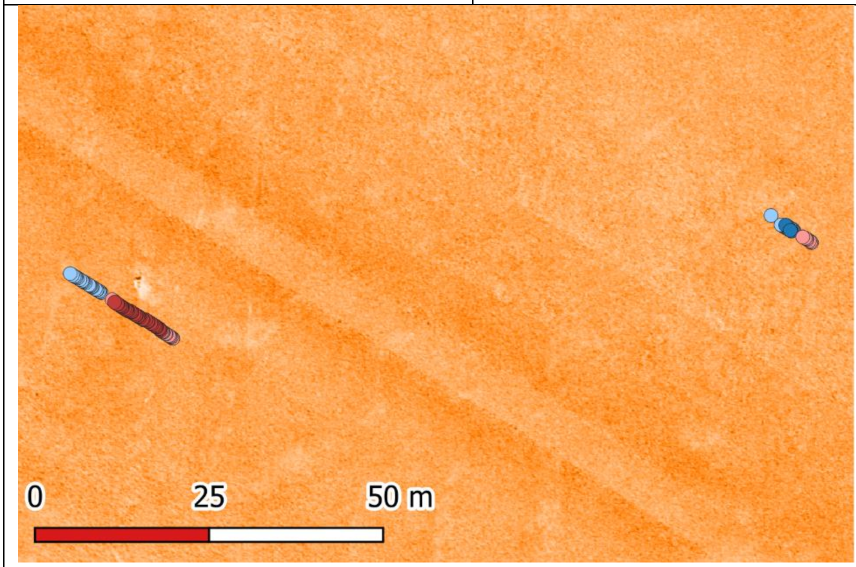
<table>
<tr><td rowspan="2">ECR2_014
MAG response.

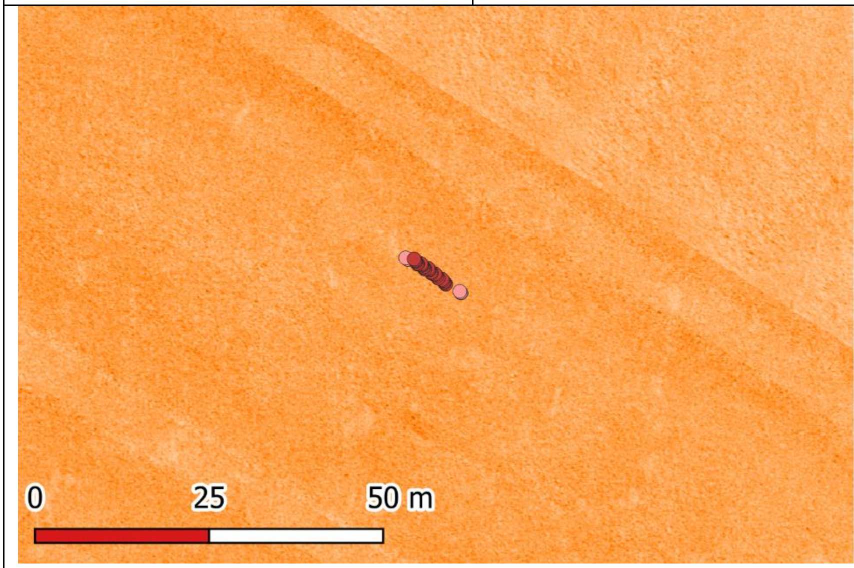
Confidence Level: 3
Significance level: 3

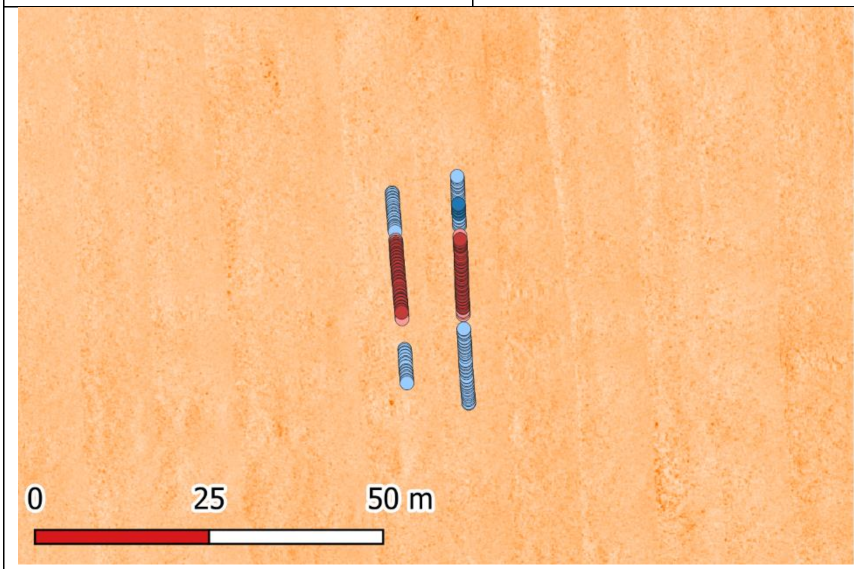
Unknown date.</td><td>Position:
440454.75E 6194113.58N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 1.1 m. Close to ECR2_013. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

<table>
<tr><td rowspan="2">ECR2_015
MAG response.

Confidence Level: 2
Significance level: 3

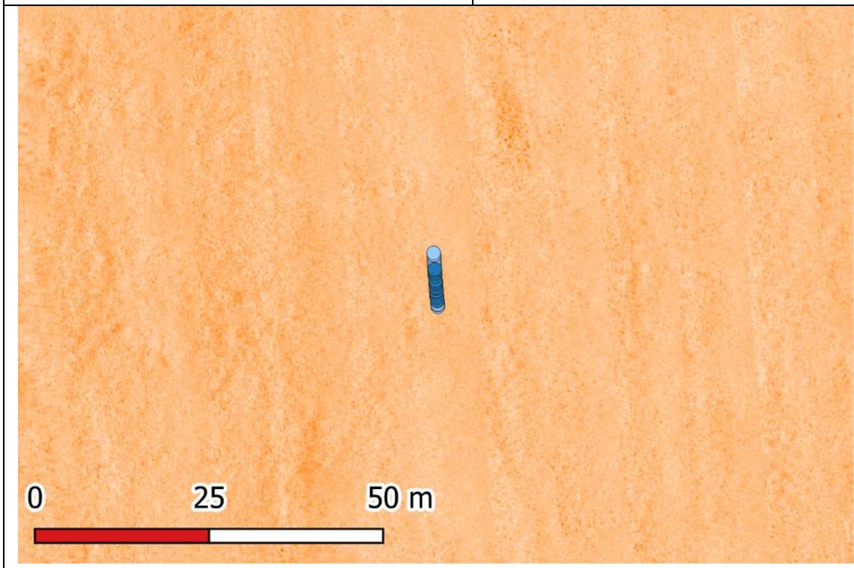
Unknown date.</td><td>Position:
442434.87E 6188579.85N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Two adjoining strong MAG anomalies, one positive, one negative. Distance c. 95 m. Target set midway between the two lines. Small indistinct debris at western line.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

ECR2_016 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** E N	**Target**: N/A **F&F:** N/A
		
Description:	Strong positive MAG anomaly. Short stretch of c. 5.8 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

ECR2_017 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 442734.20E 6185180.97N	**Target**: N/A **F&F:** N/A
		
Description:	Strong MAG anomaly, both positive and negative, across two close transects. Stretches c. 14.7 m. No visible debris nearby.	
Recommended action:	Protection zone 100 m.	

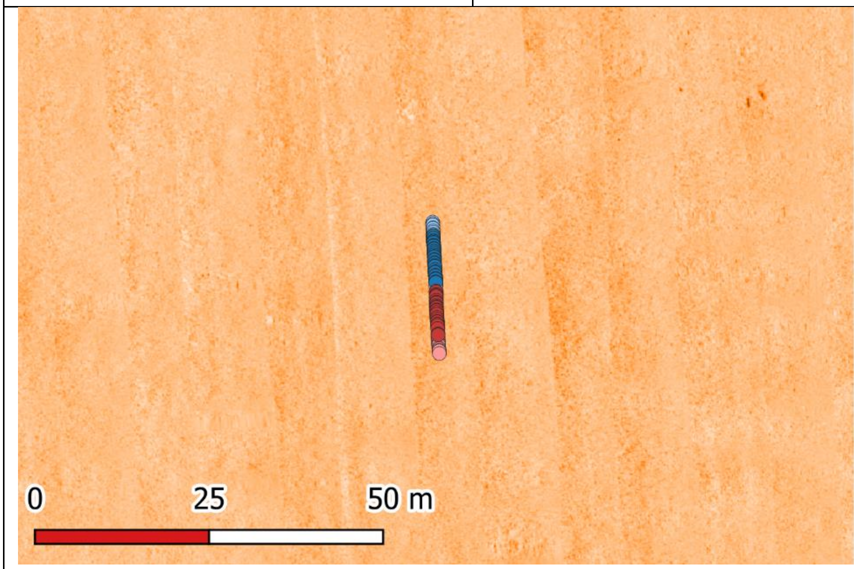
<table>
<tr><td rowspan="2">ECR2_018
MAG response.

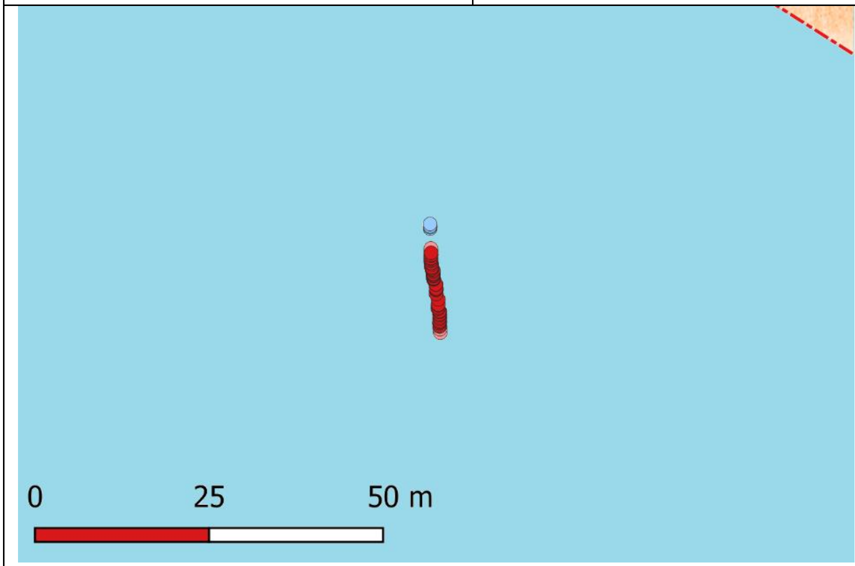
Confidence Level: 3
Significance level: 3

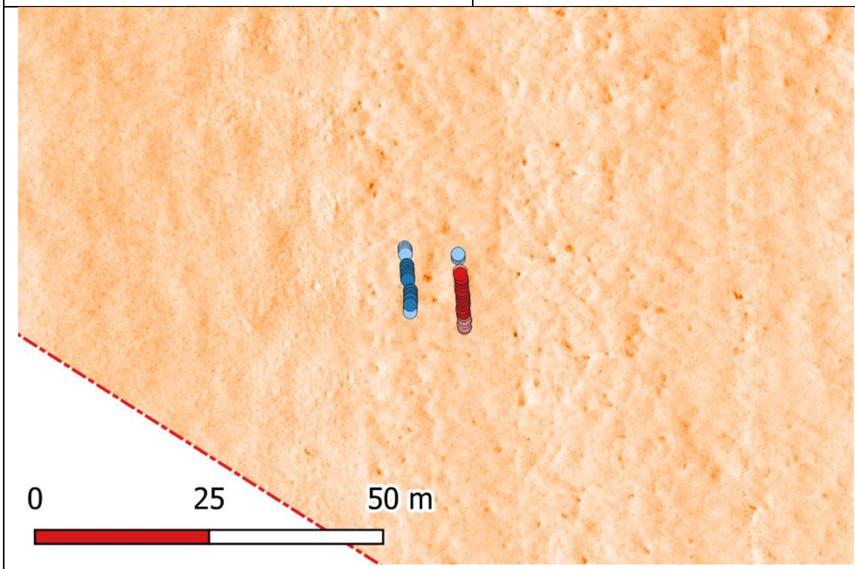
Unknown date.</td><td>Position:
447035.75E 6184757.35N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Very short stretch of c. 4.8 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

<table>
<tr><td rowspan="2">ECR2_019
MAG response.

Confidence Level: 3
Significance level: 2

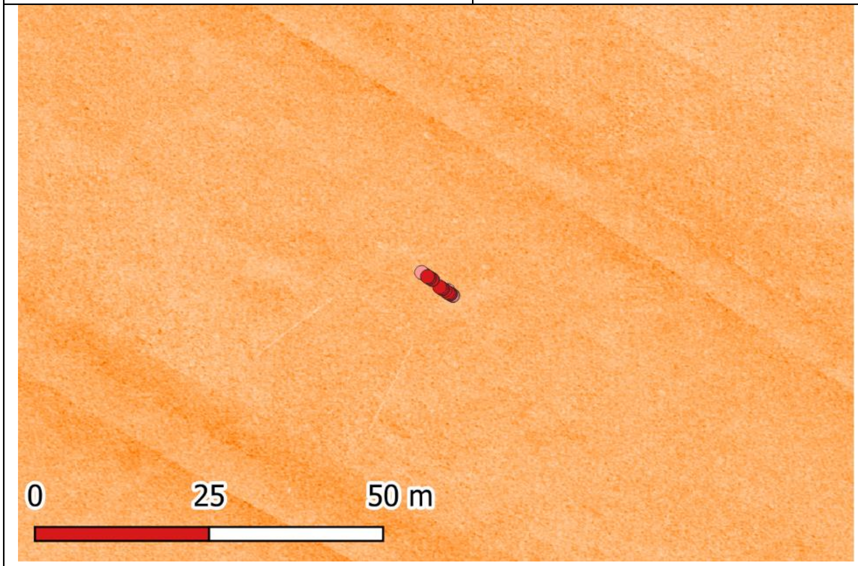
Unknown date.</td><td>Position:
447085.85E 6185596.56N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomaly, both positive and negative. Stretches c. 14.8 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

ECR3_004 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 446277.66E 6184714.22N 	**Target**: N/A **F&F:** N/A
Description:	Strong positive MAG anomaly. Stretches c. 10.8 m. NB: Located c. 55 m S of cable area.	
Recommended action:	Protection zone 100 m.	

ECR3_005 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 446033.09E 6184986.11N 	**Target**: N/A **F&F:** N/A
Description:	Two parallel MAG anomalies, one positive and one negative. Short stretch of c. 7 m. No clear debris nearby.	
Recommended action:	Protection zone 50 m.	

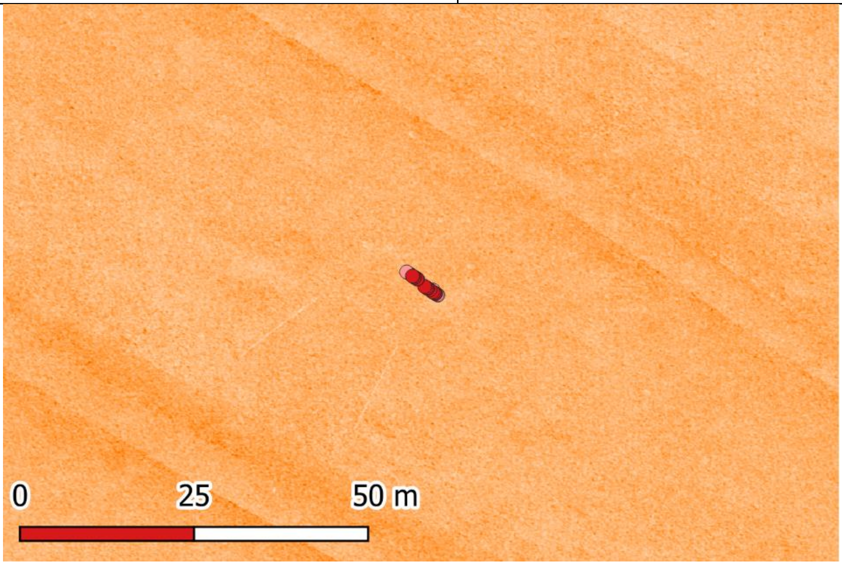
<table>
<tr><td rowspan="2">ECR3_006
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
441487.96E 6188397.31N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Short stretch of c. 5 m. No debris nearby, but two converging lines S of target.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

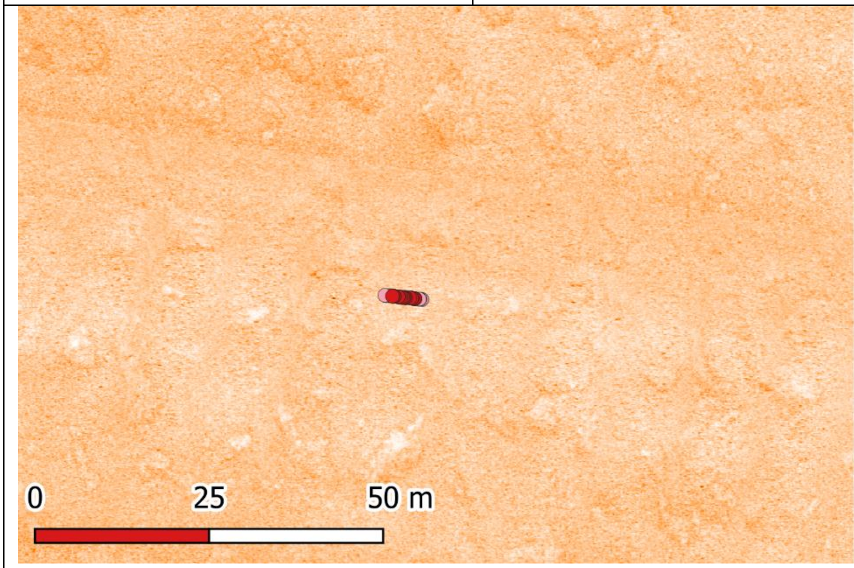
<table>
<tr><td rowspan="2">ECR3_007
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
438023.96E 6191249.78N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 2.4 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

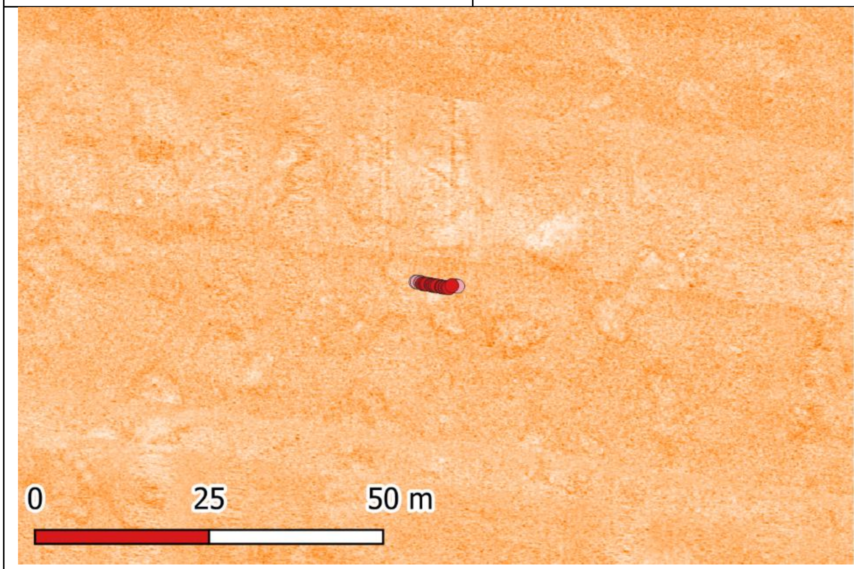
<table>
<tr><td rowspan="2">ECR3_008
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
436840.84E 6191103.34N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 3.3 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

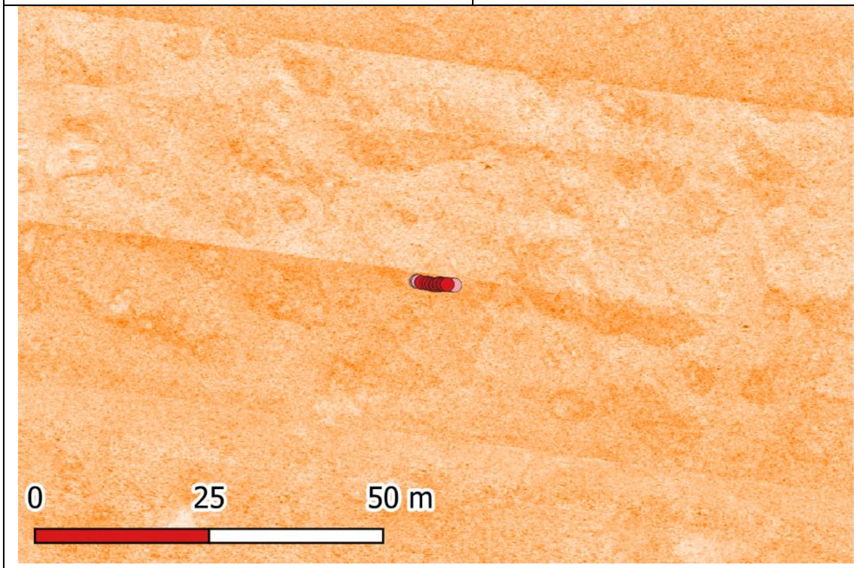
<table>
<tr><td rowspan="2">ECR3_009
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
436557.77E 6191056.30N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 4.4 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

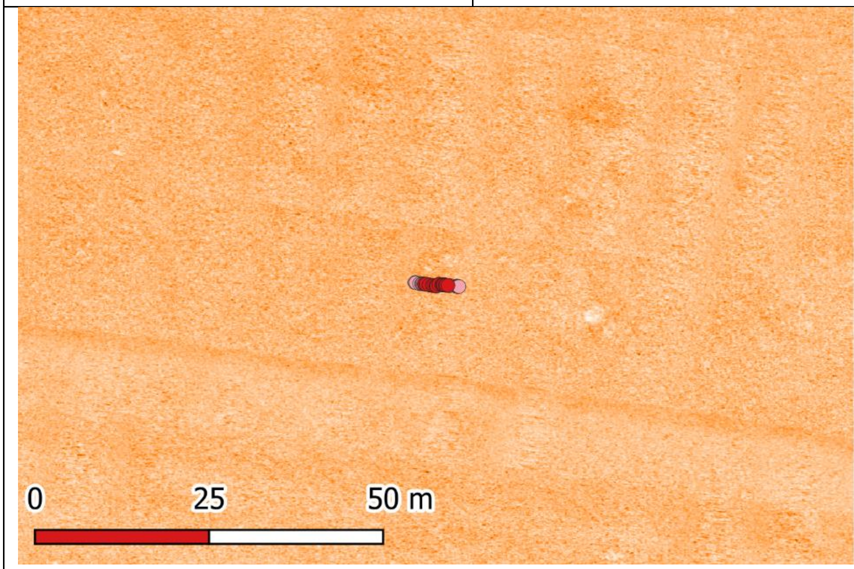
<table>
<tr><td rowspan="2">ECR3_010
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
436534.42E 6190878.19N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 3.7 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

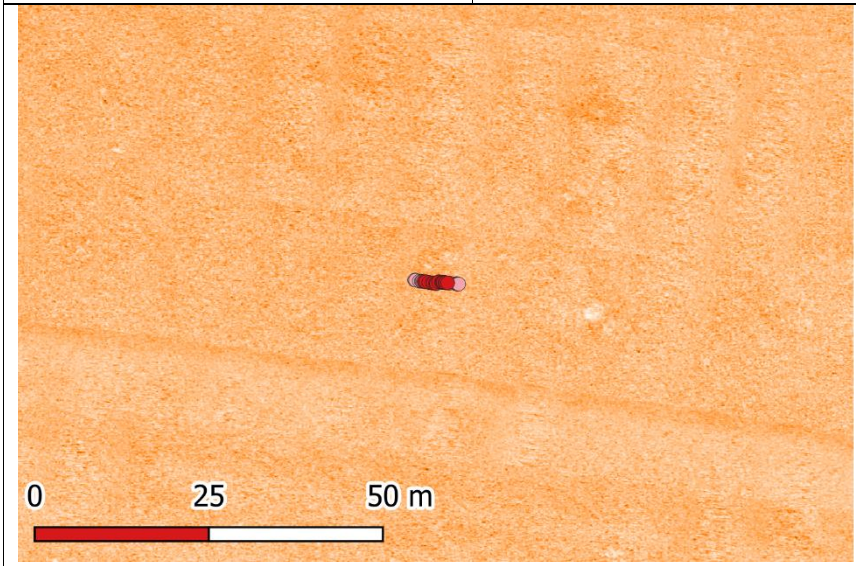
<table>
<tr><td rowspan="2">ECR3_011
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
435606.95E 6190937.75N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 3.8 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

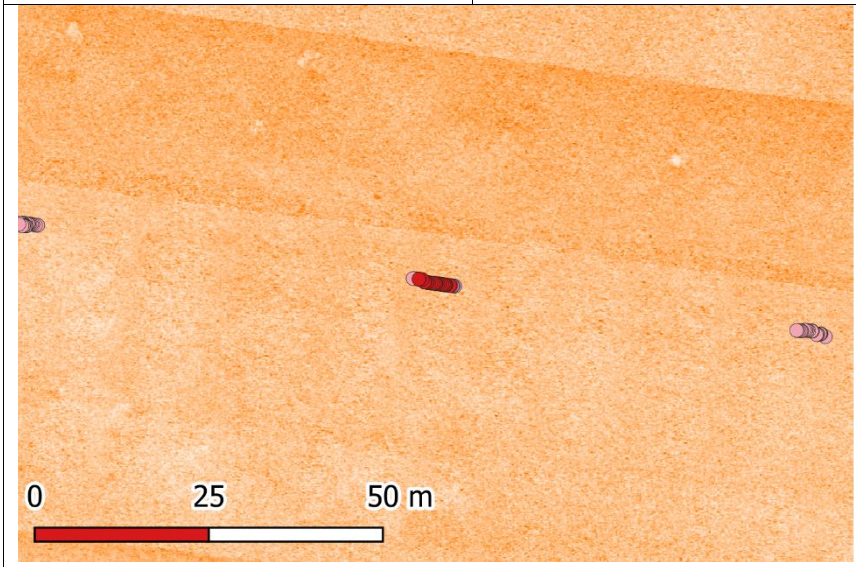
<table>
<tr><td rowspan="2">ECR3_012
MAG response.

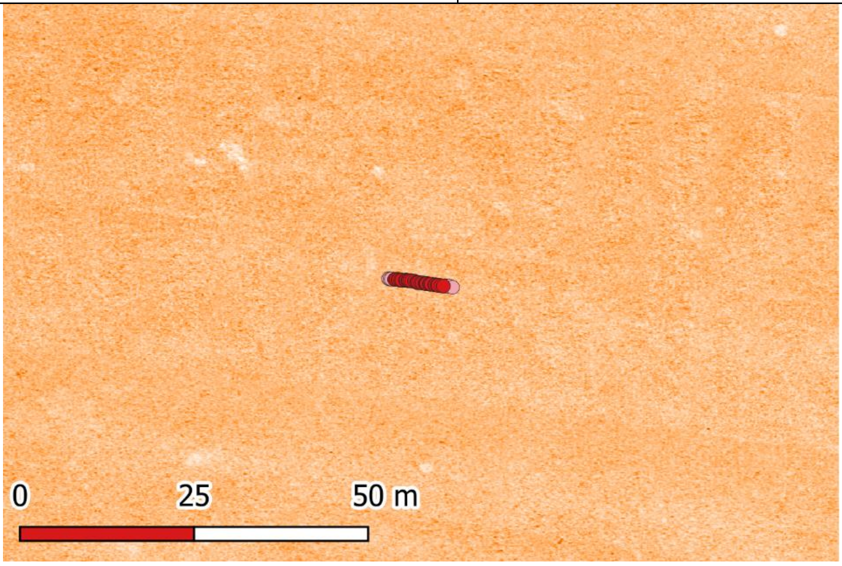
Confidence Level: 3
Significance level: 3

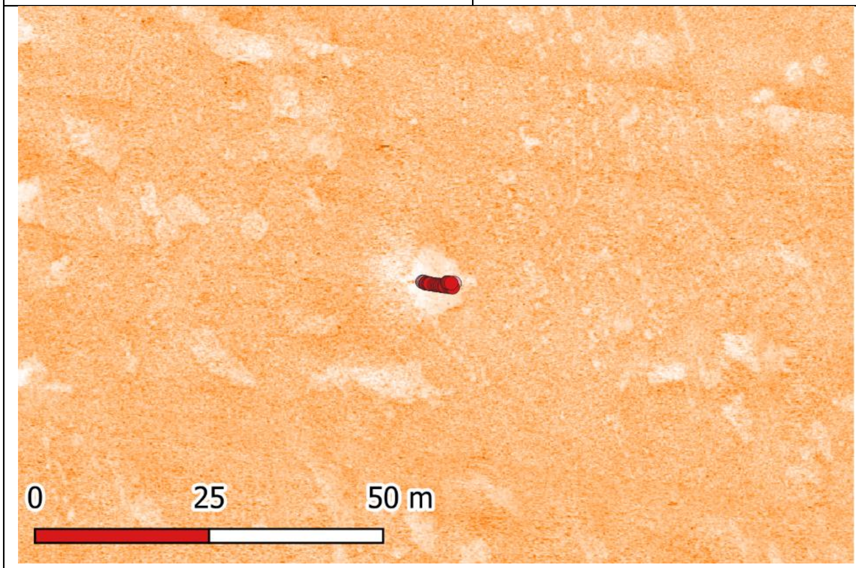
Unknown date.</td><td>Position:
432845.80E 432845.80N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 1.7 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

<table>
<tr><td rowspan="2">ECR3_013
MAG response.

Confidence Level: 3
Significance level: 3

Unknown date.</td><td>Position:
E N</td><td>Target: N/A
F&F: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 4.5 m, however further moderate MAG anomalies E and W of the target. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

ECR3_014 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 434982.98E 6191051.51N	**Target**: N/A **F&F:** N/A
	 	
Description:	Strong positive MAG anomaly. Short stretch of c. 7.2 m. No visible debris nearby.	
Recommended action:	Protection zone 50 m.	

ECR3_015 MAG response. Confidence Level: 3 Significance level: 3 Unknown date.	**Position:** 434266.45E 6191182.04N	**Target**: N/A **F&F:** N/A
	 	
Description:	Strong positive MAG anomaly. Very short stretch of c. 3.9 m.	
Recommended action:	Protection zone 50 m.	

5.5. Sea-level index points

Lab-number	Placename / core / sample	Euref 89 zone 32 N (East)	Euref 89 zone 32 N (North)	Water depth	Sample elevation masl	Sediment	Dated material	Species	Environmet	Uncalibrated 14C measurement bp	Reservoir correction	Reservoir corrected age bp	Sediment cover above SLIP (m)	Id (Number in sea-level curve)	Smaple elevation used in sea-level curve	Calibrated age interval "start" (BP)(95.4%)	Calibrated age interval "end" (BP)(95.4%)
AAR-31695	282-VC-R2-004, R1	429513,50	6252964,50	-27,00	-31,50	Marine sediments	Shell	*Spisula species*	Marine	42654 ± 420	400	42254	4.0-5.0	1	-31,50	45662	44374
AAR-31696	282-VC-R2-004, R2	429513,50	6252964,50	-27,00	-32,70	Marine sediments	Shell	*Spisula soldia*	Marine	43350 ± 577	400	42950	5.0-5.55	2	-32,70	46562	44571
AAR-31697	282-VC-OWF-B1-007, R3	404742,50	6233577,20	-31,00	-32,60	Marine sediments	Shell	*Cerestoderma edula*	Marine	9060 ± 41	400	8660	1.0-2.25	3	-32,60	9712	9536
AAR-31698	282-VC-OWF-B1-007, R4	404742,50	6233577,20	-31,00	-33,31	PEAT	PLANT	Reeds? Phragmites stemps	Terrestrial	8687 ± 39	0	8687	2.25-2.37	4	-33,31	9762	9541
AAR-31699	282-VC-OWF-B1-007, R5	404742,50	6233577,20	-31,00	-33,50	PEAT	PLANT	Reeds?	Terrestrial	8752 ± 49	0	8752	2.37-2.68	5	-33,50	10110	9548
AAR-31700	282-VC-OWF-B1-007, R6	404742,50	6233577,20	-31,00	-35,79	PEAT	Wood	Tvig with bark	Terrestrial	11704 ± 44	0	11704	4.68-4.90	6	-35,79	13738	13462
AAR-31701	282-VC-OWF-B2-005, R7	416054,80	6243508,70	-26,00	-27,90		Wood	Woodfragment	Coastal	8664 ± 38	0	8664	1.40-2.40	7	-27,9	9702	9538
AAR-31702	282-VC-OWF-B2-005, R8	416054,80	6243508,70	-26,00	-27,90	Marine sediments	SHELL	*Cerestoderma edule*	Marine	9205 ± 48	400	8805	1.40-2.40	8	-27,90	10150	9608
AAR-31703	282-VC-OWF-B2-005, R9	416054,80	6243508,70	-26,00	-29,52	PEAT	WOOD	Wood fragment	Terrestrial	8776 ± 43	0	8776	3.40-3.64	9	-29,52	10115	9555
AAR-31704	282-VC-OWF-B3-003, R10	419910,50	6255663,59	-27,00	-30,58	Marine sediments	SHELL	Ubestemt marin	Marine	45983 ± 641 **)	400	45583	3.42-3.75	10	-30,58	49704	46444
AAR-31705	282-VC-OWF-B4-010, R11	425338,60	6233562,90	-25,00	-27,13	Marine sediments	SHELL	Ubestemt marin, *Tellina*	Marine	42385 ± 424	400	41961	2.04-2.22	11	-27,13	45461	44156
AAR-31706	282-VC-OWF-B4-010, R12	425338,60	6233562,90	-25,00	-27,57		WOOD	Woodfragment	?	47495 **)	0	0	2.22-2.93	12	-27,57	51513	48868
AAR-31707	282-VC-OWF-B4-010, R13	425338,60	6233562,90	-25,00	-27,57	Marine sediments	SHELL	Ubestemt art (waterworn)	Marine	43285 ± 502	400	42885	2.22-2.93	13	-27,57	46206	44582
AAR-31708	282-VC-OWF-B4-010, R14	425338,60	6233562,90	-25,00	-28,31	Marine sediments	SHELL	*Actica islantica*	Marine	45073 ± 544 **)	400	44673	2.93-3.70	14	-28,31	48226	45935
AAR-31709	282-VC-R3-025, R15	433415,60	6249849,00	-26,00	-27,64	PEAT	WOOD	Woodfragments	?	46280 **)	0	0	1.60-1.69	15	-27,64	49452	47908
AAR-31710	282-VC-R5-065, R16	438420,40	6235163,09	-20,00	-21,46	Marine sediments	SHELL	*Actica islantica*	Marine	4303 ± 32	400	3903	1.41-1.51	16	-21,46	4420	4236
AAR-31711	282-VC-OWF-B1-004, R17	410789,00	6244688,50	-29,00	-29,51	PEAT	WOOD	Wood, tvig with bark	Terrestrial	9558 ± 40	0	9558	0.40-0.62	17	-29,51	11096	10716
AAR-31712	282-VC-R3-018, R18	425756,60	6245074,50	-28,7	-29,89	Marine sediments	SHELL	*Cerestoderma edule*	Marine	43060 ± 415	400	42660	1.11-1.28	18	-29,89	45909	44601
AAR-31713	282-VC-OWF-B1-ARC-004, R19	405491,30	6238662,20	-25,9	-26,85	MUD/PEAT	WOOD	Wood fragment	Terrestrial	8887 ± 38	0	8887	0.90-1.00	19	-26,85	10184	9800
AAR-31714	282-VC-R2-015A, R20	441963,00	6256286,00	-16,5	-20,00	CLAY/SILT	WOOD	Wood fragment	?	out of range	0	0	3.35-3.66	20	-20,00	out of range	out of range
AAR-31715	282-VC-R5-056A, R21	428135,63	6237873,75	-26,4	-28,45	CLAY/SILT	SHELL	*Cerestoderma edula*	Marine	41259 ± 397	400	40859	2.00-2.10	21	-28,45	44512	43125
AAR-1819	Jyske Rev, core 562003	406899,00	6305681,00	?	-33,25	Marine sediments	SHELL	*Tellina fabula*	Marine	7920 ± 110	400	7520	?	22	-33,25	8543	8038
AAR-1818	Jutland Bank	390814,63	6319068,16	?	46,00	Marine sediments	SHELL	*Littorina littorea*	Marine	8930 ± 150	400	8530	?	23	46,00	10119	9126
AAR-1828	Jyske rev. Agger II	388205,79	6325515,11	?	-33,00	Marine sediments	SHELL	?	Marine	9500 ± 140	400	9100	?	24	-33,00	10655	9778
AAR-1827	Jyske rev. Agger I	380441,63	6329025,36	?	-24,00	Marine sediments	SHELL	?	Marine	8870 ± 90	400	8470	?	25	-24,00	9661	9146
AAR-1818	Jyske rev. Agger II	390814,63	6319068,16	?	-46,00	Marine sediments	SHELL	*Littorina littorea*	Marine	8930 ± 150	400	8530	?	26	-46,00	10119	9126
AAR-1822	Jyske rev, Boring 562011	442651,06	6296145,57	?	-34,50	Marine sediment	SHELL	*Cardium edule*	Marine	9350 ± 100	400	8950	3,45	27	-34,50	10260	9688
AAR-1820	Jyske rev, Boring 562010	442651,06	6296145,57	?	-33,54	Marine sediment	SHELL	*Cardium edule*	Marine	9080 ± 90	400	8680	5,50	28	-33,54	10118	9490
AAR-1819	Jyske rev, Boring 562003	442651,06	6296145,57	?	-33,25	Marine sediment	SHELL	*Tellina fabula*	Marine	7920 ± 110	400	7520	2,43	29	-33,25	8543	8038
AAR-1821	Jutland Bank, 562010-V	420286,82	6289188,13	?	?	Marine sediment	SHELL	*Nucula nitida*	Marine	9090 ± 90	400	8690	2,50	30	?	10120	9499
K-6149	Strande I	448797,41	6270636,90	?	-11,70	Marine sediments	SHELL	?	Marine	7780 ± 155	0	7780	?	31	-11,70	9017	8220
K-6148	Strande I	448797,41	6270636,90	?	-4,25	Marine sediments	SHELL	*Ostrea edulis*	Marine	6090 ± 140	0	6090	?	32	-4,25	7306	6639
K-6147	Strande I	448797,41	6270636,90	?	-3,75	Marine sediments	SHELL	*Ostrea edulis*	Marine	6020 ± 100	0	6020	?	33	-3,75	7160	6659
K-6150	Strande II, freshwater	448797,41	6270636,90	?	-10,50		Gytja	Gyttja	Lacustrine	8400 ± 144	0	8400	?	34	-10,50	9665	9014
AAR-2593	Nissum Bredning	460179,93	6282325,67	?	?	Marine sediments	FORAMS	*Ammonia beccari*	Marine	7065 ± 60	400	6665	2,15	35	?	7655	7428
AAR-2594	Nissum Bredning	460451,71	6278613,04	?	?	Marine sediments	FORAMS	*Ammonia beccari*	Marine	7160 ± 60	400	6760	1,95	36	?	7713	7506
AAR-2595	Nissum Bredning	460451,71	6278613,04	?	?	Marine sediments	FORAMS	*Ammonia beccari*	Marine	7230 ± 80	400	6830	2,55	37	?	7844	7515
AAR-2596	Nissum Bredning	463216,42	6279329,42	?	?	Marine sediments	FORAMS	*Ammonia beccari*	Marine	3280 ± 60	400	2880	1,85	38	?	3205	2854
AAR-2597	Nissum Bredning	463216,42	6279329,49	?	?	Marine sediments	FORAMS	*Ammonia beccari*	Marine	3930 ± 65	400	3530	3,00	39	?	4059	3594

AAR-2598	Nissum Bredning	459037,32	6269907,08	?	?	Marine sediments	FORAMS	*Ammonia beccari*	Marine	6200 ± 75	400	5800	0,80	40	?	6784	6407
K-4596	Dødemandsbjerg, corring	446277,58	6232216,86	?	-12,00	Marine sediment	SHELL	*Ostrea edulis*	Marine	6740 ± 130	0	6740	12,50	41	-12,00	7919	7365
K-3421	Stauning Pynt	460212,17	6200474,87	?	?		PEAT	?	Terrestrial	6470 ± 100	0	6470	1,10	42	?	7570	7168
AAR-3289	North sea, Jyske Rev	385479,61	6310262,37	?	-41,80	Marine sediments	SHELL	Div. species	Marine	8180 ± 80	400	7780	3,60	43	-41,80	8972	8393
AAR-3296	Jyske Rev (Agger clay)	438316,49	6296310,92	?	-34,70	Marine sediments	SHELL	Div. species	Marine	9380 ± 90	400	8980	6,00	44	-34,70	10334	9745
K-4502	Rønland, corring E 66 from -9,5 to -10,5	450522,75	6280142,58	?	-10,00	Marine sediments	SHELL	*Ostrea edulis*	Marine	6800 ± 105	0	6800	11,50	45	-10,00	7916	7434
K-4503	Rønland, corring E 66 from -8,5 to -9,5,	450522,75	6280142,58	?	-9,00	Marine sediments	SHELL	*Ostrea edulis*	Marine	6500 ± 100	0	6500	10,50	46	-9,00	7575	7174
K-4504	Rønland, corring E 66 from -7,5 to -8,5	450522,75	6280142,58	?	-8,00	Marine sediments	SHELL	*Ostrea edulis*	Marine	6320 ± 100	0	6320	9,50	47	-8,00	7427	6992
AAR-3281	Jyske Rev	410315,70	6326534,19	?	-51,05	Marine sediments	SHELL	Div. species	Marine	9240 ± 80	400	8840	2,10	48	-51,05	10188	9607
AAR-3290	Jyske Rev	410315,70	6326534,19	?	-53,85	Marine sediments	SHELL	*Abra prismatica*	Marine	10050 ± 70	400	9650	4,95	49	-53,85	11205	10762
AAR-3294	Jyske Rev (Agger clay)	390255,01	6301780,16	?	-26,10	Marine sediments	SHELL	*Corbula gibba*	Marine	6350 ± 70	400	5950	3,10	50	-26,10	6975	6629
AAR-3295	Jyske Rev (Agger clay)	390255,01	6301780,16	?	-27,70	Marine sediments	SHELL	*Corbula gibba*	Marine	6650 ± 65	400	6250	4,70	51	-27,70	7312	6986
AAR-3298	Jyske Rev (Agger clay)	438316,49	6296310,92	?	-34,05	Marine sediments	SHELL	*Mytilus edulis*	Marine	9190 ± 75	400	8790	5,35	52	-34,05	10148	9554
K-4552	Dover Odde, cultural layer	466979,47	6285892,91	?	-0,20	Archaeological site	Cultural deposit	Hazelnut	Terrestrial	6610 ± 100	0	6610	?	53	-0,20	7665	7324
AAR-7299	North sea, N of Horns Rev	441930,99	6215858,99	?	-15,10	Marine sediments	SHELL	*Scrobicularia plana*	Marine	7005 ± 47	400	6605	1,53	54	-15,10	7570	7428
AAR-7297	North sea, N of Horns Rev	441930,99	6215858,99	?	-14,00	Marine sediments	SHELL	*Cerastoderma edule*	Marine	6517 ± 50	400	6117	0,54	55	-14,00	7161	6855
AAR-1825	North sea, 578001-IX	336810,04	6238090,95	?	?	Marine sediments	SHELL	*Cyprina islandica*	Marine	7700 ± 70	400	7300	6,00	56	?	8316	7969
AAR-1826	North sea, 578001-X	336810,04	6238090,95	?	?	Marine sediments	SHELL	*Macoma baltica*	Marine	9400 ± 100	400	9000	6,00	57	?	10407	9765
AAR-3293	Lille Fisker Banke.	336810,04	6238090,95	?	-48,23	Marine sediments	SHELL	*Acanthocardia echinata*	Marine	5325 ± 55	400	4925	4,23	58	-48,23	5883	5492
AAR-7183	Horns Rev	446472,20	6181894,88	?	?	Marine sediments	SHELL	*Spisula solida*	Marine	5670 ± 50	400	5270	?	59	?	6190	5928
AAR-7184	North sea, N of Horns Rev	446472,20	6181894,88	?	?	Marine sediments	SHELL	*Spisula solida*	Marine	5695 ± 60	400	5295	?	60	?	6268	5932
AAR-7185	North sea, N of Horns Rev	446472,20	6181894,88	?	?	Marine sediments	SHELL	*Spisula solida*	Marine	5520 ± 45	400	5120	?	61	?	5988	5743
UBA-32860	B0203VC, VIKING LINK	443802,32	6181000,41	?	-17,80	Marine sediments	SHELL	*Scrobicularia*	Marine/brackish	6457±43	400	6057	1.6-1.8	62	-17,8	7153	6786
UBA-32861	B0220VC, VIKING LINK	412834,39	6184743,08	?	-18,70	Marine sediments	SHELL	*Scrobicularia*	Marine/brackish	3687±30	400	3287	1.7-2.0	63	-18,7	3571	3448
UBA-32862	B0226VC, VIKING LINK	408051,08	6185061,82	?	-19,89	Marine sediments	SHELL	*Scrobicularia*	Marine/brackish	5277±32	400	4877	1.6-3.0	64	-20	5709	5485
Beta-479843	Beta-479843, Baltic Pipe	368159,00	6186111,95	?	-37,29	Marine sediments	SHELL	*Macoma baltica*	Marine/brackish	8660±30	400	8260	3.10-3.17	65	-37	9408	9038
Beta-479081	Beta-479081, Baltic pipe	368159,00	6186111,95	?	-37,70	PEAT			Terrestrial	9900±30	0	9900	3.38-3.80	66	-38	11396	11236
KIA-51169	DOG 2	321417,46	6248391,46	-42,1	-47,16	PEAT	BULK SAMPLE		Terrestrial	9547 ± 60	0	9547	5.06-5.07	67	-47,16	11151	10665
KIA-51170	DOG 2	321417,46	6248391,46	-42,1	-47,20	PEAT	BULK SAMPLE		Terrestrial	9311 ± 51	0	9311	5.10-5.11	68	-47,2	10661	10295
KIA-51171	DOG 2	321417,46	6248391,46	-42,1	-47,23	PEAT	BULK SAMPLE		Terrestrial	9595 ± 51	0	9595	5,13	69	-47,23	11168	10751
AAR-35647	Energiø, Northsea. P1 : BH-1012 : sample 04BagA : 03.00	349662,00	6258709,00	?	-39,6	Marine sand	Shell		Marine	2671 ± 30	400	2271	3	70	-39,6	2347	2157
AAR-35648	Energiø, Northsea. P2 : BH-1012 : sample 05BagB : 04.30	349662,00	6258709,00		-40,90	Marine sand	Shell	*Cardium*	Marine	8320 ± 41	400	7920	4,3	71	-40,9	8983	8600
AAR-35649	Energiø, Northsea. P3 : BH-079 : sample 04BagB : 02.25	348090,00	6263564,00		-30,15	Marine sand	Shell		Marine	36268 ± 769	400	35868	2,25	72	-30,15	42086	39656
AAR-35650	Energiø, Northsea. P4 : BH-079 : sample 05BagB : 02.75	348090,00	6263564,00		-30,65	Marine sand	Shell		Marine	6372 ± 37	400	5972	2,75	73	-30,65	6934	6676
AAR-35651	Energiø, Northsea. P5 : BH-079 : sample 10BagB : 05.20	348090,00	6263564,00		-33,1	Marine sand	Shell		Marine	5533 ± 38	400	5133	5,2	74	-33,1	5990	5749
AAR-35652	Energiø, Northsea. P6 : BH-1002 : sample 53BagA : 50.50	347315,00	6247314,00		-89,2	Peat	Peat		Terrestrial	>47906	0	47906	50,5	75	-89,2	52159	49471
AAR-35653	Energiø, Northsea. P7 : BH-1002 : sample 53BagA : 50.50	347315,00	6247314,00		-89,2	Peat	Wood		Terrestrial	>45847	0	45847	50,5	76	-89,2	48776	47471

AAR-35654	Energiø, Northsea. P8 : BH-1005 : sample 07BagA : 05.50	331240,00	6251314,00		-47,4	Peat	Wood		Terrestrial	>45244	0	45244	5,5	77	-47,4	48157	46943
AAR-35655	Energiø, Northsea. P9 : BH-1005 : sample 07BagA : 05.50	331240,00	6251314,00		-47,4	Peat	Wood		Terrestrial	>46893	0	46893	5,5	78	-47,4	50023	48500
AAR-35656	Energiø, Northsea. P10 : BH-1005 : sample 54BagB : 52.05	331240,00	6251314,00		-93,95	Peat	Wood		Terrestrial	>45123	0	45123	52,05	79	-93,95	48064	46872
AAR-35657	Energiø, Northsea. P11 : BH-1005 : sample 54BagB : 52.05	331240,00	6251314,00		-93,95	Peat	Wood		Terrestrial	>44060	0	44060	52,05	80	-93,95	46786	45935
AAR-35658	Energiø, Northsea. P12 : BH-1005 : sample 55BagA : 53.00	331240,00	6251314,00		-94,9	Peat	Wood		Terrestrial	>42942	0	42942	53	81	-94,9	45788	45006
AAR-35659	Energiø, Northsea. P13 : BH-1006 : sample 09BagA : 08.00	348762,00	6252531,00		-49,6	Sand or peat	Organic material		?	9608 ± 44	0	9608	8	82	-49,6	11173	10765
AAR-35660	Energiø, Northsea. P14 : BH-1007 : sample 30BagB : 23.70	346355,00	6253246,00		-64,3	Peat	Wood		Terrestrial	>45124	0	45124	23,7	83	-64,3	48064	46873
AAR-35661	Energiø, Northsea. P15 : BH-1007 : sample 30BagB : 24.50	346355,00	6253246,00		-65,1	Peat	Wood		Terrestrial	>49867	0	49867	24,5	84	-65,1	out of range	out of range
AAR-35662	Energiø, Northsea. P16 : BH-1010 : sample 08BagC : 06.90	341141,00	6256600,00		-41,9	Peat	Peat		Terrestrial	10055 ± 49	0	10055	6,9	85	-41,9	11814	11342
AAR-35663	Energiø, Northsea. P17 : BH-1010 : sample 08BagC : 06.90	341141,00	6256600,00		-41,9	Peat	Peat		Terrestrial	10025 ± 43	0	10025	6,9	86	-41,9	11745	11316
AAR-35664	Energiø, Northsea. P18 : BH-1011 : sample 03BagA : 02.00	343560,00	6256918,00		-38,2	SAND	Wood		?	8807 ± 47	0	8807	2	87	-38,2	10150	9628
AAR-35665	Energiø, Northsea. P19 : BH-1011 : sample 03BagA : 02.00	343560,00	6256918,00		-38,2	SAND	Shell		Marine	9592 ± 47	400	9192	2	88	-38,2	10496	10242
AAR-35666	Energiø, Northsea. P20 : BH-1016 : sample 69BagA : 67.00	340604,00	6260855,00		-109,8	Peat	Wood		Terrestrial	>48336	0	48336	67	89	-109,8	out of range	out of range
AAR-35667	Energiø, Northsea. P21 : BH-1016 : sample 69BagA : 67.00	340604,00	6260855,00		-109,8	Peat	Wood		Terrestrial	>45765	0	45765	67	90	-109,8	48710	47380
AAR-35668	Energiø, Northsea. P22 : BH-1017 : sample 17BagA : 11.00	343364,00	6262939,00		-54,4	SAND	Shell		Marine	>48000	400	48000	11	91	-54,4	51686	48945
AAR-35669	Energiø, Northsea. P23 : BH-1017 : sample 18BagA : 11.50	343364,00	6262939,00		-54,9	SAND	Wood		?	>47708	0	47708	11,5	92	-54,9	51869	49080
AAR-35670	Energiø, Northsea. P24 : BH-1017 : sample 18BagB : 11.70	343364,00	6262939,00		-55,1	SAND	Wood		?	>51096	0	51096	11,7	93	-55,1	51097	51096
AAR-35671	Energiø, Northsea. P25 : BH-1021 : sample 45BagC : 44.30	357783,00	6264770,00		-85,8	SAND	Shell		Marine	>45900	400	45900	44,3	94	-85,8	48823	47523
AAR-36838	EC4_C_A_VC_093; X3 - 02BAGD	442188,00	6257752,00	-17,00	-18,50	SAND	shell		Marine	438 ± 26 1955*	400	38	1,50	95	-18,5	255	34
AAR-36839	EC4_C_A_VC_093; X4 - 02BAGE	442188,00	6257752,00	-17,00	-18,65	CLAY	shell		Marine	512 ± 25 1955*	400	112	1,65	96	-18,65	267	21
AAR-36840	EC4_C_B_VC_019; X6 - 02BAGA	368075,00	6260958,00	-40,50	-41,50		shell		Marine	9788 ± 56	400	9388	1,00	97	-41,5	10763	10429
AAR-36841	EC4_C_B_VC_019; X7 - 02BAGB	368075,00	6260958,00	-40,50	-41,60	Peat	Plant remains		Terrestrial	9214 ± 40	0	9214	1,10	98	-41,6	10499	10249
AAR-36842	EC4_C_B_VC_025; X8 - 02BAGC	374133,00	6260666,00	-38,40	-39,80	Gyttja or peat	wood		?	9088 ± 44	0	9088	1,40	99	-39,8	10375	10182
AAR-36843	EC4_C_B_VC_030; X9 - 04BAGA	379260,00	6260420,00	-34,80	-37,80	Clay	shell		Marine	9344 ± 44	400	8944	3,00	100	-37,8	10219	9908
AAR-36844	EC4_C_B_VC_030; X10 - 04BAGE	379260,00	6260420,00	-34,80	-38,40	Silt or peat	wood (branches)		Marine Forams	9045 ± 40	0	9045	3,60	101	-38,4	10254	10160
AAR-36845	EC4_C_B_VC_031; X11 - 03LINERA(a)	380259,00	6260373,00	-35,50	-38,00	Clay	shell		Marine	9443 ± 39	400	9043	2,50	102	-38	10252	10165
AAR-36846	EC4_C_B_VC_031; X12 - 03BAGD	380259,00	6260373,00	-35,50	-38,25	Peat	wood (branches)		Terrestrial	9107 ± 42	0	9107	2,75	103	-38,25	10405	10193
AAR-36847	EC5_C_D_VC_035; X16 - 01BAGD	383901,00	6260197,00	-36,80	-37,65	Clay or silt	shell		Marine	8815 ± 37	400	8415	0,85	104	-37,65	9530	9313
AAR-36848	EC5_C_D_VC_035; X17 - 02BAGB	383901,00	6260197,00	-36,80	-38,05	Peat	wood	small branches + plant	Terrestrial	9133 ± 46	0	9133	1,25	105	-38,05	10485	10210
AAR-36849	EC5_C_D_VC_057a; X18 - 05BAGE	405962,00	6259135,00	-32,50	-37,10	Sand	shell		Marine	8220 ± 36	400	7820	4,60	106	-37,1	8719	8463
AAR-36850	EC5_C_D_VC_057a; X19 - 05BAGF	405962,00	6259135,00	-32,50	-37,20	SAND	wood - (small branch)		?	53196 ± 1620 **	0	53196	4,70	107	-37,2	out of range	out of range

AAR-36851	EC5_C_D_VC_081; X20 - 03BAGC	430200,00	6257966,00	-25,40	-27,90	SAND	wood - (small branch)		Marine	8760 ± 46	0	8760	2,50	108	-27,9	10110	9551
AAR-36852	EC5_C_D_VC_081; X21 - 05BAGD	430200,00	6257966,00	-25,40	-30,20	Peat (decomposed)	wood (bark?)		Terrestrial	49648 ± 1109 *	0	49648	4,80	109	-30,2	out of range	out of range
AAR-36853	EC5_C_C_VC_106; X23 - 5Arch-2	421448,00	6194113,00	-23,00	-27,15	Peat	Plant remains		Terrestrial	8244 ± 39	0	8244	4,15	110	-27,15	9406	9029
AAR-36854	EC5_C_C_VC_107; X24 - 2Arch1	422136,00	6193447,00	-23,40	-24,40	SAND	shell		Marine	7854 ± 37	400	7454	1,00	111	-24,4	8359	8186
AAR-36855	EC5_C_C_VC_107; X25 - 2Arch2	422136,00	6193447,00	-23,40	-24,75	Peat	Peat		Terrestrial	10545 ± 50	0	10545	1,35	112	-24,75	12702	12471
AAR-36856	EC5_C_C_VC_109; X26 - 4Arch1	423443,00	6192181,00	-23,80	-26,10	Peat	Peat		Terrestrial	8954 ± 45	0	8954	2,30	113	-26,1	10228	9909
AAR-36857	EC5_C_C_VC_109; X27 - 5Arch1	423443,00	6192181,00	-23,80	-26,40	Peat	Peat		Terrestrial	9861 ± 48	0	9861	2,60	114	-26,4	11397	11195
AAR-36858	EC5_C_C_VC_121a; X29 - 2ArchB-1	435061,00	6189344,00	-19,30	-20,80	SAND	shell		Marine	6566 ± 31	400	6166	1,50	115	-20,8	7162	6961
AAR-36859	EC5_C_C_VC_121a; X31 - 3Arch1	435061,00	6189344,00	-19,30	-21,30	SAND	wood (branches)		?	10504 ± 51	0	10504	2,00	116	-21,3	12685	12191
AAR-36860	EC5_C_C_VC_121a; X32 - 3Arch1	435061,00	6189344,00	-19,30	-21,30	SAND	shells		Marine	412 ± 23 1955*	400	12	2,00	117	-21,3	253	40
AAR-36861	EC5_C_C_VC_124; X33 - 04BAGD	437940,00	6188598,00	-18,80	-22,30	SAND or clay	shells		Marine	8444 ± 36	400	8044	3,50	118	-22,3	9080	8770
AAR-36862	EC5_C_C_VC_124; X34 - 05BAGB	437940,00	6188598,00	-18,80	-22,95	Peat	wood (branch)		Terrestrial	8182 ± 43	0	8182	4,15	119	-22,95	9275	9014
AAR-36863	EC5_C_D_VC_006; X35 - 02BAGC	355726,00	6261555,00	-42,40	-44,05	Clay	wood (branch)		?	9437 ± 44	0	9437	1,65	120	-44,05	11060	10515
AAR-36864	EC5_C_D_VC_006; X36 - 02BAGC	355726,00	6261555,00	-42,40	-44,05	Clay	shells		Marine	8871 ± 38	400	8471	1,65	121	-44,05	9536	9439
AAR-36865	EC5_C_D_VC_011; X37 - 02BAGC	360283,00	6261336,00	-41,50	-43,25	Sand and clay	shells		Marine	3925 ± 30	400	3525	1,75	122	-43,25	3887	3699
AAR-36866	EC5_C_D_VC_011; X38 - 02BAGC	360283,00	6261336,00	-41,50	-43,25	Sand and clay	wood (branch)		?	39655 ± 383		39655	1,75	123	-43,25	43887	42527
AAR-36867	EC5_C_D_VC_011; X39 - 02BAGD	360283,00	6261336,00	-41,50	-43,35	Peat	wood (branch)		Terrestrial	9192 ± 42		9192	1,85	124	-43,35	10494	10244
AAR-36868	EC5_C_D_VC_011; X40 - 03BAGB	360283,00	6261336,00	-41,50	-43,70	SAND	shells		Marine	8306 ± 43	400	7906	2,20	125	-43,7	8983	8595
AAR-36869	EC5_C_D_VC_011; X41 - 03BAGD	360283,00	6261336,00	-41,50	-44,00	Peat	wood (branch)		Terrestrial	11821 ± 53		11821	2,5	126	-44	13790	13520
FTMC-IA24-1	GT_VC_010, sample P2, X1	435392,77	6231162,38	-19,90	-20,30	PEAT	Wood		Terrestrial	9090±44	0	9090	0,4	127	-20,3	10375	10183
FTMC-IA24-2	GT_VC_019, sample P2, X2	426092,63	6225226,23	-25,42	-28,27	GYTTJA	Shells	*cardium*	Marine	9349±45	400	8949	2,85	128	-28,27	10224	9909
FTMC-IA24-3	GT_VC_019, sample P2, X3	426092,63	6225226,23	-25,42	-28,84	PEAT	wood		Terrestrial	8830±42	0	8830	3.35-3-50	129	-28,84	10150	9696
FTMC-IA24-4	GT_VC_020, sample 2,4D, X4	425436,63	6224725,98	-26,01	-27,66	SAND	Shells	*cardium*	Marine	9479±43	400	9079	1,65	130	-27,66	10371	10178
FTMC-IA24-5	GT_VC_030, X5	439660,70	6194721,28	-20,68	-25,13	CLAY	Shells		Marine	38375±364	400	37975	4,35-4.55	131	-25,13	42557	41960
FTMC-IA24-6	GT_VC_033, sample P1, X6	439319,56	6197610,41	-21,26	-23,31	GYTTJA	Shells	*cardium*	Marine	8805±42	400	8405	2,05	132	-23,31	9528	9304
FTMC-IA24-7	GT_VC_035, sample 4,2D, X7	439090,33	6199536,07	-21,56	-24,91	SAND	Wood, branch		?	45698±1374	0	45698	3,35	133	-24,91	54453	45512
FTMC-IA24-8	GT_VC_037, sample P1, X8	438860,32	6201458,72	-21,74	-22,30	CLAY	Shells		Marine	4304±34	400	3904	0,50-0,63	134	-22,3	4422	4187
FTMC-IA24-9	GT_VC_037, sample P2, X9	438860,32	6201458,72	-21,74	-23,34	GYTTJA	Shells	*cardium, mytilus edulis*	Marine	56245±2614	400	55845	1,55-1,65	135	-23,34	out of range	out of range
FTMC-IA24-10	GT_VC_037, sample P2, X10	438860,32	6201458,72	-21,74	-23,34	GYTTJA or PEAT	Wood, branch		?	45299±1286	0	45299	1,55-1,65	136	-23,34	51959	45387
FTMC-IA24-11	GT_VC_038, sample 2,3D, X11	438790,92	6202086,85	-21,84	-22,74	SILT	Shells		Marine	2497±31	400	2097	0,9	137	-22,74	2147	1950
FTMC-IA24-12	GT_VC_056a, sample P2, X12	428630,64	6208908,92	-25,51	-26,31	PEAT	Wood, branch		Terrestrial	8593±43	0	8593	0,7-0,9	138	-26,31	9685	9485
FTMC-IA24-13	GT_VC_056a, samlpe P2, X13	428630,64	6208908,92	-25,51	-27,39	PEAT	Wood, branch		Terrestrial	9959±46	0	9959	1,8-1,95	139	-27,39	11687	11246
FTMC-IA24-14	GT_VC_064, sample P2, X14	441628,00	6188630,00	-19,34	-20,34	SAND	Shellls		Marine	2247±31	400	1847	0,9-1,10	140	-20,34	1830	1640
FTMC-IA24-15	GT_VC_068, sample 6,2D, X15	437213,29	6190662,30	-19,60	-25,00	CLAY	Shells		Marine	36134±316	400	35734	5,4	141	-25	41406	40156
FTMC-IA24-16	GT_VC_071, sample P2, X16	435122,57	6190943,55	-20,19	-24,29	PEAT	Wood, branch		Terrestrial	7102±38	0	7102	4,1	142	-24,29	8010	7845
FTMC-IA24-17	GT_VC_071, sample P3, X17	435122,57	6190943,55	-20,19	-24,44	PEAT	Wood, branch		Terrestrial	6757±38	0	6757	4,25	143	-24,44	7675	7521
FTMC-IA24-18	GT_VC_071, sample P3, X18	435122,57	6190943,55	-20,19	-24,44	PEAT	Shells		?	8594±40	400	8194	4,25	144	-24,44	9279	9020

FTMC-IA24-19	GT_VC_072, sample P5,2D, X19	434076,84	6191083,48	-20,47	-24,49	CLAY	Shells	*mytilus edulis*	Marine	8623±41	400	8223	3,95-4,10	145	-24,49	9399	9025
FTMC-IA24-20	GT_VC_078, sample P1, X20	428850,62	6191783,25	-22,79	-23,89	PEAT	Peat		Terrestrial	10613±45	0	10613	1,1	146	-23,89	12725	12493
FTMC-IA24-21	GT_VC_079, sample P1, X21	427797,57	6191924,83	-23,56	-24,36	PEAT	Peat		Terrestrial	10622±46	0	10622	0,8	147	-24,36	12726	12496
FTMC-IA24-22	NS_OWF_VC_002, sample P2, X22	404360,39	6187658,92	-21,66	-24,56	SAND	Shells		Marine	7170±38	400	6770	2,80-3,00	148	-24,56	7677	7573
FTMC-IA24-23	NS_OWF_VC_002, sample P4, X23	404360,39	6187658,92	-21,66	-25,94	SAND	Shells		Marine	6950±38	400	6550	4,20-4,35	149	-25,94	7566	7358
FTMC-IA24-24	NS_OWF_VC_002, sample P4, X24	404360,39	6187658,92	-21,66	-25,94	SAND	Wood fragments		?	7740±41	0	7740	4,20-4,36	150	-25,94	8592	8426
FTMC-IA24-25	NS_OWF_VC_003, sample P2, X25	411728,02	6221057,53	-28,38	-29,71	SAND	Shells		Marine	2505±32	400	2105	1,25-1,40	151	-29,71	2290	1991
FTMC-IA24-26	NS_OWF_VS_004, sample P2, X26	412389,48	6208861,83	-24,12	-29,37	SAND	Shells,	Knivmusling	Marine	5066±35	400	4666	5,15-5,35	152	-29,37	5472	5316
FTMC-IA24-27	NS_OWF_VC_005, sample P1, X27	411459,98	6227117,10	-30,04	-32,09	SAND	Shells	*cardium*	Marine	3209±32	400	2809	1,95-2,15	153	-32,09	2999	2792
FTMC-IA24-28	NS_OWF_VC_006, sample P2, X28	411720,45	6204667,42	-22,20	-28,10	SAND	Shells		Marine	5928±35	400	5528	5,8-6,0	154	-28,1	6398	6281
FTMC-IA24-29	NS_OWF_VC_007, sample P3, X29	419069,52	6199097,39	-23,81	-27,46	SAND	Shells		Marine	5362±35	400	4962	3,55-3,75	155	-27,46	5848	5596
FTMC-IA24-30	NS_OWF_VC_008, sample P3, X30	422571,66	6194659,33	-23,61	-27,71	GYTJJA	Shells		Marine	7912±39	400	7512	4,0-4,2	156	-27,71	8394	8197
FTMC-IA24-31	NS_OWF_VC_009, sample P1, X31	398923,46	6228429,53	-12,72	-15,57	SAND	Shells		Marine	6397±36	400	5997	2,75-2,95	157	-15,57	6939	6743
FTMC-IA24-32	NS_OWF_VC_009, sample P2, X32	398923,46	6228429,53	-12,72	-18,35	SAND	Shells		Marine	7502±38	400	7102	5,55-5,70	158	-18,35	8010	7845
FTMC-IA24-33	NS_OWF_VC_010, sample P1, X33	417946,58	6201845,78	-24,61	-27,01	SAND	Shells		Marine	3758±35	400	3358	2,3-2,5	159	-27,01	3690	3484
FTMC-IA24-34	NS_OWF_VC_010, sample P2, X34	417946,58	6201845,78	-24,61	-29,56	SAND	Shells		Marine	6648±37	400	6248	4,85-5,05	160	-29,56	7260	7015
FTMC-IA24-35	NS_OWF_VC_010, sample P3, X35	417946,58	6201845,78	-24,61	-29,76	PEAT	Shells		?	5973±36	400	5573	5,05-5,25	161	-29,76	6437	6295
FTMC-IA24-36	NS_OWF_VC_010, sample P3, X36	417946,58	6201845,78	-24,61	-29,76	PEAT	Peat		Terrestrial	9720±43	0	9720	5,05-5,25	162	-29,76	11240	10876
Beta - 697330	GT_VC_001, sample 1.4D	444924,11	6233508,38	-10,01	-10,46	CLAY	organic sediment		?	43500	0	43500	0,45	163	-10,46	46113	45473
Beta - 697331	GT_VC_004, sample 3.2D	441604,48	6232691,65	-19,14	-20,94	PEAT	wood		Terrestrial	43500	0	43500	1,8	164	-20,94	46113	45473
Beta - 697332	GT_VC_005a, sample 2.2D	440498,03	6232418,10	-18,93	-19,98	CLAY	organic sediment		?	36220	0	36220	1,05	165	-19,98	41398	41075
Beta - 697333	GT_VC_010, sample 1,3D	435392,77	6231162,38	-19,90	-20,30	PEAT	Plant material		Terrestrial	9340±30	0	9340	0,4	166	-20,3	10657	10430
Beta - 697334	GT_VC_012, sample 2.2D	432731,00	6230242,43	-21,12	-22,97	GYTTJA	organic sediment		?	4380±30	0	4380	1,85	167	-22,97	5042	4860
Beta - 697335	GT_VC_019, sample 4.1D	426092,63	6225226,23	-25,42	-28,67	PEAT	Wood		Terrestrial	8920±30	0	8920	3,25	168	-28,67	10188	9909
Beta - 697336	GT_VC_021, sample 2,2D	446030,00	6185904,00	-9,74	-11,29	GYTTJA	organic sediment		?	3370±30	0	3370	1,55	169	-11,29	3692	3491
Beta - 697337	GT_VC_027, sample 6,1D	440053,61	6191402,87	-21,74	-27,29	CLAY	organic sediment		?	43500	0	43500	5,55	170	-27,29	46113	45473
Beta - 697338	GT_VC_033, sample 3,4D	439319,56	6197610,41	-21,26	-23,31	GYTTJA	Plant material		?	8090±30	0	8090	2,05	171	-23,31	9126	8794
Beta - 697339	GT_VC_034, sample 1,4D	439204,86	6198573,28	-21,32	-22,07	GYTTJA	organic sediment		?	8900±30	0	8900	0,75	172	-22,07	10177	9905
Beta - 697340	GT_VC_038, sample 3,2D	438790,92	6202086,85	-21,84	-23,94	PEAT	Plant material		Terrestrial	37340±400	0	37340	2,1	173	-23,94	42350	41438
Beta - 697341	GT_VC_056a, sample 1,3D	428630,64	6208908,92	-25,51	-26,11	PEAT	Plant material		Terrestrial	8300±30	0	8300	0,6	174	-26,11	9429	9141
Beta - 697342	GT_VC_068, sample 4,1D	437213,29	6190662,30	-19,60	-23,00	SAND	Plant material		?	8060±30	0	8060	3,4	175	-23	9084	8778
Beta - 697343	GT_VC_071, sample 5,2D	435122,57	6190943,55	-20,19	-24,44	PEAT	Plant material		Terrestrial	6930±30	0	6930	4,25	176	-24,44	7836	7680

Beta - 697344	GT_VC_078, sample 1,3D	428850,62	6191783,25	-22,79	-23,89	PEAT	Plant material		Terrestrial	10830±30	0	10830	1,1	177	-23,89	12823	12729
Beta - 697345	GT_VC_079, sample 1,3D	427797,57	6191924,83	-23,56	-24,36	PEAT	Plant material		Terrestrial	10930±40	0	10930	0,8	178	-24,36	12921	12751