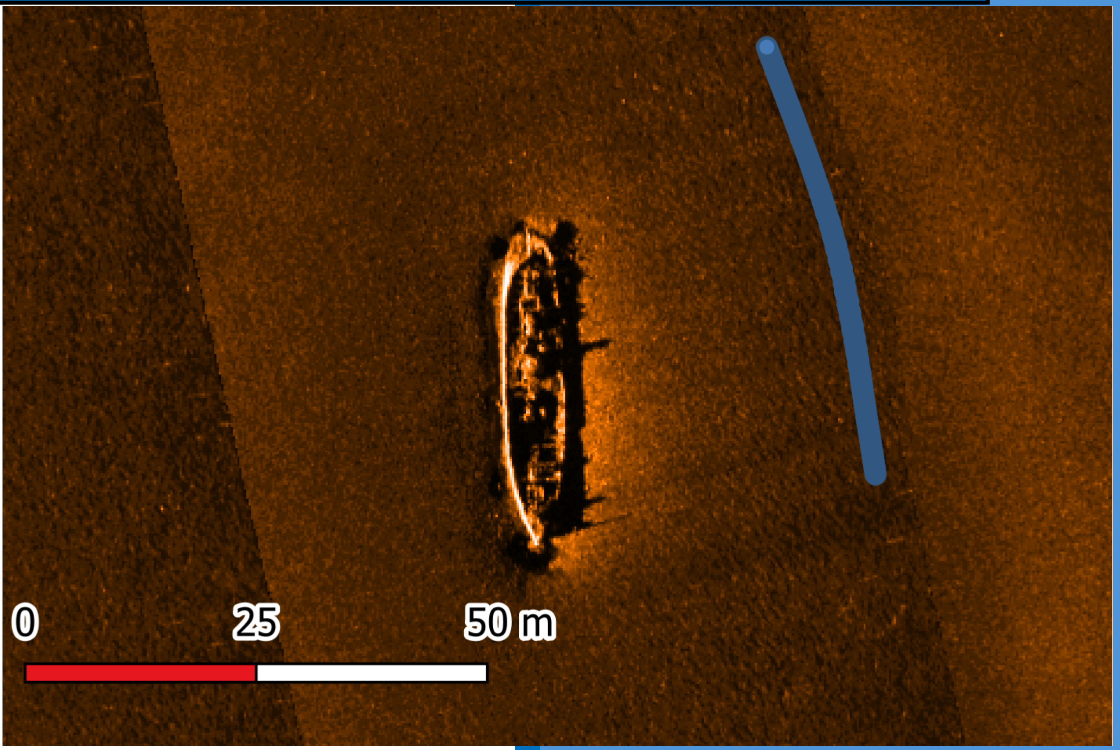
2025

# MAV 2023-46 North Sea I Area 2 Offshore Wind Farm Geoarchaeological Analysis

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Marinarkæologi Vestdanmark (MAV)

30-06-2025

# Resumé

På vegne af Energinet har Marinarkæologi Vestdanmark (MAV) gennemført en geoarkæologisk analyse for Vindmølleområdet Norsøen I, delområde 2. Da dette arbejde er en fortsættelse af arbejdet i område 1 er dele af den tidligere rapport bragt igen i denne rapport. For eksempel er der ingen borekerner tilgængelige fra område 2, og afsnittet, som beskriver hvordan havniveauerne er beregnet, er derfor gengivet i denne rapport. Generelle forhold og overvejelser er også de samme mellem rapporterne.

Rapporten vurderer potentialet 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 marinarkæologiske forundersøgelser i 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 seks skibsvrag og tilknyttede vragrester. Listen over mål for primær inspektion omfatter seks skibsvrag, seks andre SSS-mål vurderet til at have arkæologisk potentiale og 71 MAG-anomalier med residualer på 50nT eller mere. De 12 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 lokaliteter, 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

On behalf of Energinet, Marinarkæologi Vestdanmark (MAV) has conducted a geoarchaeological analysis for Area 2 of the North Sea 1 OWF project. As this is a continuation of the work done for Area 1, parts of the geoarchaeological analysis written for Area 1 have been reused in this report. For example, no core samples have been available for Area 2 and the sections describing how the sea-level was determined were therefore reused. General conditions and considerations are also mostly the same.

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 these 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 various 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 six older shipwrecks and associated shipwreck debris. The list of targets for primary inspection includes 6 shipwreck sites, 6 other SSS targets judged to have archaeological potential and 71 MAG anomalies with residuals of ±50 nT or greater. The 12 SSS targets should be inspected further by ROV and/or diver. If these 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: Wreck BM12_003 as seen in SSS and MAG data.*

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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 |
| **SMR** | Sites and Monuments Record, in Denmark: FFM |
| **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. This project encompasses subarea 2 of this area.

The OWF 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 |
| Report finish date: | 30-6-2025 |
| Participating archaeologists: | PMA (MOMU), BE (DKM) |
| Stone Age responsibility: | PMA |
| Historical archaeology responsibility: | BE |
| Name of site: | North Sea 1 Area 2 |
| FFM Systemnr. | 255270 |
| Site and location number (FFM): | 400110c-159 |
| MAV collaboration case no.: | MAV2023-46 North Sea 1 - Part 2 |
| Date of approval of budget: | 04.07.2023 |
| Type of budget: | Geoarchaeological analysis – voluntary agreement |
| Period of investigation: | 2025 |
| 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 (FFM): | X: 412636 Y: 6215214 |
| Geographic coordinate system: | Euref89 UTM zone 32N |
| Water depth: | 0m-33,51m |
| Area of investigation: | 804 $km^2$ |

## 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 2024- June 2025. The deadline for the report is June 30th, 2025. The report covers the entire planned offshore wind farm area and export cable routes and includes all available data and resources.

## 1.5. Reference documents

| Document | Reference | Author |
|---|---|---|
| Nordsøen I Havvindmøllepark og kabelruter – Arkæologisk analyse | MAV 2023-45 | DKM/MAV |
| Arkivalsk kontrol Havmøllepark Nordsøen 1 | MAV 2023-45 | DKM/MAV |
| Bilag 1 – 2023-02-01 MH2030. Marinarkæologi.pdf | | ENERGINET |
| Tidsplan milepæle.xlsx | | ENERGINET |
| ACTION LIST.xlsx | | ENERGINET |
| Scope of Services – Lot 4 | 22/02940-14 | ENERGINET |
| Best Practice – Marinarkæologi incl. Appendices | 16/03737-3 | ENERGINET/SLKS |
| Screening of seabed geological conditions for the offshore wind farm area North Sea I and the adjacent cable corridor area | GEUS Rapport 2023/15 | GEUS |
| Geophysical Site Survey Report Danish Offshore Wind 2030LOT 4, Work Package C, Area 1 | 104287-ENN-OI-SUR-REP-LOT4WPCA1 | 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 |
| Geomodel. Danish Offshore Wind 2030, North Sea 1, Denmark | Report no- 2, 2D UHRS Survey Geomodel Integrated with CPT Data, Full Site | Fugro/Energinet |

# 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), Lost Frontiers (Gaffney et al. 2017) and SUBNORDICA (that will be running from 2024-2029), which is all aims at reconstructing 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 but the find is described by 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

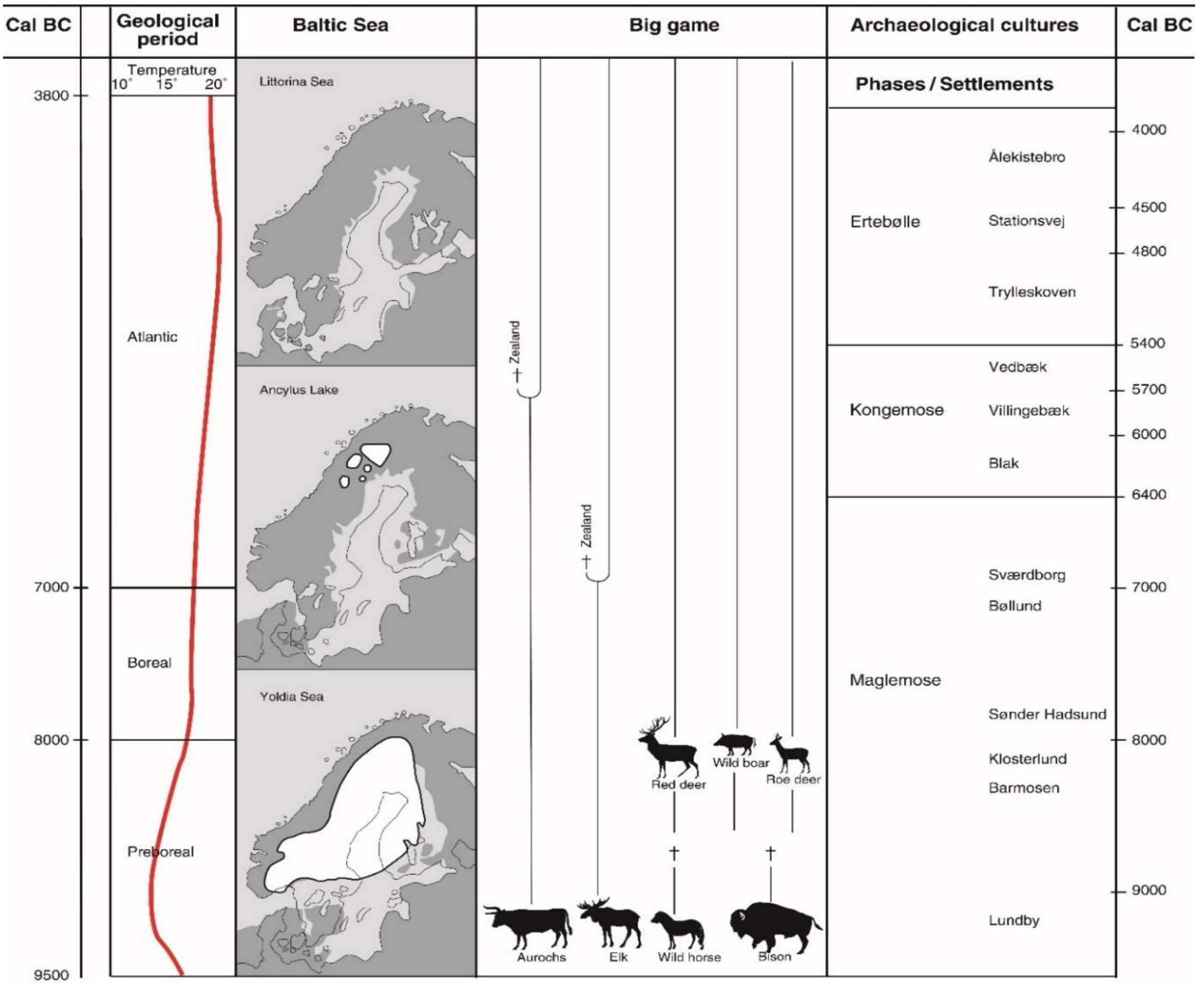


*Figure 1. Schematic of cultural and natural developments in South Scandinavia in calibrated years BC. (Astrup 2018)*

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 A1 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 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).

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. This is the result of 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 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, 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 A2

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

It has not been possible to include core logs from A2 in the current geoarchaeological analysis as they were not yet collected at the time of writing. If there had been an opportunity to review the core logs, this would have been done with the aim of identifying samples that could be sent for dating to improve the shore displacement curve produced for A1. The curve is considered representative of both areas and is therefore included in the present analysis. For the same reason, it has been decided to include the description of the sea level curve used in the area.

For the North Sea 1 OWF site (area 1) and the associated cable route areas GEO conducted analysis and interpretation of vibrocore samples. 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.

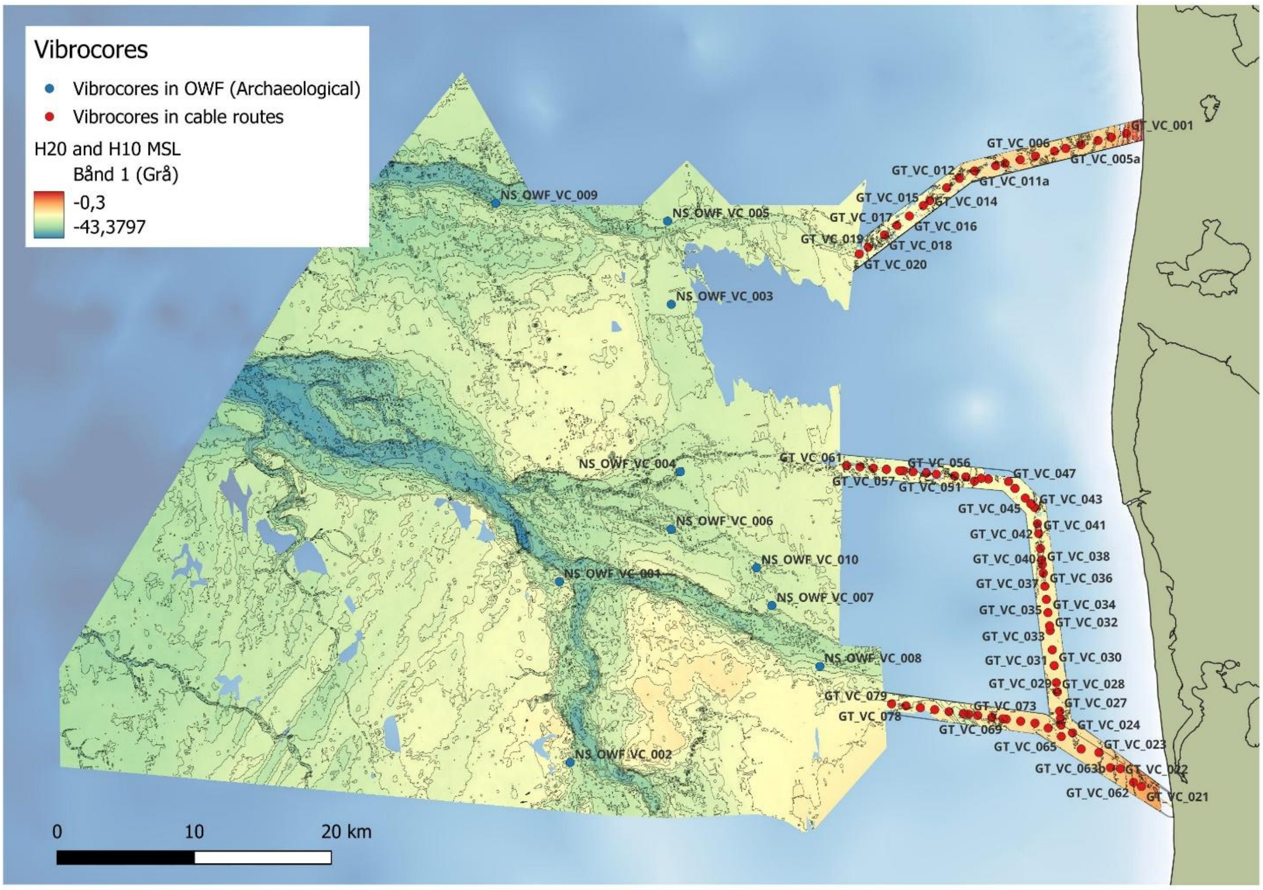


*Figure 2. Vibrocore positions and names from North Sea I OWF. Contour lines show the modern bathymetry below sea level. Unnamed dots represent vibrocore locations in the ECR area.*

### 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 indicate 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.

## 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 were so few dated samples before 2024 that more dated SLIPs were needed to improve the accuracy of sea level models. It was therefore vital to develop a shoreline displacement curve for that was based on local data from the North Sea 1 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 6.3 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. As can be seen Figure 3 the analysis has been made primarily on data from A1 and surrounding areas.

*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 |

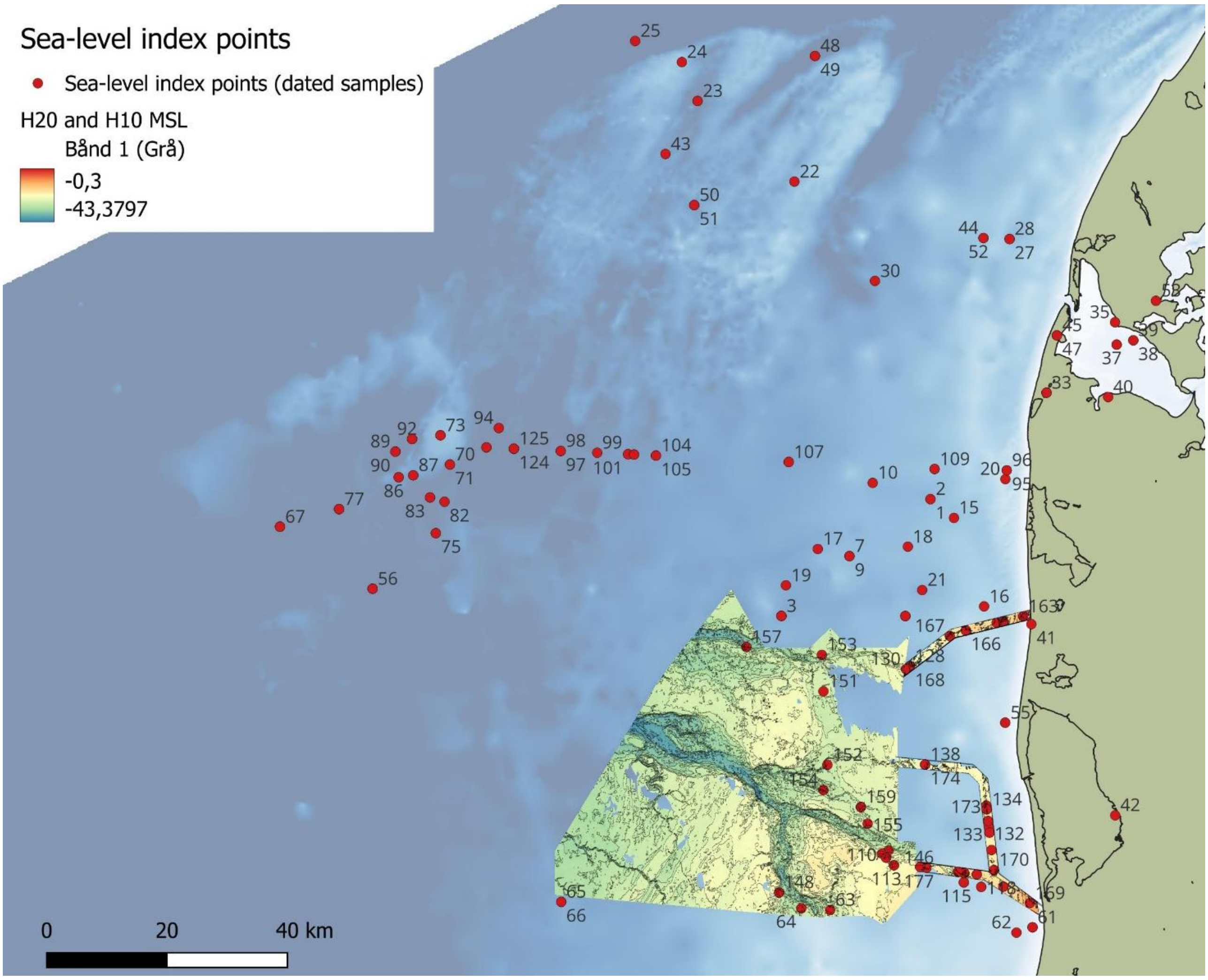


*Figure 3 Core positions from which material has been radiocarbon-dated (shown in red). Numbers refer to ID number in Appendix 6.3 and sea-level curve in Figure 4.*

89 borings have been available in the North Sea 1 area. All 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 October 14th 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 6.3.

### 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. 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 6.3. while Figure 3 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 $C^{14}$ 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 6.3 (column “id”) and Table 1 so it is possible to find additional information about the individual samples that are dated.

Figure *4* 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.

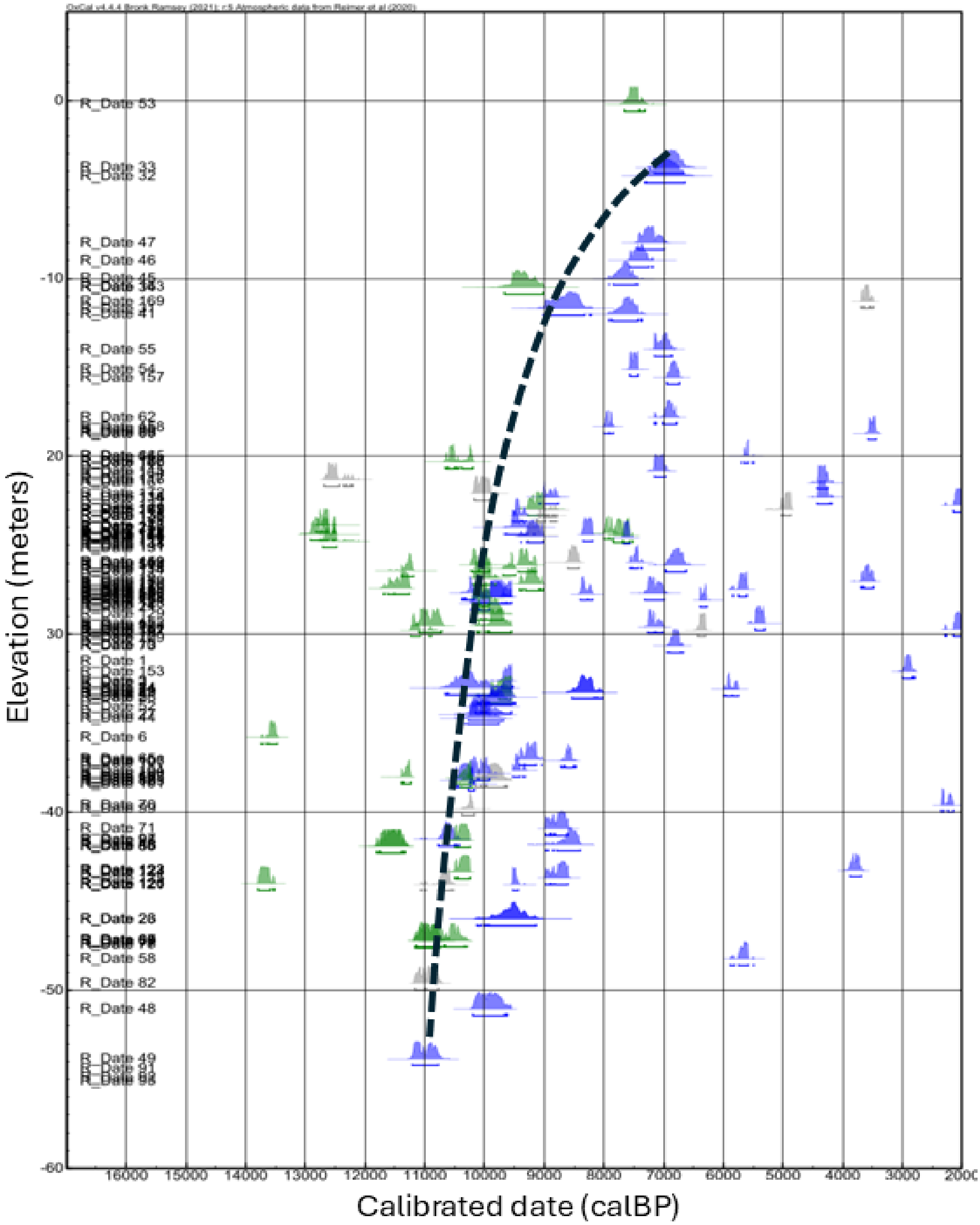


*Figure 4. Shoreline displacement curve where the dashed line gives the hypothesized sea level in the planned cable route area during the Holocene. Marine samples are shown in blue whereas terrestrial samples are shown in green.*

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 8 to Figure 13.*

| **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

A report with interpreted horizons and units were available for the geoarchaeological interpretations. 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 6). The identified horizons represent the boundaries between different sediment layers in the subsurface, with each layer corresponding to a specific depositional environment (see descriptions in figure 5). The seismic horizons have been used to identify seismic units and 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. It is essential to understand the units and horizons as varying sediment types of 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<br>▪ 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<br>▪ 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<br>Freshwater<br>Meltwater<br>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<br>Freshwater<br>Meltwater<br>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 5. 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.

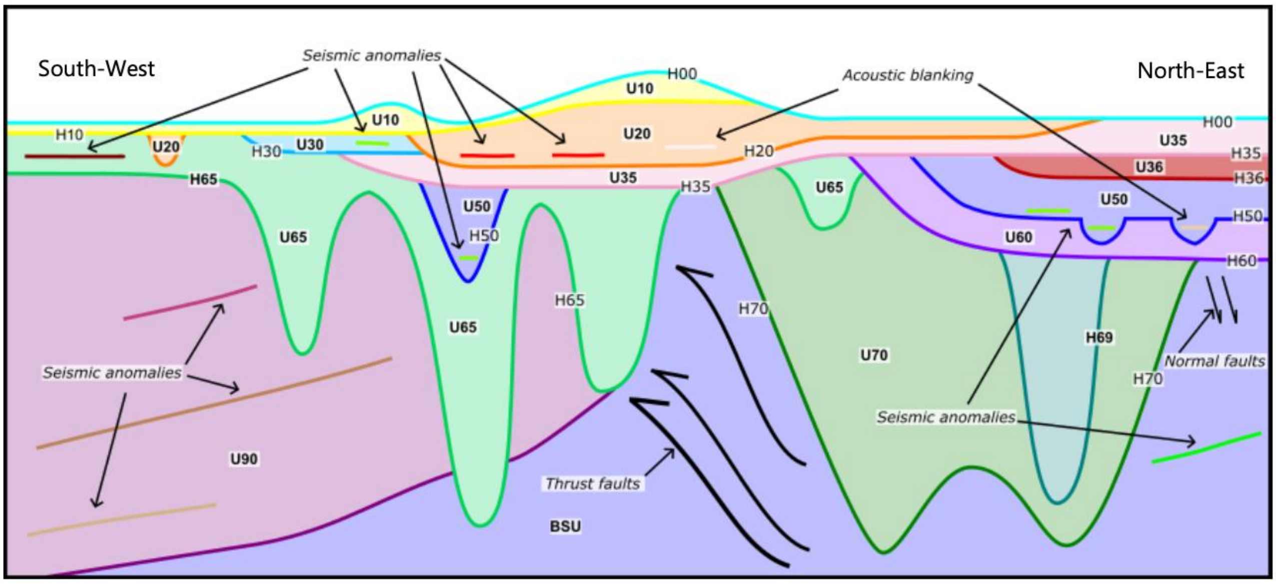


*Figure 6. Conceptual model of interpreted horizons and units in the top 200 m. Figure from Report no 2 by Fugro (2024).*

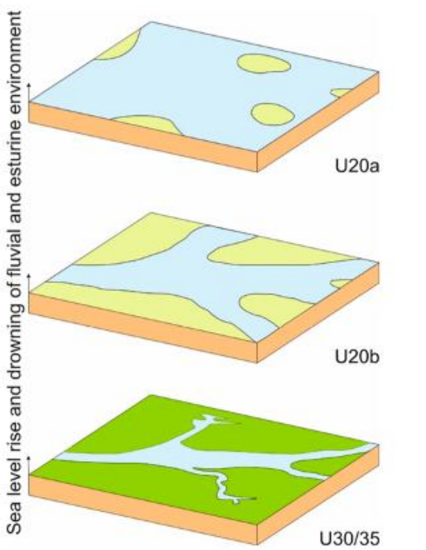


*Figure 7. The figure illustrates the sea-level rise during the Holocene, beginning with the inundation of the lowest areas, such as river systems, and progressively covering the rest of the terrestrial environment. Figure from Report no 2 by Fugro (2024).*

In the report by Fugro (2024) three units were interpreted as Weichselian in age: U36, U35 and U30. Of these, Unit 36 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 U50 and the meltwater sand of Unit U35. Unit 36 comprises silt and sand. Overlying U36 is U35 that is interpreted as a meltwater/braided glacio-fluvial system deposited during the Weichselian glacial period (Fugro 2024). U30 and U36 have limed coverage across the North Sea 1 project areas and for that reason they are of little value in determining the position of the coastline in the Holocene period. While U35 offers better coverage, it is not deemed as suitable as H20, which has been chosen as the input file for the coastline models.".

Unit 20 comprises a network of infill in three main paleochannels and several secondary distributary channels. It is believed that U20 was formed in estuarine and marine depositional environments when the area was flooded during the postglacial transgression (Fugro 2024, p. 45). The thickness reaches up to approximately 30 m and the base of Unit 20 is often characterised by the presence of peat deposits or organic rich clay (Fugro report page 41). H20 is believed to represent the transitional phase between the glacial surface and the postglacial marine deposits that has accumulated in the old paleochannels. Unit 20 is built up by a mix of freshwater and marine sediments of postglacial age. The unit is registered in large parts of the project area and has therefore been selected as the primary surface for the attempts of reconstructing the paleocoastlines in the area.

## 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 considers horizon H20 to be the last (and youngest) terrestrial horizon that existed in the area before the area was transgressed in the early Holocene. H20 and H10 (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 H20 is not present we have used H10 because H10 is considered more representative of the Stone age terrain than the modern bathymetry.

The different coastlines are 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.

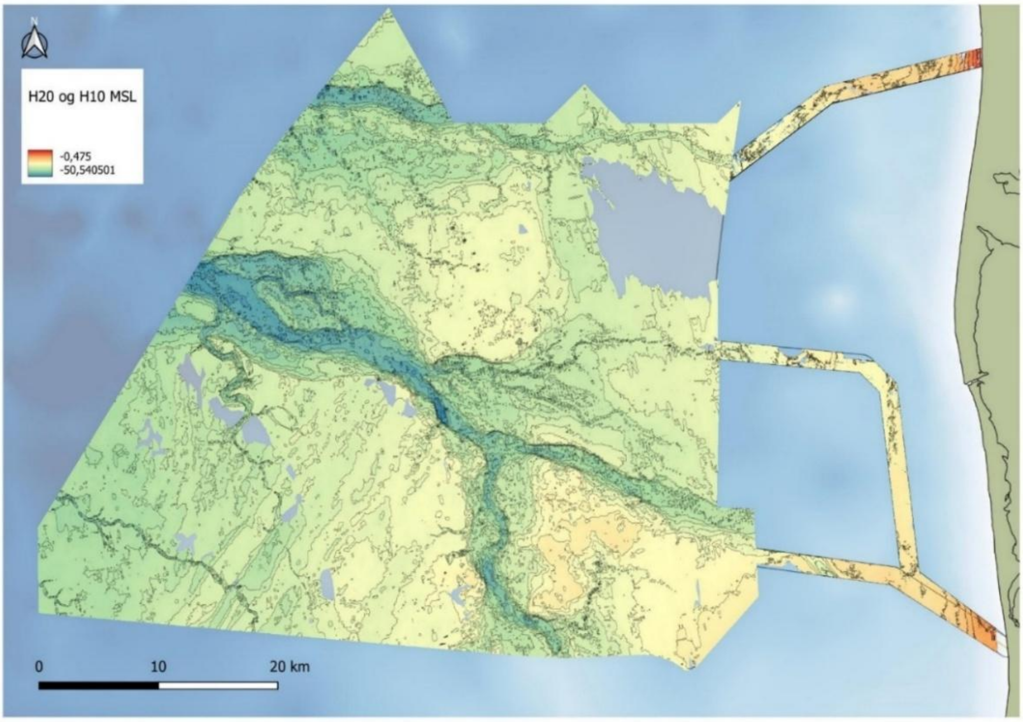


*Figure 8. Modelled coastline at ~11000 years BP, showing no inundation of the area. An elevation of – 50 m below msl in horizon H10 and H20 has been used to determine the position of the coastline.*

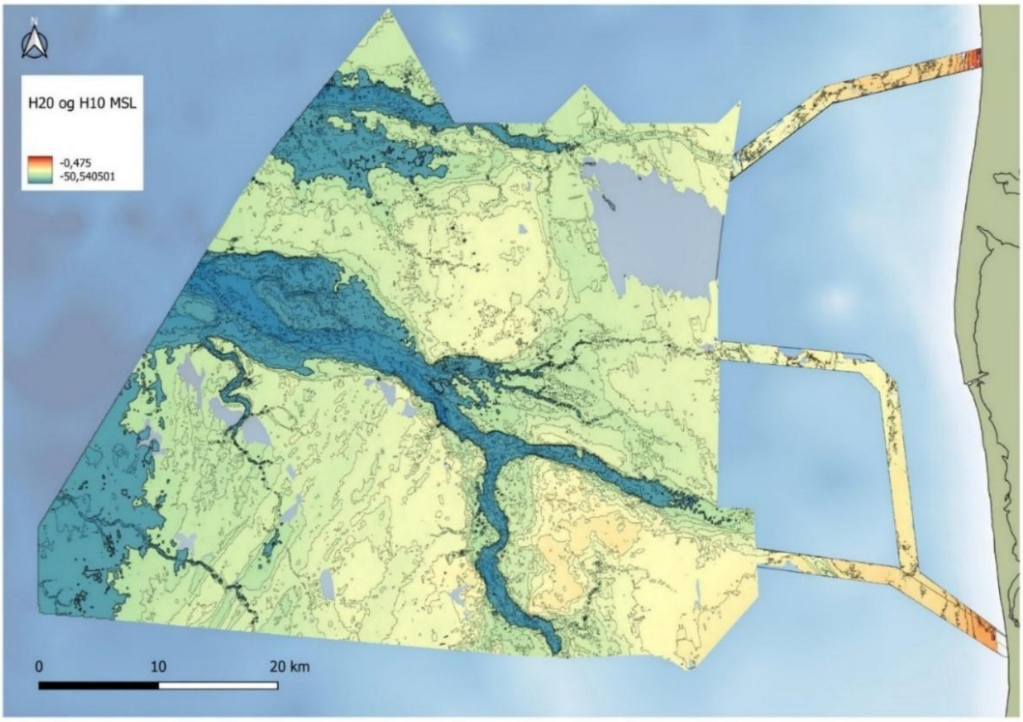


*Figure 9. Modelled coastline at ~10500 years BP, showing inundation of the lower channel systems. An elevation of – 36 m below msl in horizon H10 and H20 has been used to determine the position of the coastline.*

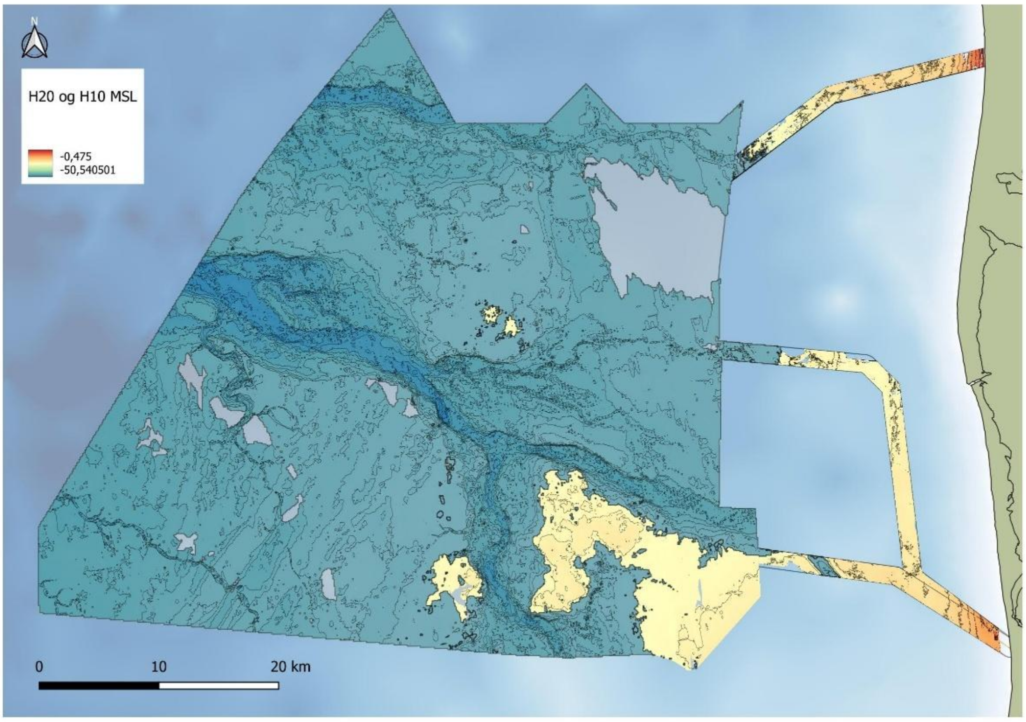


*Figure 10. Modelled coastline at ~ 10000 years BP. An elevation of – 26 m below msl in horizon H10 and H20 has been used to determine the position of the coastline.*

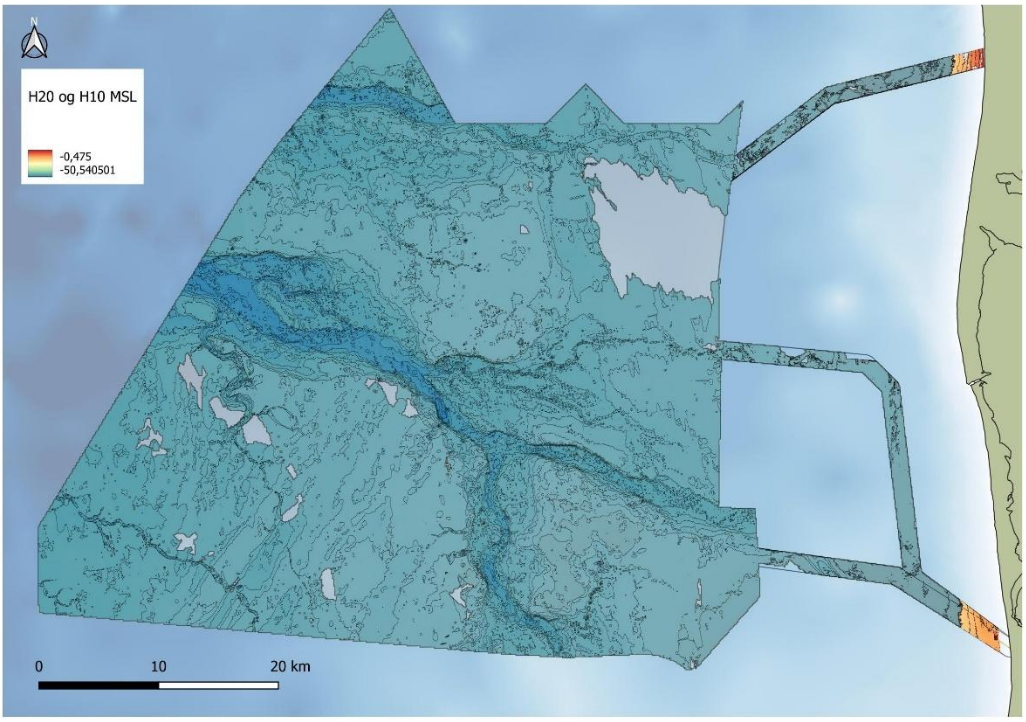


*Figure 11. Modelled coastline at ~9500 years BP, showing inundation across the OWF site and most of the cable routes. An elevation of – 13 m below msl in horizon H10 and H20 has been used to determine the position of the coastline.*

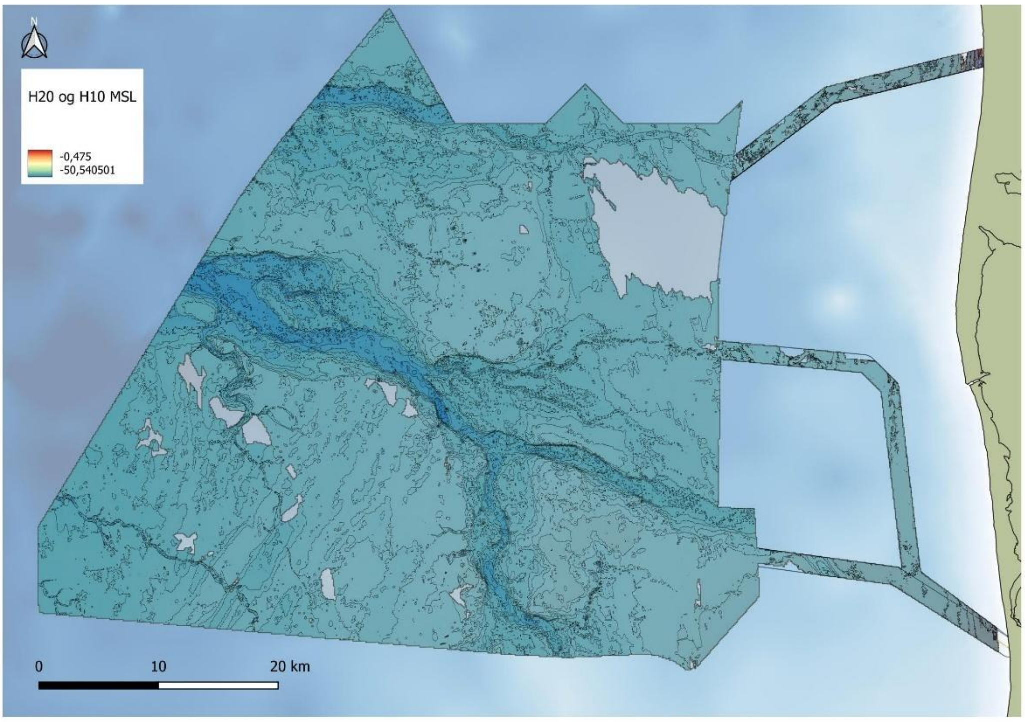


*Figure 12. Modelled coastline at ~9000 years BP, showing inundation across the OWF site and the cable routes. An elevation of – 8 m below msl in horizon H10 and H20 has been used to determine the position of the coastline*

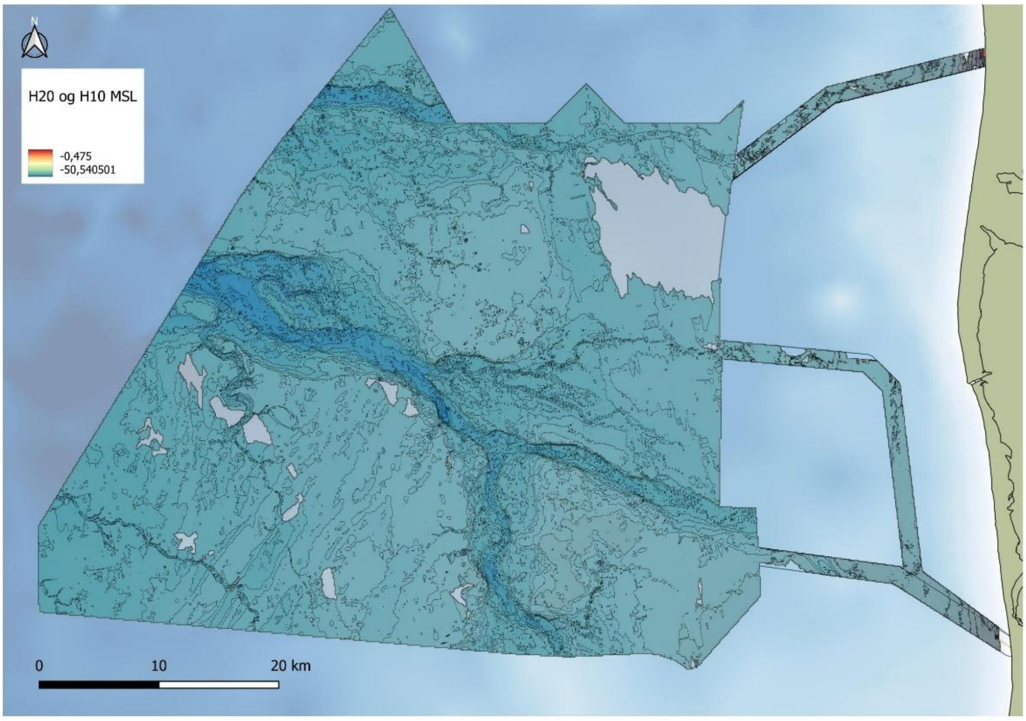


*Figure 13. Modelled coastline at ~8500 years BP, showing inundation across the OWF site and the cable routes. An elevation of – 6 m below msl in horizon H10 and H20 has been used to determine the position of the coastline.*

The new coastline models indicate that the sea had not yet reached the area 11,000 BP, and the entire OWF area was dry land. However, by 10,500 BP, water had entered the western part of the area, forming a marine coast and fjord-like environment. A major fjord system appears to have developed in the northern part of the project area as an extension of several river systems. Additionally, two other rivers seem to have had their outlets in the area around 10,500 BP. All land areas in the OWF region were subsequently flooded within just 500 years between 10,500 BP and 10,000 BP, due to a sea-level rise of approximately 10 meters, from -36 to -26 meters. The coastline models suggest that it was not possible to settle in the OWF area after approximately 10,000 BP. Therefore, any potential Stone Age material in the area most likely originates from either the Late Paleolithic cultures and/or the early Maglemose culture.

## 2.7. Areas of archaeological interest

### 2.7.1. Former coastlines, fjords and river outlet areas

Normally in a geoarchaeological 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 (e.g. Fischer 1997, 2004, Sørensen 1996 and 2007). 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 (Astrup 2018). 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 (The horizontal displacement of the coastlines is depicted on figure 8 to 13 with 500 years' time intervals). 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 may therefore be difficult to detect sites in some areas simply because it was impossible to have many repeated settlements / habitations in areas that witnessed rapid sea-level rise compared to a stable coastline.

### 2.7.2. Former lake and river environment

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.). At the moment of writing MAV haven't had access to any core logs from A2. However, it is likely that the depressions along the former rivers that is visible in H20 are filled with peat. 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. Isopach grids as in Figures 14 and 15 are required to show where layers with archaeological Stone Age potential are in reach 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. The available isopach models have thus be used to prioritise areas with a thin sediment cover (less than 2.5 and 5m) on top of H20. It follows that H10 could mark a transitional phase between glacial layers and marine postglacial sediments. Areas with a thin sediment cover above H10 might therefore represent exactly those locations where the ancient glacial land surfaces are easily accessible. But it is also likely that the H10 surface experienced significant erosion during the transgression phase, affecting any archaeological sites that once existed below H10.

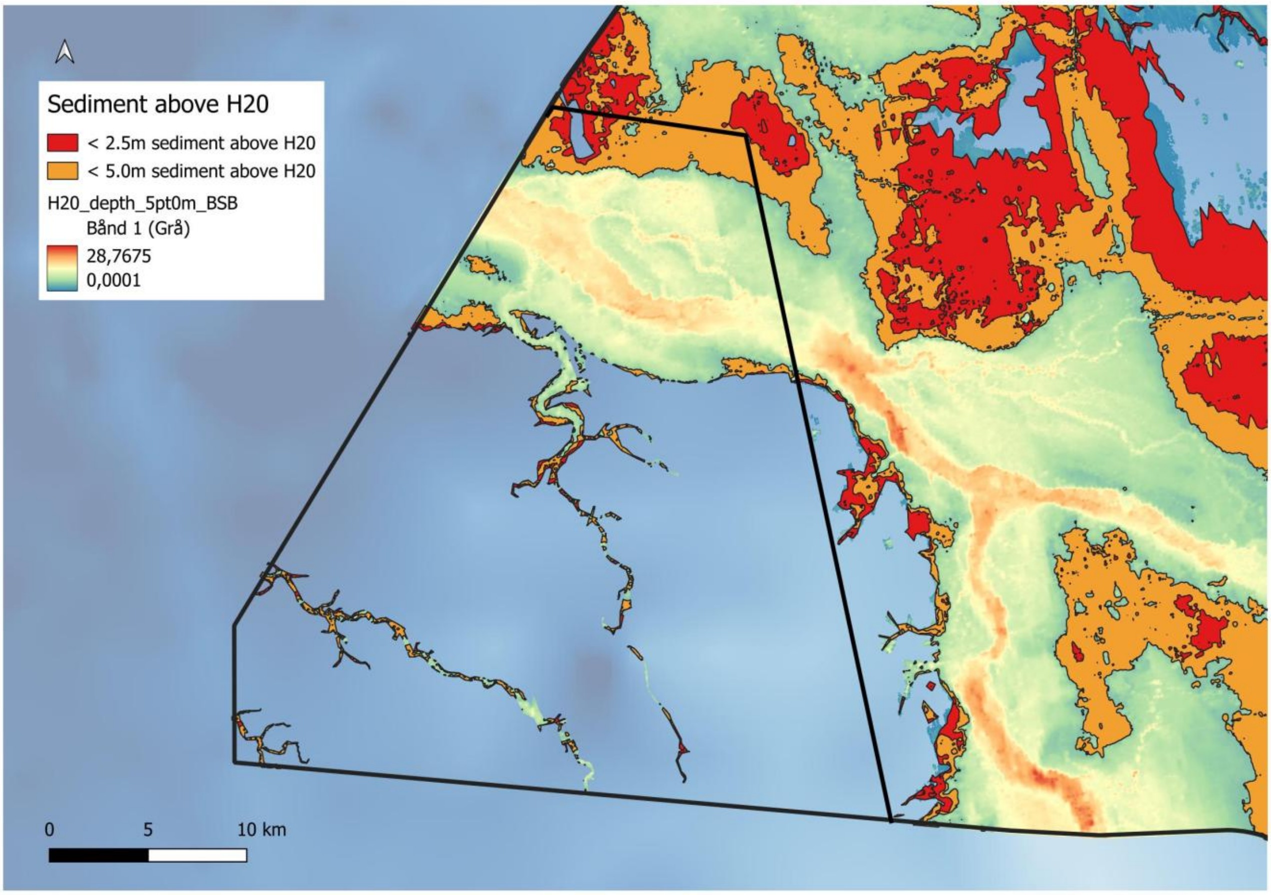


*Figure 14. BSB isopach model of H20 in the North Sea I OWF area. Areas shown in red are believed to have a sediment cover that is less than 2.5 m think on top of H20. Areas that are shown in orange is believed to have a sediment cover with a maximum thickness of 5 m.*

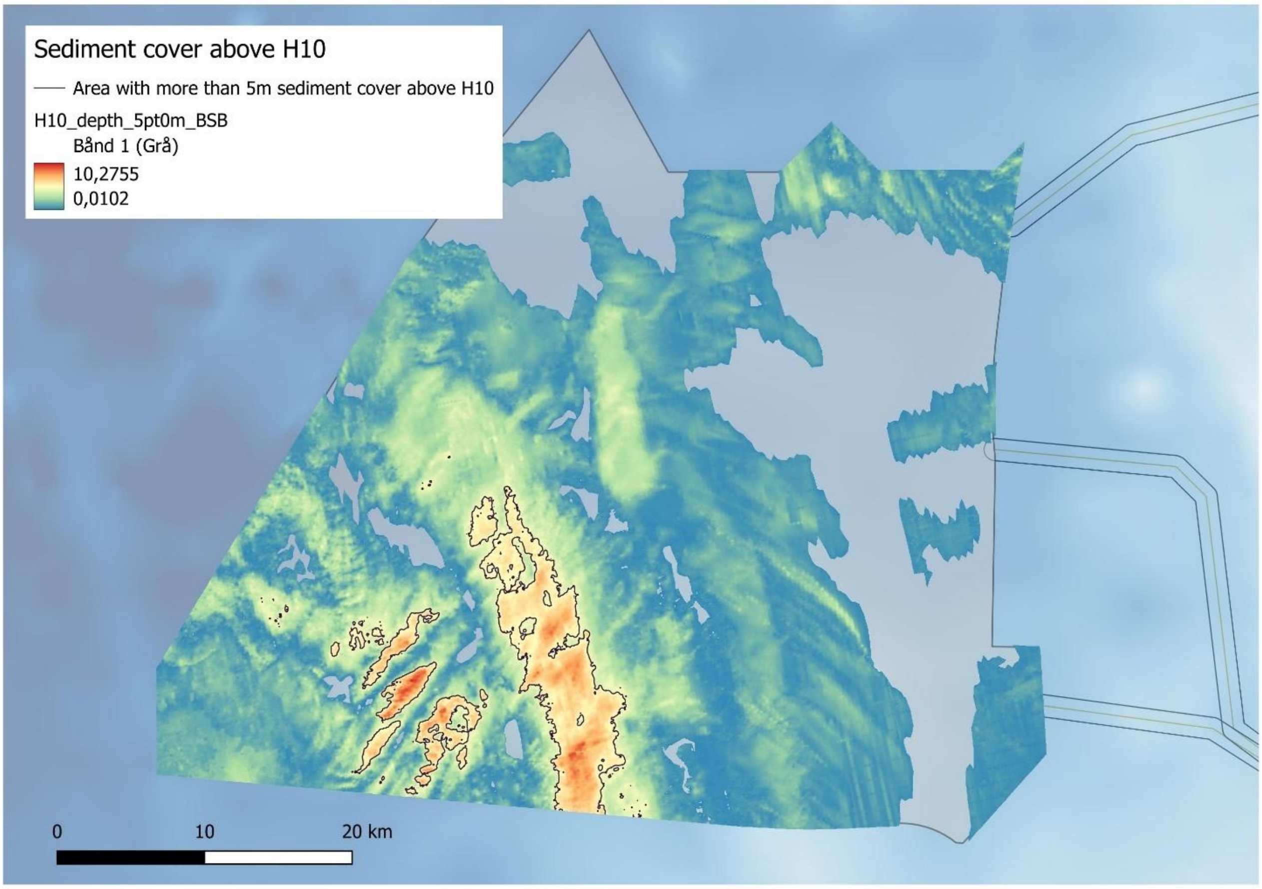


*Figure 15. BSB isopach model of H10 in the North Sea I OWF area. Areas that are enraptured with a line is believed to have a sediment cover on top of archaeological layers that surpasses 5 meters.*

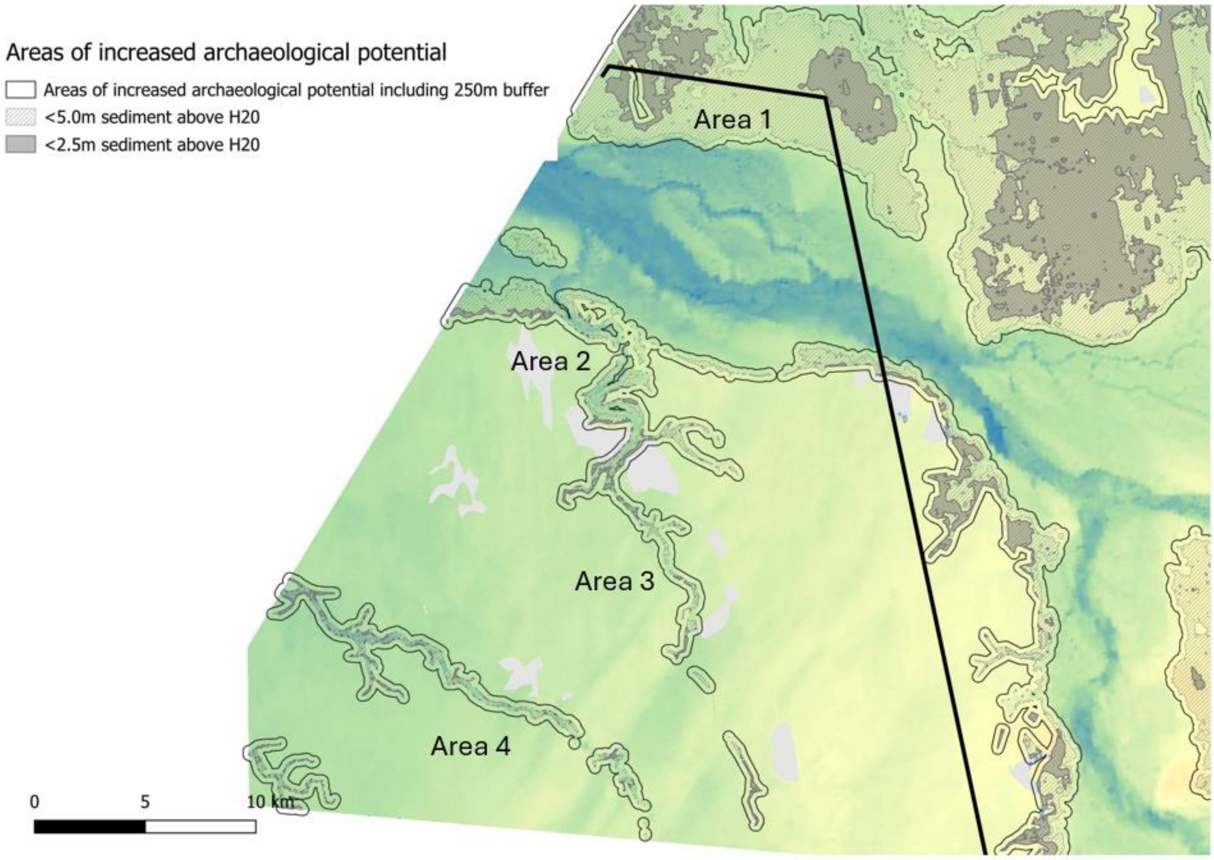


*Figure 16. Areas of increased archaeological potential.*

## 2.8. Recommendations regarding submerged Stone Age archaeology

It is rare that enormous landscapes that existed thousands of years ago appear with an incredible number 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 models provide a good starting point for selection areas with archaeological potential and on that basis, we recommended that the areas shown in Figure 16 should be examined in a subsequent phase III survey. Our geological and archaeological rationale for the selection of the specific areas can be summarized as:

H20 mainly represents channel infill and does therefore mirror the old rivers and terrain lowering's. H20 has therefore been used to identify areas where the sediment cover on top of H20 is less than 2.5m and 5m. We have decided to highlight those areas where archaeological remains are at risk of future construction work and because any potential archaeological sites in this zone are within reach of the available archaeological methods (dredging, grab-sampling etc.).

The actual area recommended for an archaeological phase III survey is defined using a buffer of 250 m around the areas mentioned above with less than 5m of sediments above H20. We suggest including a bufferzone of 250m to ensure that more of the archaeological sites originally located along the rivers are encompassed in the selected area and because there might be an archaeological potential in looking for material in H10 within the defined buffer zone.

**Area 1** is believed to have offered favourable conditions for exploiting a diverse range of marine and terrestrial resources. This area, located adjacent to a tunnel valley, remained dry land until it was inundated by the sea, making it potentially suitable for late Paleolithic reindeer hunters. Around 10,500 BP, a fjord system developed, and if people also utilized marine resources, this would have been an ideal location for habitation sites. A larger river system flowed into the eastern part of the fjord system. Such areas are known to have been highly attractive during the late Mesolithic period and we believe that the opportunity to exploit a mix of resources from both the river environment and the ocean could have made this area very favourable around 10,500 cal BP.

**Area 2** is selected because it marks the location of a former river outlet within a fjord system. Around 10,500 cal BP, this area provided the opportunity to exploit a wide combination of marine and terrestrial resources. Such locations are considered hotspots because people could utilize various resources from multiple rivers and the ocean at the same point.

**Area 4** and 4 are considered to have provided favourable conditions for humans to exploit resources in a nearby river and forest. Sites in similar environments are known from many places in Denmark where they typically cluster along former rivers and lakes.

## 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 area. These conclusions warrant a phase III-based survey in areas that is considered to be of particular archaeological interest (hotspots) and where archaeological material is in risk of being impacted by the construction work. The North Sea I (A2) project covers an enormous area of approximately 800 $km^2$. We would strongly recommend that an archaeological test survey programme is made to examine if archaeological sites/material can be identified in the area that is suggested in Figure 16. Due to the water depths in the area, it will probably be necessary to carry out such a test 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

At the core of the geo-archaeological analysis, the SSS, MBES and MAG data were analysed, along with the archival data previously evaluated. Data were provided by Energinet, along with a first analysis by geophysicists. The SSS and MAG targets indicated by the geophysics team has been evaluated alongside a new review of the data.

For easy comparability of the results, all maps of SSS and MBES data are shown in scale 1:1000, unless stated otherwise. Where applicable there are also cross refences to geophysics targets and to FFM.

## 3.1. Confidence, significance and recommendations

All designated targets below 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.

The 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.

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

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.

## 3.2. SSS and MBES

SSS data 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 17).

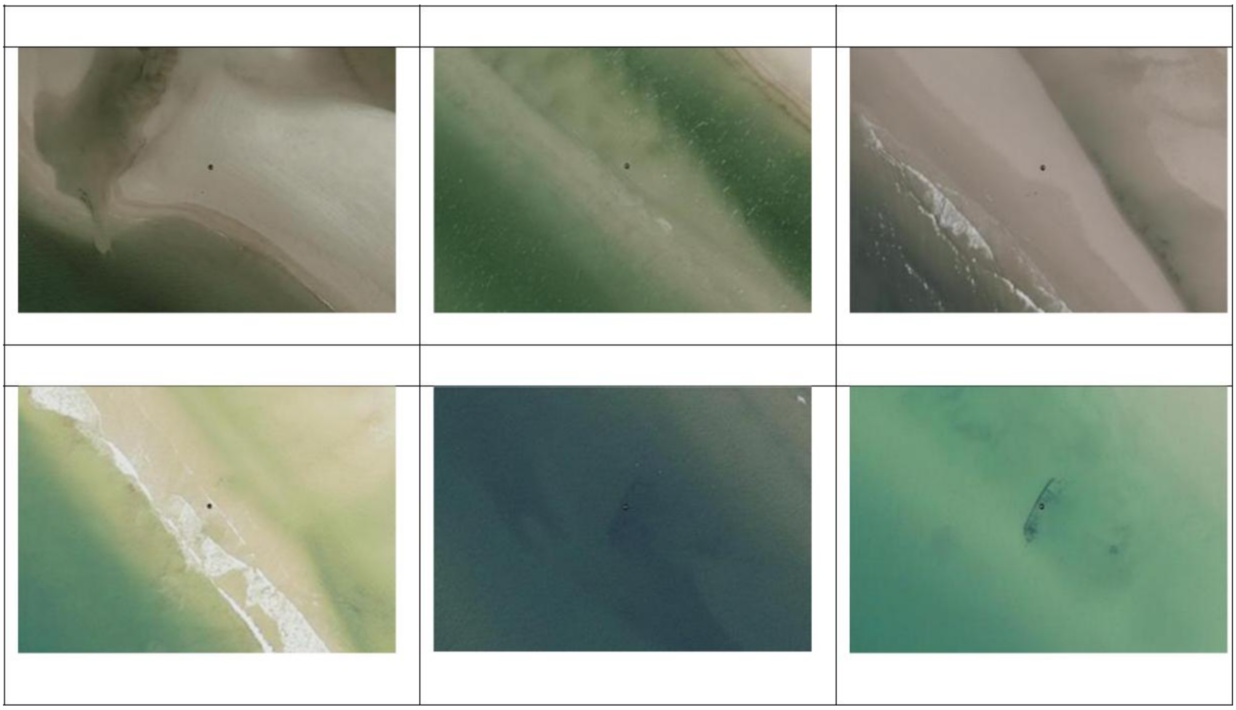

*Figure 17. Aerial photos of the gradual exposure of an unidentified wreck at Esperance Bay, Skallingen.*

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 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 18). 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.

In total 14 positions have been located by the SSS data and listed in appendix 6.1. Of these, one is seemingly a 20' shipping container, while another is identified as a fishing vessel, which sank in 2005, and is not protected. If the remaining 12 locations, 6 are wreck.

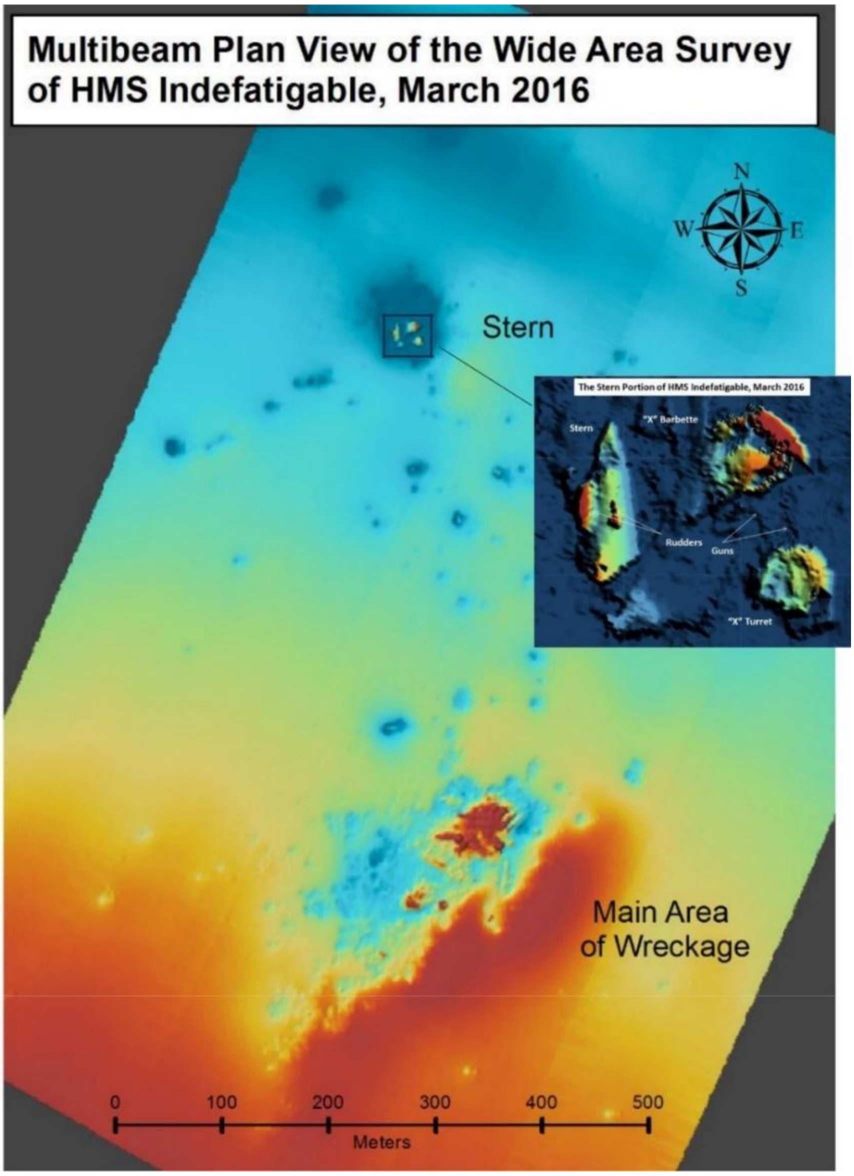


*Figure 18. Debris area from HMS Indefatigable. MBES data from 2016 with insert detail of the stern section. From: McCartney 2017, fig. 5 and 6.*

## 3.3. MAG-targets

The SSS anomalies were cross-checked with the MAG targets provided by Energinet, and references are made in appendix 6.1. 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 generally 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 a large distance 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.

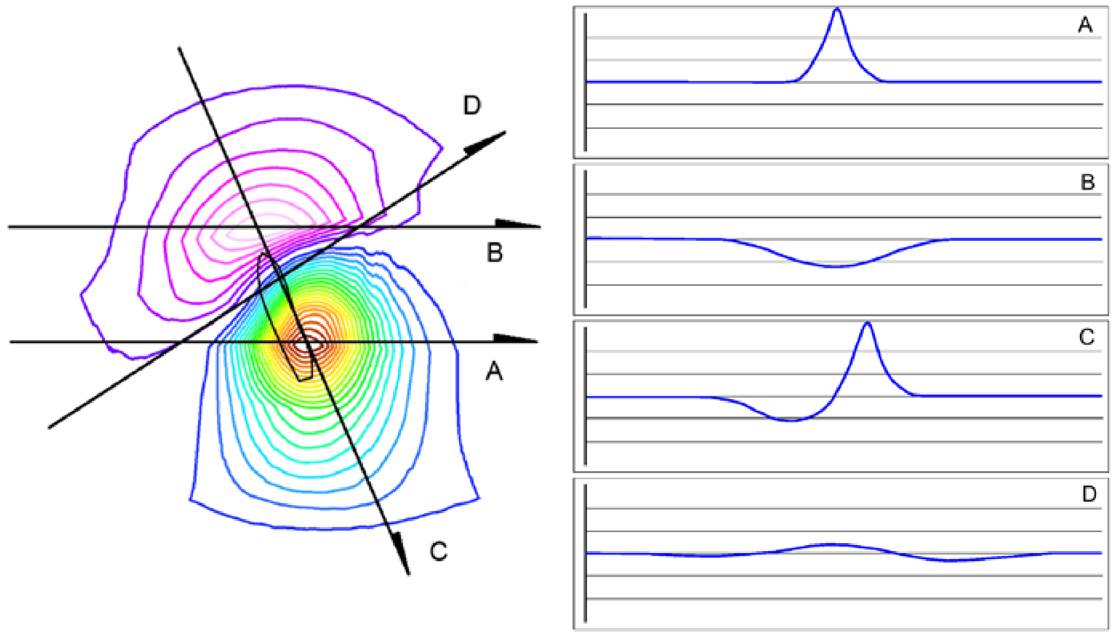


*Figure 19. Armed trawler HMT Elk (L×B: 31.1 × 6.4 m, mined 1940). The magnetic field model, and examples of the resulting magnetic response at various curses through the magnetic field. After Holt 2019: Fig. 8.*

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.

For comparison, and to facilitate interpretation of the MAG data, a few of the well-defined SSS targets have been shown with their MAG response in appendix 6.1.

It is, however, also noticeable that the cutter Helle, which has been observed in the SSS data, gives a very slight MAG signal. The vessel was abandoned by its crew due to a heavy fire and subsequently sank. It is not detectable under the criteria used here, nor with a threshold of ±20nT.

MAG results are listed in appendix 6.2, with a total of 71 located anomalies.

## 3.4. Wreck databases

Important complimentary sources to the geophysical data are the existing databases of wrecks. These are '*Fund og Fortidsminder'*, the Danish National Sites and Monuments Record (FFM), '*Søfartsstyrelsens vragregister'*, the database of wrecks from the Maritime Authorities, as well as '*Vragguiden*', a database of wrecks maintained by recreational divers. These data have been presented in previous reports.[1] Other databases without positional information have been consulted for reference. In so far 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. Many of the data stem from the Danish Maritime Authorities, the position being given based on the record of the sailors. They are mostly set by dead reckoning, or by earlier navigational systems. Only with the development of GPS the positions can be considered reasonably reliable.

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.

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 the 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. It must be noted that 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.

In terms of geographical precision, the databases of wrecks are therefore the weakest data. 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.

One site from the databases warrants special mentioning in itself, but also illustrates the challenges with positioning. Although not yet covered by the rolling 100-year protection under Danish law, the research vessel S/S DANA is highly significant in the history of Danish maritime research, and should be protected under the Law's provisions for protecting newer wrecks (Figure 20). In 1928-30 DANA circumnavigated the earth, travelling more than 65,000 nm, furthering oceanographic research tremendously. Many years of oceanographic research was lost when the ship was lost in a collision in 1935. DANA was a former British naval trawler, HMT John Quilliam (1917), the first delivered of the 112 Mersey class Admiralty trawlers. When it was bought in 1921 it was probably in bad need of its refit.

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[1] A. Jensen 2023: *Arkivalsk kontrol havmøllepark Nordsøen 1*. MAV 2023/45.

The ship sank after being rammed by the German trawler PICKHUBEN in thick fog. All crew was saved and landed in Esbjerg by PICKHUBEN, who subsequently took full blame for the incident.

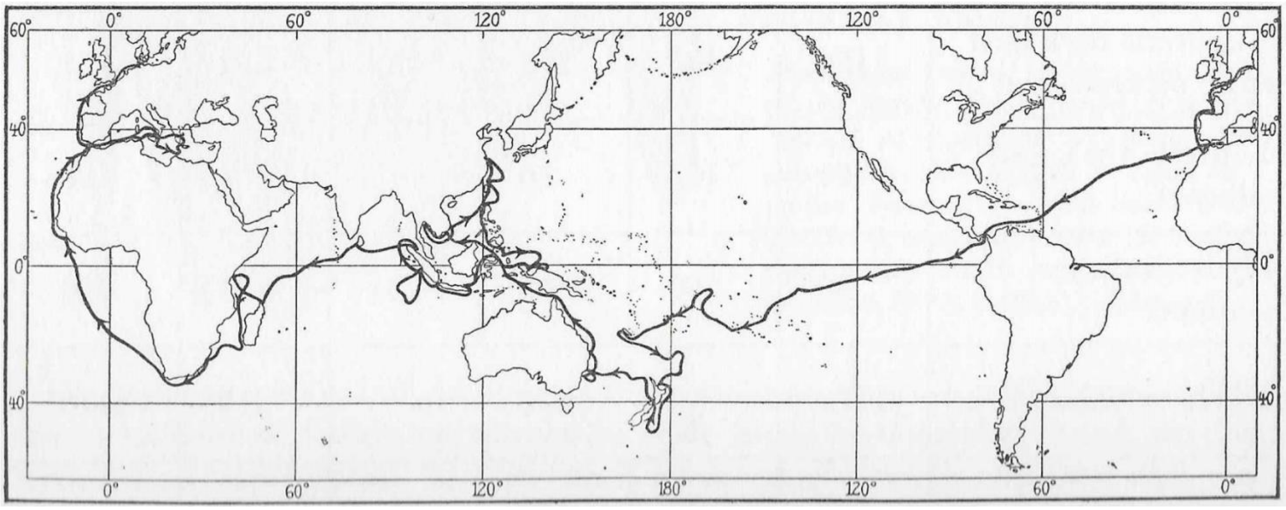


Figure 20. *Above: The survey vessel DANA embarking on its circumnavigation, 1928 (Photo: J.S. Elfelt). Below: The route of the 1928-1930 circumnavigation.*

The wreck of DANA is found in the Maritime Authorities database of wrecks as being positioned in subarea BM17. FFM also has a point here, with reference to EfS 1624/1935.

However, the wording of original formal inquiry must lead to a position further east: At 4:00 the ship registered its position at 55°53'N/6°24'E, which is 20 nm easterly from the registered wreck position. Until a few minutes before the collision it kept a speed 4 kts true course due E, only to reduce speed and finally stop in the very last minutes before the collision a little more than 2 hours later. This would place the ship slightly over 8 nm from the last recorded position, not 20 nm.

The position now registered stem from the captain's original report, sent right after landing in Esbjerg, where he gave the ships' position as "*55 degrees, 55 minutes northern latitude, approx. 7 degrees eastern longitude*", exactly where the points from the Maritime Authorities database and FFM places the wreck. The position in the databases may therefore be considered faulty, also considering that there is no evidence, neither from SSS nor MAG data, that there is a steel wreck in the vicinity.

By dead reckoning from the official inquiry, the position of the wreck of DANA should be around 352250E/6189930N or 55°49.9'N/6°38.5'E (WGS84) (Figure 21). If this estimate is correct, the officially recorded position is off by c. 13 nm. In fact, Gert Normann of JD contractors has found a wreck at 55°48.409'/6°38.804', which is very likely to be DANA.[2] This is not far off from the position calculated here.

The conclusion must be that, although registered here, this highly significant wreck is not found within the area. The position has been corrected in FFM. It may be a coincidence, but worth of note that Danish nautical maps show a wreck exactly at position 55°53'N/6°24'E, the last reported position of DANA, but two hours before the incident. This was high profile event, and positions probably harvested for the databases with occasionally very broad hand.

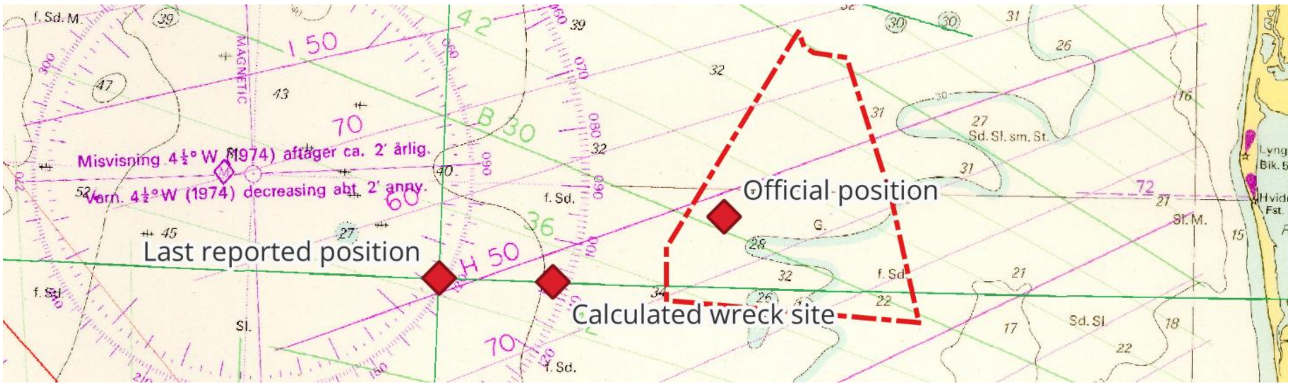


*Figure 21. S/S Dana. The vessels last reported position, the calculated position and the official position. OWF Area 2 is also shown. Background map: Maritime Authorities, 1974. Scale 1:1,000,000.*

The wrecks are generally covered in sediment, or deteriorated completely, and thus not visible in the other data. Another option is that the registered position of far off, as illustrated with the DANA example. Only in one case an SSS site can possibly be linked to a database position (BM16_003 / FFM 400110c-101), although with a distance of 800 m. Otherwise we have not been able to identify these wrecks on the seabed. The confidence is generally set to 2 – 'Medium', as the exact position of the wrecks is uncertain, while much confidence can be placed in the identification and year. With the potential discrepancies between registered and actual position, it is difficult to advice on a suitable protection

[2] Gert Normann, pers. comm. 2025-06-20.

zone. However, as remains of these wrecks most likely still exist below the seabed, they are important to include here. Caution must be shown when working in the general area surrounding these positions.

A total of 20 sites are registered in Area 2 and not also seen in SSS or MAG data. Two of these are modern vessels, which are not protected, and one is a sighting of masts above water. The rests are snagged nets reported by fishermen.

*Table 3. Sites from* Fund og Fortidsminder *in Area 2.*

| ID | Site and location nr. (FFM) | Conf. | Signif. | Year lost | Description | Rec. Action |
|---|---|---|---|---|---|---|
| BM13_012 | 400110c-100 | 2 | 2 | | Wreck, snag reported by fisher. Pilothouse reported. | Caution |
| BM13_013 | 400110c-114 | 2 | 2 | | Wreck. Reported by fishing vessel in 1970. No further data. | Caution |
| BM13_014 | 400110c-99 | 2 | 2 | | Wreck. Reported by fishing vessel. No further data. | None |
| BM13_015 | 400110c-70 | 2 | 2 | | Wreck. Reported by fishing vessel. No further data. | Caution |
| BM14_016 | 400110c-102 | 2 | 2 | | Wreck. Reported by fishing vessel. No further data. | Caution |
| BM14_017 | 400110c-72 | 2 | 2 | | Wreck. Reported by fishing vessel. No further data. | Caution |
| BM14_018 | 400110c-78 | 2 | 1 | | Airplane. Reported by fishing vessel. Probably the same as BM13_019. Possible war grave. | Caution |
| BM14_019 | 400110c-77 | 2 | 1 | | Airplane. Reported by fishing vessel. Probably the same as BM13_018. Possible war grave. | Caution |
| BM14_020 | 400110c-6 | 2 | None | 1975 | Fisherman E-29 Jonna Olesen, sunk 1975. | None |
| BM14_021 | 400110c-26 | 2 | 2 | 1896 | Two masts seen above water in 1896. EfS 25/732 1896. | Caution |
| BM14_022 | 400110c-98 | 3 | 2 | | Wreck. Reported by fishing vessel. No further data. | Caution |
| BM14_023 | 400110c-127 | 2 | None | 1973 | Dutch fisherman sunk 1973. Lucia Hendrika | None |
| BM15_028 | 400110c-104 | 2 | 2 | | Wreck. Reported by fishing vessel. No further data. | Caution |
| BM15_020 | 400110c-74 | 2 | 2 | | Wreck. Reported by fishing vessel. No further data. | Caution |
| BM15_030 | 400110c-103 | 2 | 2 | | Wreck. Reported by fishing vessel. No further data. | Caution |
| BM15_031 | 400110c-73 | 2 | 2 | | Wreck. Reported by fishing vessel. No further data. | Caution |
| BM16_040 | 400110c-101 | 2 | 2 | | Wreck. Reported by fishing vessel. No further data. | Caution |
| BM16_041 | 400110c-76 | 2 | 2 | | Wreck. Reported by fishing vessel. No further data. | Caution |
| BM16_042 | 400110c-75 | 2 | 2 | | Wreck. Reported by fishing vessel. Close to MAG anomaly BM16_037. | Caution |
| BM17_024 | 400110a-99 | 2 | 2 | | Wreck. Reported by fishing vessel. No further data. | Caution |

## 3.5. Most significant finds in the OWF Area 2

Even if they stay unidentified after further investigation, the six wrecks found on the SSS data should be protected in future development. BM12_003 is a well-preserved trawler, representative of the period of the early steel trawlers. BM14_005 is a smaller vessel, but most likely also a fishing vessel. Both types were used for patrol and mine sweeping duties during the world wars, so the vessels' roles at the time of sinking cannot be ascertained. BM16_013 is less well preserved but fits the general size of a trawler.

BM17_003 is in the same size range as the trawlers, but harder to identify. This wreck is broken in two main parts, with further damage to the wreck. Therefore, the length and beam are difficult to measure. But the visible part can be measured to at least 40 m, with the current length of the wreck site being c. 48 m. In a 2005 expedition to search for DANA, Gert Normann of JD Contractors also located this wreck (Object IV). It was not investigated further at that time, and was considered to possibly be a wooden ship.[3] With the addition of magnetometers in this investigation we can say with certainty that it is a steel vessel. The general dimensions fit a trawler.

Two larger vessels are seen with BM 17_002 and BM17_004. With lengths upwards of 100m they are representative of the freighters, which formed the backbone of maritime transport across the North Sea, and indeed across the world.

A seventh vessel, BM18_001, is identified as a fishing vessel, which sank in 2005. It is hence not protected under Danish law until 2105.

The six wrecks found by SSS in the c. 800 km$^2$ of Area 2 can be compared to the seven wrecks found in the c. 1500 km$^2$ of OWF Area 1 and connected ECR. The density of wrecks is higher in Area 2. In Area 1 there was a wreck for every 215 km$^2$, while in Area 2 the number is 134 km$^2$. This tendency would probably increase westward as projects approach the traditional shipping lanes between the English Channel and Skagerrak. The same is seen in the distribution of targets, where both SSS and MAG targets are concentrated in the western half of Area 2. This is useful for later comparison and future planning.

Separated by only c. 700 m, two locations have been reported by fishermen as nets snagging an aircraft (BM14_018, BM14_019). Although coincidently two airplanes can crash in almost the same spot, it is likely to be the same plane. Note that although not identified this plane is highly likely to be a war grave and should be protected. Extra effort was put into locating the site in the SSS and MAG data, but there are no convincing targets.

## 3.6. Summary and recommendations for historical archaeology in OWF Area 2

In all 105 positions are registered within North Sea I OWF Area 2. A few of these positions are mostly included for completeness, as they are clearly modern, but also very visible in the data. For these locations, the recommended action is stated as 'None'.

The SSS data produced 14 targets, of which 6 are clearly well-preserved wrecks. Others are more indistinct debris, for which a smaller protection zone is recommended. Depending on the extent of the target, we have recommended protection zones of 100 m (7 sites) or 50 m (5 sites). This means that 2 targets are mentioned, but no action is deemed necessary, as they are modern: One wreck and one shipping container.

[3] Gert Normann 2005: *Dykkertogtet til S/S Dana*. https://www.seawarmuseum.dk/Ny-Viden--Artikler/Andre-artikler/Dykkertogtet-efter-SS-Dana-2005 [last accessed 2025-06-20].

For the 71 MAG anomalies with unusually high deviations from the background (± 50nT), 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.

Only one historically recorded wreck positions in FFM is surely protected by the Danish Museum Act, being more than 100 years old, while another 17 are net snag 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, that of the DANA, seems to be erroneous and removed from the study, while two positions are recorded for recent wrecks. In both cases no action is warranted.

The total number of positions for which action must be considered is therefore 100, while another 5 is included for completeness.

All 105 sites are attached in SHP format, Euref89 UTM32N :

- A_Area2_Archaeology_Historical_Potential.SHP

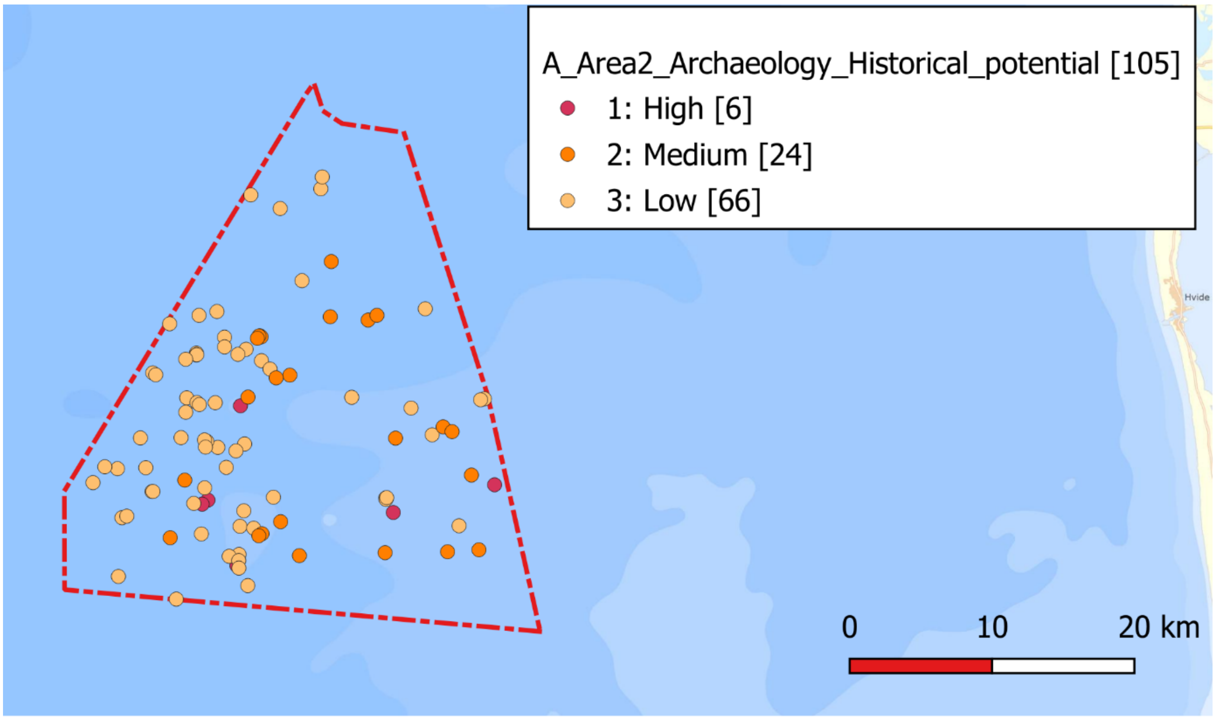


*Figure 22. Overview of sites in Area 2, shown by significance. Background map: 'Skærmkort', Dataforsyningen, Klimadatastyrelsen. Scale 1:500,000.*

# 4. Target investigation

## 4.2 Stone Age sites

It is suggested that selected areas are examined for Stone Age material. Due to the water depths in the area, it will probably be necessary to carry out such a test survey by suctioning up material and not by grab sampling using an excavator. 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. The MAV collaboration conducted a test excavation using suction dredging prior to the construction of the wind turbines at Vesterhav South. This investigation was carried out using the suction dredger vessel (Kronos). The vessel was used in one day to examine four selected positions. Seabed sediments were sucked up and passed through a sieve before the material landed in the ship. Subsequently, archaeologists had a visual inspection of the material to identify any archaeological material. We suggest that a similar method could be used in connection with the North Sea 1 project. 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.

## 4.1. Historical sites

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.

# 5. Literature


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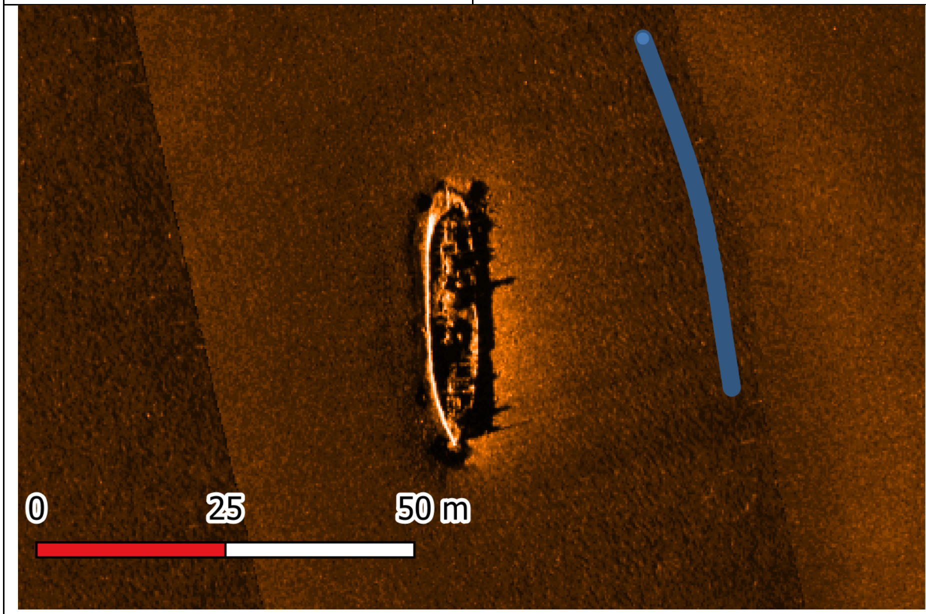
# 6. Appendices

## 6.1. SSS-targets in the OWF Area 2

<table>
<tr><td rowspan="3">BM12_003<br>Wreck<br><br>Confidence level: 1<br>Significance level: 1<br><br>Late 19th-Early 20th century</td><td>Position:<br>397505.52E 6194842.63N</td><td>Target: S_NM_BM12_0258<br>FFM: N/A</td></tr>
<tr><td colspan="2">
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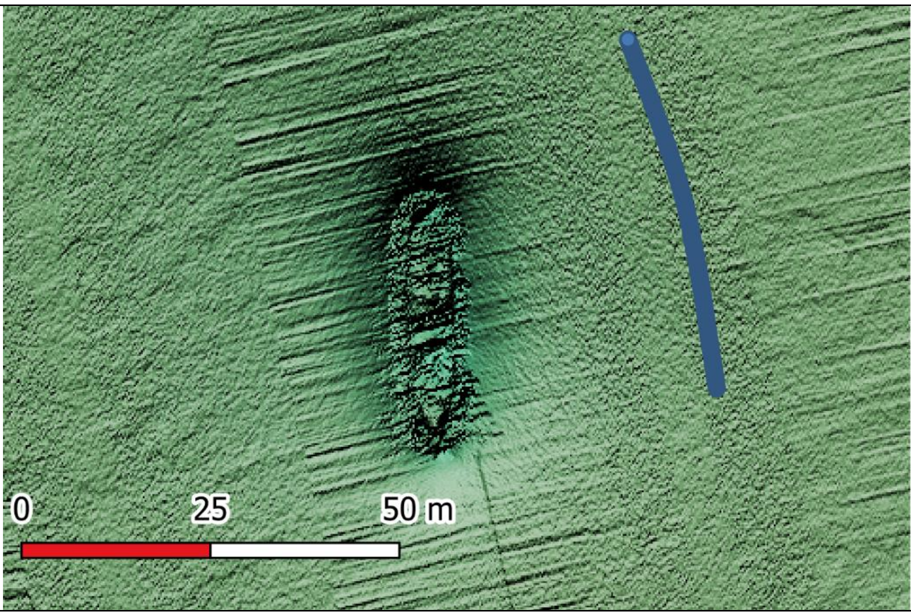
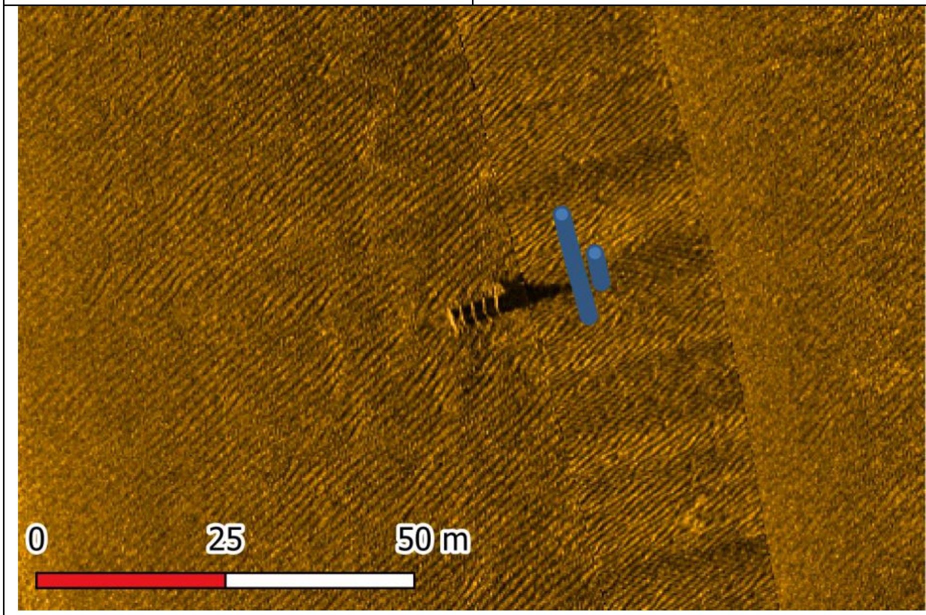
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Wreck, L: c. 33.8m B: c. 6.8 m. Rounded stern. Sterring house at or slightly aft of midships. No wrecks previously registrered at or near the position.<br><br>Strong negative MAG anomalies E of the wreck (M_NM_BM12_0206 and M_NM_BM12_0284)</td></tr>
<tr><td>Recommended action:</td><td colspan="2">ROV/Diver inspection. Protection zone 100 m.</td></tr>
</table>

<table>
<tr>
<td rowspan="3">BM13_003<br>Shipping container<br><br>Confidence level: 1<br>Significance level: - None<br><br>Recent</td>
<td>Position:<br>392468.88E 6198280.09N</td>
<td>Target: S_NM_BM13_0373<br>FFM: N/A</td>
</tr>
<tr>
<td colspan="2">
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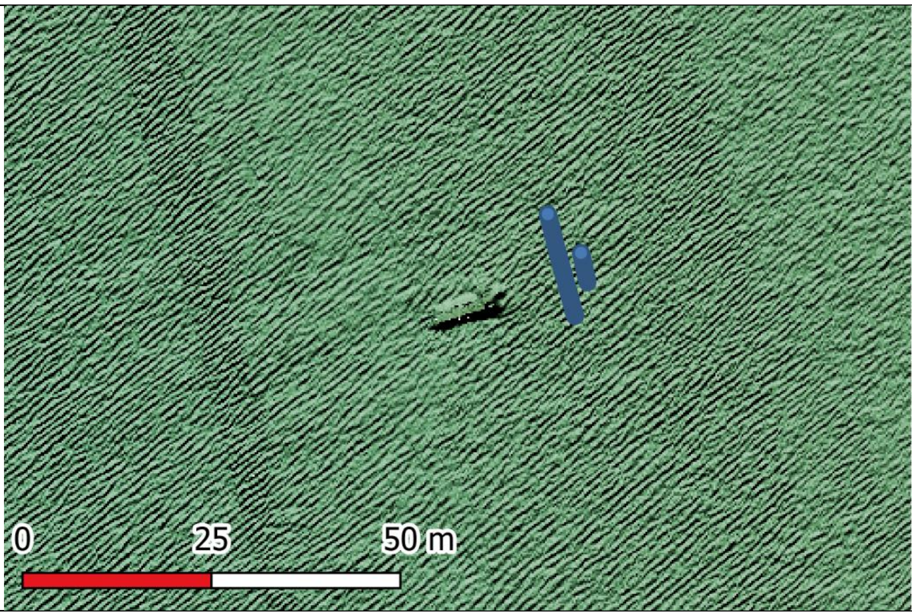
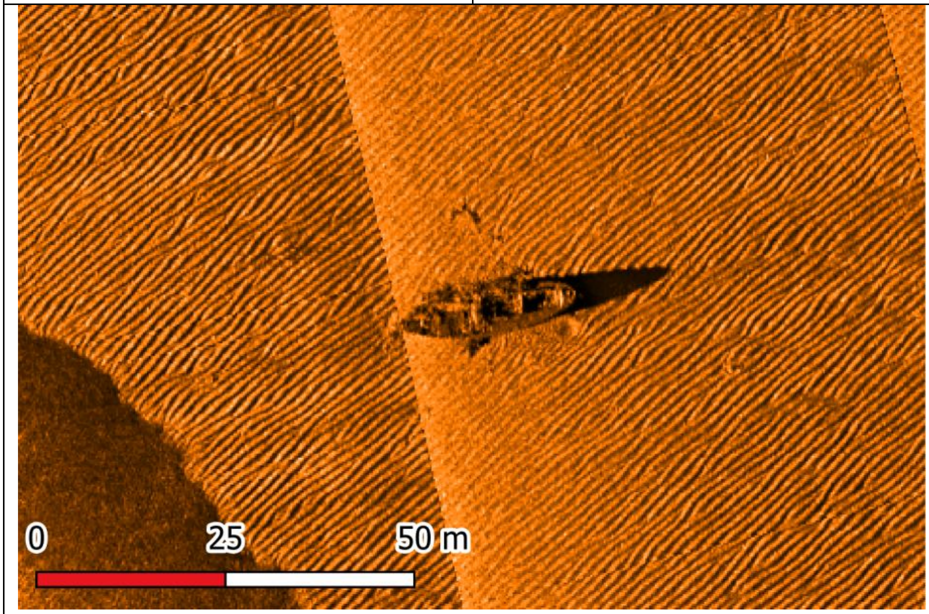
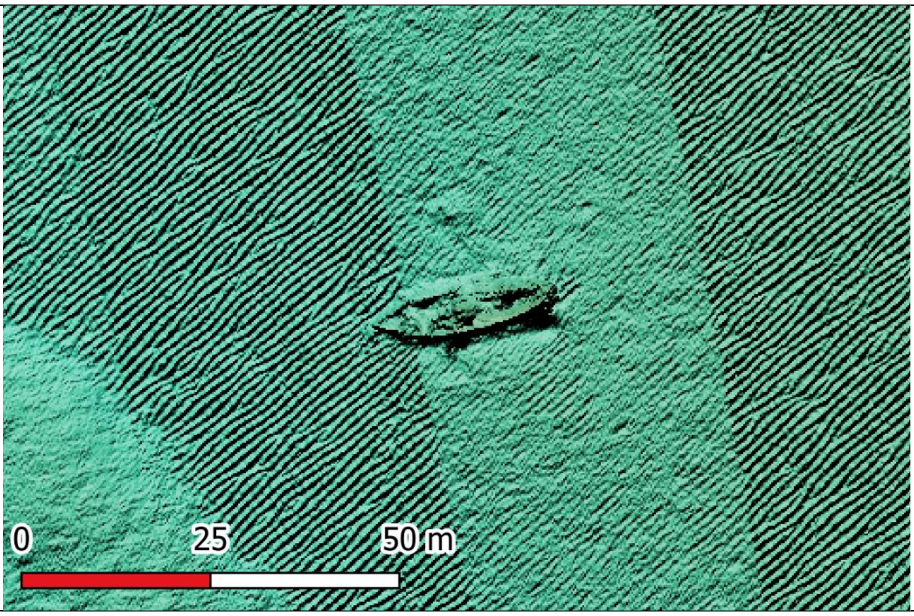
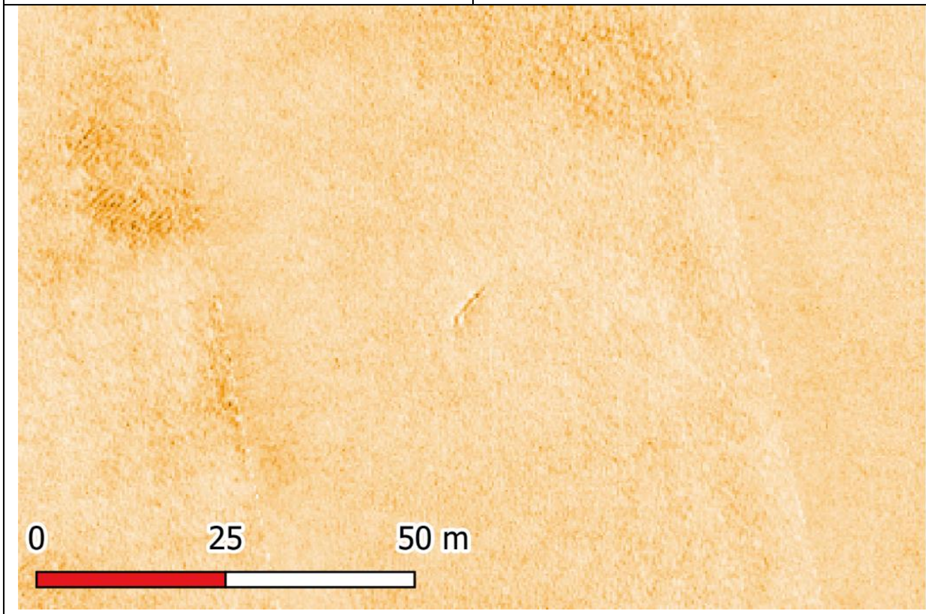
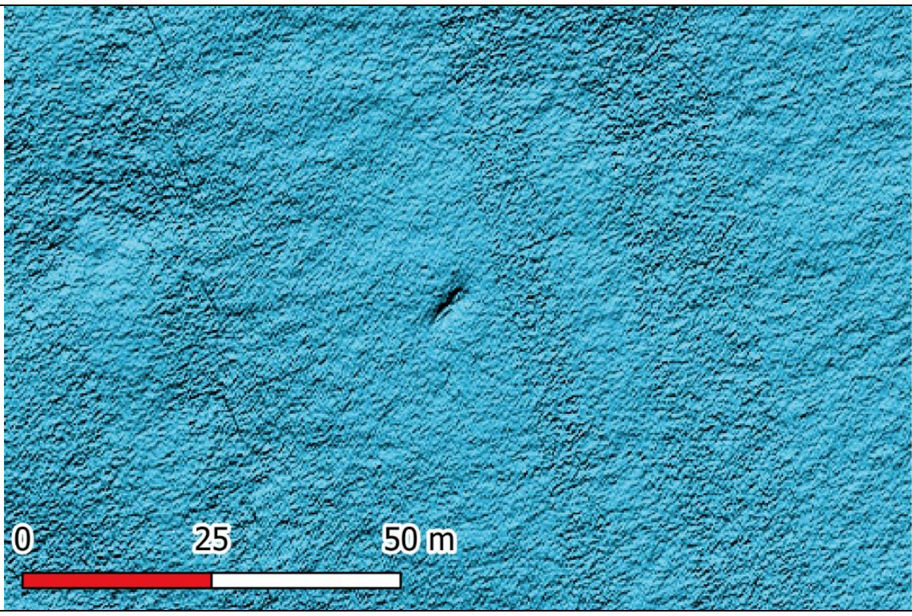
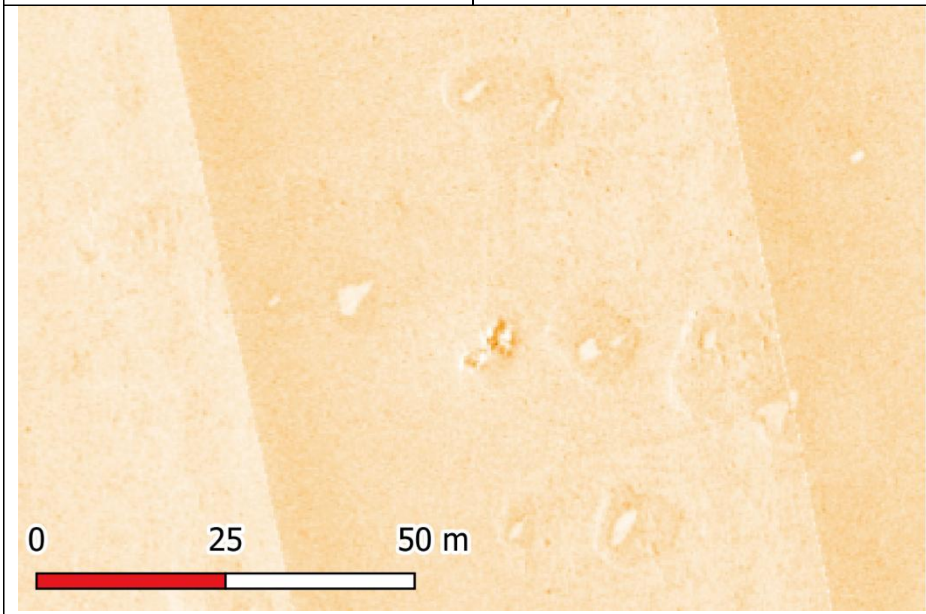
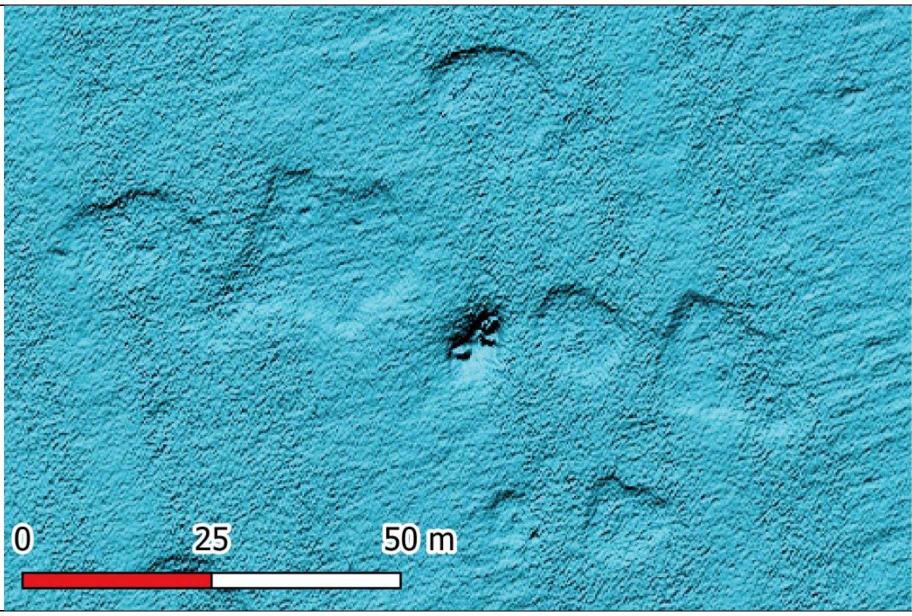
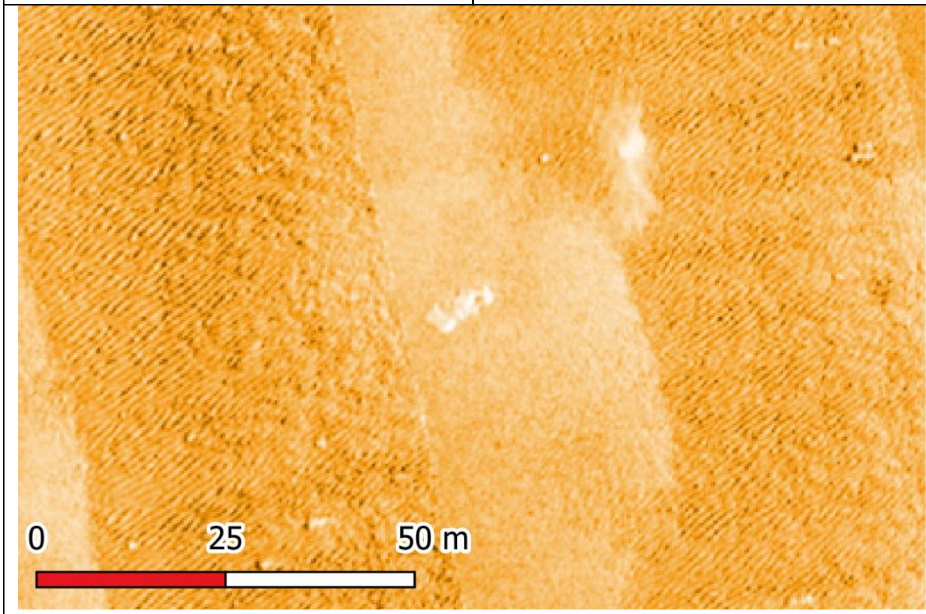
<tr>
<td colspan="2">
</td>
</tr>
<tr>
<td>Description:</td>
<td colspan="2">Rectangular object with transverse ribs, c. 6.1 m long. Most likely a 20’ shipping container.<br><br>Strong negative MAG anomalies just east of the site (M_NM_BM13_0674)</td>
</tr>
<tr>
<td>Recommended action:</td>
<td colspan="2">None</td>
</tr>
</table>

| **BM14_005**<br>Wreck<br><br>Confidence level: 1<br>Significance level: 1<br><br>Late 19th-Early 20th century | **Position:**<br>390381.81E 6192894.64N | **Target:** S_NM_BM14_0294<br>**FFM:** N/A |
|---|---|---|
| |  | |
| |  | |
| **Description:** | Wreck, L: c. 23.6m B: c. 6.9 m. Rounded stern. Steering house at or slightly forward of midships. No wrecks previously registrered at or near the position. Seemingly well preserved.<br><br>Strong negative MAG anomaly close to the wreck (M_NM_BM12_0387) | |
| **Recommended action:** | ROV/Diver inspection. Protection zone 100 m. | |

| | | |
|---|---|---|
| **BM16_005**<br>Debris<br><br>Confidence level: 1<br>Significance level: 3<br><br>Unknown age | **Position:**<br>376728.12E 6206745.93N | **Target**: S_FR_BM16_0755<br>**FFM:** N/A |
| |  <br>  | |
| **Description:** | Linear debris, c. 6.5 m long. Visible scour marks on the MBES. Unknown object.<br><br>No MAG anomalies, so non-ferrous. | |
| **Recommended action:** | Protection zone 50 m. | |

<table>
<tr><td>BM16_007<br>Debris<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown age</td><td>Position:<br>380038.67E 6204364.64N</td><td>Target: S_FR_BM16_2247<br>FFM: N/A</td></tr>
<tr><td></td><td colspan="2">
<br>
</td></tr>
<tr><td>Description:</td><td colspan="2">Unidentified debris. Clear scour marks.<br><br>No MAG targets.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

<table>
<tr><td rowspan="3">BM16_009<br>Debris<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown age</td><td>Position:<br>381118.10E 6203562.39N</td><td>Target: S_FR_BM16_3563<br>FFM: N/A</td></tr>
<tr><td colspan="2">
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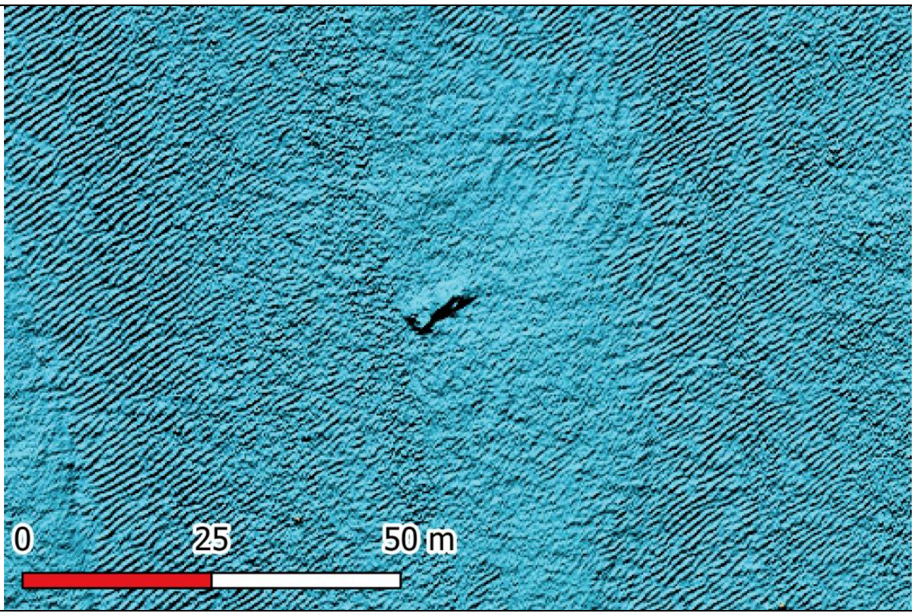
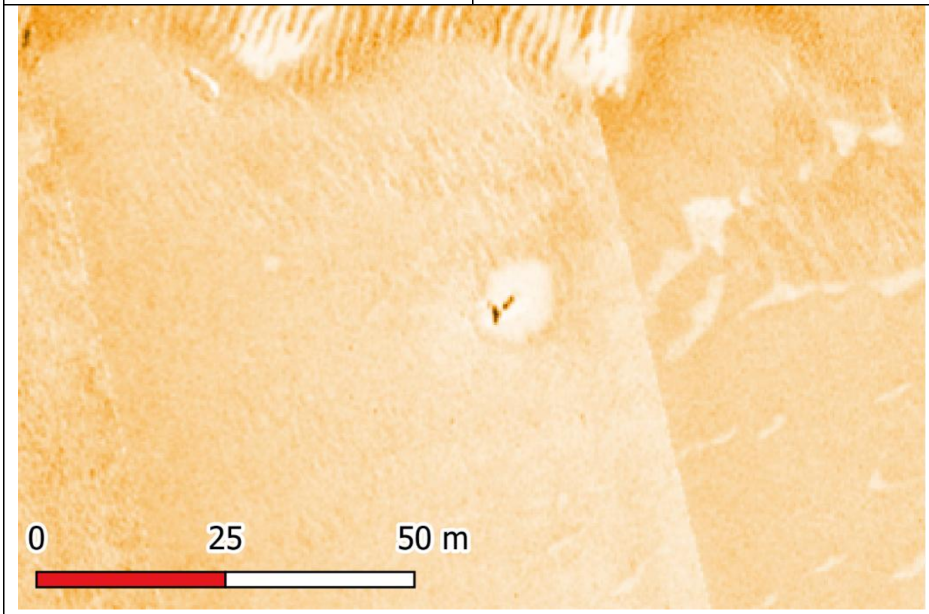
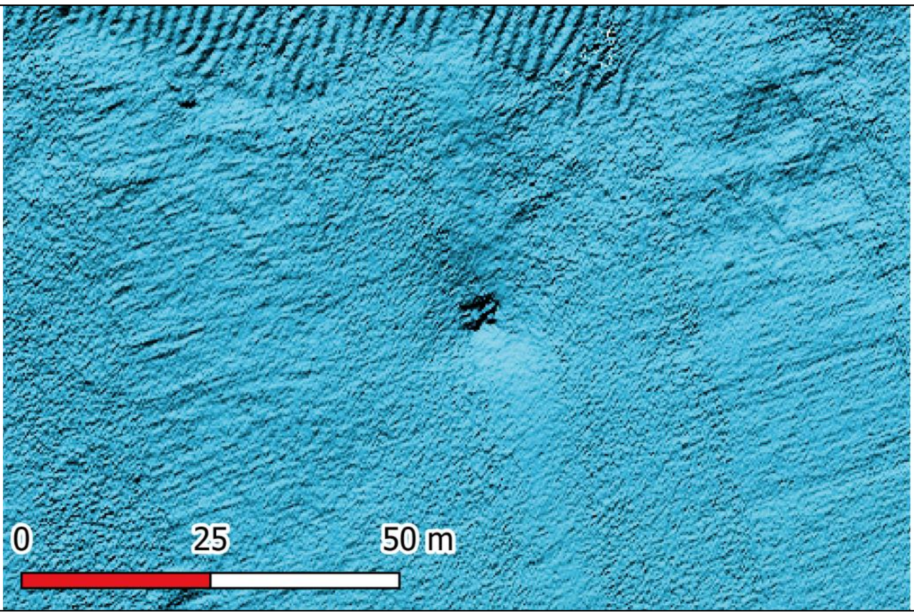
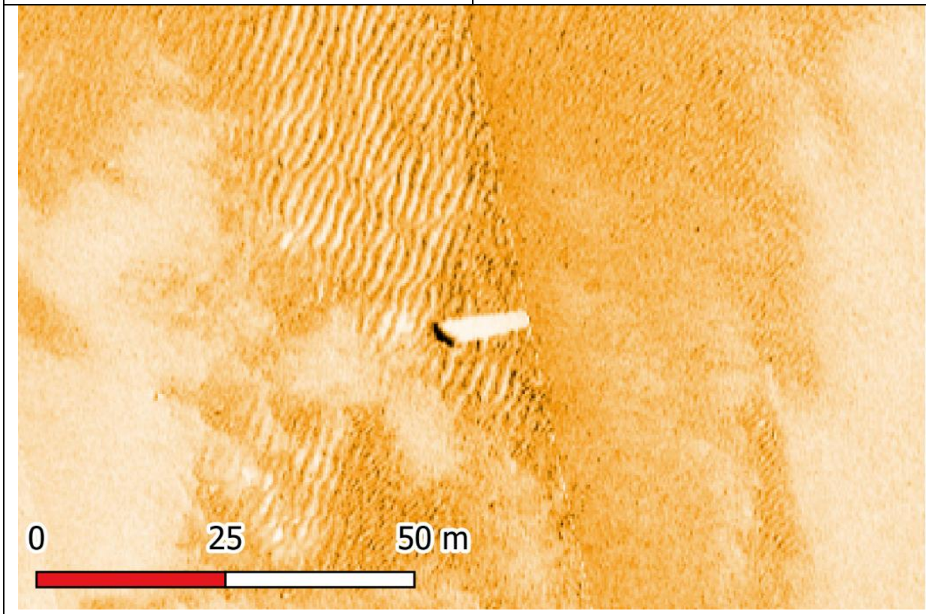
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Unidentified debris. Almost rectangular shape with dimensions 4.2×9.0m. Just outside an ‘intermediate’ boulder field. No scour.<br><br>No MAG target.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

<table>
<tr><td rowspan="3">BM16_010<br>Debris<br><br>Confidence level: 2<br>Significance level: 3<br><br>Unknown age</td><td>Position:<br>381720.79E 6202975.76N</td><td>Target: S_FR_BM16_4282<br>FFM: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Unidentified debris. Clear scour marks. Especially from the MBES, the target seems like a linear object with wider attachments at one end. Length c. 5.3 m.<br><br>No MAG target.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

<table>
<tr><td rowspan="3">BM16_011<br>Debris<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown age</td><td>Position:<br>377869.05E 6200608.47N</td><td>Target: S_FR_BM16_2076<br>FFM: N/A</td></tr>
<tr><td colspan="2">
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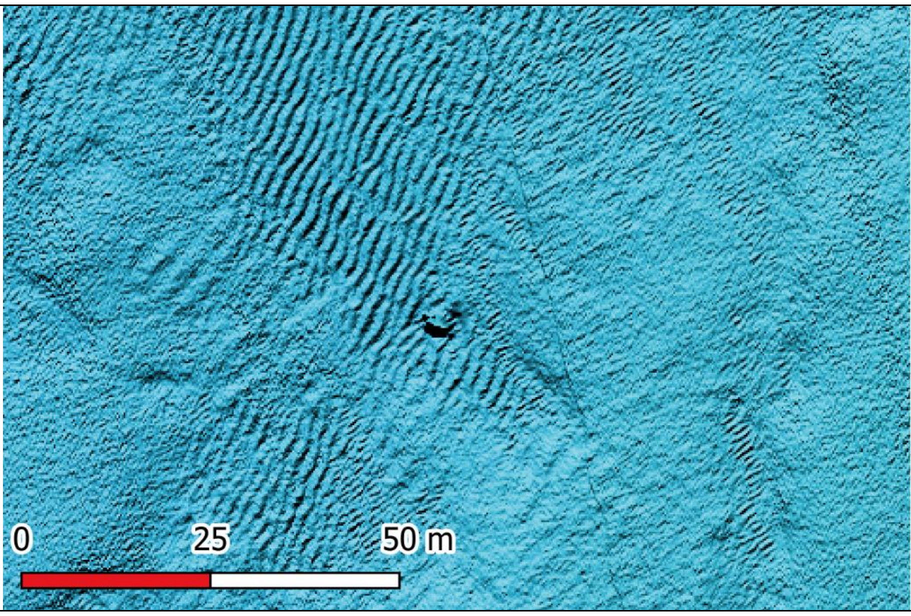
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Unidentified debris. Irregular circular object, c. 3.5×4m. No scour marks.<br><br>No MAG target.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

<table>
<tr>
<td rowspan="3">BM16_013<br>Wreck<br><br>Confidence level: 1<br>Significance level: 1<br><br>Unknown age.<br>Probably</td>
<td>Position:<br>379643.43E 379643.43N</td>
<td>Target: S_FR_BM16_1510<br>FFM: N/A (maybe 100110c-101)</td>
</tr>
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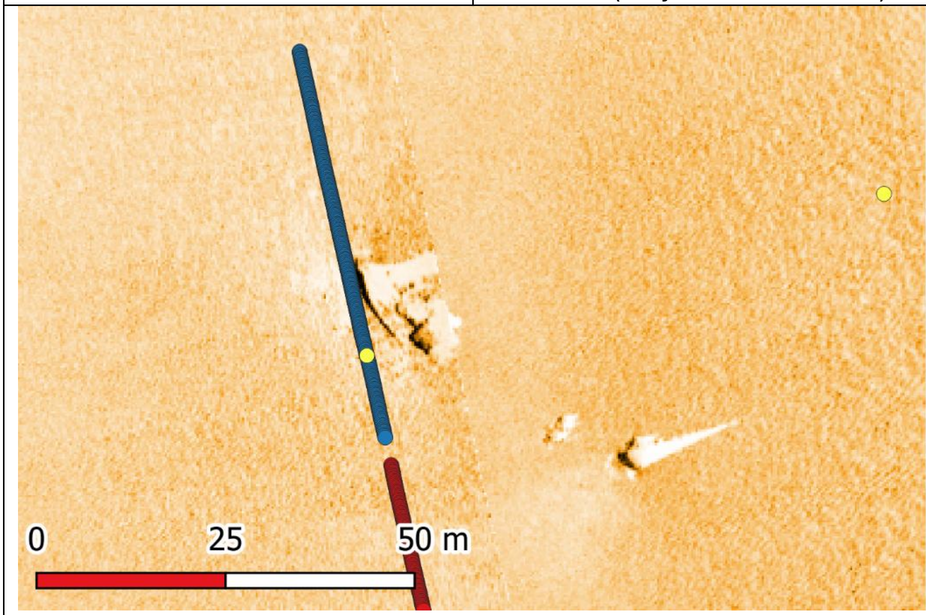
<td colspan="2">
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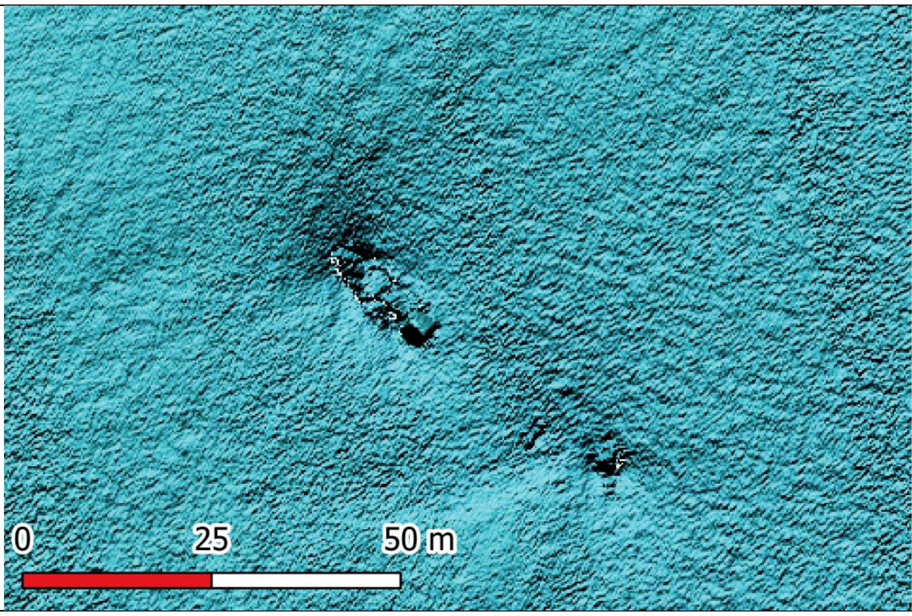
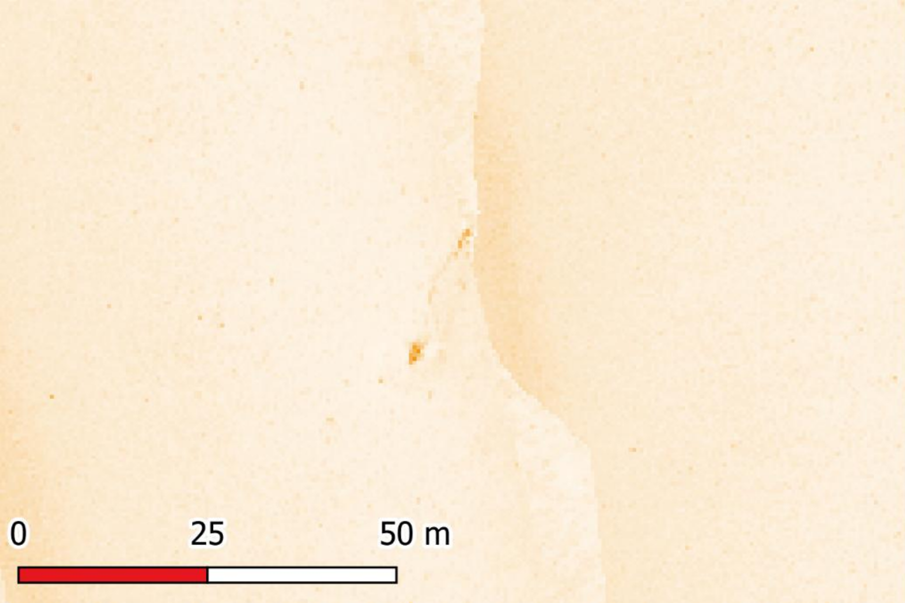
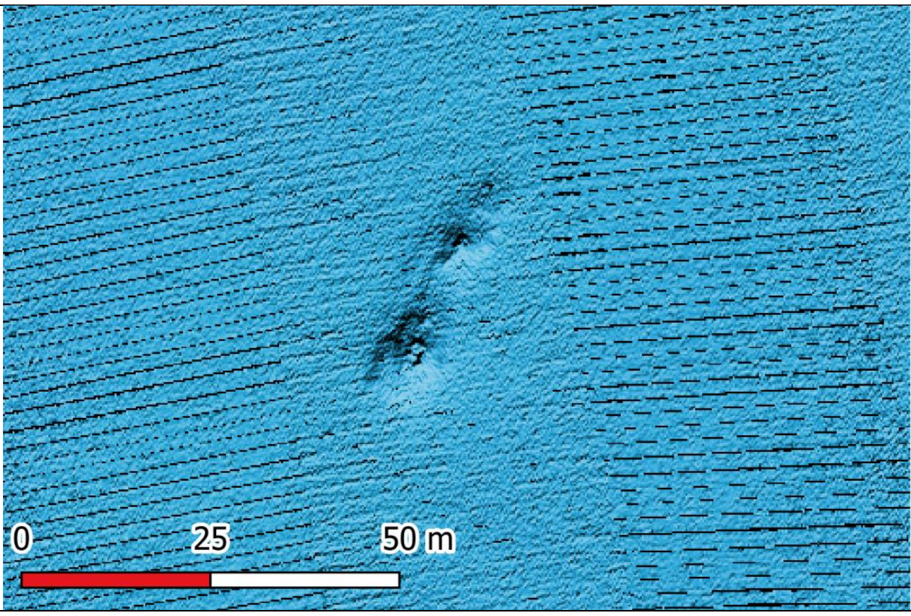
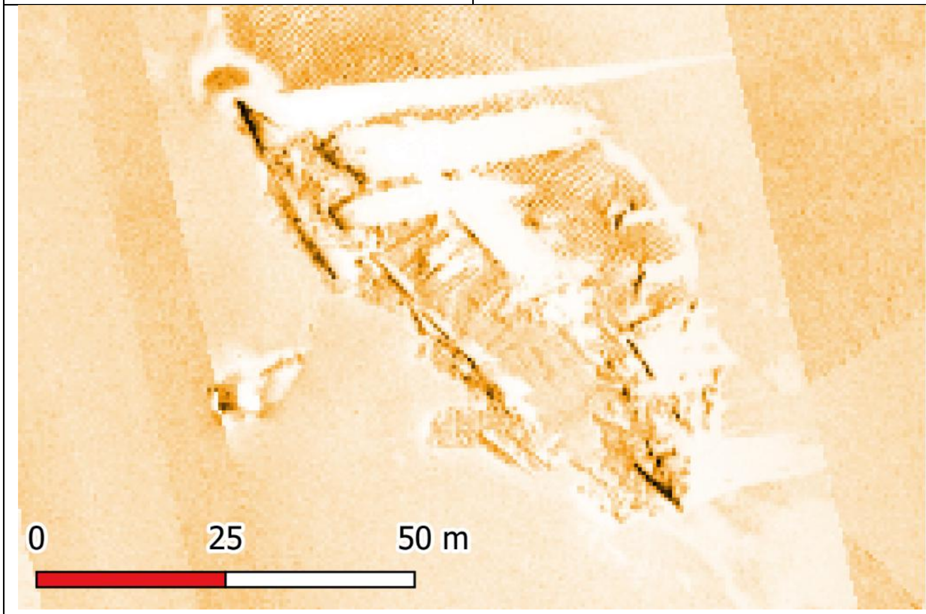
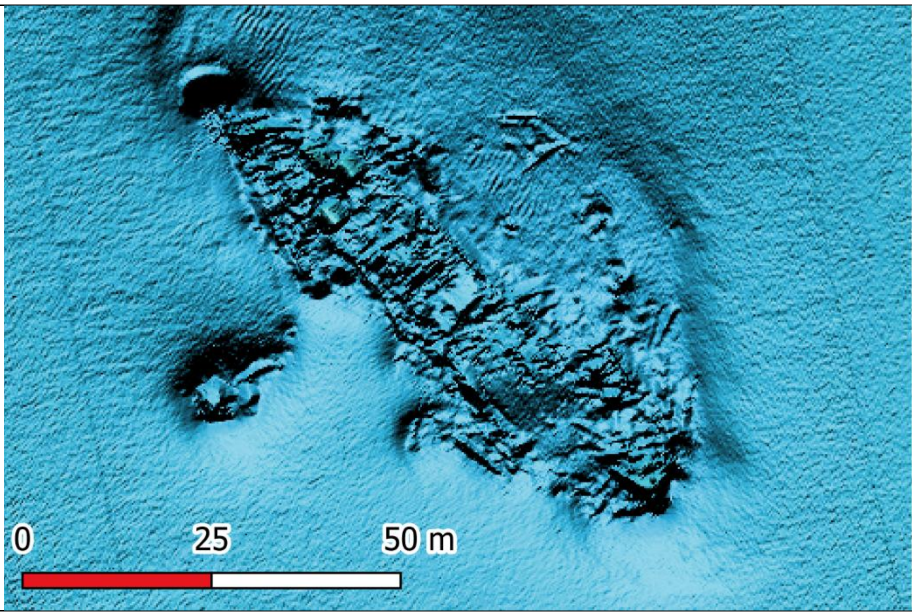
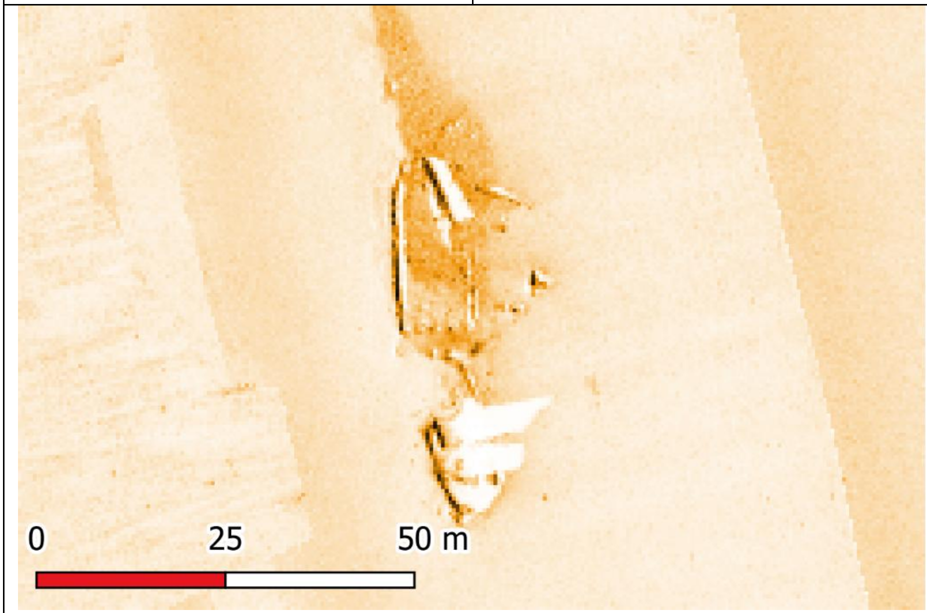
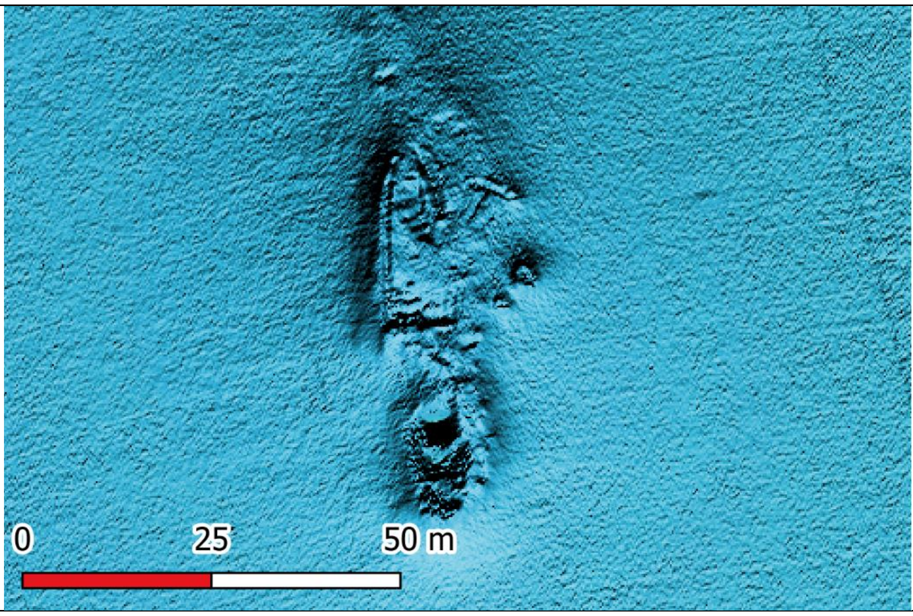
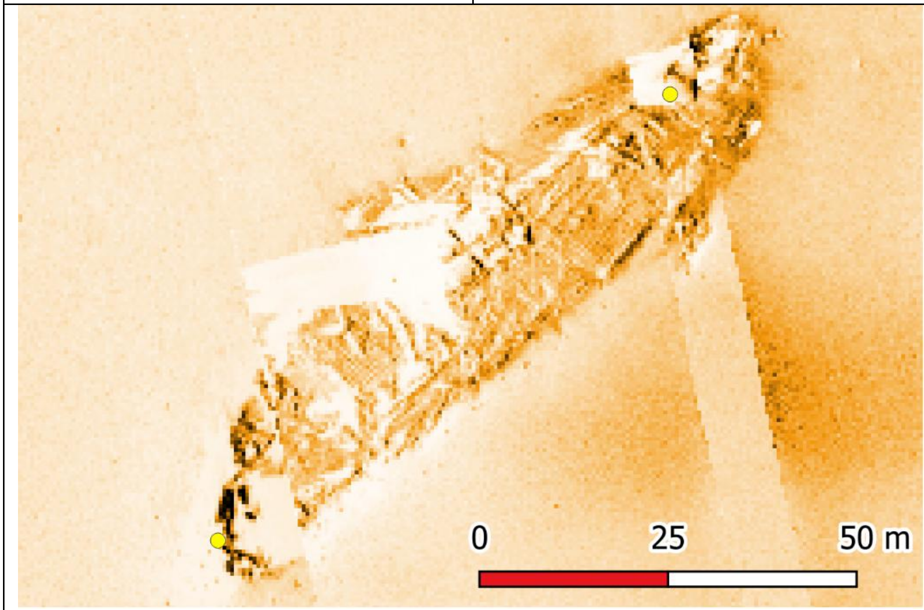
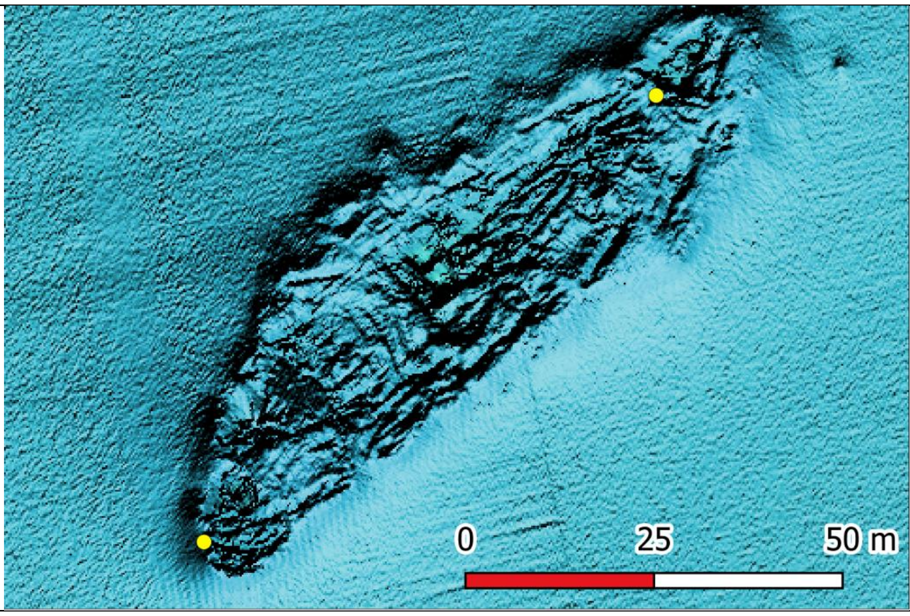
<td colspan="2">
</td>
</tr>
<tr>
<td>Description:</td>
<td colspan="2">Wreck. Stem section with a boiler visible at a length of 18 m. Further debris in SE bearing, aligned with the stem, making the entire debris field c. 46 m long. Visible scour marks around largest pieces, but nothing conclusive in the middle. It may therefore be separated pieces of debris, or a partly buried hull with the stem and stern sections visible. The boiler seems to point towards an earlier date, and this wreck is most likely protected.<br><br>Strong MAG target, both positive and negative, stretching c. 94 m just W of the wreck (M_FR_BM16_0287).<br><br>800 m NE of this position a wreck is reported as a net snag by a fisherman in 1986 (FFM 400110c-101). This could be the same wreck.</td>
</tr>
<tr>
<td>Recommended action:</td>
<td colspan="2">ROV/Diver inspection. Protection zone 100 m.</td>
</tr>
</table>

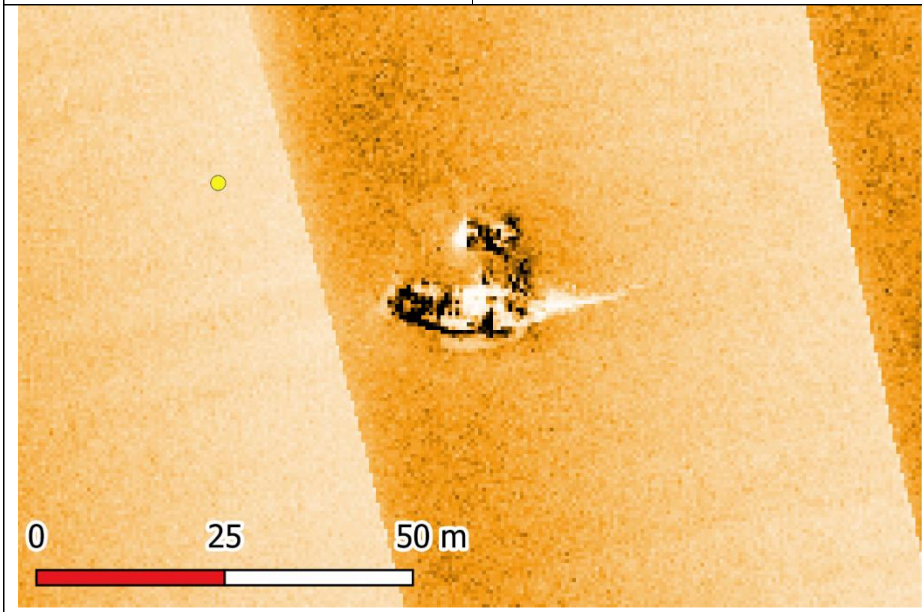
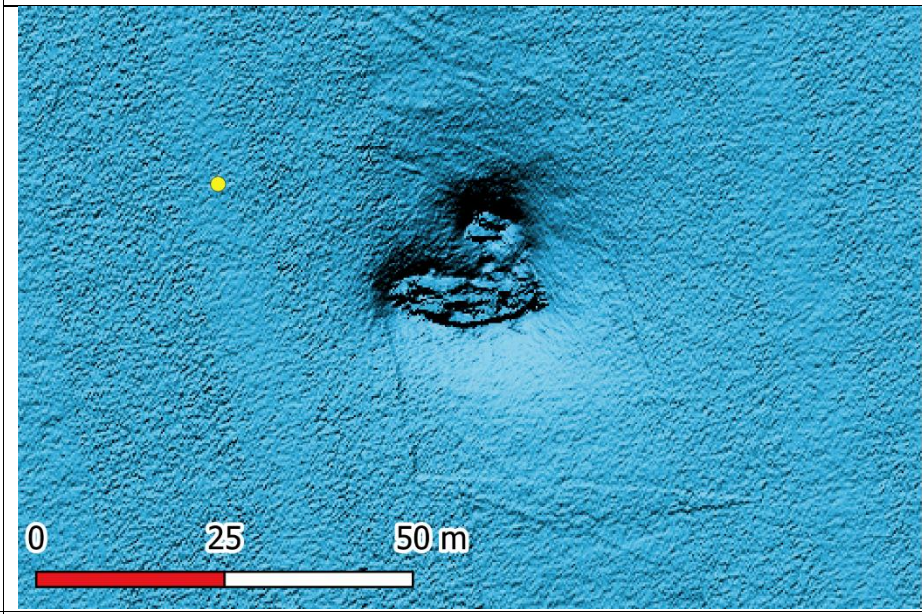
| | | |
|---|---|---|
| **BM17_001**<br>Debris<br><br>Confidence level:3<br>Significance level: 2<br><br>Unknown age | **Position**:<br>375725.52E 6195168.67N | **Target**: S_FR_BM17_0405 / S_FR_BM17_0406<br>**FFM:** N/A |
| |     | |
| **Description:** | Longitudinal object. Geophysicist interpreted this a two separate pieces of debris. However, the large piece towards S could be interpreted as having ribs. Also, there are clear scour marks in the area between the two pieces. Total length of debris field is ca. 20 m.<br><br>No MAG target, so target is non-ferrous. | |
| **Recommended action:** | ROV/Diver inspection. Protection zone 100 m. | |

<table>
<tr>
<td rowspan="3">BM17_002<br>Wreck<br><br>Confidence level: 1<br>Significance level: 1<br><br>Late 18th-early 19th century</td>
<td>Position:<br>377353.55E 6193764.20N</td>
<td>Target: S_FR_BM17_0649<br>S_FR_BM17_0649<br>M_FR_BM17_0383<br>M_FR_BM17_0550<br>FFM: N/A</td>
</tr>
<tr>
<td colspan="2">
</td>
</tr>
<tr>
<td colspan="2">
</td>
</tr>
<tr>
<td>Description:</td>
<td colspan="2">Wreck. Preserved below main deck: Boilers visible. The site is about 79 m long. About 27 m of the stern section is broken off and seems to be partially covered by the midship section. The total length of the ship would have been around 87 m. Beam c. 12 m.<br>One section is found ca. 15-20 m W of the main site (S_FR_BM17_0650).<br><br>Strong MAG anomalies across the area.</td>
</tr>
<tr>
<td>Recommended action:</td>
<td colspan="2">ROV/Diver inspection. Protection zone 100 m.</td>
</tr>
</table>

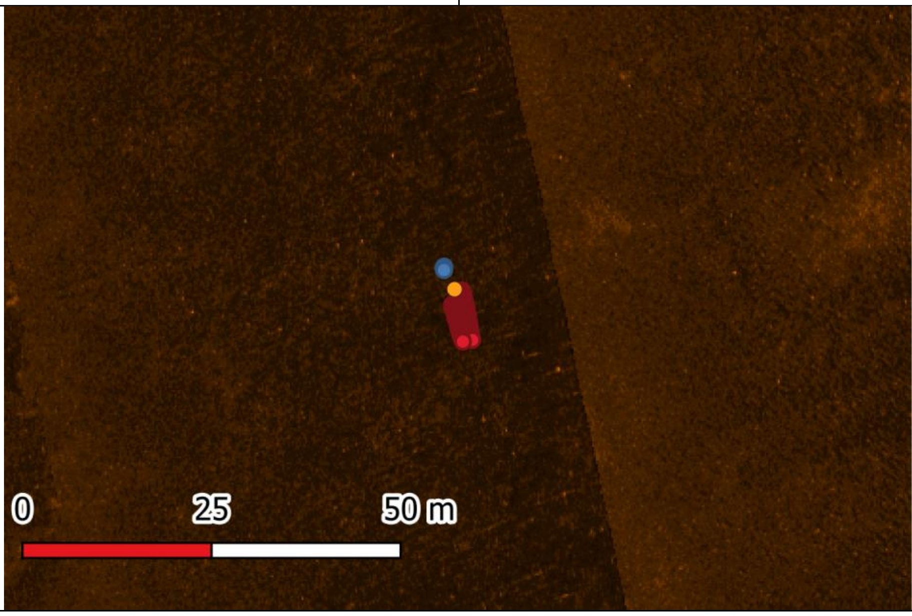
| **BM17_003**<br>Wreck<br><br>Confidence level: 1<br>Significance level: 1<br><br>Late 18th-early 19th century | **Position:**<br>376947.54E 6193480.52N | **Target**: S_FR_BM17_0651<br>M_FR_BM17_0261<br>M_FR_BM17_0258<br>**FFM:** N/A |
|---|---|---|
| | <br> | |
| **Description:** | Wreck, broken in more pieces, with two main sections. Original length at least 40 m, the site currently being 49 m long. Beam is difficult to measure, as one side is clearly broken outwards. This gives a current width of the site of c. 9.1 m, but measured at the southern (stern) section, the original beam may have been 7-8 m.<br><br>Strong MAG anomalies across the area. | |
| **Recommended action:** | ROV/Diver inspection. Protection zone 100 m. | |

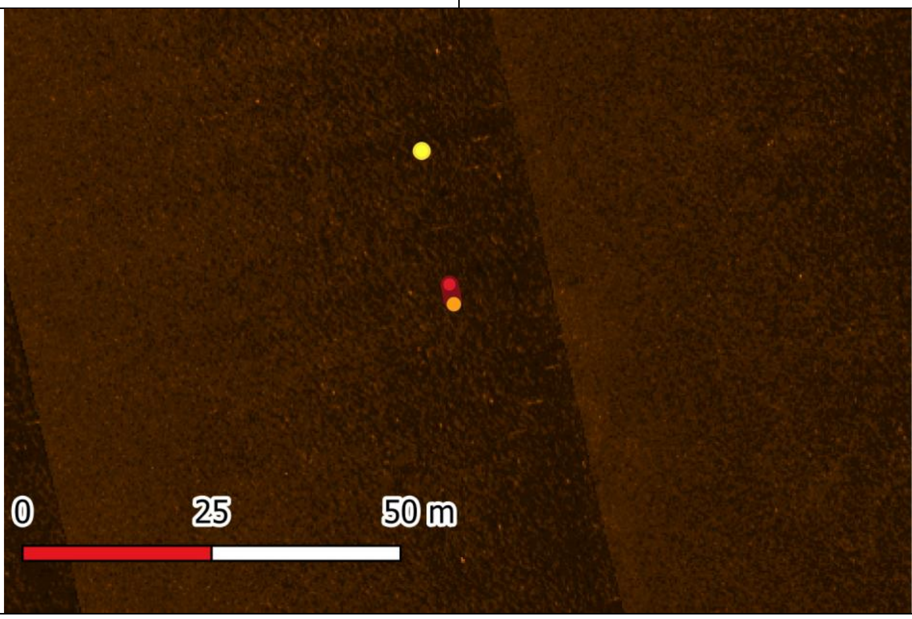
<table>
<tr><td>BM17_004<br>Wreck<br><br>Confidence level: 1<br>Significance level: 1<br><br>Late 18th-19th century</td><td>Position:<br>379393.0E 6189155.25N</td><td>Target: S_FR_BM17_0939<br>M_FR_BM17_0302<br>M_FR_BM17_0354<br>M_FR_BM17_0458<br>FFM: N/A</td></tr>
<tr><td></td><td colspan="2">

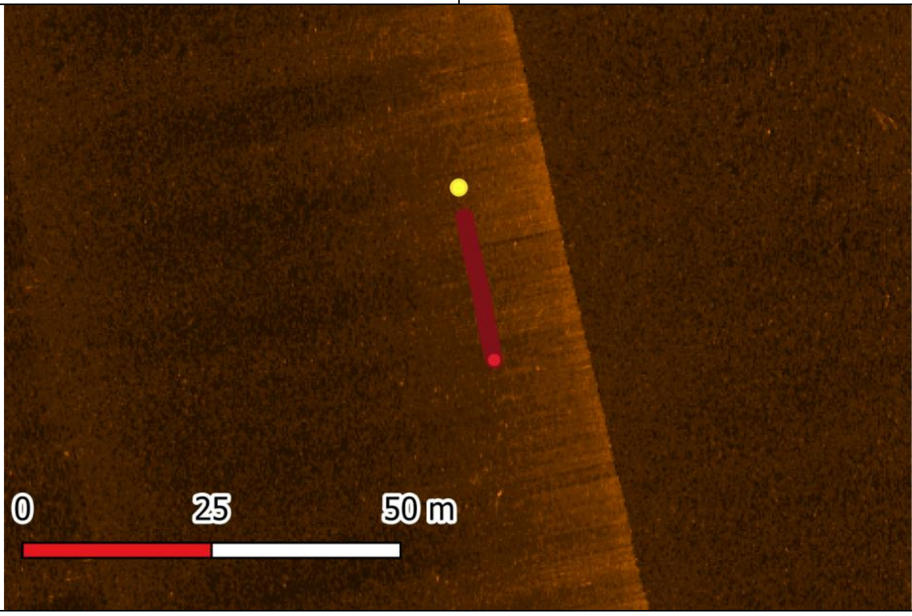

</td></tr>
<tr><td>Description:</td><td colspan="2">Wreck. Length c. 98 m, beam c. 15.3 m. Deteriorated, although it also seems that the geophysical data are slightly misaligned.<br><br>Strong MAG anomalies across the area.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">ROV/Diver inspection. Protection zone 100 m.</td></tr>
</table>

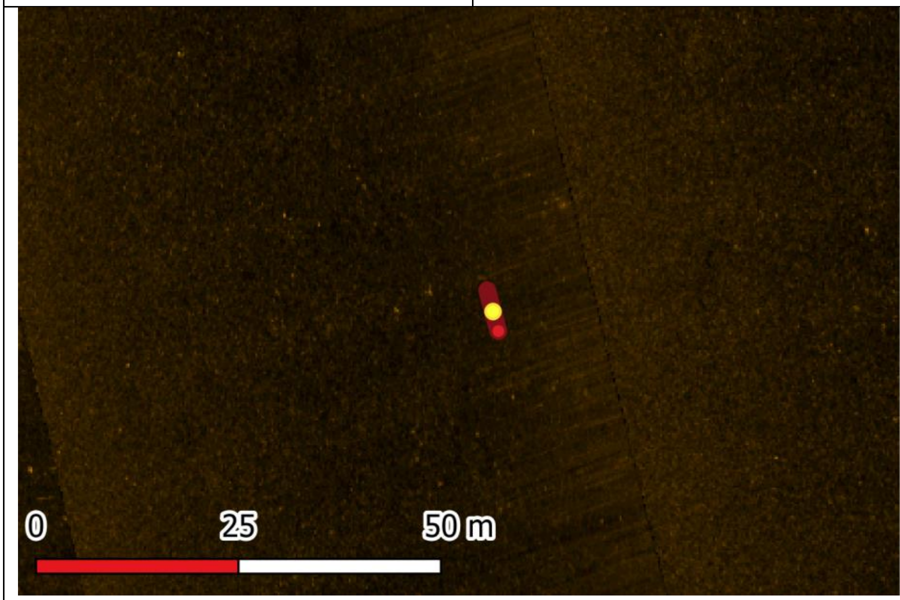
<table>
<tr>
<td rowspan="3">BM18_001<br>Wreck, cutter<br><br>Confidence level: 1<br>Significance level: none<br><br>Modern</td>
<td>Position:<br>369390.37E 6189304.12N</td>
<td>Target: S_FR_BM18_0012<br>S_FR_BM18_0013<br>M_FR_BM18_0103<br>FFM: N/A</td>
</tr>
<tr>
<td colspan="2">
</td>
</tr>
<tr>
<td colspan="2">
</td>
</tr>
<tr>
<td>Description:</td>
<td colspan="2">Fishing vessel, RI462 Helle. Sank May 26, 2005 after fire onboard. All crew rescued. Efs 49/1200 2005.<br><br>Surprisingly, no strong MAG response in the area, neither at ±50nT nor ±20nT. One MAG target set, though, so some light response.</td>
</tr>
<tr>
<td>Recommended action:</td>
<td colspan="2">None</td>
</tr>
</table>

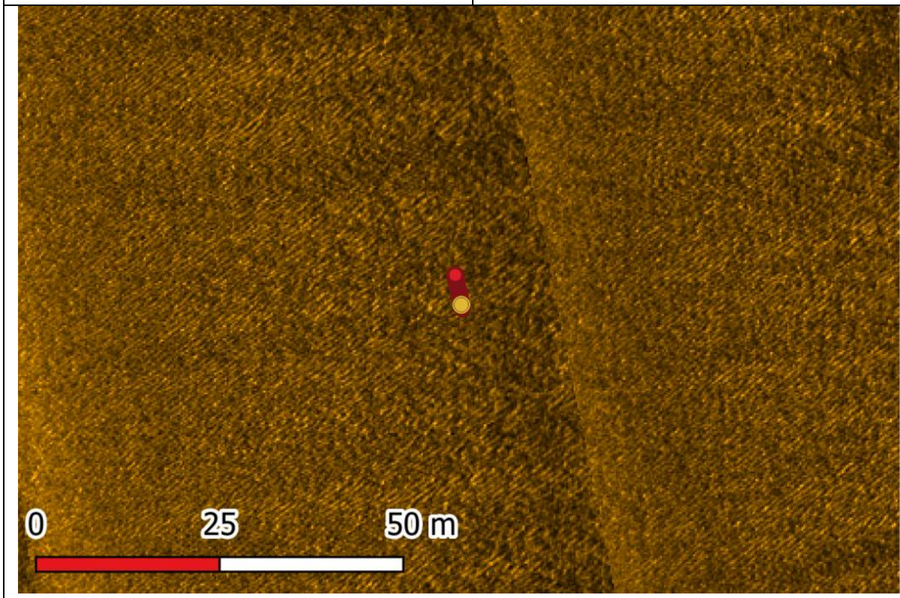
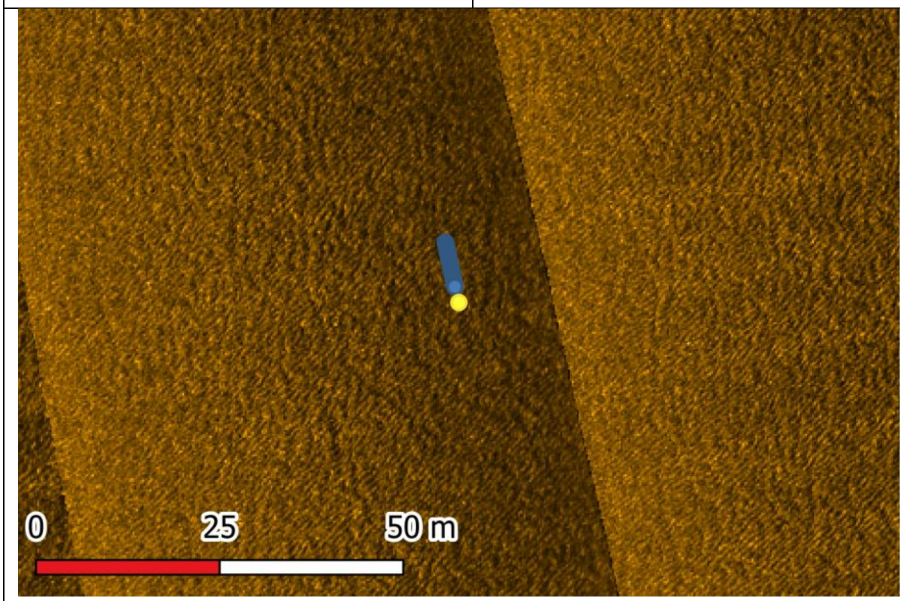
## 6.2. MAG-targets

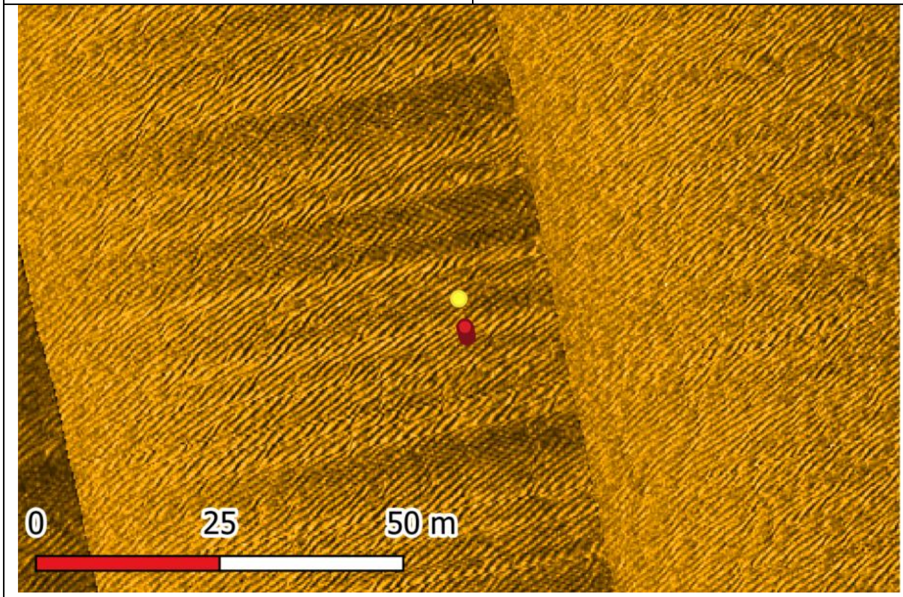
| | | |
|---|---|---|
| **BM12_005**<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>396790.28E 6200878.91N | **Target**: M_NM_BM12_0128<br>M_NM_BM12_313<br>**FFM:** N/A |
| | <br> | |
| **Description:** | MAG anomaly, both positive and negative. Stretches c. 10.4 m. Double due to two survey lines running here. | |
| **Recommended action:** | Protection zone 50 m | |

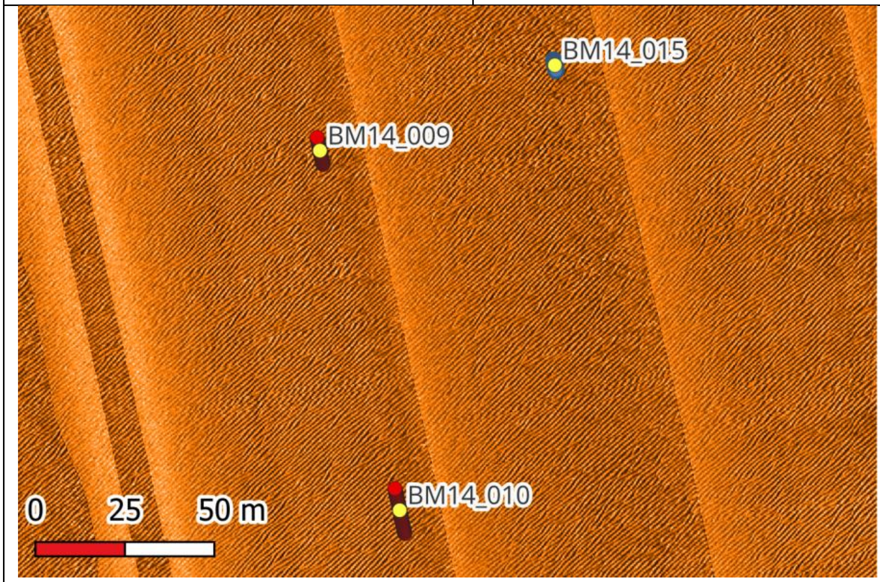
| | | |
|---|---|---|
| **BM12_006**<br>MAG response.<br>Possibly debris<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>396518.78E 6200816.77N | **Target**: M_NM_BM12_0156/0157<br>**FFM:** N/A |
| | <br> | |
| **Description:** | Strong positive anomaly. Short stretch, c. 2.1 m. However, geophysicists have placed two targets N and S of these anomalies, masking a total span of c. 67 m, if they are indeed connected. | |
| **Recommended action:** | Protection zone 100 m. | |

<table>
<tr><td rowspan="2">BM12_007<br>MAG response.<br><br>Confidence level: 2<br>Significance level: 2<br><br>Unknown date.</td><td>Position:<br>395875.60E 6195525.00N</td><td>Target: M_NM_BM12_0659<br>FFM: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Stretches c. 19,3 m.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

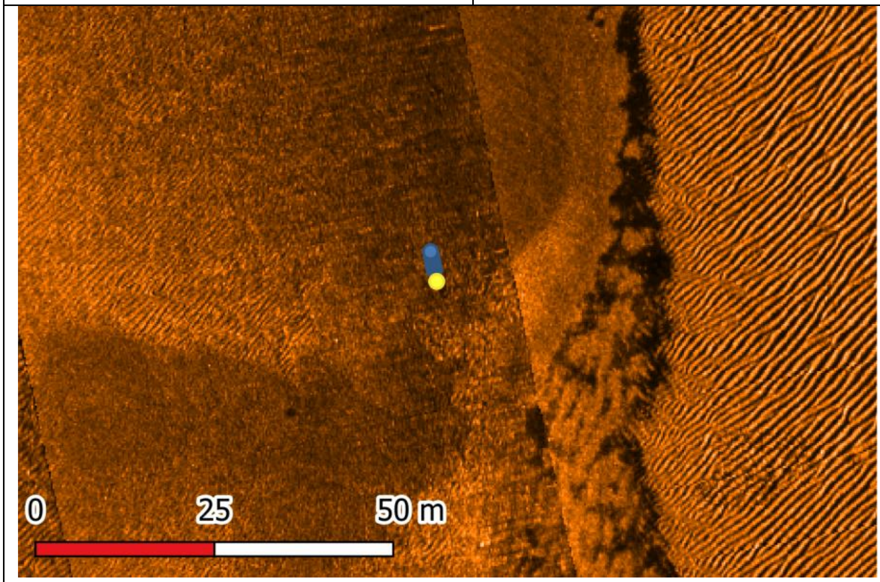
<table>
<tr><td rowspan="2">BM13_007<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date.</td><td>Position:<br>392627.63E 6207205.48N</td><td>Target: M_NM_BM13_0024<br>FFM: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch, c. 4.5 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m</td></tr>
</table>

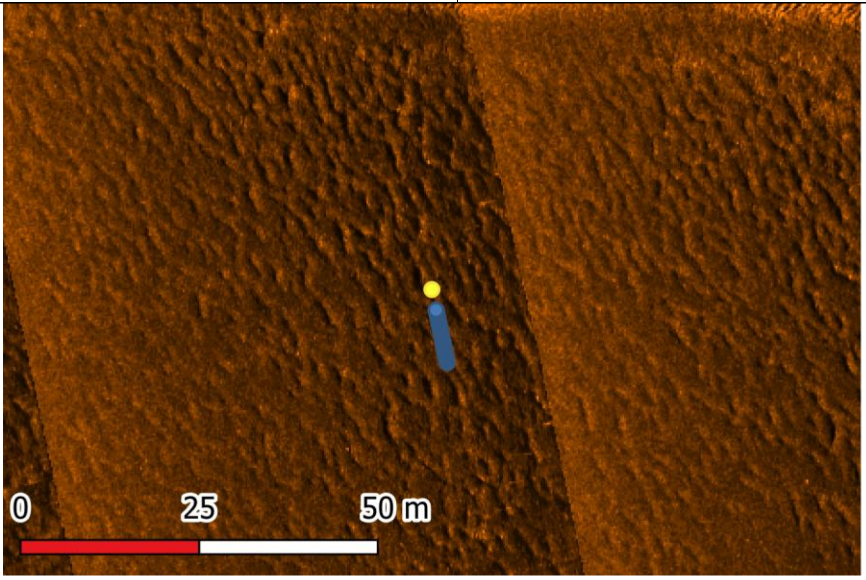
| | | |
|---|---|---|
| **BM13_008**<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>391631.95E 6200232.51N | **Target:** M_NM_BM13_1017<br>**FFM:** N/A |
| | <br> | |
| **Description:** | Strong positive MAG anomaly. Very short stretch c. 4.6 m. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |
| **BM13_010**<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>393114.41E 6198350.68N | **Target:** M_NM_BM13_0381<br>**FFM:** N/A |
| | <br> | |
| **Description:** | Strong negative MAG anomaly. Short stretch of c. 6.2 m. No debris visible nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

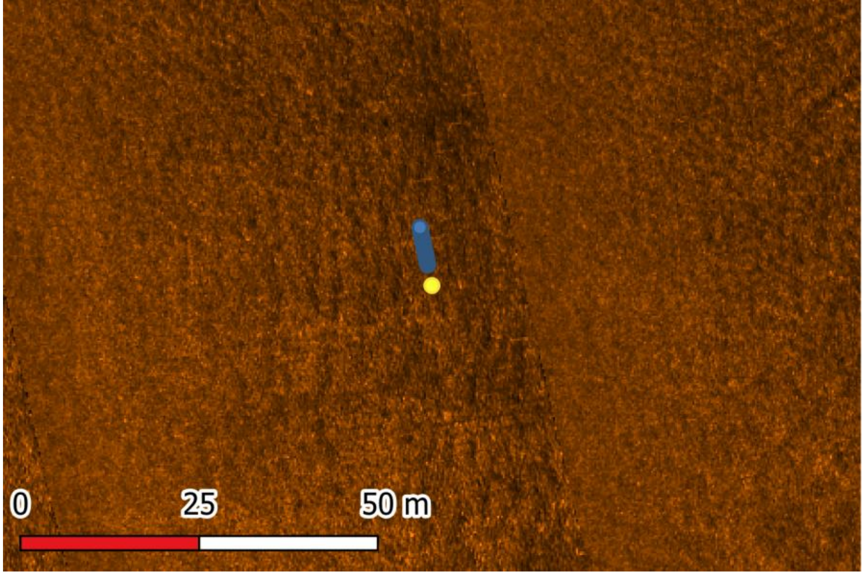
| | | |
|---|---|---|
| **BM13_011**<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>395000.70E 6191962.35N | **Target**: M_NM_BM13_0163<br>**FFM:** N/A |
| | <br> | |
| **Description:** | Strong negative MAG anomaly. Very short stretch of 1.3 m. No debris visible nearby | |
| **Recommended action:** | Protection zone 50 m | |

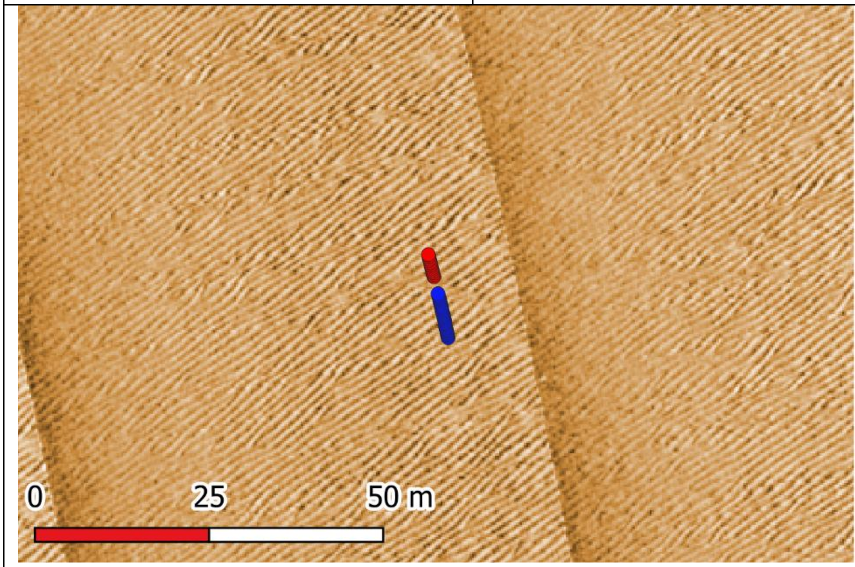
| | | |
|---|---|---|
| **BM14_009**<br>**BM14_010**<br>**BM14_015**<br>MAG responses.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>389850.95E 6193914.21N (009)<br>389873.25E 6193813.59N (010)<br>389916.61E 6193938.10N (015) | **Target**: N/A<br>**FFM:** N/A |
| | <br> | |
| **Description:** | Three short spans of high MAG anomaly in relatively close proximity. Possibly related to a common target between survey lines. Distance between 009 and 010 is c. 100 m. Distance from 009 to 015 is c. 70 m. | |

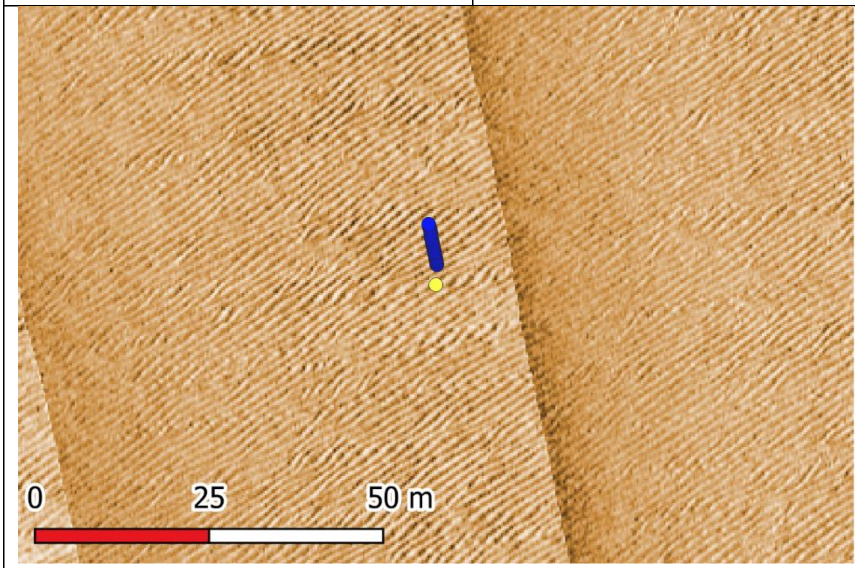
| | |
|---|---|
| | No target designated by geophysics team in the area. No debris visible nearby.<br><br>BM14_009, strong positive anomaly, c. 7.8 m<br>BM 14_010, strong positive anomaly, c. 12.9 m<br>BM14_015, strong negative anomaly, c. 3.1 m. |
| **Recommended action:** | Protection zone 3x50 m, or one of 150m in the centre of the three targets. |

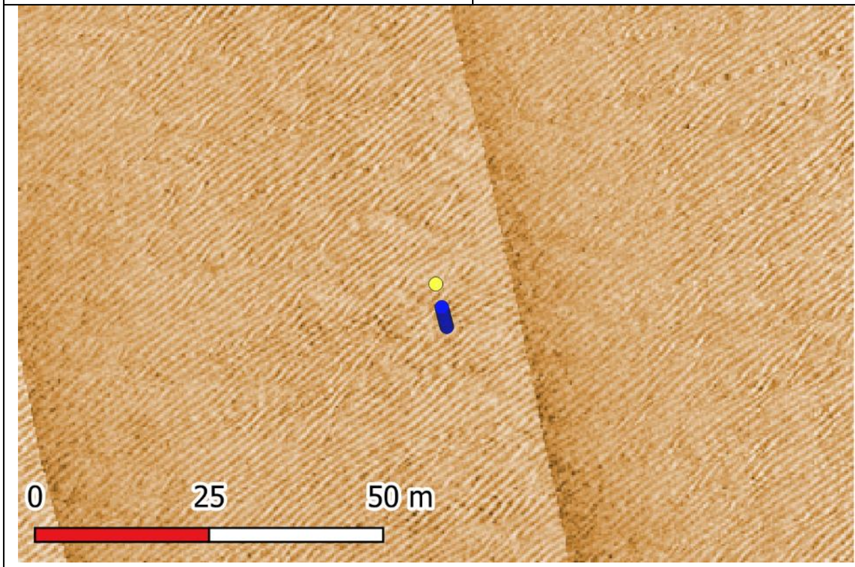
| | | |
|---|---|---|
| **BM14_011**<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position**:<br>387459.17E 6200987.13N<br> | **Target**: M_NM_BM14_0152<br>**FFM:** N/A |
| **Description:** | Strong negative MAG anomaly. Very short span of c. 2.7 m. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

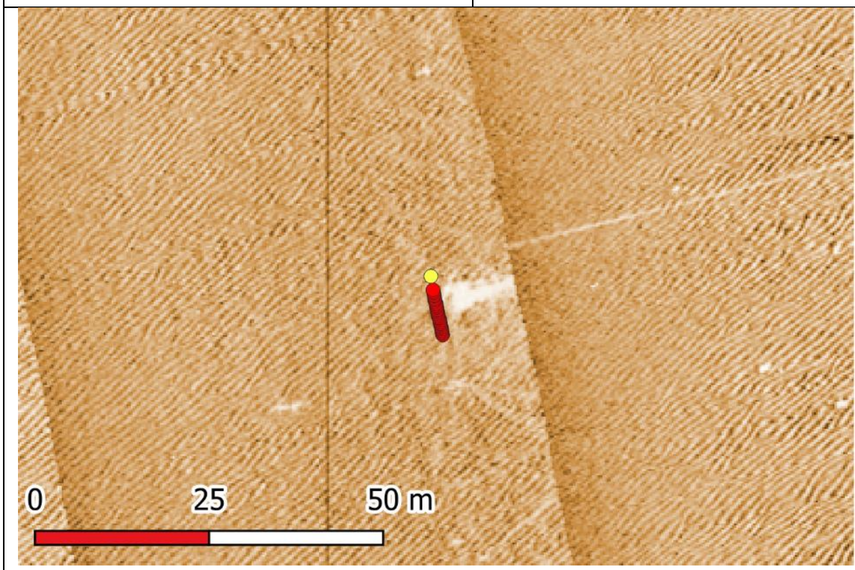
<table>
<tr><td>BM14_012<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date.</td><td>Position:<br>385285.09E 6215634.92N<br></td><td>Target: M_NM_BM14_0367<br>FFM: N/A</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Short span of c. 7.6 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

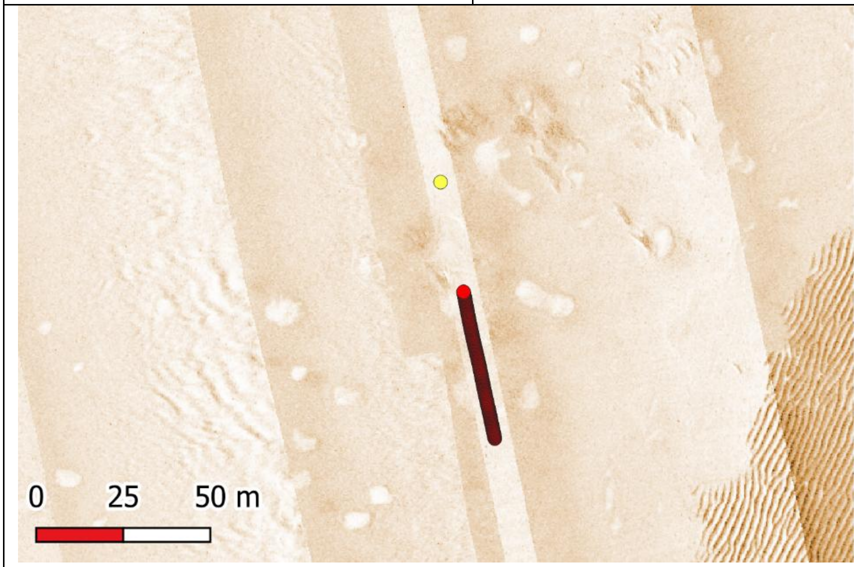
<table>
<tr><td>BM14_013<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date.</td><td>Position:<br>385390.28E 6216470.46N<br></td><td>Target: M_NM_BM14_0422<br>FFM: N/A</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Short span of c. 5.3 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

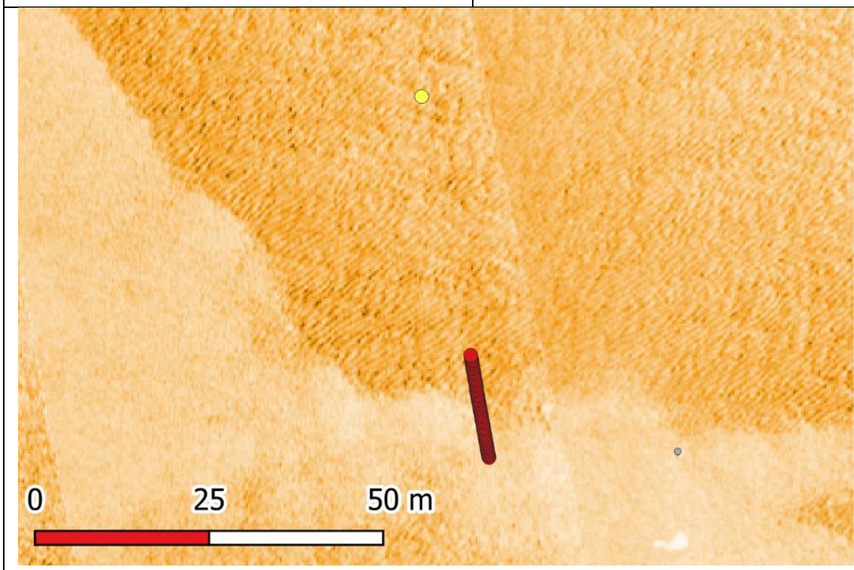
<table>
<tr><td rowspan="2">BM15_002<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date.</td><td>Position:<br>380365.03E 6226306.87N</td><td>Target: M_NM_BM15_0109<br>FFM: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomaly, both positive and negative. Spans c. 12.3 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

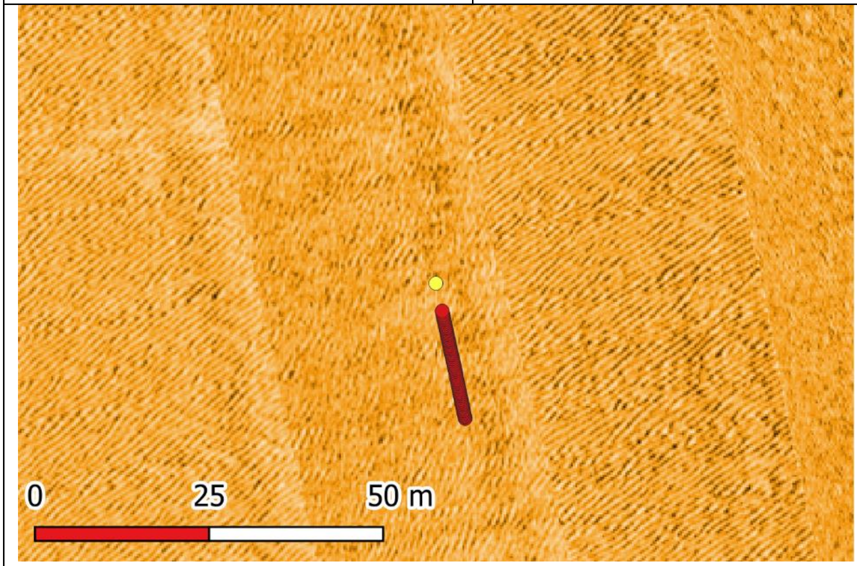
<table>
<tr><td rowspan="2">BM15_003<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date.</td><td>Position:<br>382432.77E 6214251.68N</td><td>Target: M_NM_BM15_0302<br>FFM: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Spans c. 6.0 m. No debris visible nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

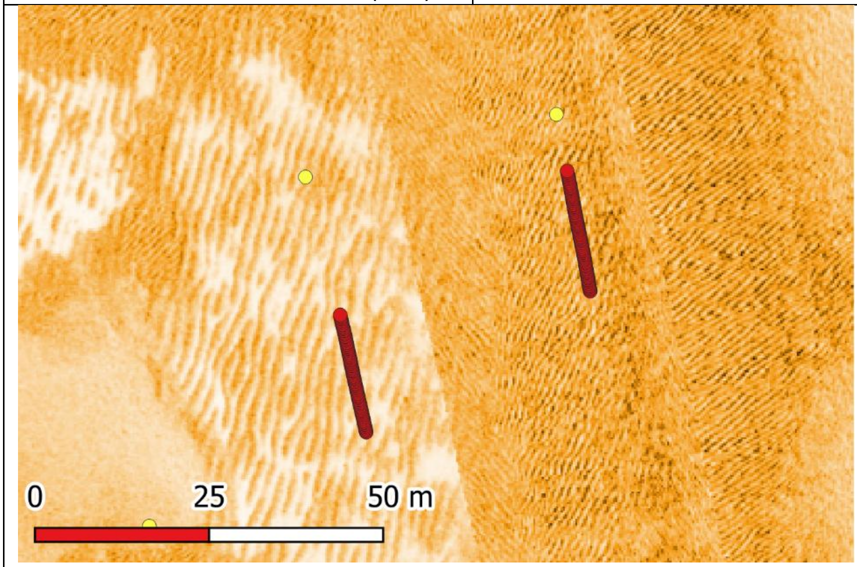
| | | |
|---|---|---|
| **BM15_004**<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>414517.81E 6218363.26N | **Target**: M_NM_BM15_0447<br>**FFM:** N/A |
| | <br> | |
| **Description:** | Strong negative MAG anomaly. Very short span of c. 2.9 m. No visible debris nearby | |
| **Recommended action:** | Protection zone 50 m. | |

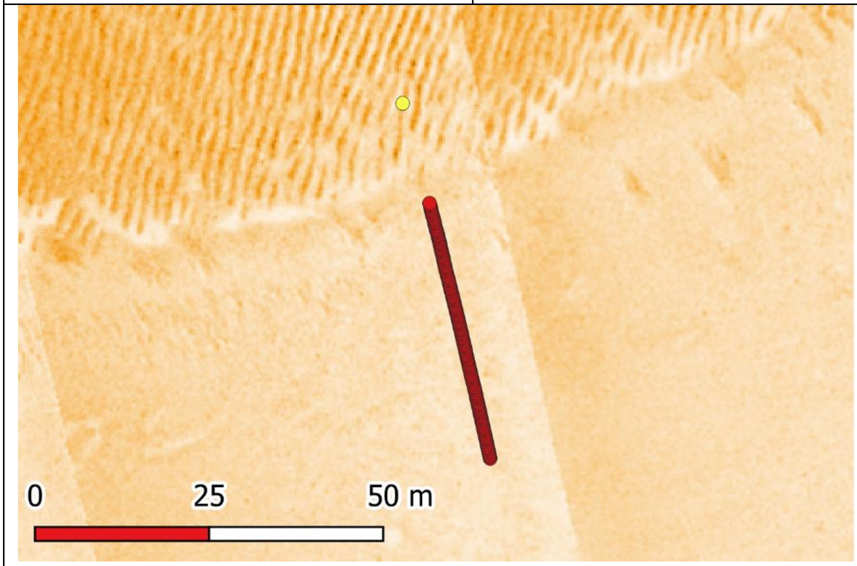
| | | |
|---|---|---|
| **BM15_005**<br>MAG response.<br>Debris.<br><br>Confidence level: 2<br>Significance level: -none<br><br>Unknown date. | **Position:**<br>385014.95E 6203007.67N | **Target**: M_NM_BM15_0345<br>**FFM:** N/A |
| | <br> | |
| **Description:** | Strong positive MAG anomaly. Short span of c. 6.6 m. Coincides with a feature which has been interpreted with a boulder by the geophysics team. The impression of the SSS feature is somewhat irregular, though. | |
| **Recommended action:** | None | |

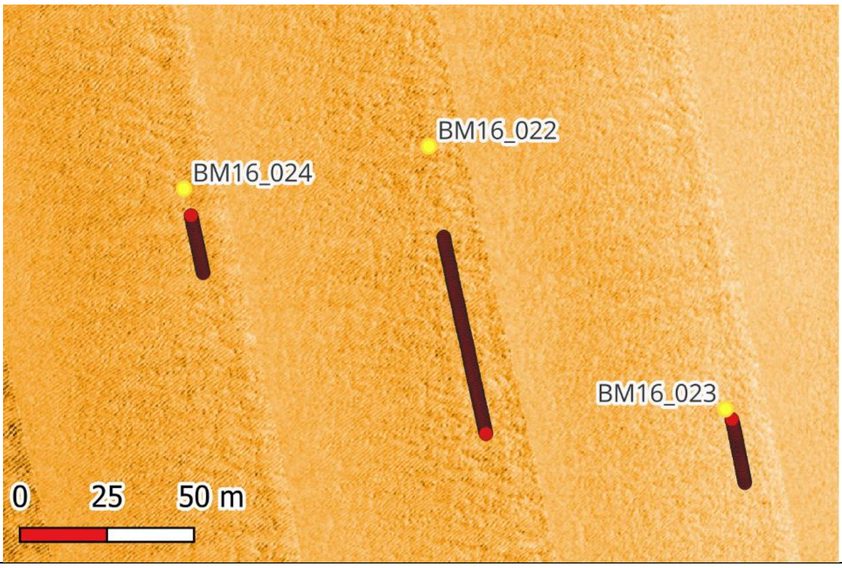
| **BM15_010**<br>MAG response. Large target.<br><br>Confidence level: 2<br>Significance level: 2<br><br>Unknown date. | **Position:**<br>407550.41E 6208081.68N | **Target**: M_FR_BM07_0409<br>**FFM:** N/A |
|---|---|---|
| |  | |
| **Description:** | Strong MAG anomaly, both positive and negative. Spans c. 23.0 m. No visible debris nearby. Could be large debris or small wreck. | |
| **Recommended action:** | Protection zone 100 m. | |

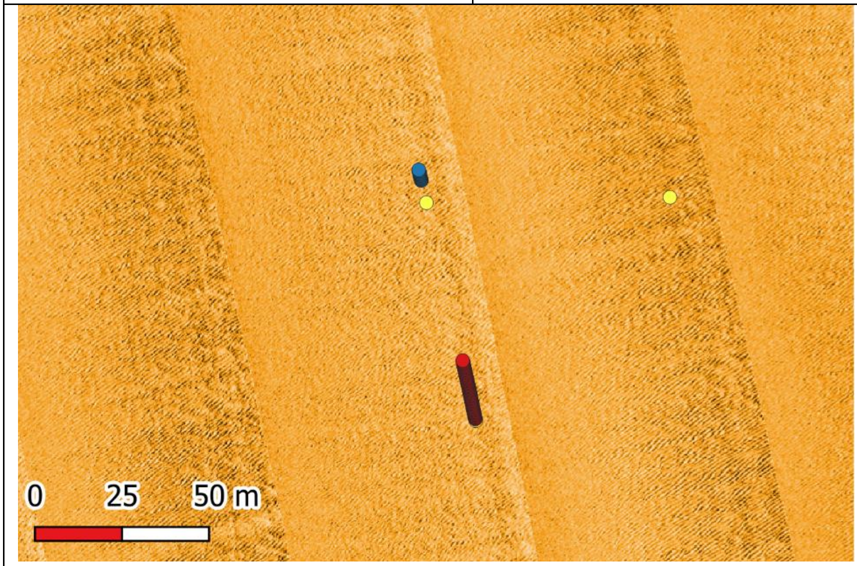
| **BM16_017**<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>377988.48E 6207014.71N | **Target**: M_FR_BM16_0207<br>**FFM:** N/A |
|---|---|---|
| |  | |
| **Description:** | Strong positive MAG anomaly. Stretches c. 14.8 m. No visible debris nearby. A MAG target is set a further 38m to the N, marking a large target, but with lower responses. | |
| **Recommended action:** | Protection zone 100 m. | |

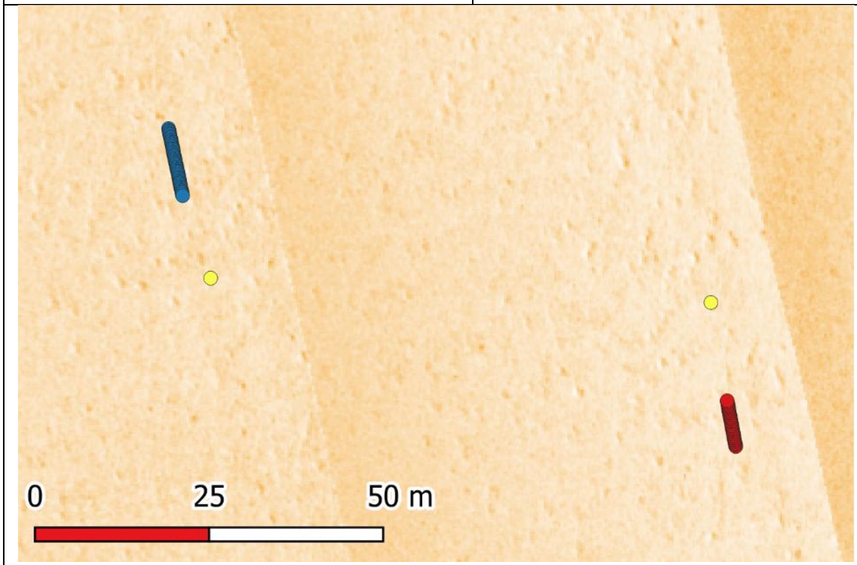
<table>
<tr><td>BM16_018<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date</td><td>Position:<br>376542.44E 6204094.81N</td><td>Target: M_FR_BM16_0161<br>FFM: N/A</td></tr>
<tr><td></td><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Stretches c. 15.8 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

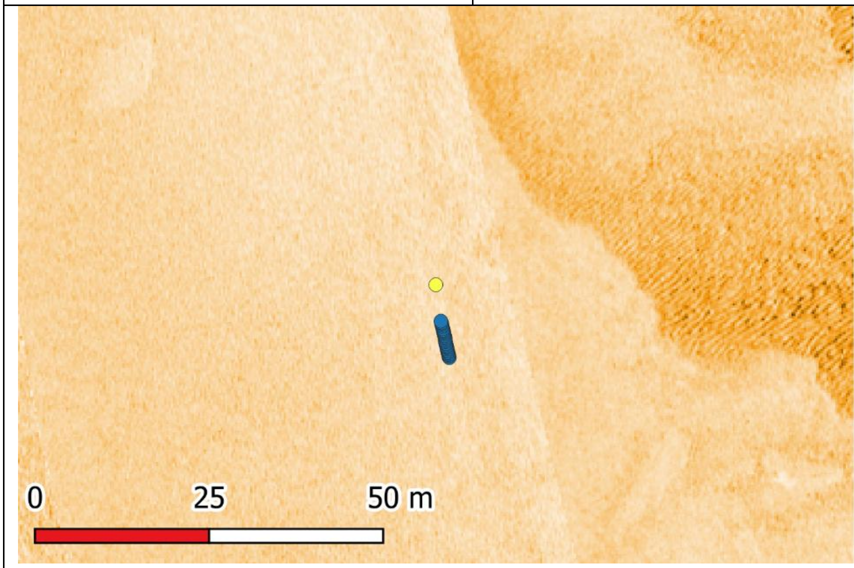
<table>
<tr><td>BM16_019<br>BM16_020<br>MAG responses.<br>Large target<br><br>Confidence level: 2<br>Significance level: 3<br><br>Unknown date</td><td>Position:<br>376532.13E 6203968.72N (019)<br>37656816E 6203977.70N (020)</td><td>Target: M_FR_BM16_0729<br>M_FR_BM16_0162<br>FFM: N/A</td></tr>
<tr><td></td><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Two parallel strong positive MAG anomaly, spanning c. 17.3 m(019) and 17.6 m (020). MAG targets set further N, marking a large target. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m, for instance in a central point between the two targets.</td></tr>
</table>

<table>
<tr><td rowspan="2">BM16_021<br>MAG response.<br>Large target.<br><br>Confidence level: 2<br>Significance level: 2<br><br>Unknown date</td><td>Position:<br>382146.80E 6202354.35N</td><td>Target: M_FR_BM16_0674<br>FFM: N/A</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Stretches c. 37.7 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">BM16_022<br>BM16_023<br>BM16_024<br>MAG responses.<br>Large target.<br><br>Confidence level: 2<br>Significance level: 2<br><br>Unknown date</td><td>Position:<br>381007,73E 6205307.77N (022)<br>381092.87E 6205232.38N (023)<br>380937.38E 6205295.61N (024)</td><td>Target: M_FR_BM16_0569 (022)<br>M_FR_BM16_0641 (023)<br>M_FR_BM16_0596 (024)<br>FFM: N/A</td></tr>
<tr><td colspan="2">NB: Scale 1:2000.<br></td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomalies in three survey lines. The longest stretch is c. 57.7 m, with MAG target set further N. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 150 m around BM16_022.</td></tr>
</table>

<table>
<tr><td rowspan="2">BM16_025<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 2<br><br>Probably 1948.</td><td>Position:<br>380828.72E 6205136.31N</td><td>Target: M_FR_BM16_0553<br>FFM: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomaly, both positive and negative. The total stretches across c. 75.8m. The negative and positive stretches are separated by about 53 m, but can still be considered the product of one large target.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

<table>
<tr><td rowspan="2">BM16_026<br>MAG response<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown age</td><td>Position:<br>379460.84E 6204005.53N</td><td>Target: M_FR_BM16_0391<br>M_FR_BM16_0353<br>FFM: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Two strong magnetic anomalies, one positive and one negative in neighboring transects. Both short stretches of c. 9.6 og 7.0 m. Could be part of same target, and location thus set in centre between them. Other MAG targets nearby. No debris visible nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100m</td></tr>
</table>

| | | |
|---|---|---|
| **BM16_027**<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date | **Position:**<br>378520.04E 6205210.25N | **Target**: M_FR_BM16_0272<br>**FFM:** N/A |
| |  | |
| **Description:** | Strong negative MAG anomaly. Short stretch of c. 5.4 m. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |



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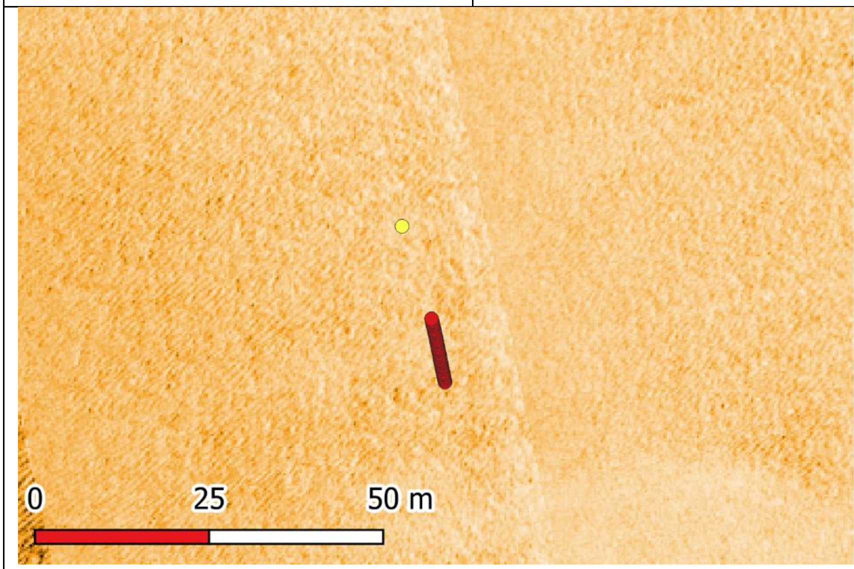
|---|---|---|
| **BM16_028**<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date | **Position:**<br>378523.65E 6204529.68N | **Target**: M_FR_BM16_0208<br>**FFM:** N/A |
| |  | |
| **Description:** | Strong positive MAG anomaly. Short stretch of c. 9.1 m. MAG Target set c. 14 m further N, indicating a larger target. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |



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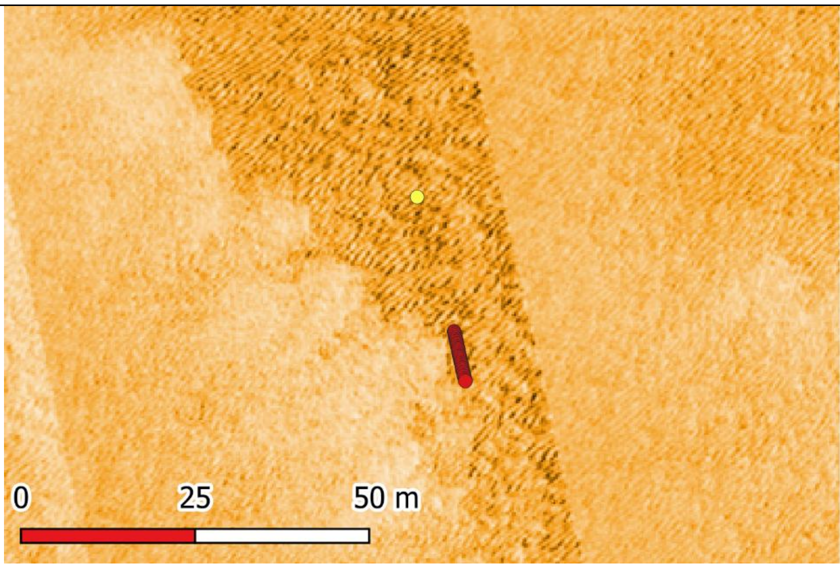
|---|---|---|
| **BM16_029** | **Position:**<br>379929.70E 6197709.07N | **Target**: M_FR_BM16_0212<br>**FFM:** N/A |

| | |
|---|---|
| MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date |  |
| **Description:** | Strong positive MAG anomaly. Short stretch of c. 7.3 m. MAG Target set c. 14 m further N, indicating a larger target. No No visible debris nearby. |
| **Recommended action:** | Protection zone 50 m. |

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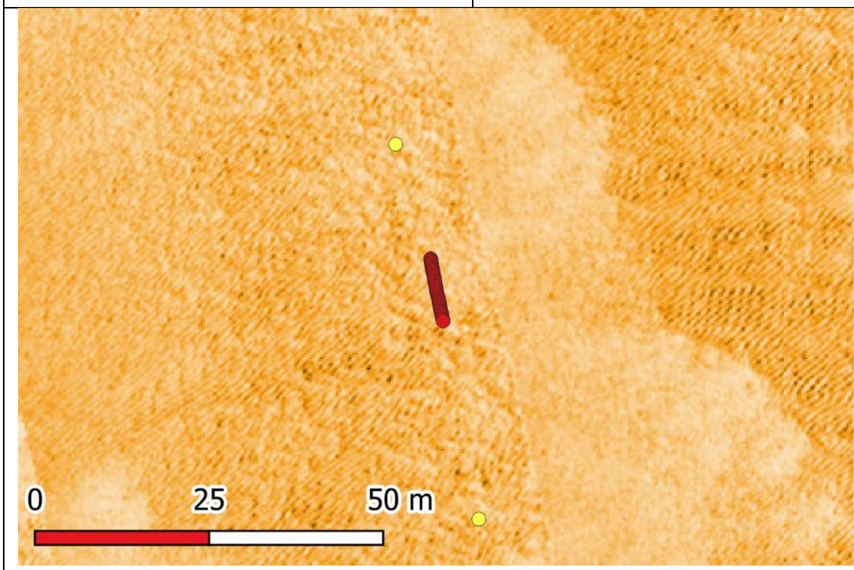
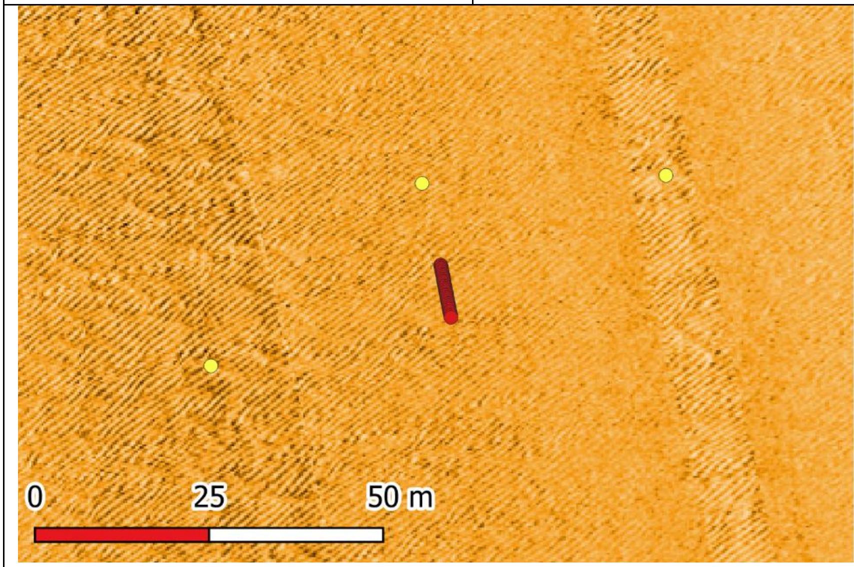
|---|---|---|
| **BM16_030**<br>MAG response. Large Target<br><br>Confidence level:3<br>Significance level: 3<br><br>Unknown date | **Position:**<br>379324.23E 6197222.40N | **Target**: M_FR_BM16_0139 / M_FR_BM16_0186<br>**FFM:** N/A |
| |  | |
| **Description:** | Strong positive MAG anomaly. Short stretch of c. 9.2 m. MAG targets set at either end, with a total distance of c. 55 m. No visible debris nearby. | |
| **Recommended action:** | Protection zone 100 m. | |

| | | |
|---|---|---|
| **BM16_031**<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date | **Position:**<br>378049.37E 6197470.89N | **Target**: M_FR_BM16_0019<br>**FFM:** N/A |
| |  | |
| **Description:** | Strong positive MAG anomaly. Short stretch of 7.7 m. MAG Target set further N. Other MAG targets nearby. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

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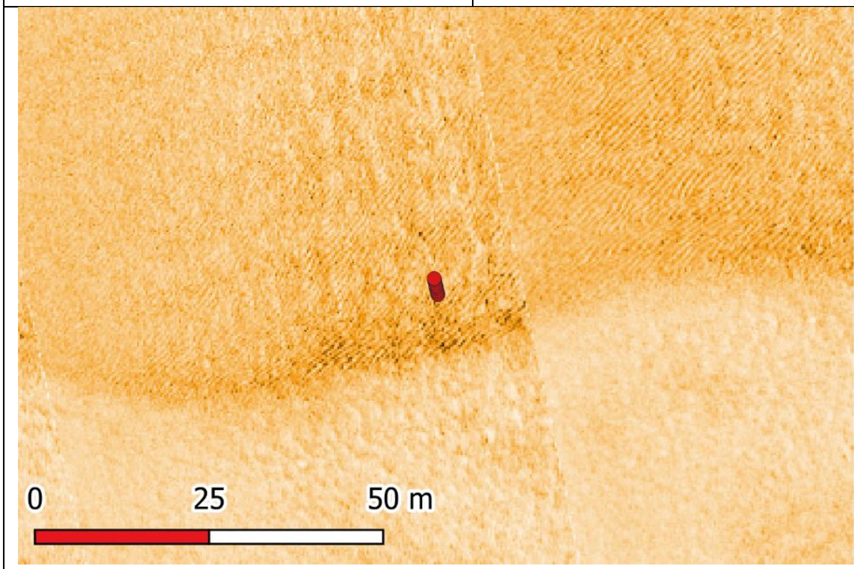
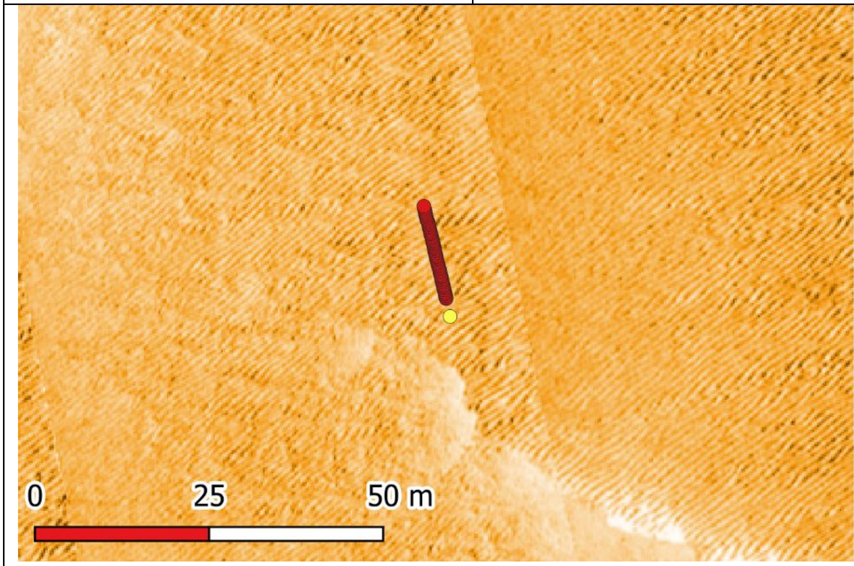
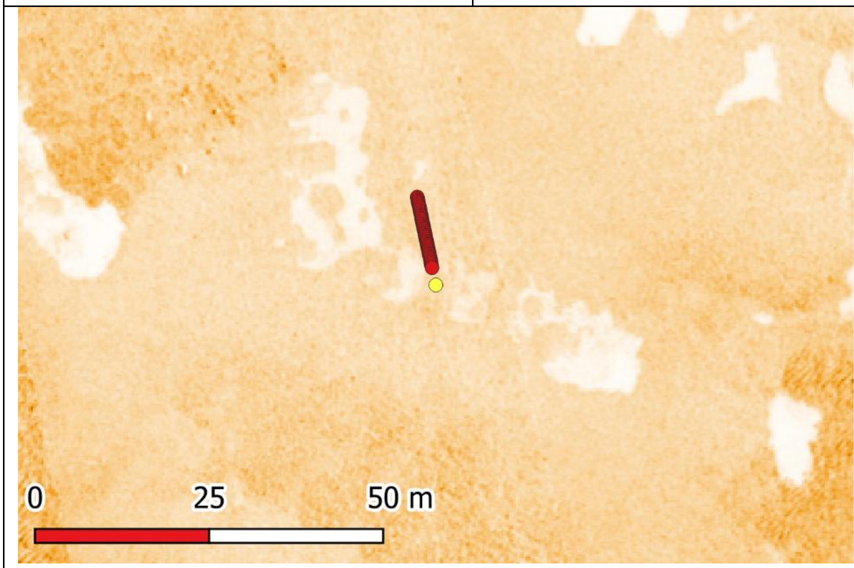
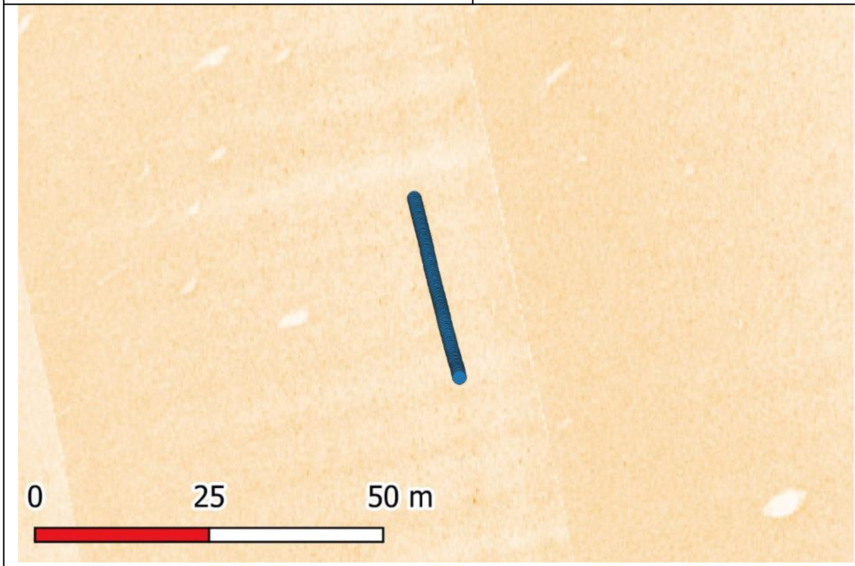
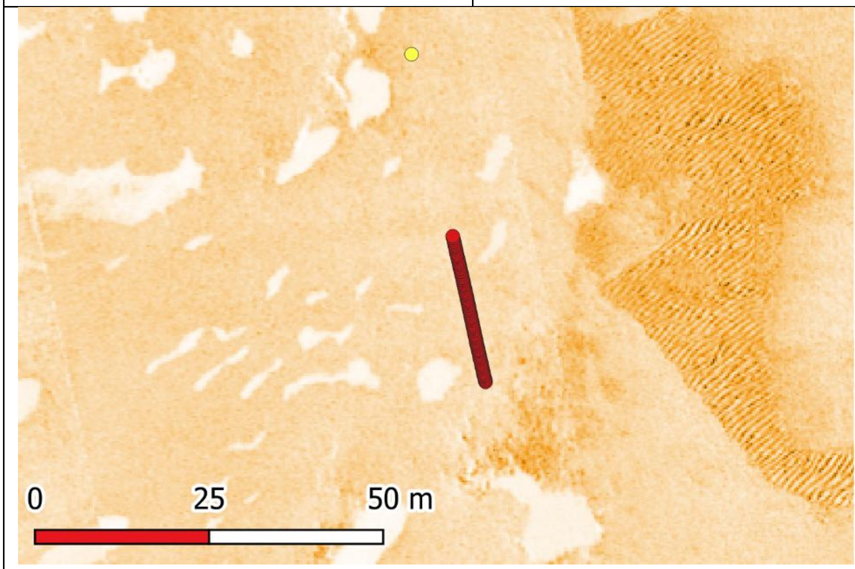
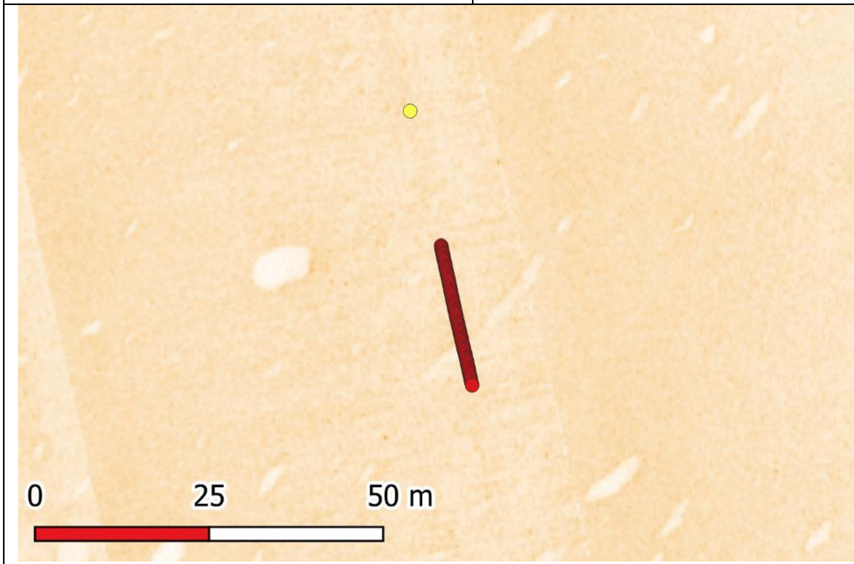
|---|---|---|
| **BM16_032**<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date | **Position:**<br>381958.79E 6193970.73N | **Target**: N/A<br>**FFM:** N/A |
| |  | |
| **Description:** | Strong positive MAG anomaly. Very short stretch of c. 2.4 m. No MAG target set at this location. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m | |

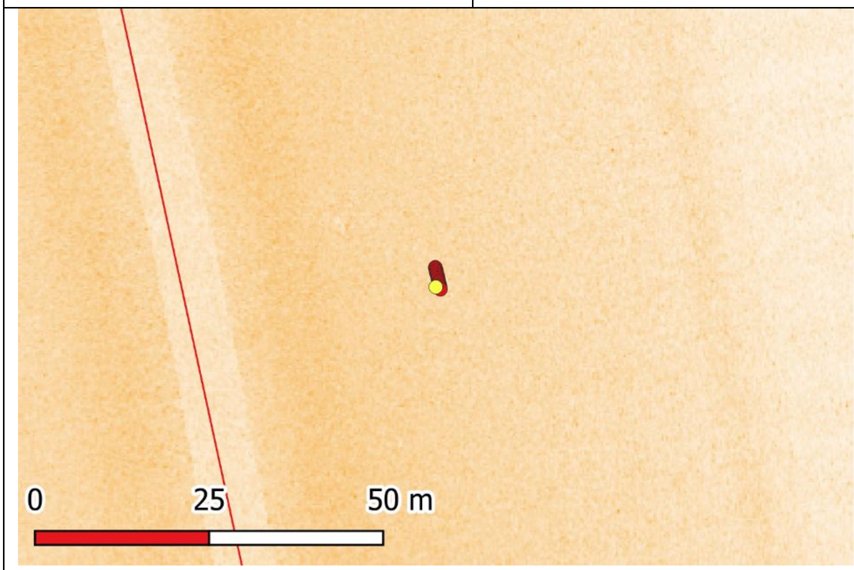
| **BM16_033**<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date | **Position:**<br>378640.56E 6196064.82N<br> | **Target:** M_FR_BM16_0056<br>**FFM:** N/A |
|---|---|---|
| **Description:** | Strong positive MAG anomaly. Stretches c. 13.7 m. No visible debris nearby. | |
| **Recommended action:** | Protection zone 100 m. | |

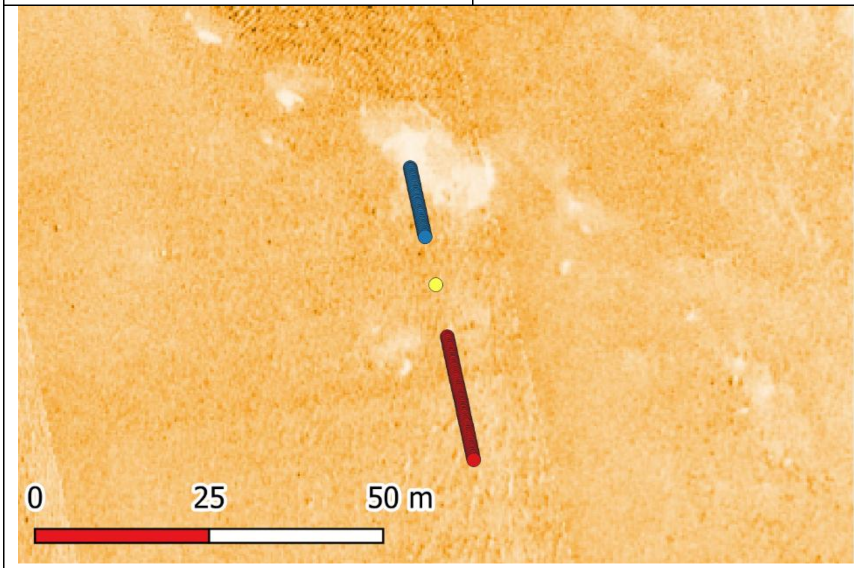
| **BM16_034**<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date | **Position:**<br>379875.74E 6193014.49N<br> | **Target:** M_FR_BM16_0107<br>**FFM:** N/A |
|---|---|---|
| **Description:** | Strong positive MAG anomaly. Stretches c. 10.4 m. No visible debris nearby. | |
| **Recommended action:** | Protection zone 100 m. | |

| **BM16_035**<br>MAG response.<br><br>Confidence level: 2<br>Significance level: 2<br><br>Unknown date | **Position:**<br>379875.74E 6193014.49N | **Target**: M_FR_BM16_0107<br>**FFM:** N/A |
|---|---|---|
| | <br> | |
| **Description:** | Strong negative MAG anomaly. Stretches c. 26.5 m. No visible debris nearby. | |
| **Recommended action:** | Protection zone 100 m. | |

| **BM16_036**<br>MAG response.<br><br>Confidence level: 2<br>Significance level: 3<br><br>Unknown date | **Position:**<br>380568.49E 6191794.38N | **Target**: M_FR_BM16_0146<br>**FFM:** N/A |
|---|---|---|
| | <br> | |
| **Description:** | Strong positive MAG anomaly. Stretches c. 21.4 m. The MAG Target is set another 26.8 m further N. No visible debris nearby. | |
| **Recommended action:** | Protection zone 100 m. | |

<table>
<tr><td rowspan="2">BM16_037<br>MAG response.<br>Possible wreck.<br><br>Confidence level: 2<br>Significance level: 2<br><br>Unknown date</td><td>Position:<br>381153.33E 6191405.58N</td><td>Target: M_FR_BM16_0203<br>FFM: 100110c-75?</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Stretches c. 20.6 m. MAG Target set further 19.8 m N. No visible debris nearby. However, FFM 100110c-75 is located c. 260 WSW of this anomaly. It may be the same site, which is a wreck reported as a net snag by a fisherman.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

<table>
<tr><td rowspan="2">BM16_038<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date</td><td>Position:<br>379537.97E 6189946.50N</td><td>Target: M_FR_BM16_0748<br>FFM: 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 3.2 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

| | | |
|---|---|---|
| **BM16_039**<br>MAG response.<br>Large target.<br><br>Confidence level: 2<br>Significance level: 2<br><br>Unknown date | **Position:**<br>383780.52E 6189864.32N | **Target**: M_FR_BM16_0545<br>**FFM:** N/A |
| | <br> | |
| **Description:** | Strong MAG anomaly, both positive and negative. Stretches c. 43.0 m. No visible debris nearby. | |
| **Recommended action:** | Protection zone 100 m. | |

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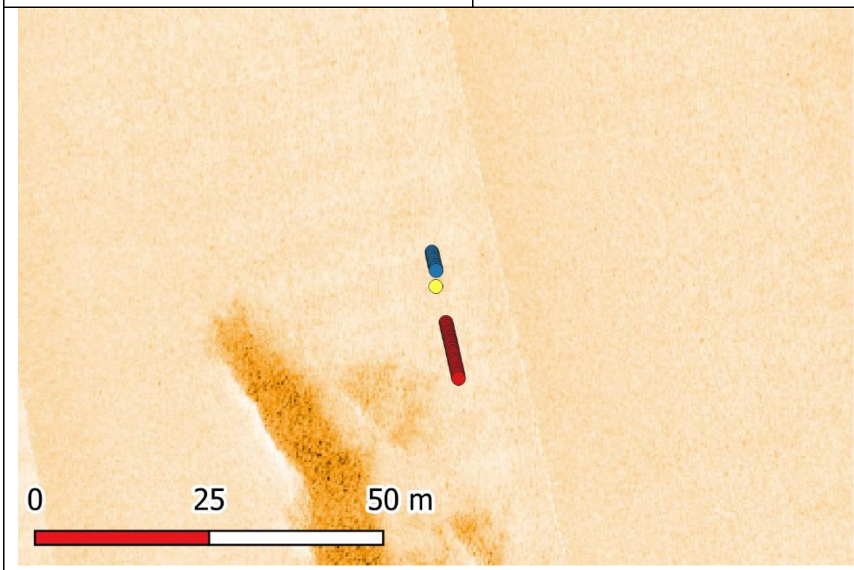
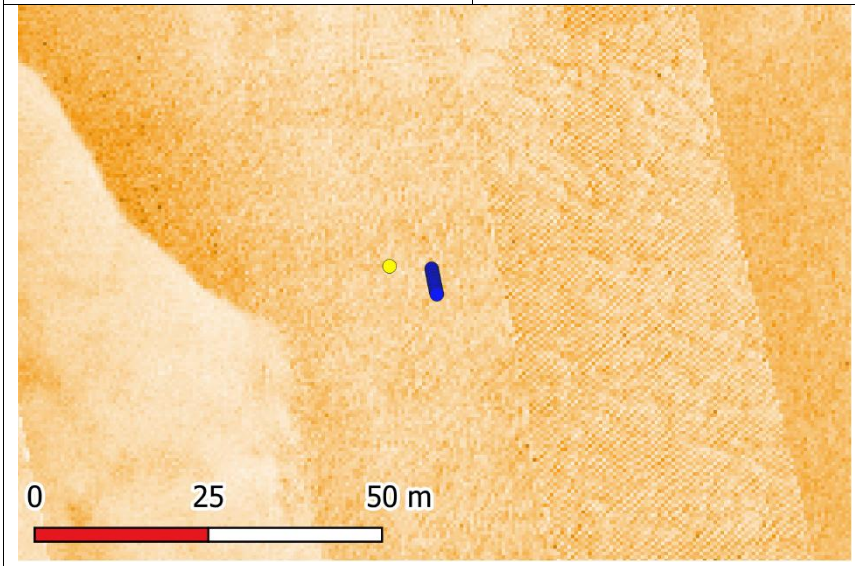
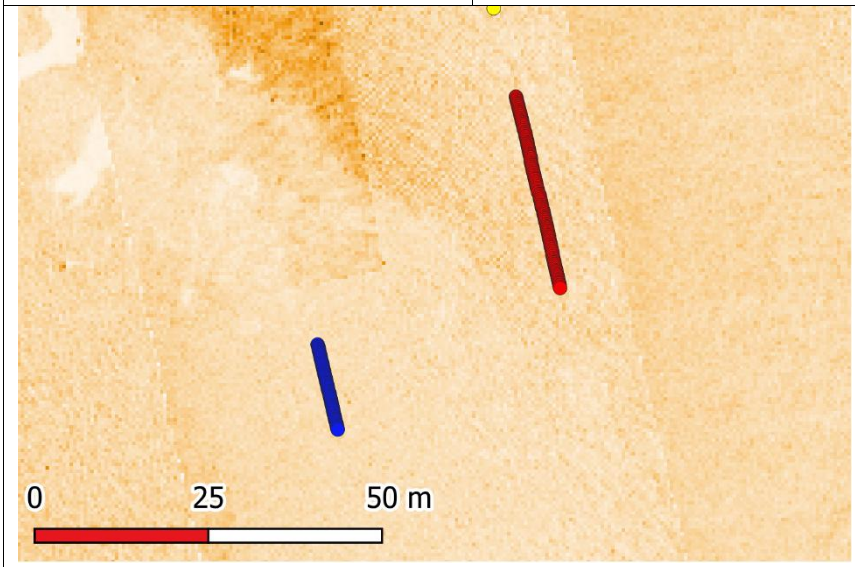
|---|---|---|
| **BM16_040**<br>MAG response.<br><br>Confidence level: 2<br>Significance level: 3<br><br>Unknown date | **Position:**<br>380155.42E 6187760.43N | **Target**: M_FR_BM16_0031<br>**FFM:** N/A |
| | <br> | |
| **Description:** | Strong MAG anomaly, both positive and negative. Stretches c. 18.6 m. No visible debris nearby. | |
| **Recommended action:** | Protection zone 100 m. | |

| BM17_005<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date | **Position:**<br>374662.82E 6206155.78N<br> | **Target:** M_FR_BM17_0587<br>**FFM:** N/A |
|---|---|---|
| **Description:** | Strong negative MAG anomaly. Very short stretch of 3.8 m. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

| BM17_006<br>MAG response.<br><br>Confidence level: 2<br>Significance level: 3<br><br>Unknown date | **Position:**<br>375794.05E 6203664.27N<br> | **Target:** M_FR_BM17_0552<br>**FFM:** N/A |
|---|---|---|
| **Description:** | Two strong MAG anomalies, one positive and one negative, in two adjoining transects. Stretches of 28.3 and 12.6 m resp. Target set between the lines. No visible debris nearby. | |
| **Recommended action:** | Protection zone 100 m. | |

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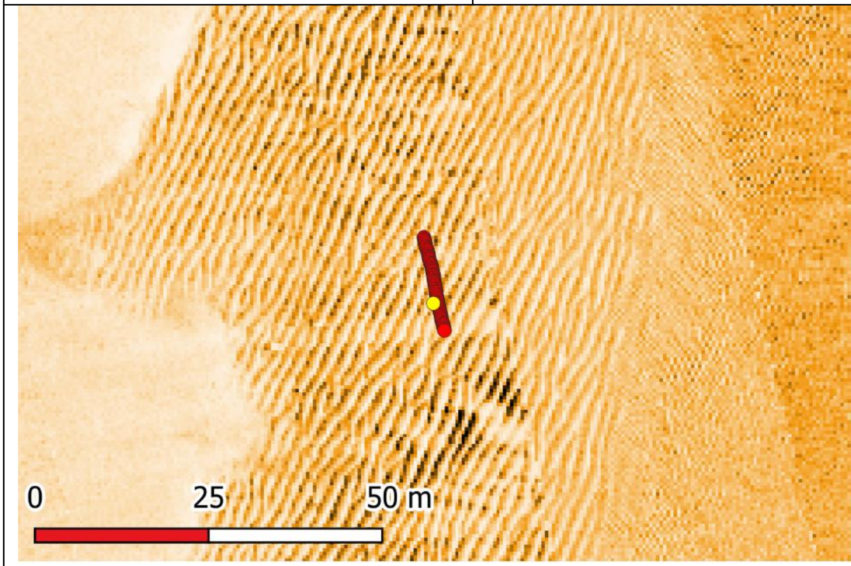
|---|---|---|
| **BM17_007**<br>MAG response.<br><br>Confidence level: 2<br>Significance level: 3<br><br>Unknown age | **Position:**<br>373476.60E 6202706.63N | **Target**: M_FR_BM17_0591<br>**FFM:** |
| |  | |
| **Description:** | Strong positive MAG anomaly. Stretches c. 13.8 m. No visible debris nearby. | |
| **Recommended action:** | Protection zone 100 m. | |

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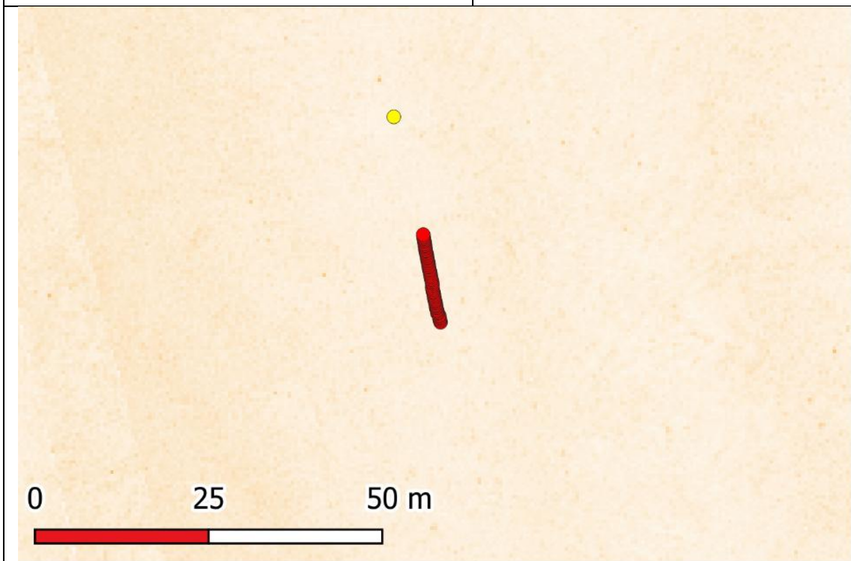
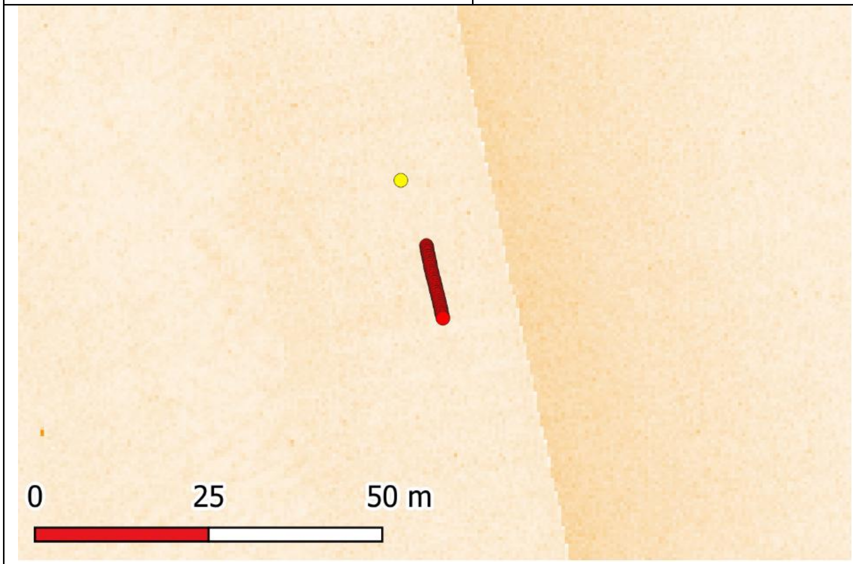
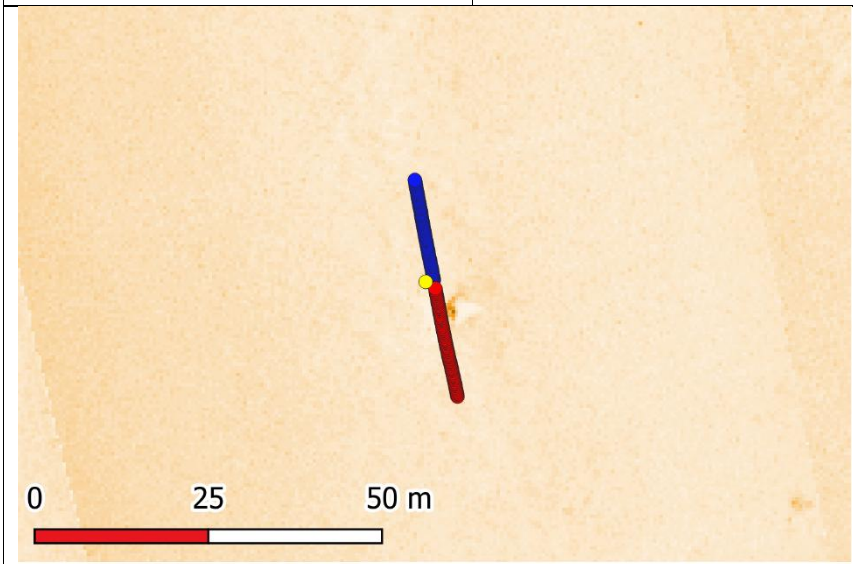
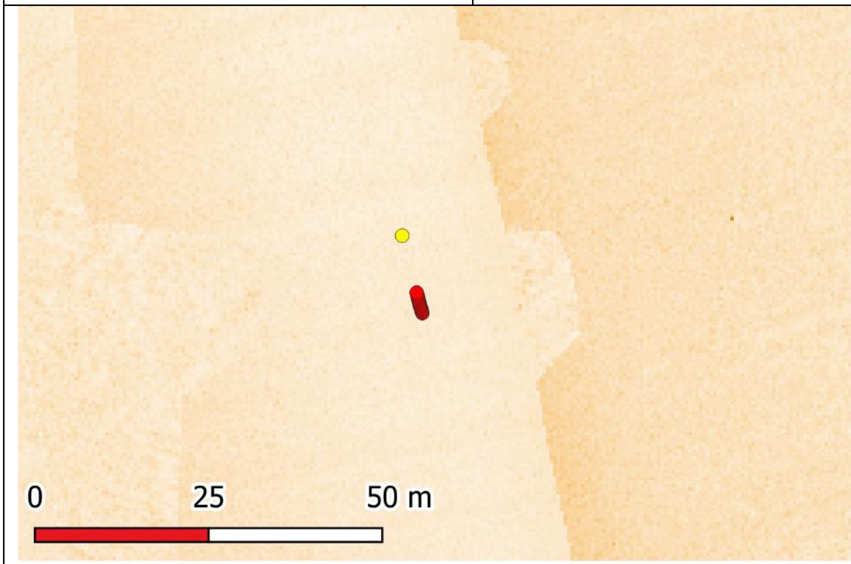
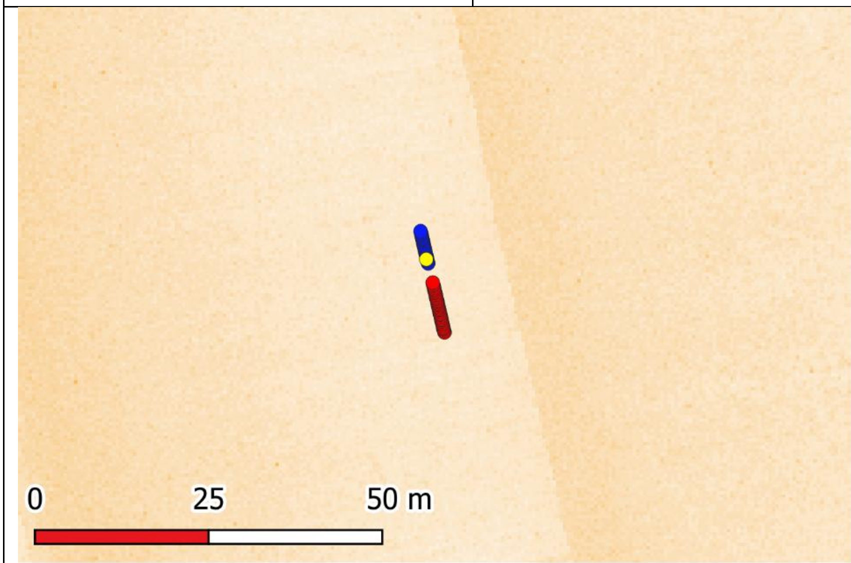
| **BM17_009**<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>376359.85E 6193533.46N | **Target**: M_FR_BM17_0510<br>**FFM:** N/A |
| |  | |
| **Description:** | Strong positive MAG anomaly. Stretch of c. 12.9 m. MAG Target is set further 17.5 m N. No visible debris nearby. | |
| **Recommended action:** | Protection zone 100 m. | |

| **BM17_010**<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>376899.76E 6191375.13N | **Target**: M_FR_BM17_0509<br>**FFM:** N/A |
|---|---|---|
| | <br> | |
| **Description:** | Strong positive MAG anomaly. Stretch of c. 10.8 m. MAG Target is set further 10.1 m N. No visible debris nearby. | |
| **Recommended action:** | Protection zone 100 m. | |

| **BM17_011**<br>MAG response.<br>Debris<br><br>Confidence level: 1<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>378848.07E 6189816.70N | **Target**: S_FR_BM17_1018<br>M_FR_BM17_0457<br>**FFM:** N/A |
|---|---|---|
| | <br> | |
| **Description:** | Strong MAG anomaly, both positive and negative. Stretch of c. 31.8 m. MAG Target is set further 17.5 m N. Crosses a visible piece of debris (S_FR_BM17_1018). | |
| **Recommended action:** | Protection zone 50 m. | |

<table>
<tr><td>BM17_012<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date.</td><td>Position:<br>379520.74E 6189516.97N<br>
</td><td>Target: M_FR_BM17_0390<br>FFM: N/A</td></tr>
<tr><td>Description:</td><td colspan="2">Strong positive MAG anomaly. Very short stretch of c. 3.1 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>BM17_013<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date.</td><td>Position:<br>379529.06E 6188990.84N<br>
</td><td>Target: M_FR_BM17_0459<br>FFM: N/A</td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomaly, both positive and negative. Stretch of c. 15.0 m. MAG Target is set further 17.5 m N. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

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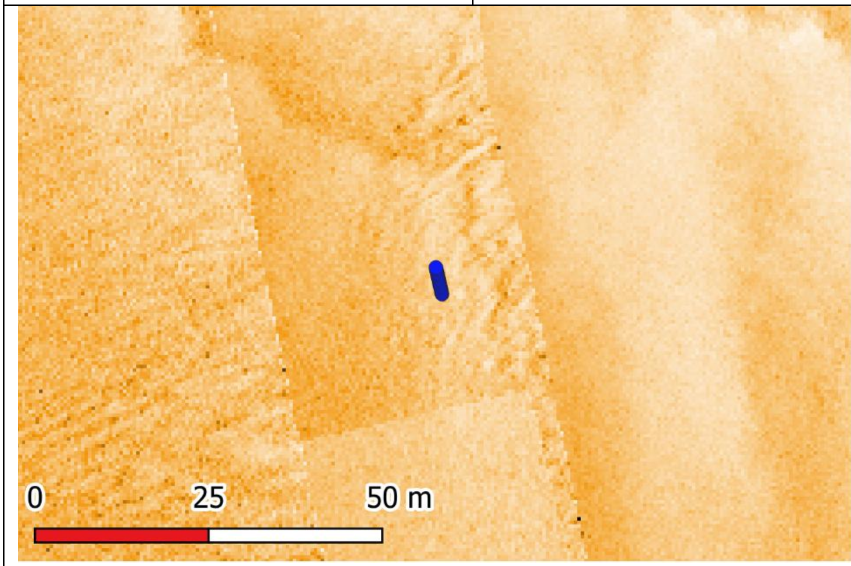
|---|---|---|
| **BM17_014**<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>379529.06E 6188990.84N | **Target**: N/A<br>**FFM:** N/A |
| |  | |
| **Description:** | Strong positive MAG anomaly. Very short stretch of c. 4.0 m. No MAG target is set. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

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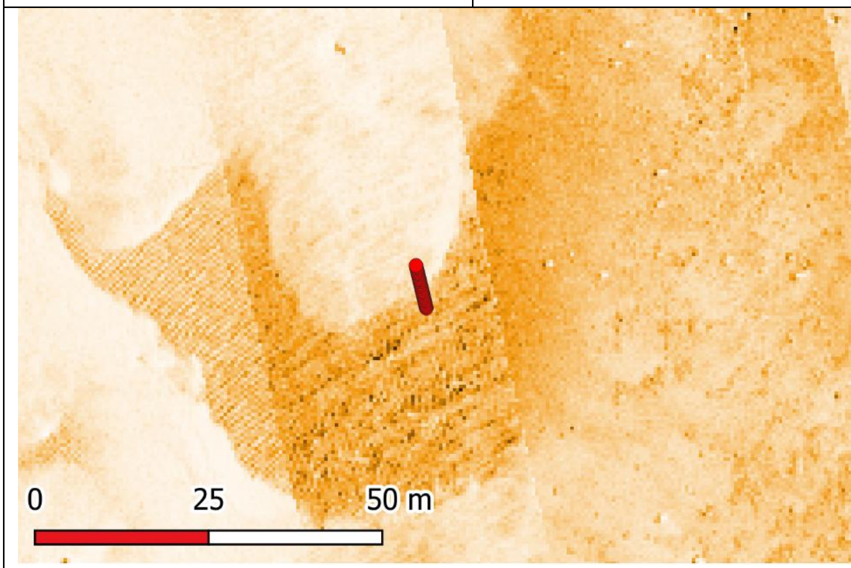
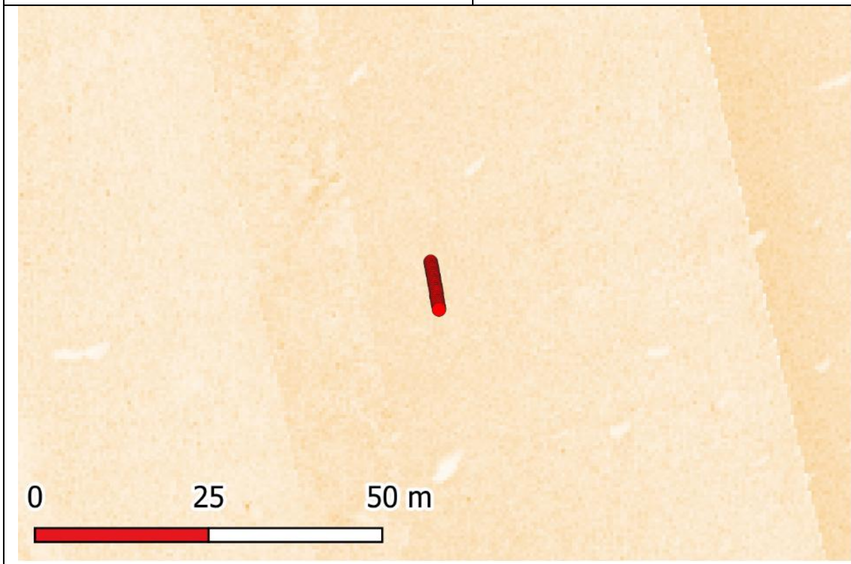
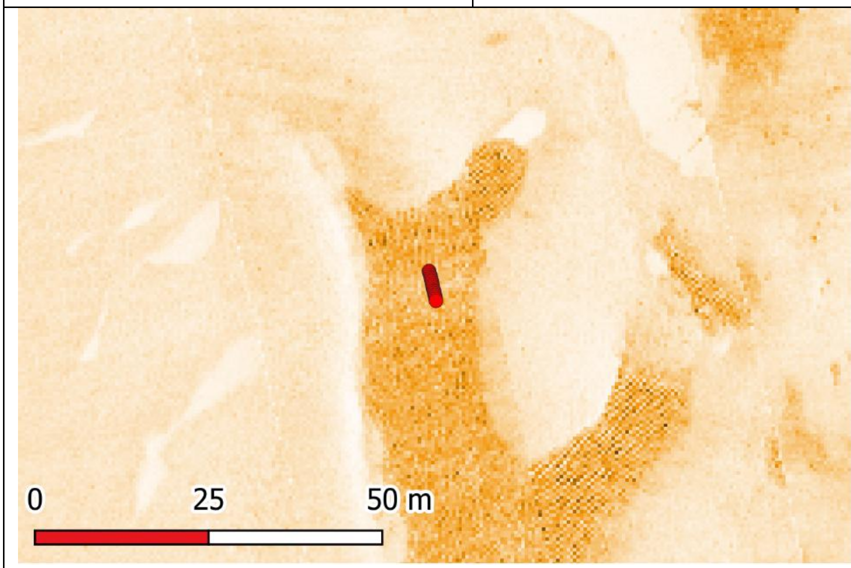
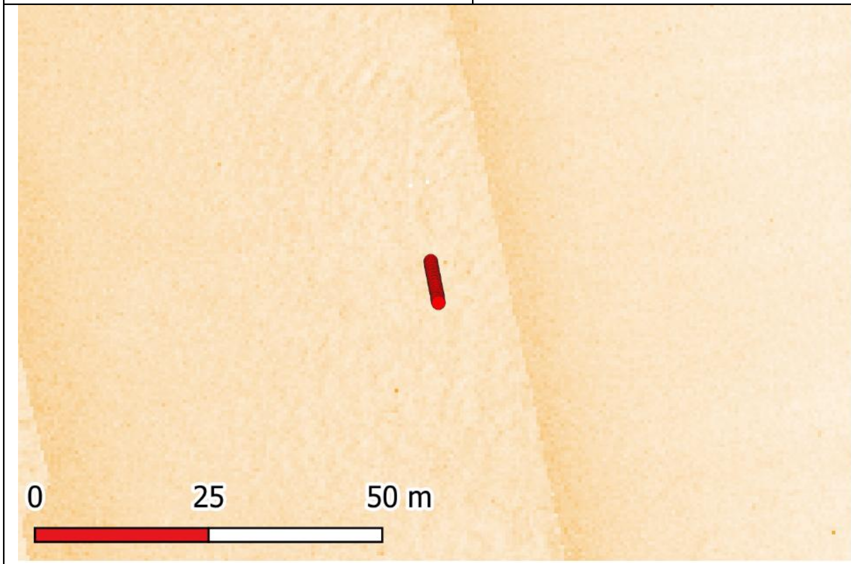
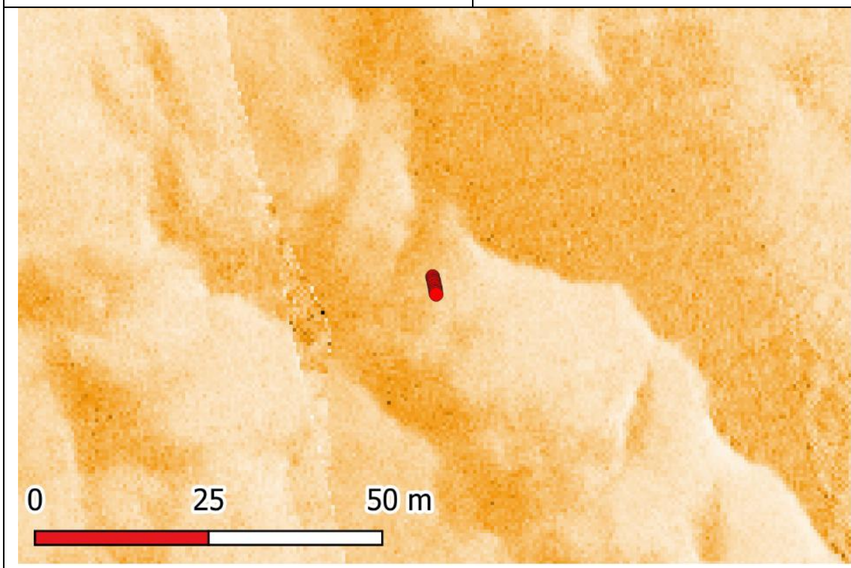
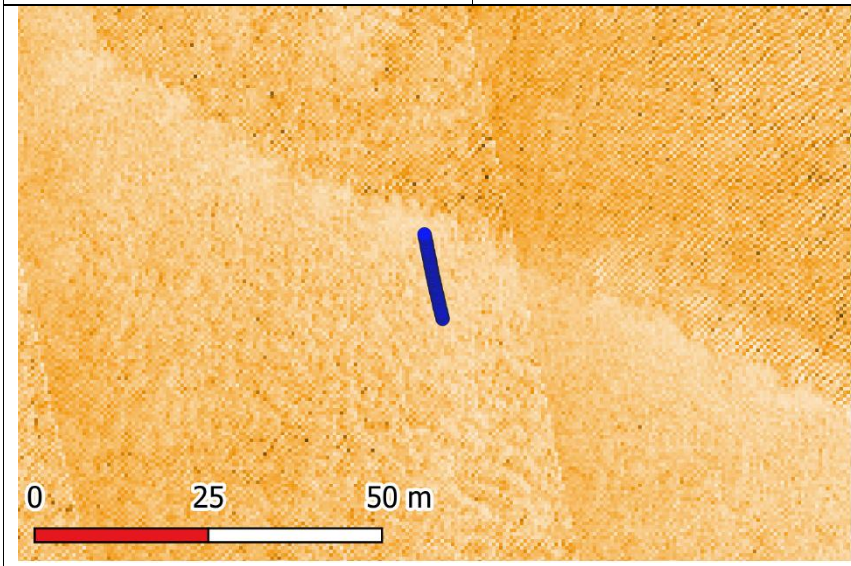
|---|---|---|
| **BM17_015**<br>MAG response.<br>Debris or boulder<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>375862.55E 6200952.89N | **Target**: N/A<br>**FFM:** N/A |
| |  | |
| **Description:** | Strong positive MAG anomaly. Short stretch of c. 6.3 m. No MAG Target is set. No visible debris nearby. Several boulders in the area. | |
| **Recommended action:** | Protection zone 50 m. | |

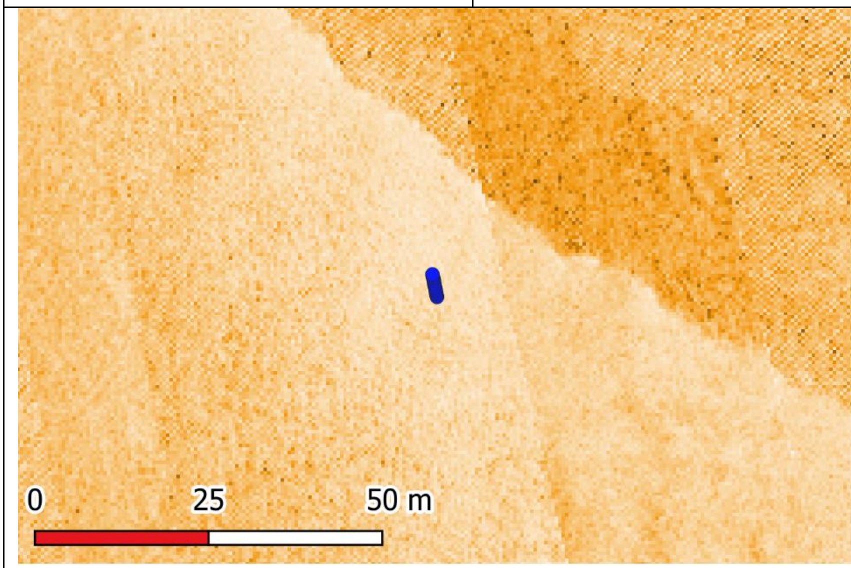
| **BM17_016**<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>376578.76E 6200621.91N<br><br> | **Target**: N/A<br>**FFM:** N/A |
|---|---|---|
| **Description:** | Strong positive MAG anomaly. Stretch of c. 7.0 m. No MAG Target is set. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

| **BM17_017**<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>376754.24E 6200479.18N<br><br> | **Target**: N/A<br>**FFM:** N/A |
|---|---|---|
| **Description:** | Strong positive MAG anomaly. Very short stretch of c. 4.4 m. No MAG Target is set. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

<table>
<tr><td rowspan="2">BM17_018<br>MAG response.<br>Debris<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date.</td><td>Position:<br>375795.80E 6199938.71N</td><td>Target: N/A<br>FFM: 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. 6.0 m. No MAG Target is set. 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">BM17_019<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date.</td><td>Position:<br>376359.85E 6193533.46N</td><td>Target: N/A<br>FFM: 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. 2.6 m. No MAG Target is set. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

| | | |
|---|---|---|
| **BM17_020**<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>377276.16E 6197896.38N<br><br><br> | **Target**: N/A<br>**FFM:** N/A |
| **Description:** | Strong negative MAG anomaly. Stretch of c. 12.4 m. No MAG Target is set. No visible debris nearby. | |
| **Recommended action:** | Protection zone 100 m. | |

| | | |
|---|---|---|
| **BM17_021**<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>377113.21E 6197992.23N<br><br><br> | **Target**: N/A<br>**FFM:** N/A |
| **Description:** | Strong negative MAG anomaly. Very short stretch of c. 3.3 m. No MAG Target is set further 17.5 m N. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

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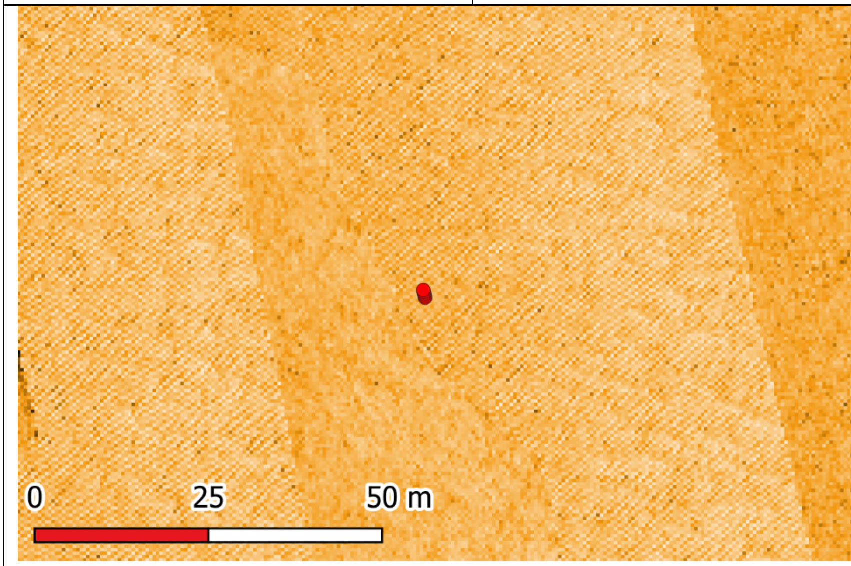
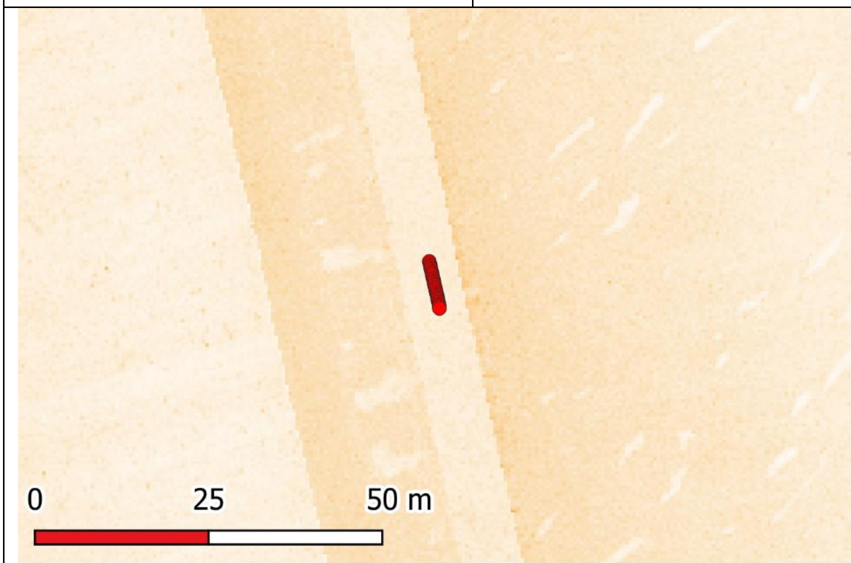
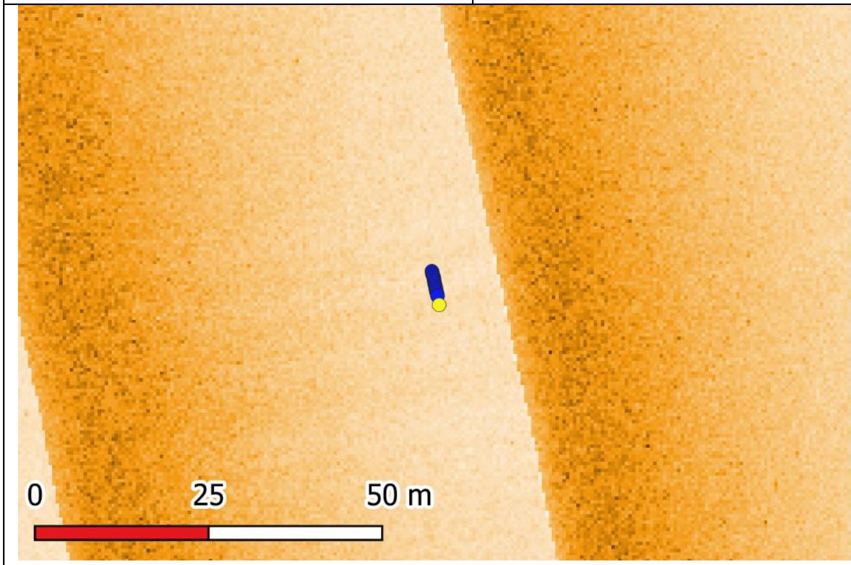
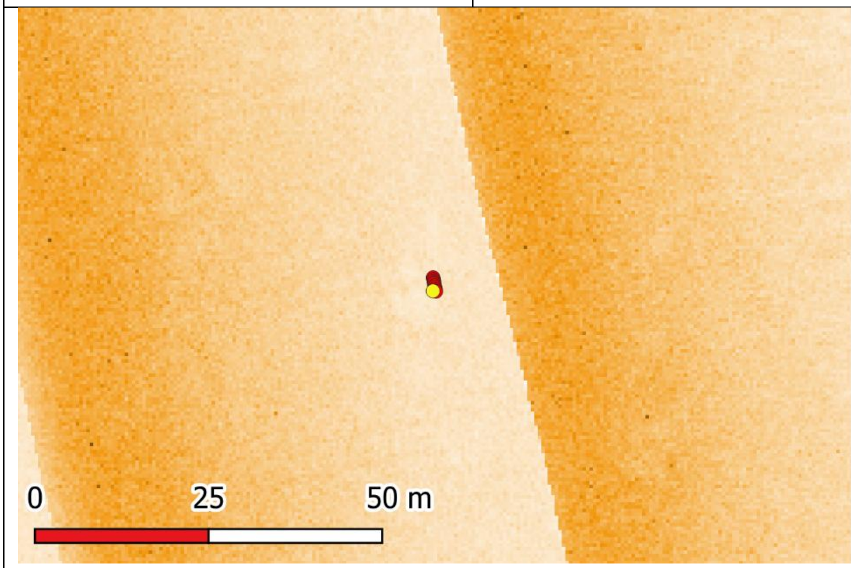
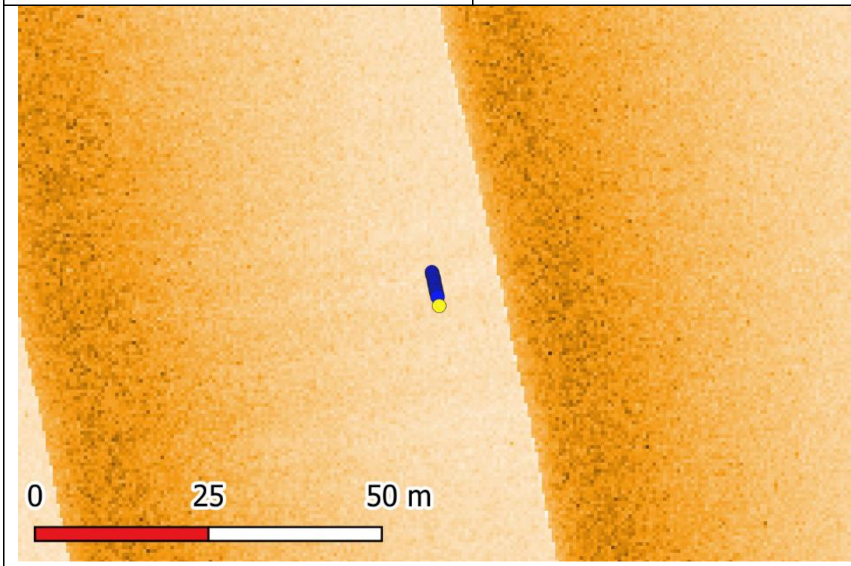
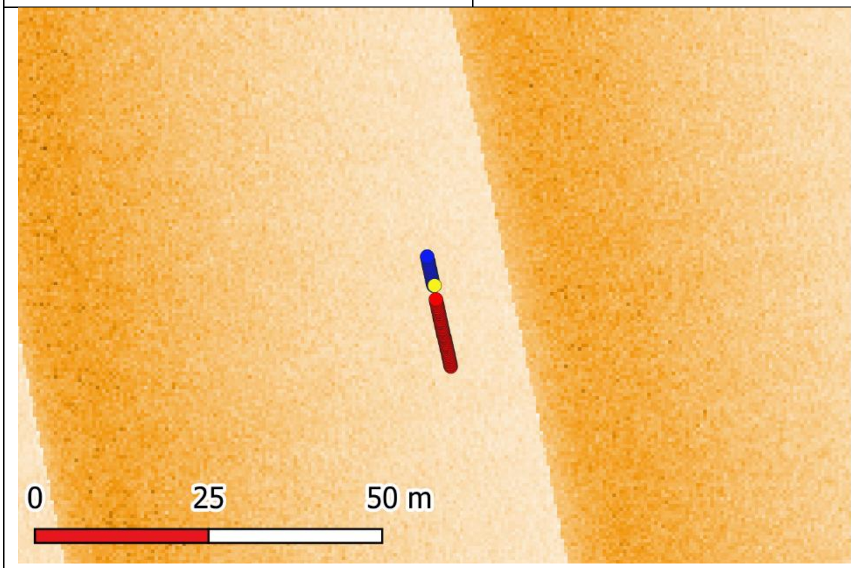
|---|---|---|
| **BM17_022**<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>377185.16E 6197491.61N<br><br> | **Target**: N/A<br>**FFM:** N/A |
| **Description:** | Strong positive MAG anomaly. Very short stretch of c. 1.1 m. No MAG Target is set. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

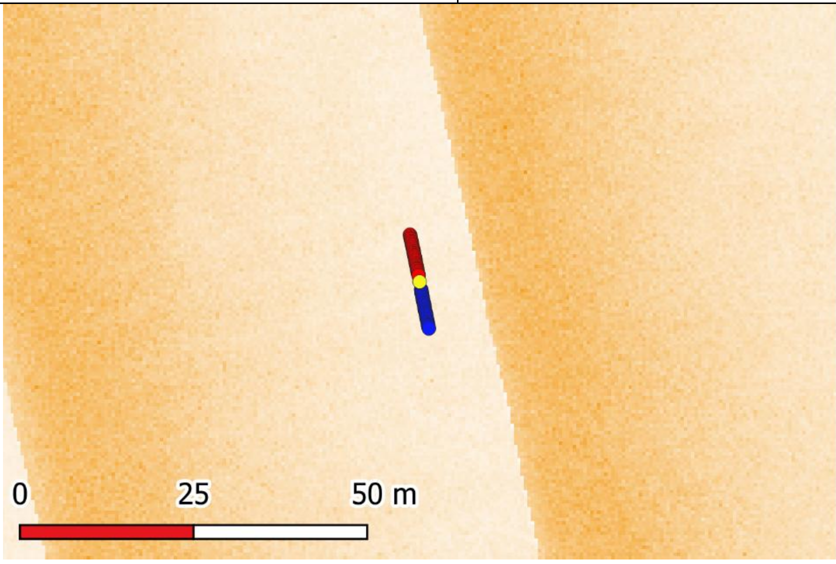
| | | |
|---|---|---|
| **BM17_023**<br>MAG response.<br>Debris.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>377126.06E 6194627.77N<br><br> | **Target**: N/A<br>**FFM:** N/A |
| **Description:** | Strong positive MAG anomaly. Short stretch of c. 7.0 m. MAG Target is set further 17.5 m N. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

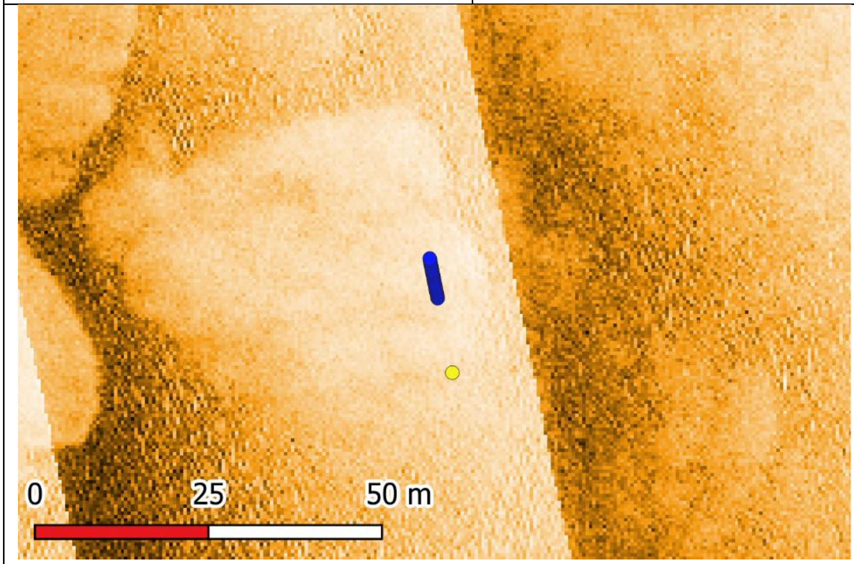
| **BM18_002**<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>371062.07E 6188403.29N | **Target:** M_FR_BM18_0233<br>**FFM:** N/A |
|---|---|---|
| |  | |
| **Description:** | Strong negative MAG anomaly. Very short stretch of c. 3.7 m. MAG Target is set further 17.5 m N. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

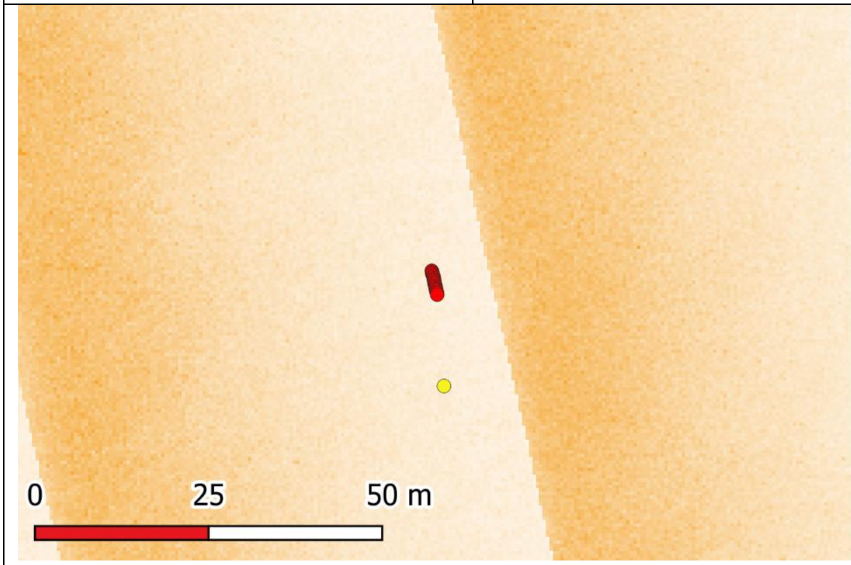
| **BM18_003**<br>MAG response.<br>Debris<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>371313.66E 6192530.17N | **Target:** M_FR_BM18_0336<br>**FFM:** N/A |
|---|---|---|
| |  | |
| **Description:** | Strong positive MAG anomaly. Very short stretch of c. 2.0 m. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

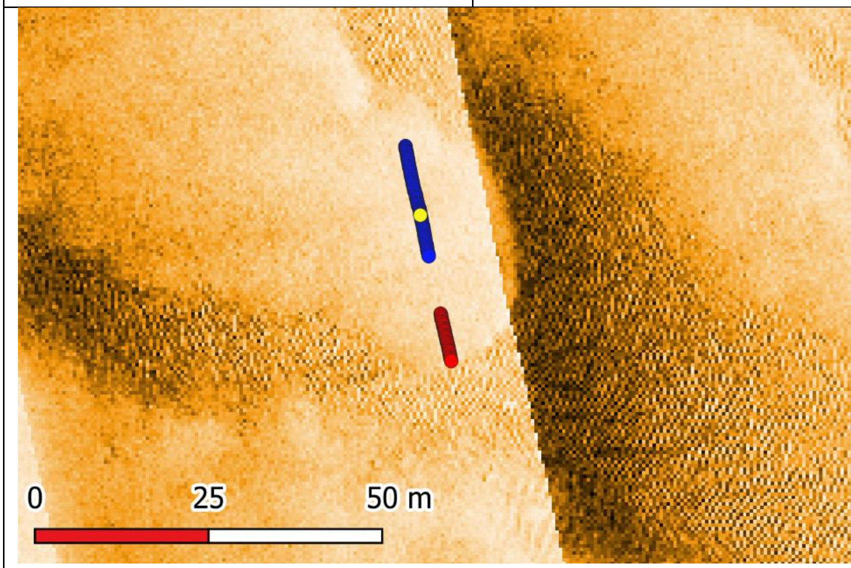
| | | |
|---|---|---|
| **BM18_004**<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>371648.02E 6192640.20N | **Target:** M_FR_BM18_0355<br>**FFM:** N/A |
| |  | |
| **Description:** | Strong negative MAG anomaly. Very short stretch of c. 2.1 m. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

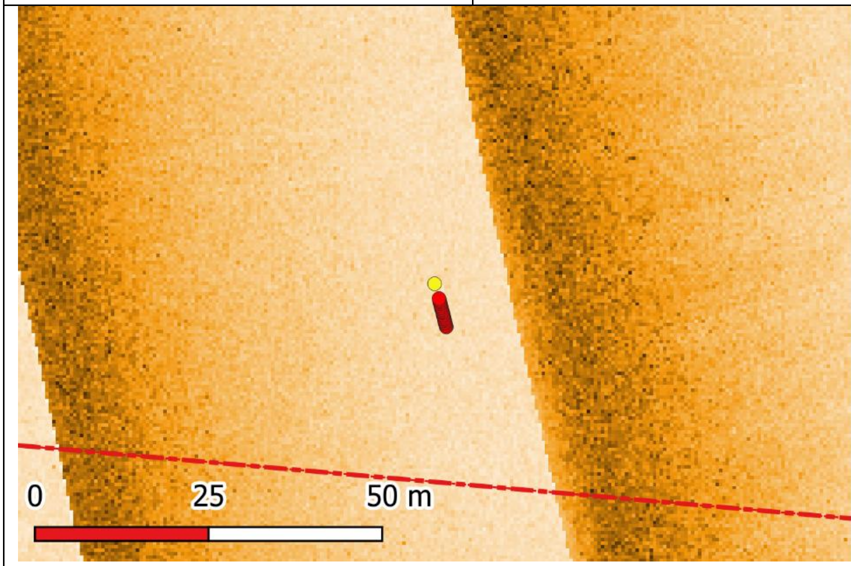
| | | |
|---|---|---|
| **BM18_005**<br>MAG response.<br><br>Confidence level: 2<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>369275.85E 6194991.47N | **Target:** M_FR_BM18_0192<br>**FFM:** N/A |
| |  | |
| **Description:** | Strong MAG anomaly, both positive and negative. Stretches c. 16.2 m. No visible debris nearby. | |
| **Recommended action:** | Protection zone 100 m. | |

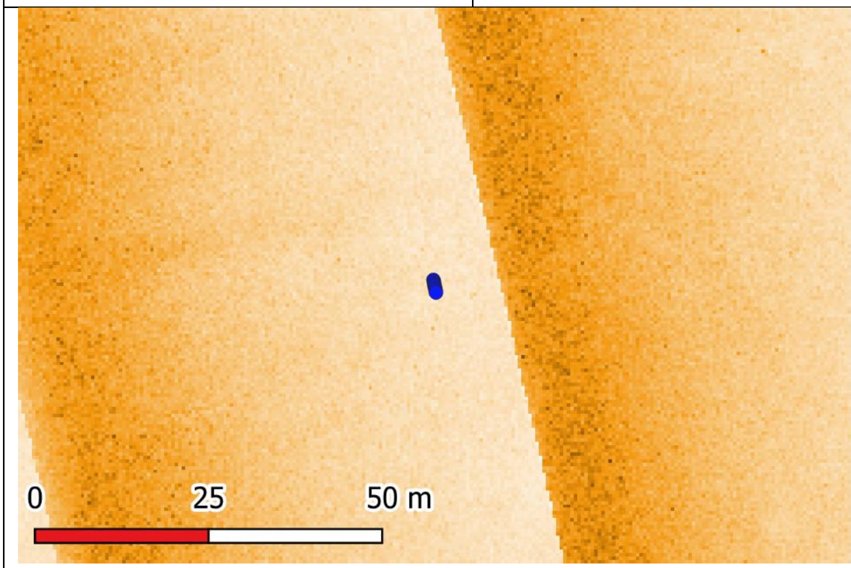
<table>
<tr><td rowspan="2">BM18_006<br>MAG response.<br><br>Confidence level: 2<br>Significance level: 3<br><br>Unknown date.</td><td>Position:<br>370997.44E 6195973.98N</td><td>Target: M_FR_BM18_0643<br>FFM: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong MAG anomaly, both positive and negative. Stretches c. 13.8 m. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 100 m.</td></tr>
</table>

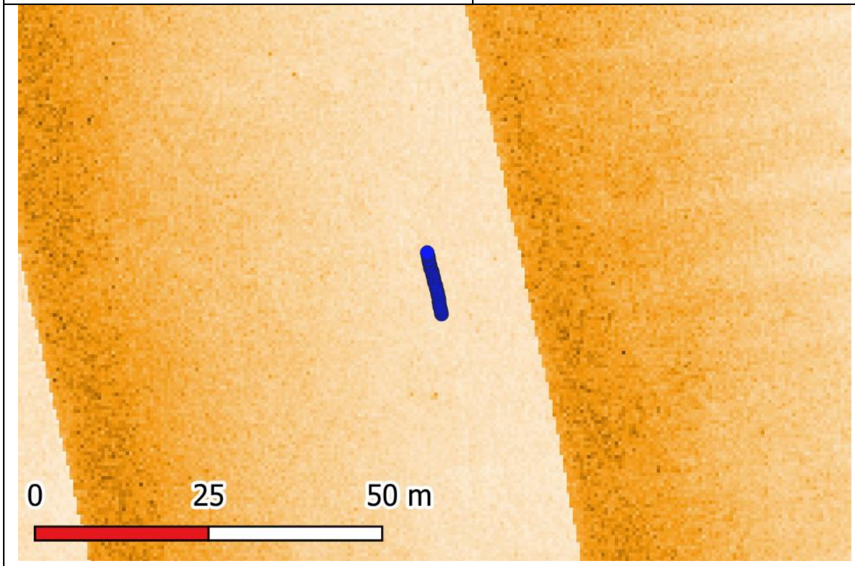
<table>
<tr><td rowspan="2">BM18_007<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date.</td><td>Position:<br>372986.72E 6196043.05N</td><td>Target: M_FR_BM18_0587<br>FFM: N/A</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Short stretch of c. 5.9 m. MAG Target is set further 10.9 m S. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

| | | |
|---|---|---|
| **BM18_008**<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>370109.43E 619610.14N<br><br><br> | **Target**: M_FR_BM18_0300<br>**FFM:** N/A |
| **Description:** | Strong positive MAG anomaly. Very short stretch of c. 3.5 m. MAG Target is set further 13.2 m N. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

| | | |
|---|---|---|
| **BM18_009**<br>MAG response.<br><br>Confidence level: 2<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>372606.62E 6198133.23N<br><br><br> | **Target**: M_FR_BM18_0589<br>**FFM:** N/A |
| **Description:** | Strong MAG anomaly, both positive and negative. Stretches c. 31.7 m. MAG Target 589 is a bit N off the turn. No visible debris nearby. | |
| **Recommended action:** | Protection zone 100 m. | |

| | | |
|---|---|---|
| **BM18_010**<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>375131.08E 6186810.13N | **Target**: M_FR_BM18_0593<br>**FFM:** N/A |
| |  | |
| **Description:** | Strong positive MAG anomaly. Very short stretch of c. 4.2m. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

| | | |
|---|---|---|
| **BM18_011**<br>MAG response.<br>Debris<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date. | **Position:**<br>373422.98E 6194367.01N | **Target**: N/A<br>**FFM:** N/A |
| |  | |
| **Description:** | Strong negative MAG anomaly. Very short stretch of c. 1.9 m. No MAG Target is set. No visible debris nearby. | |
| **Recommended action:** | Protection zone 50 m. | |

<table>
<tr><td>BM18_012<br>MAG response.<br><br>Confidence level: 3<br>Significance level: 3<br><br>Unknown date.</td><td>Position:<br>373490.53 E 6194370.72N</td><td>Target: N/A<br>FFM: N/A</td></tr>
<tr><td></td><td colspan="2">
</td></tr>
<tr><td>Description:</td><td colspan="2">Strong negative MAG anomaly. Short stretch of c. 8.9 m. No MAG Target is set. No visible debris nearby.</td></tr>
<tr><td>Recommended action:</td><td colspan="2">Protection zone 50 m.</td></tr>
</table>

## 6.3. 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 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |

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| 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 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |

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| 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 |