Netherlands Enterprise Agency

Site Studies Borssele Wind Farm Zone

Archaeological Assessment

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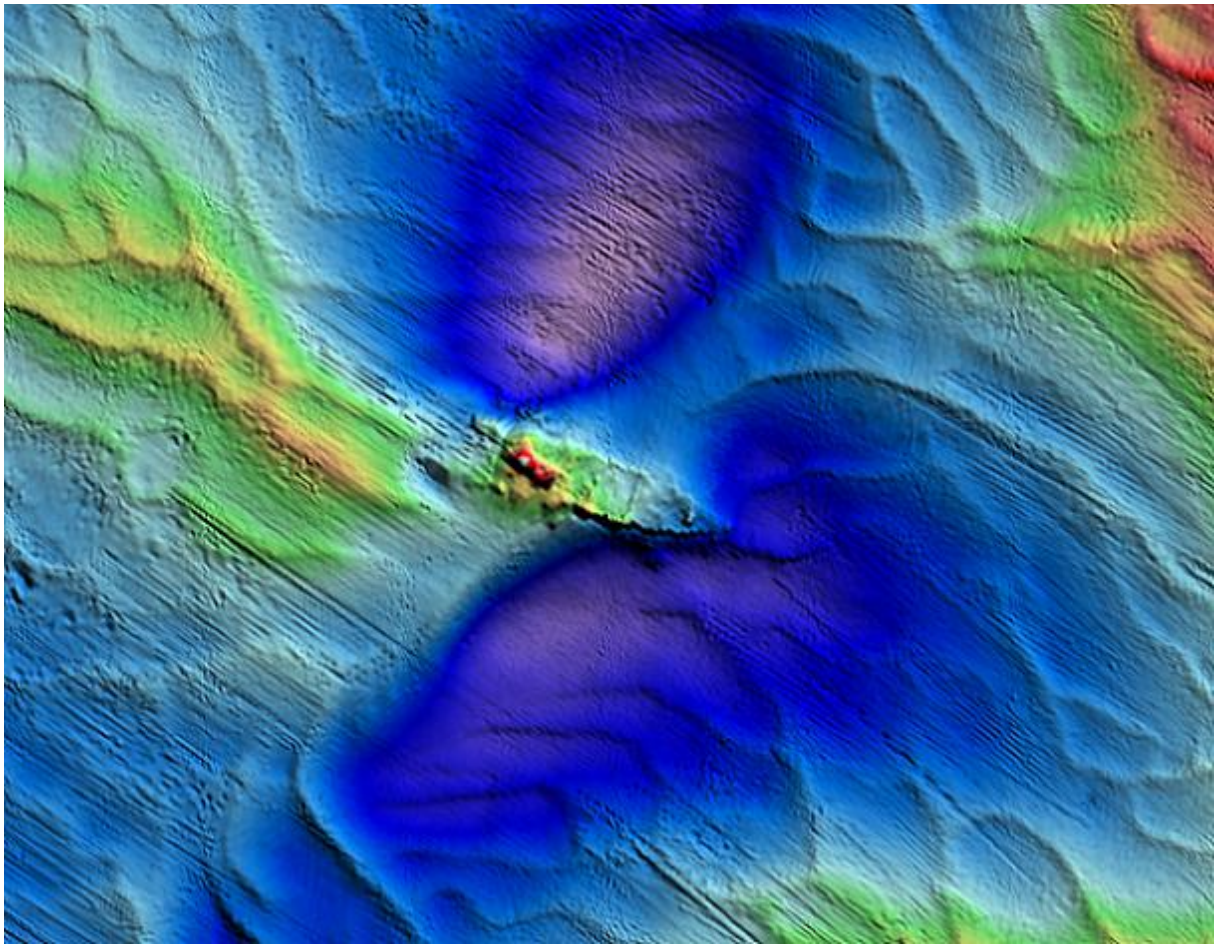
Author Periplus Archeomare

Archaeological assessment
Borssele Windfarm Zones



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Periplus Archeomare Report 16A001-02

Archaeological assessment Borssele Windfarm Zones

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Front page: multibeam echo sounder image of 42 meters long unknown ship wreck in the Borssele Wind Farm Zones. Note extensive scouring north and south of the wreck.

Content

Table 1. Dutch archeological periods

Period	Time in Years				
Post-medieval / Modern Times	1500	A.D.	-	Present	
Late medieval period	1050	A.D.	-	1500	A.D.
Early medieval period	450	A.D.	-	1050	A.D.
Roman Times	12	B.C.	-	450	A.D.
Iron Age	800	B.C.	-	12	B.C.
Bronze Age	2000	B.C.	-	800	B.C.
Neolithic (New Stone Age)	5300	B.C.	-	2000	B.C.
Mesolithic (Stone Age)	8800	B.C.	-	4900	B.C.
Paleolithic (Early Stone Age)	300.000	B.C.	-	8800	B.C.

Table 2. Administrative details of the research area

Project	Archeological assesment Borssele wind farm zones
Location	Northsea
Toponym	Borssele Wind Farm Zones
Chart	1801-01
Coordinates (ETRS89 UTM31N)	Centre E 496973, N 5726062 North E 504374, N 5738878 East E 509657, N 5731128 West E 484179, N 5732483 South E 504040, N 5713246
Archis cis-code	66109 (Desk study) 3993903100 (archaeological assessment)
Surface areas of investigation	Site I: 6325 ha Site II: 6778 ha Site III: 7921 ha (incl. Site V) Site IV: 7235 ha
Current area use	Shipping lane, fishery and recreation
Hydrographical data	Tidal currents, water depth between 15 and 42 meter LAT.
Area administrator	Ministry of Infrastructure and the Environment (Rijkswaterstaat Zee en Delta)
Authorities	Ministry of Economic Affairs with the Dutch Cultural Heritage Agency as advisor.

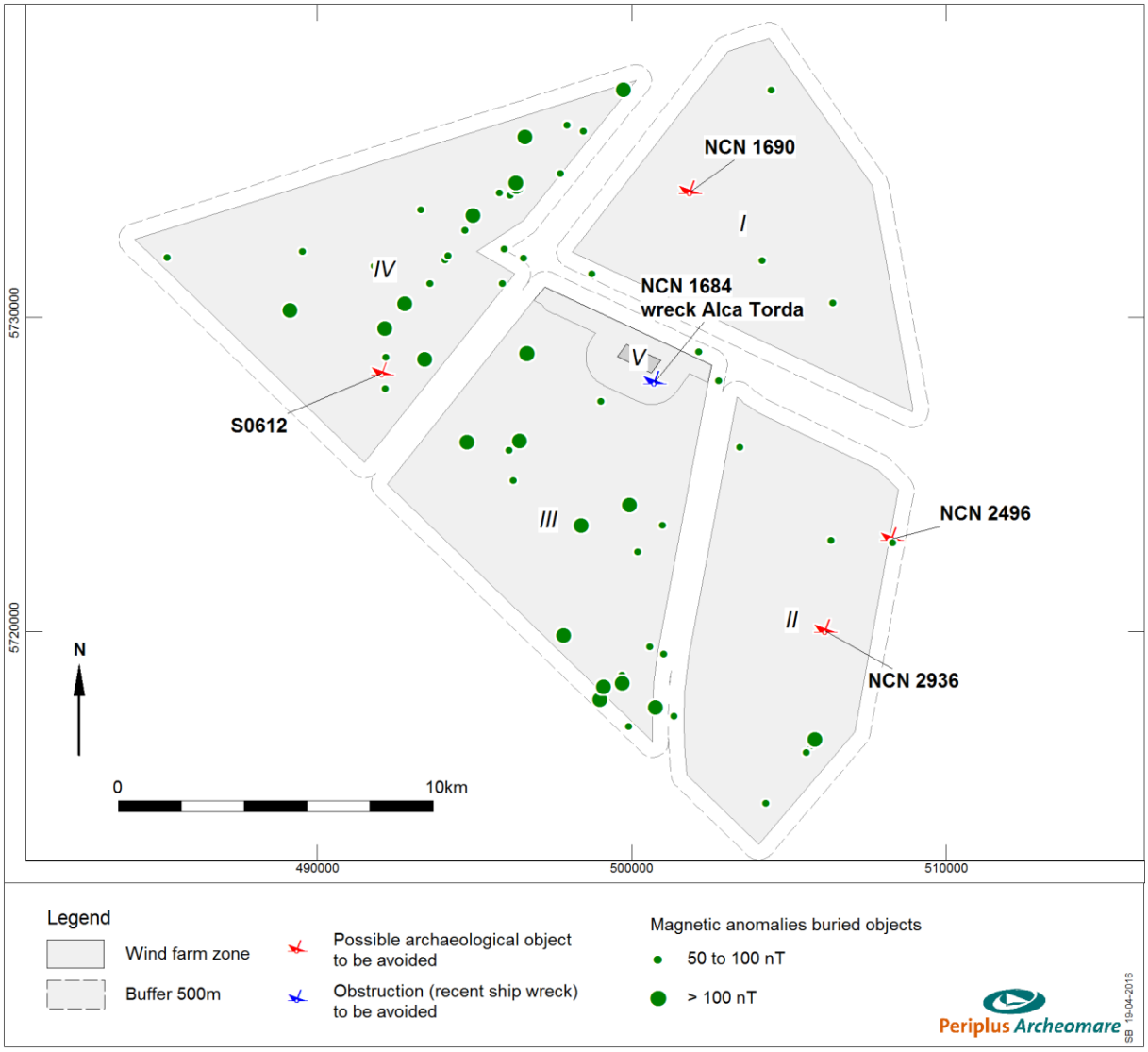
Summary

On behalf of the Netherlands Enterprise Agency (RVO.nl) Periplus Archeomare has executed an archaeological assessment of the survey data collected in the future Wind Farm Zones Borssele.

The investigation comprised an assessment of geophysical data and a comparison with known objects in the area in order to identify potential archaeological objects. A large quantity of survey data (*side scan sonar magnetometer* and *multibeam* echosounder) was analysed in order to conduct an archaeological assessment.

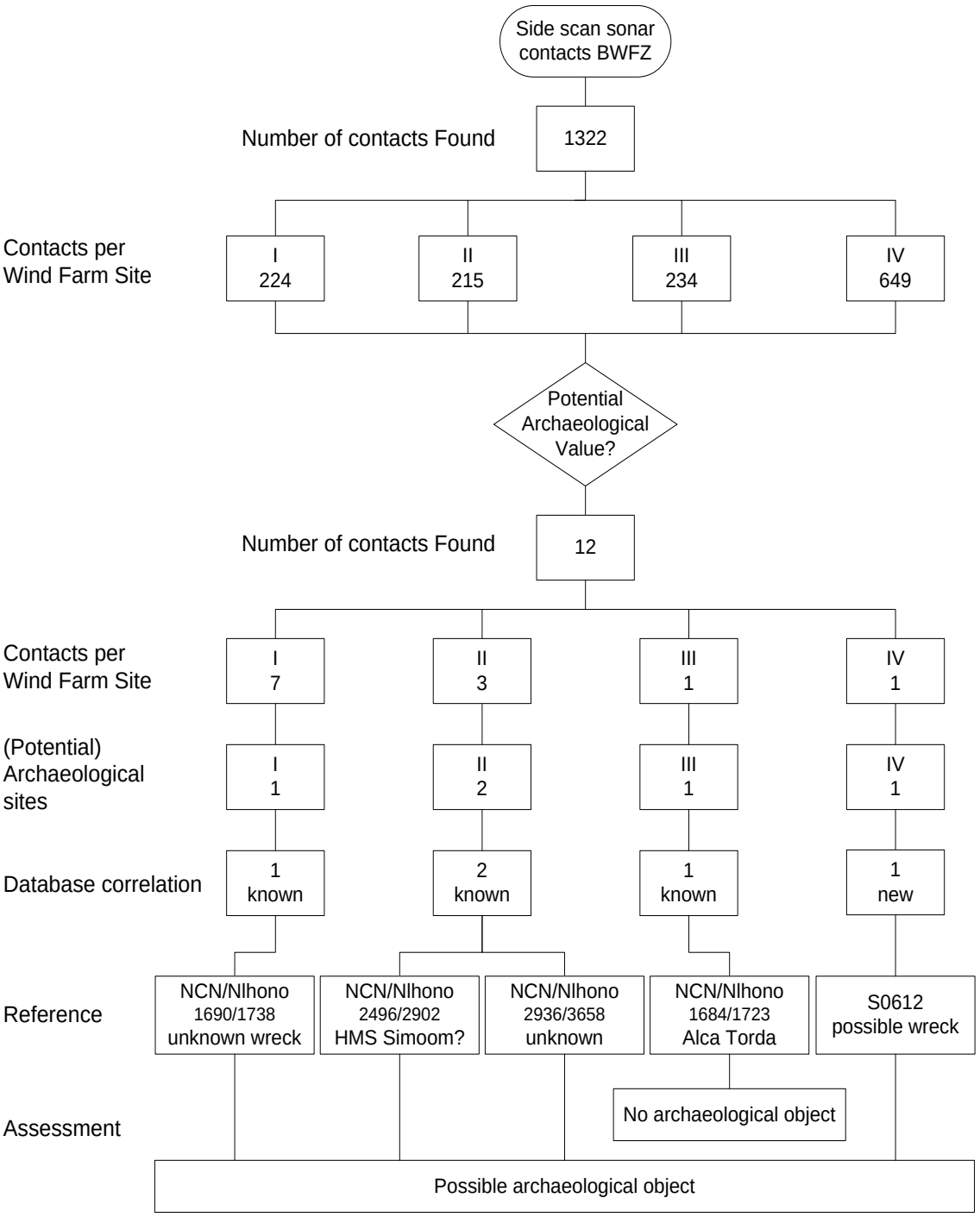
Four of the assessed contacts are designated to be of potential archaeological value based on the dimensions and shapes of the contacts and supplemented information from existing observations. A summary of the locations with possible archaeological value are presented in the table and figure below.

Location type	Total	Corresponding to known objects (NCN)	Identified in survey data
Visible structures at surface	4	3	1
Buried ferrous structures	65	0	65



The wreck of the fishing cutter Alca Torda which sunk in the seventies of the 20th century is not considered to be of archaeological value.

A summary of the process which led to the identification of four possible archaeological objects in the *side scan sonar* data is outlined in the flow chart below.

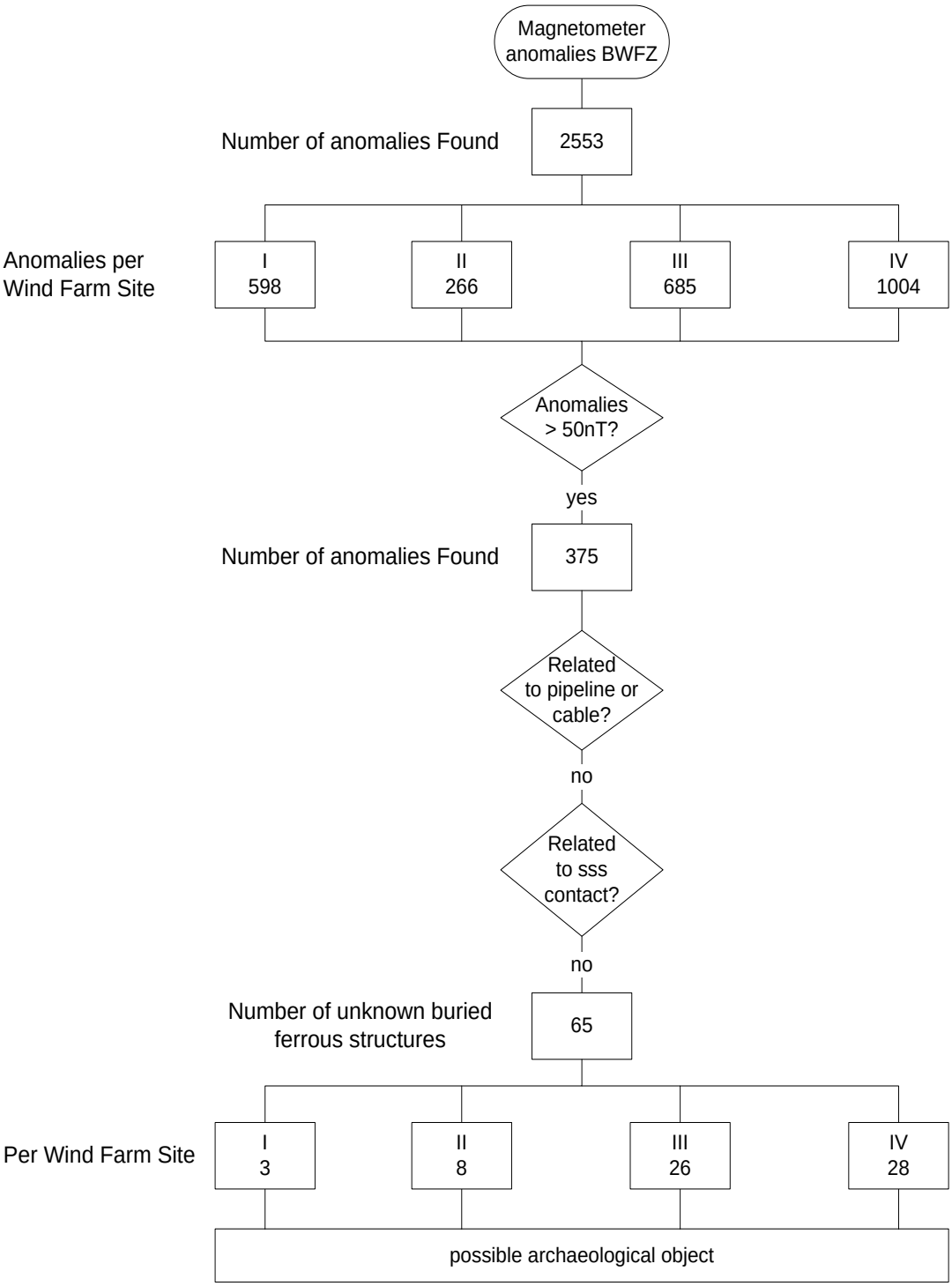


Concerning the visible structures at the seabed surface. As long as the archaeological value of the remains is not determined, it is advised not to conduct disturbing activities on the locations including a buffer zone of 100 meters around. This also applies to cable trenching and anchorages of work vessels.

The buffer zone of 100 meters is a standard that applies to the protection of cultural heritage, this distance may be reduced if it can be substantiated that the applied disturbance has no effect on the archaeological object.
For example, when no anchoring is used during cable lay operations the buffer zone can be decreased. Consent may be obtained after consultation with Rijkswaterstaat and the Cultural Heritage Agency.

Concerning the buried ferrous structures, it is advised to avoid such areas whilst installing wind turbines and constructing a trench for the cables. It should be stressed that the origin of the magnetic anomalies is unknown and apart from possible archaeological remains any type of man-made objects can be encountered including unexploded ammunition, anchors, pieces of chains and cables, debris, etcetera.

A summary of the process which led to the identification of 65 magnetometer anomalies which could represent possible archaeological objects is outlined in the flow chart below.



If it is not feasible to avoid the reported magnetometer locations, additional research is required in order to determine the actual archaeological value of the reported locations.

It is advised that the UXO research within 100 meter of the 65 magnetometer anomalies are carried out under onboard archaeological supervision. Depending on the outcome of the UXO research can be decided if additional research (for instance by means of ROV or dive investigations) is needed. If the UXO research indicates that the object has no archaeological value, the location can be omitted.

The cumulative surface areas occupied by side scan sonar and magnetometer buffer zones are shown in the figure below.

During the installation of the wind turbines and cable lay operations, archaeological objects may be discovered which were completely buried or not recognized as an archaeological object during the geophysical survey. We recommend passive archaeological supervision based on an approved program of requirements. Passive archaeological supervision means that an archaeologist is not present during the execution of the work but always available on call. Conducting this recommendation would prevent delays during the work when unexpectedly archaeological remains are found. In accordance with the Monuments Act 1988 (Revised 2007), it is required to report those findings to the competent authority. This notification must also be included in the scope of work.

1 Introduction

1.1 Developments in offshore wind power

In 2013 more than 40 organizations and the Government entered into the Energy Agreement for Sustainable Growth (Energieakkoord voor Duurzame Groei). An important part of this agreement includes scaling up of offshore wind power development. The Ministry of Economic Affairs presented a road map outlining how the Government plans to achieve its offshore wind goals in accordance with the time line agreed upon in the Energy Agreement.

The road map sets out a schedule of tenders offering 700 MW of development each year in the period 2015 – 2019. The Dutch Government has developed a systematic framework under which offshore wind farm zones are designated. Any locations outside these wind farm zones are not eligible to receive a permit. Within the designated wind farm zones the government decides the specific sites where wind farms can be constructed using a so-called Wind Farm Site Decision ('Kavelbesluit'). This contains conditions for building and operating a wind farm on a specific site. The Dutch transmission system operator TenneT will be responsible for grid connection.

Winners of the site development tenders will be granted a permit to build a wind farm according to the Offshore Wind Energy Act (Wet Windenergie op Zee[1]), a SDE+ grant and offered a grid connection to the main land. The Ministry (Rijksdienst voor ondernemend Nederland) provides all relevant site data, which can be used for the preparation of bids for these tenders.

1.2 Borssele Wind Farm Zone

One of the farms to be developed is the Borssele Wind Farm Zone (hereafter referred to as BWFZ).

The BWFZ, shown in figure 1, is located at the southern border of the Netherlands Exclusive Economic Zone (EEZ); 0.5 km from the Belgium EEZ. The zone borders a sand extraction area in the southeast and a piloting area in the east. Anchoring areas and a shipping lane are located at the north side of the zone. The Belgian dedicated offshore wind zone is located directly to the southwest.

The BWFZ of approximately 344 km^2 (234 km^2 excluding maintenance and safety zones) is located 22.2 km from shore (12 nautical miles) and is initially sub-divided into four BWFS (Site I - IV). Currently BWFS III is split into production BWFS III (330 MW) and innovation BWFS V (20 MW). In the remainder of this report Site III refers to the initial area of WFS III including the current areas of Site III and Site V. Water depth approximately ranges from 16 to 38 m. In total, approximately 1,400 MW offshore wind capacity is planned in the zone.

1.3 Motive

Preservation of archaeological remains in the seabed (*in situ*) is to be strived for according to Dutch Law.[2] The development of the BWFZ can pose a potential threat to archaeological remains in the area. Archaeological research can result in information on the type, size, age, occurrence, integrity and preservation of remains which are known or can be expected in the BWFZ. Based on information which sprouts from archaeological research control measures can be taken to preserve valuable remains if applicable.

In 2014 an archaeological desk study has been performed.[3] From the study it was concluded that *in situ* early prehistoric archaeological remains can be present in areas where the late Pleistocene to early Holocene landscape is still preserved in the geological stratigraphy.

[1] http://wetten.overheid.nl/BWBR0036752.

[2] Monuments Act.

[3] Waugh 2014.

A second type of archaeological remains which is expected within the BWFZ comprises historic wrecks and other objects, such as lost equipment or cargo and crashed airplanes.

According to the authors the risk of degradation of prehistoric sites by the development of the BWFZ is small; additional research into the presence of prehistoric remains was therefore not considered necessary. An investigation into the presence of historic wrecks and crashed airplanes by means of geophysical survey, however, was advised. For this research a Schedule of Requirements (Dutch: Programma van Eisen) was drafted in which it was proposed to follow the advice of the desk study. Competent authorities (Dutch Cultural Heritage Agency (RCE) approved this Schedule of Requirementss.

1.4 Site surveys

In 2015 two separate geophysical campaigns have been executed in the Borssele Wind Farm Zone (BWFZ). Site I and II were surveyed by DEEP BV, Site III and IV by Fugro Survey B.V.[4] The research areas were investigated with geophysical and geotechnical techniques. The purpose of these investigations was to establish an accurate geological model and to map possible obstructions in order to provide tendering parties with the information needed and to assist future developers in their construction decisions.

Periplus Archeomare analysed a small portion of the data acquired by Fugro in Site III an Site IV in order to determine if these data are fit for the identification of possible archaeological objects in the areas.[5] This pilot has shown that the quality and resolution of the geophysical data is sufficient for a first archaeological assessment of the observed contacts and described objects.

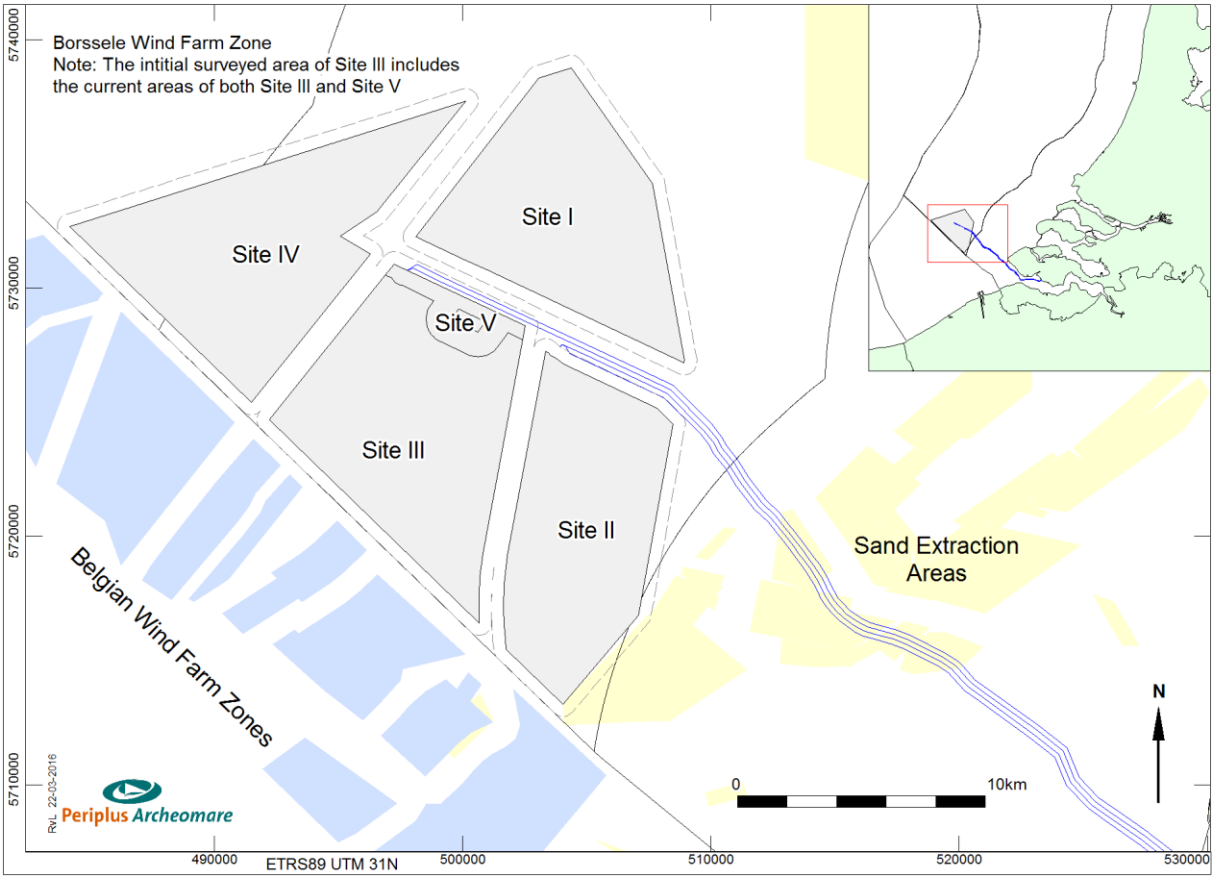


Figure 1. Overview of the research area

[4] Marchetti 2015.

[5] Brenk 2016.

1.5 Purpose

The purpose of this investigation is to assess and interpret the possible presence of archaeological remains which are to be expected within the BWFZ by an analysis of geophysical data.

This investigation comprises an assessment of pre-installation survey data. The data acquired during the geophysical surveys are analysed to identify potential archaeological sites, and to cross-reference against the findings of the desk study. The investigation focuses on shipwrecks, lost goods and airplanes from WWII which are exposed on the seabed. Buried objects which have induced scouring and disturbance of the natural seabed morphology are also included in this research.

Completely buried objects cannot be identified by means of the geophysical equipment deployed. Following the advice of the desk study, archaeological remains of prehistoric settlements are not investigated.

The research is executed in March/April 2016 by R, van Lil and S. van den Brenk (both KNA senior prospector).

1.6 Research questions

For this investigation different research questions are defined in the authorised Schedule of Requirements:[6]

- Are there any phenomena visible on the seabed?

If so:

- How are these phenomena described?
- Do these phenomena reflect the presence of anthropogenic or natural objects or structures?

If these phenomena are identified as anthropogenic:

- Do the anthropogenic objects or structures represent potential archaeological remains?

If there are archaeological objects:

- Is it possible to identify these objects and prioritize them?

If these phenomena are identified as natural:

- What kind of natural phenomena are identified?
- Is it possible, according the acoustic images, to describe morphological zones with a high, middle or low sedimentary activity of the seabed?

If so:

- How is this activity interpreted?

General questions:

- What is the relation between recorded objects and the morphology of the seabed?
- Is it - according to this relationship - possible to identify areas in which anthropogenic objects are to be expected?
- When no acoustic phenomena are found, can this be the result of erosion, sedimentation or human interfering?
- Which precautions are necessary to prevent the disturbance of possible archaeological remains?

Buried objects:

- Do seismic data indicate the presence of buried objects?

If so:

- Can - by correlating the SBP targets with SSS, MBES and MAG data - be concluded upon the character of the buried object?
- Should measures to be taken in order to prevent detoriation of possible archaeological values?

[6] Van den Brenk en van den Oever 2015.

2 Methodology

2.1 Known objects

The survey companies have summarized the *side scan sonar* contacts and *magnetometer* anomalies encountered within the BWFZ in detailed event listings. From different databases the occurrence of objects within the BWFZ is known. The contacts included in the survey event listings are compared with the database objects in the area. For this comparison four different datasets are used:

- the Hydrographic Service database (hereafter referred to as NLhono database);
- the Rijkswaterstaat Sonarreg database (hereafter referred to SR database);
- Dutch Cultural Heritage Agency database ARCHIS;
- The Dutch Nationaal Contact Nummer database (hereafter referred to as NCN);

The National Contact Number (NCN)

The NCN database combines the data from three governmental databases:

- The Dutch Continental Shelf and Westerschelde wrecks register from the Hydrographic Service of the Royal Netherlands Navy;
- The SonarReg92 object database of Rijkswaterstaat;
- The ARCHIS database (the official archaeological database of the Ministry of Cultural Heritage)

The permission for the use of the NCN database for the analysis was granted by the owner (Rijkswaterstaat Sea and Delta)

The NCN database contains all basic information (E, N and description) of the NLhono, SR and Archis databases. More detailed information is gathered through the other datasets.

In addition to ship wrecks information on contacts referred to as 'foul' or 'obstruction' is included. From these objects the origin is not always known, but information on the location, dimensions and other valuable information is listed. Besides the databases other sources containing information on wrecks and historic finds are consulted for comparison with the survey results.

All known data is combined and plotted in a GIS. In this way an overview is made of the areas in which archaeological remains are present or to be expected. The known contacts are a reference framework for the assessment of data recorded during the route survey.

2.2 Archaeological assessment of survey data

The geophysical and hydrographic survey techniques employed include *side scan sonar* (SSS), *magnetometer* (MAG), *multibeam* (MBES) and subbottom profiling (SBP). With *side scan sonar* all objects and structures on the seabed can be made visible. Seabed sediment of different composition can be distinguished by their characteristic reflection. *Multibeam* images reveal the morphology of the seabed. Large objects and scouring can be mapped. Smaller objects, like thin cables, or flat objects lying on the seabed often are impossible to identify in *multibeam* images.

Magnetometer contacts are identified by the presence of ferro-metalic objects which induce an anomaly in the earth magnetic field. These objects can be buried or lying on the seabed. Unlike *side scan sonar* and *multibeam* the contacts are tagged at the sailed survey line. The actual object can be located at both sides of the survey line. Given the 100 meter spacing of the run lines the accuracy of the position is in this same order: 100 meter.

DEEP and Fugro processed their survey data and produced detailed event listings of the *side scan sonar* en *magnetometer* contacts encountered within the survey areas. Alike the known objects the locations of the contacts are plotted in a GIS.

In the course of this archaeological assessment a selection is made based on the dimensions of the reported contacts. The fraction of contacts larger than or equal to four (4) meter is looked into in more detail. Purpose of this analysis is to identify contacts that could reflect potential archaeological sites.

This is done by analyses of:

- *side scan sonar* images included in the survey reports;
- raw *side scan sonar* data (XTF-files) in SonarWiz;
- raw *multibeam*-data (xyz-files) in Autoclean and Global Mapper;
- values of magnetic anomalies reported in the survey reports;
- comparison of *side scan sonar* and *magnetometer* contacts;

Apart from the survey data studied the geological constellation and seabed morphology of the area are taken into account as outcrops of geological strata and sedimentary structures can lead to (apparent) anomalies in the *side scan sonar* record.

The *side scan sonar* images are scanned in order to define potential archaeological sites. A selection of contacts was made of contacts to be studied in detail. The interpretation of *side scan sonar* contacts is based on best professional judgement. In order to identify the exact nature of the contacts observed with certainty additional research by means of a ROV or divers shall be needed.

2.3 Data Analysis

The first step in the data analysis is to cross-reference known objects within the surveyed area with the survey data. For the comparison the results of the desk study and the survey datasets were used. All the known objects were projected in a GIS together with the survey data.

For the cross-reference we have assumed that all present possible contacts and anomalies have been reported and described by the survey contractors. Only the raw data is used, when available, to verify the description of found objects and anomalies as reported.

The positions of the interpreted contacts from the different surveys were compared with the positions of the known objects collected from the databases. Besides that, all the positions of both the survey contacts and the known objects were plotted on the high resolution *multibeam* grid to visualize the morphological influence of the presence of these objects. This assisted in the determination of possible archaeological value of the present remains. If an object had a potential archaeological value, the description of the object was finalised.

Besides the objects detected from the *side scan sonar* survey also the *magnetometer* contacts were plotted on the high resolution *multibeam* grid. For the *magnetometer* contacts that corresponded with the *side scan sonar* contacts within 25 meters of each other, these contacts were considered to be related. When at the position of the *magnetometer* anomaly no visible object was recognized the size of the anomaly was leading. If the magnetic anomaly of a contact is more than 50 nT (nano-Tesla) then it is stated that the contact could possibly be of archaeological value. All the *magnetometer* contacts above 50 nT but within 25 meter of the existing cable and pipeline routes are exempt for further investigation. It has to be stressed that within this assessment no distinction can be made between anomalies related to possible archaeological objects or anomalies related to (for example) unexploded ordinance (UXO's).

An archaeological assessment has been undertaken for all visible contacts. This interpretation is based on best 'professional judgment'.

The research is executed in March and April 2015 by R. van Lil (KNA senior prospector) and S. van den Brenk (KNA senior prospector). The investigation is carried out according to specifications set up within the Dutch Quality Standard for Archaeology (*KNA waterbodems 3.2; protocol 4103*).

2.4 Used Sources

The following sources were used for the analysis:

- Survey data Fugro and DEEP, original survey data and reported interpretations;
- Archaeological desk study Vestigia;
- Unexploded Ordnance (UXO) desk study REASeuro;
- ARCHIS database Cultural Heritage Agency;
- Archeomare Database;
- NLhono database Hydrographic Service of the Royal Netherlands Navy;
- Wrecksite.eu;
- Database, Nationaal Contact Nummer (NCN).

For a complete list of used sources and literature see the reference list at page 36.

Italic written words are explained in the glossary at page 35.

3 Known objects

For the archaeological desk study different existing datasets of known archaeological objects and obstructions were combined and visualised in a GIS (see figure 2). Objects of archaeological importance, such as wrecks, but also obstructions were mapped and selected.

The NCN, NLhono, SR and ARCHIS databases contain twenty-one (21) possible archaeological objects and obstructions which are located in the BWFZ or in the vicinity of the planned wind farm. In addition to the objects of potential archaeological importance three (3) locations which according to a UXO study performed by REASeuro could contain possible explosives are displayed in figure 2.[7]

The known objects are displayed in figure 2 and listed in table 2.

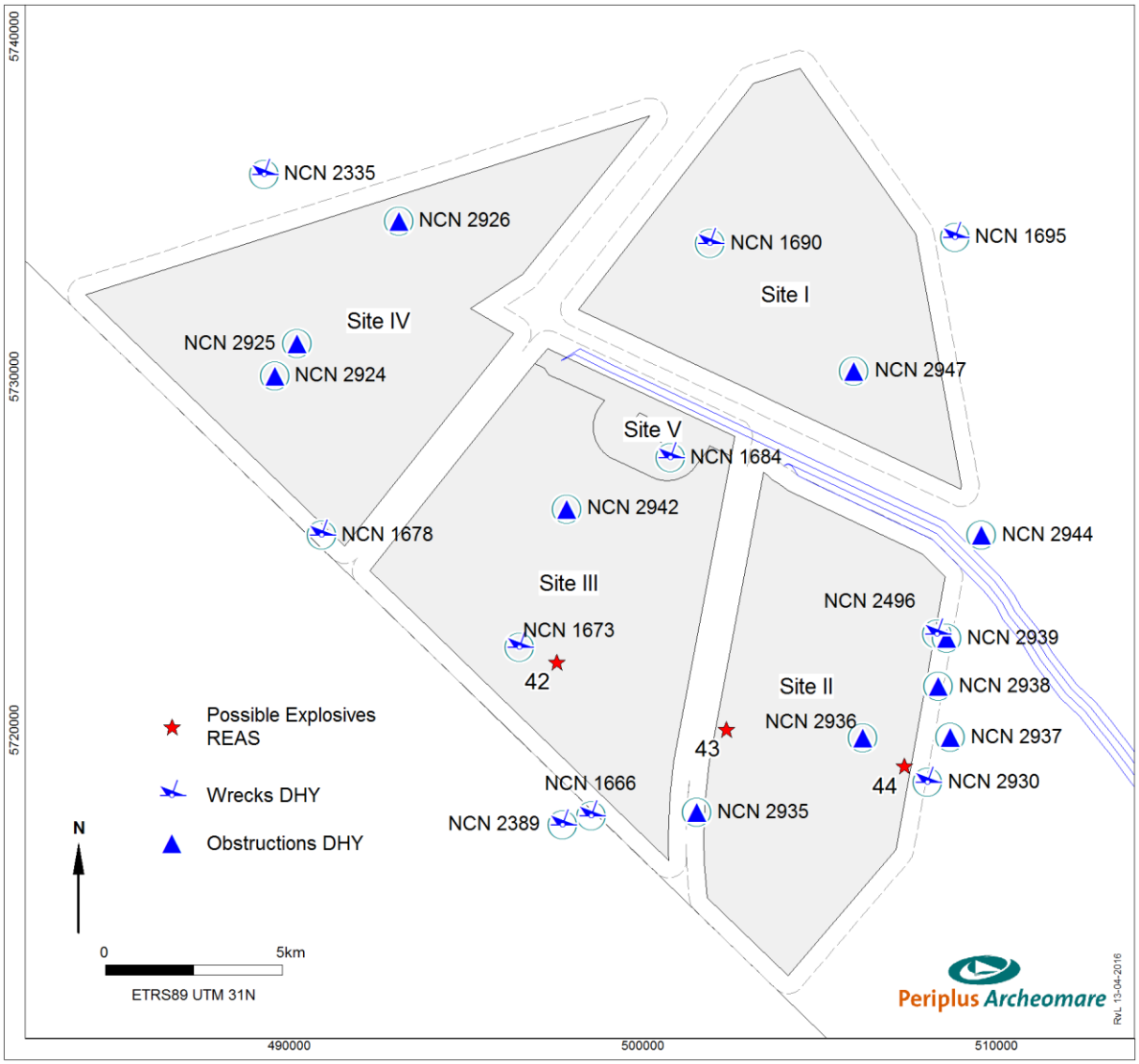


Figure 2. Known obstructions and wrecks

Ten (10) of the objects are labelled as ship wreck. Two (2) wrecks are supposedly located within the BWFZ; three (3) within the 500m safety zone and five (5) outside the safety zone but still in the vicinity of the BWFZ.

[7] Van den Berg 2014.

Note that the latter are included in this report as the accuracy of the positions of both obstructions and wrecks in the databases consulted can vary.

Eleven (11) of the objects are described as obstruction. Six (6) obstructions are supposedly located within the BWFZ; three (3) within the 500m safety zone and three (3) outside the safety zone. Three (3) possible explosives are not included in table 3.

WFS	NCN	NLhono	SR92	ARCHIS	Type	ETRSX	ETRSY	L (m)*	W (m)*	Remark
I	1690	1738			Wreck	501841	5733981	44	8	Reported 1980, R95=5m, no additional information
I	2947	3671			Obstruction	505913	5730373			Foul, reported 2010, R95=5m, mbeam recording RWS 2012
Outside I	1695	1747			Wreck	508774	5734149	16	2	Dutch tug boat "Frans", sunk 12-10-1977, R95=5m
II	2936	3658			Obstruction	506163	5720019			Foul, reported 2010, R95=5m
Buffer II	2496	2902	8379		Wreck	508262	5722946	28	3	HMS Simoom, length 28m, R95=5m, mbeam images RWS 2011 & 2012;
Buffer II	2935	3657			Obstruction	501462	5717911			Foul, reported 2010, R95=5m
Buffer II	2938	3660			Obstruction	508298	5721466			Foul, reported 2010, R95=5m
Buffer II	2939	3661			Obstruction	508528	5722826			Reported 2010, R95=5m
Outside II	2930	3652			Wreck	507991	5718757	12	5	R95=5m, no additional information
Outside II	2937	3659			Obstruction	508631	5720033			Foul, reported 2010, R95=5m
III	1673	1703			Wreck	496448	5722577			Theoretical location wreck Alca Torda, actual location is 6,8 km to the north (NLhono 1723), no wreck at location NLhono 1703
III	2942	3666			Obstruction	497789	5726478			Foul, reported 2010, R95=5m
Outside III	1666	1693			Wreck	498483	5717818			Reported 1977, R95=1000m, no additional information
Outside III	2389	2730			Wreck	497668	5717561	40		Reported 1990, R95=5m, no additional information
IV	2924	3644			Obstruction	489533	5730228			Foul, reported 2010, R95=5m
IV	2925	3645			Obstruction	490156	5731141			Foul, reported 2010, R95=5m
IV	2926	3646			Obstruction	493046	5734607			Foul, reported 2010, R95=5m
Buffer IV	1678	1714			Wreck	490861	5725735			Fishing vessel, reported 1910 showing mast, R95=5m, no additional information
Outside IV	2335	2595			Wreck	489224	5735928			Wreck Copenhagen? Length 127m, Roll-on Roll-off Ferry, Finland, reported 1988, R95=5m

WFS	NCN	NLhono	SR92	ARCHIS	Type	ETRSX	ETRSY	L (m)*	W (m)*	Remark
Buffer III & V	1684	1723	12173		Wreck	500719	5727925	17	4	Actual location wreck Alca Torda, length 17m, mbeam recording RWS 2012, R95=5m
Cable corridor	2944	3668	12157		Obstruction	509513	5725743	3	3	Reported 2010, R95=5m, SR: H=0.4m

Table 3. Known objects (excluding UXO) within 2 kilometer from the BWFZ

* based on NLhono; measured dimensions in SR might differ.

All contacts listed occur both in the NCN and NLhono database. Three (3) contacts comprising two (2) wrecks and an obstruction are also contained in the SonarReg (SR) database.

None of the contacts has been found in the archaeological database Archis. The SR database contains images of which a selection is shown in figure 3.

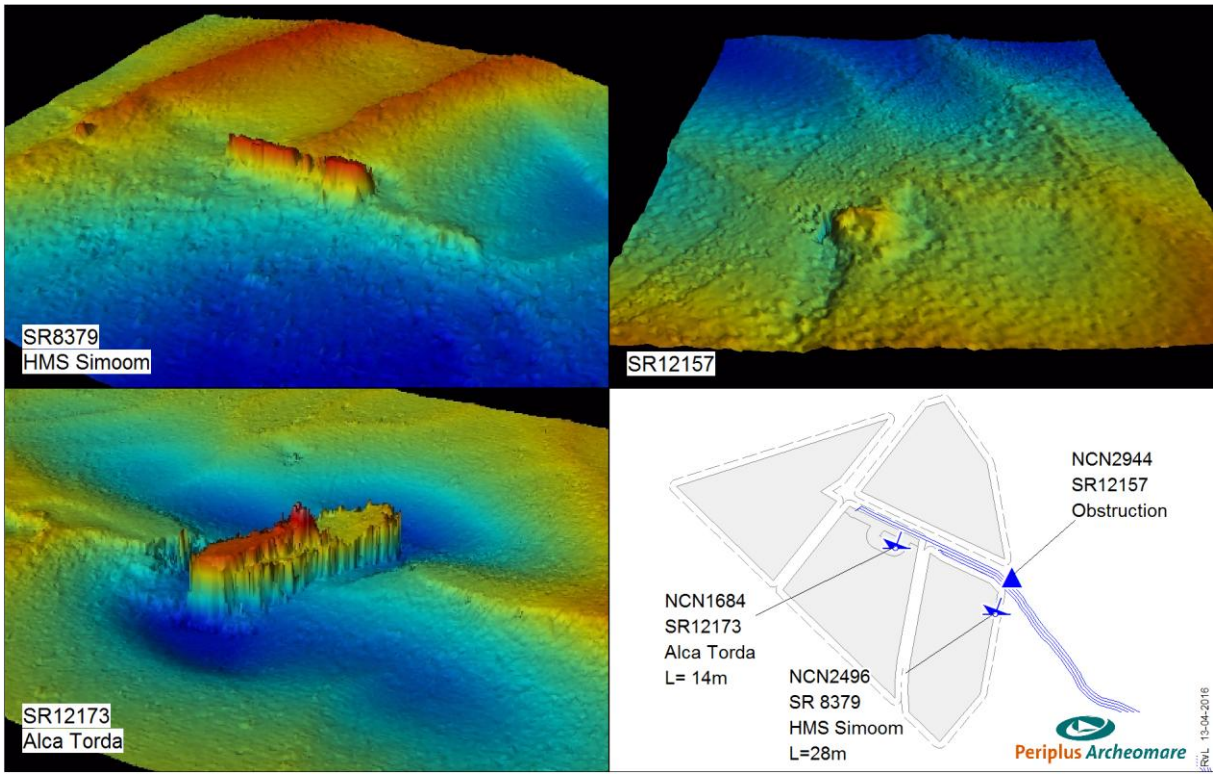


Figure 3. SR-images

Additional research within various databases provided valuable information on the wreck sites which occur in or near the BWFZ.

Alca Torda

Wreck NCN1684/SR12173 has been identified as the Belgian cutter 'Alca Torda' which sunk in 1973. The database of the Hydrographic service placed the wreck at the incorrect location (NLhono1703 instead of NLhono1723). The incorrect location was adopted by the desk study and Fugro.

The wreck is not considered to be of archaeological value. Therefore its presence will not - from an archaeological point of view - jeopardize the development of the wind farm.

Figure 4. Photograph of the Alca Torda before sinking in 1973

HMS Simoom

According to the database information NCN2494/SR8379 has been identified as the 'HMS Simoom'. The SR database dimensions are: L=28m; W=3m. The internet site www.wrecksite.eu contains two (2) wrecks named HMS Simoom.

One wreck concerns a British submarine built in 1941 and sunk by a mine 'in the Aegian Sea' in1943; the other wreck is a British destroyer built in 1916 and scuttled by a torpedo the night of January 22nd, 1917. According to www.wrecksite.eu the 1916 steamer HMS Simoom is located 9 kilometer east of the NCN-database location: 518435E/5727220N. This ship however is larger than the wreck found: 84,1 x 8,2 x 2,8m. Possibly part of the wreck exposed at the seabed is smaller than the total length of the wreck. In other words part of the wreck can be buried. The certainty with which the wreck was identified as HMS Simoom is not known. So it cannot fully be excluded the actual wreck present is that of another ship than the HMS Simoom.

Figure 5. Photograph of the HMS Simoom (1916)

Tugboat Frans

On October 12, 1977 at 5 o'clock in the morning the Dutch tugboat Frans was on its way from Rotterdam to Bordeaux when it rapidly started to take on water.[8] According to the survivors the ship sunk in seconds. The cause remains a mystery. From the six crew member, four were rescued by the Dutch coaster Gretina Holwerda. Two crew members drowned.

[8] Dagblad Het vrije volk, 12-10-1977.

4 Survey results

4.1 Seabed bathymetry and morphology

The seabed morphology is characterized by the presence of southwest - northeast trending sand waves. Superposed on these sand waves northwest - southeast trending mega current ripples have developed. In the lower lying areas between the sand waves the presence of mobile sands. Tertiary clayey deposits could be present in these areas at or near the seabed surface.

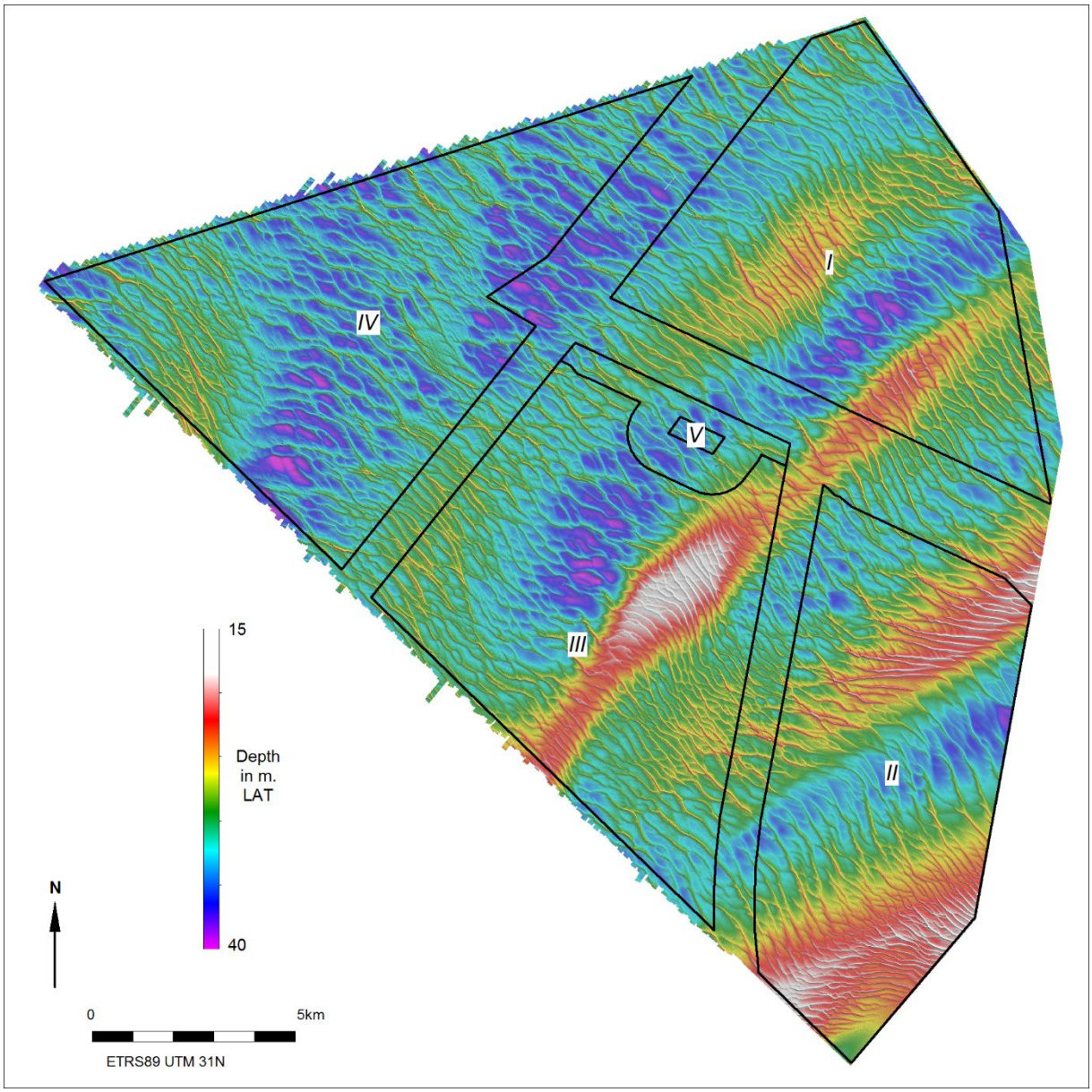


Figure 6. Bathymetry map of the Borssele Wind Farm Zones

Within the BWFZ including a 500 meter safety zone one thousand three hundred and twenty two (1322) *side scan sonar* contacts and two thousand five hundred and fifty three (2553) *magnetometer* contacts are recorded and reported. Table 4 shows the number of *side scan sonar* and *magnetometer* contacts found in each of the four wind farm sites.

BWFS	Survey company	Number of contacts	
		Side scan sonar	Magnetometer
I	DEEP	224	598
II	DEEP	215	266
III	FUGRO	234	685
IV	FUGRO	649	1004
Total		**1322**	**2553**

Table 4. Number of side scan sonar and magnetometer contacts tagged by DEEP and FUGRO

4.2 Side scan sonar

The interpretation of the *side scan sonar* contacts by DEEP and FUGRO is summarized below. The contacts referred to as contact, objects and (linear) debris include unknown objects which can be man-made or of natural origin.

BWFS	Contact / Object or (linear) Debris	Exposure Incl. Freespan & XING		Wreck or Wreck Debris	Anchor
		Pipeline	Cable		
I	39	152	26	7	
II	95	100	16	3	1
III	232	1		1	
IV	648	1			
Total	**1014**	**254**	**42**	**11**	**1**

Table 5. Interpretation of SSS-contacts by DEEP and FUGRO

All *side scan sonar* contact images delivered by the survey companies have been scanned and checked for the presence of potential archaeological contacts. This is done by analyses of:

- *side scan sonar* images included in the survey reports;
- raw *side scan sonar* data (XTF-files) in SonarWiz;
- raw *multibeam*-data (xyz-files) in Autoclean and Global Mapper;
- comparison of *side scan sonar* and magnetometer contacts.

Apart from the survey data studied the geological constellation and seabed morphology of the area are taken into account as outcrops of geological strata and sedimentary structures can lead to (apparent) anomalies in the *side scan sonar* record.

The interpretation of *side scan sonar* contacts is based on best professional judgement. In order to identify the nature of the contacts observed with certainty additional research by means of a ROV or divers is needed.

All contacts larger than four (4) meter are examined in detail. This selection of large contacts comprises a total one hundred and seventy seven (177) contacts. Contacts identified by the survey companies as pipelines and cables are not included in this selection. For a complete listing of the result of this examination is referred to Appendix 1. A summary of the outcome of the detailed inspection of selected contacts is presented in table 6.

From table 6 can be read that eighty three (83) contacts, or forty seven (47) percent, are interpreted as natural phenomenon. These natural phenomena comprise sand ripples, isolated shell beds and outcrops of clay amidst a predominantly sandy seabed. The sonar images often display elongated contacts with a granular reflection which is alike the surrounding seabed. Also elongated contacts with a hard granular reflection occur which, based on the analysis of *multibeam* images are recognized as sand ripples. The contacts that are interpreted as shell beds display isolated high reflective areas with no shadows. Local outcrops of clay lead to an anomalous morphology of the seabed with the surrounding sandy seabed in which sand ripples have developed.

Interpretation Periplus	Number
natural phenomenon	83
unknown object	53
cable	19
cable or rope	5
cable or pipeline	3
pipeline	1
anchor	1
wrecks	3
wreck debris	7
possible wrecks	2
Total	**177**

Table 6. Result of the assessment of selected side scan sonar contacts

Fifty three (53) contacts are classified as unknown object. The character of these contacts cannot be determined with certainty by means of the data available. Twenty six *side scan sonar* contacts can be identified on *multibeam* images.

A total of twenty eight (28) linear contacts are observed which are interpreted to reflect man-made objects consisting of (pieces of) cables, pipelines or rope. At one (1) location an anchor could be present. This interpretation is based on the dimensions and occurrence in the *side scan sonar* image. However, no magnetic anomaly is tagged in the neighbourhood of the contact so the interpretation is to be considered uncertain.

The three (3) wrecks listed in table 6 are wrecks known from the NLhono database. These wrecks presumably concern the HMS Simoom, the Alca Torda and a wreck which has not yet been identified. The seven (7) items of wreck debris are all linked to these known wrecks: six (6) are linked to the unidentified wreck and one (1) is linked to the HMS Simoom.

At two (2) locations possible wrecks have been found. According to the NLhono database an obstruction/foul has been encountered (NCN2936/NLhono3658) at one of these locations. Thus, the object found is known in the database but has not been interpreted as possible wreck before. The second object found possibly is a ‘new’ wreck which has not been encountered before.

Below the (possible) wreck sites will be described in more detail.

S0612: possible wreck
Contact S0612 is classified as a possible ship wreck. The location of this contact is 492046E/ 5728215N (As Found on MBES). The contact shows on the *multibeam* images internal northwest-southeast trending elongated structures with some scouring on north and south side of contact. The sonar image shows an elongated contact with hard reflection and clear shadow surrounded by a large number of point reflections. The point reflections do not display clear shadows and might reflect the presence of cobbles.

The dimensions based on the *multibeam* images are: Length=7.0m; Width=5.0m; Height=0.9m. The contact concerns a possible wreck that is located in BWFSIV and is not included in one of the databases studied. No *magnetometer* contact could be linked to S0612.

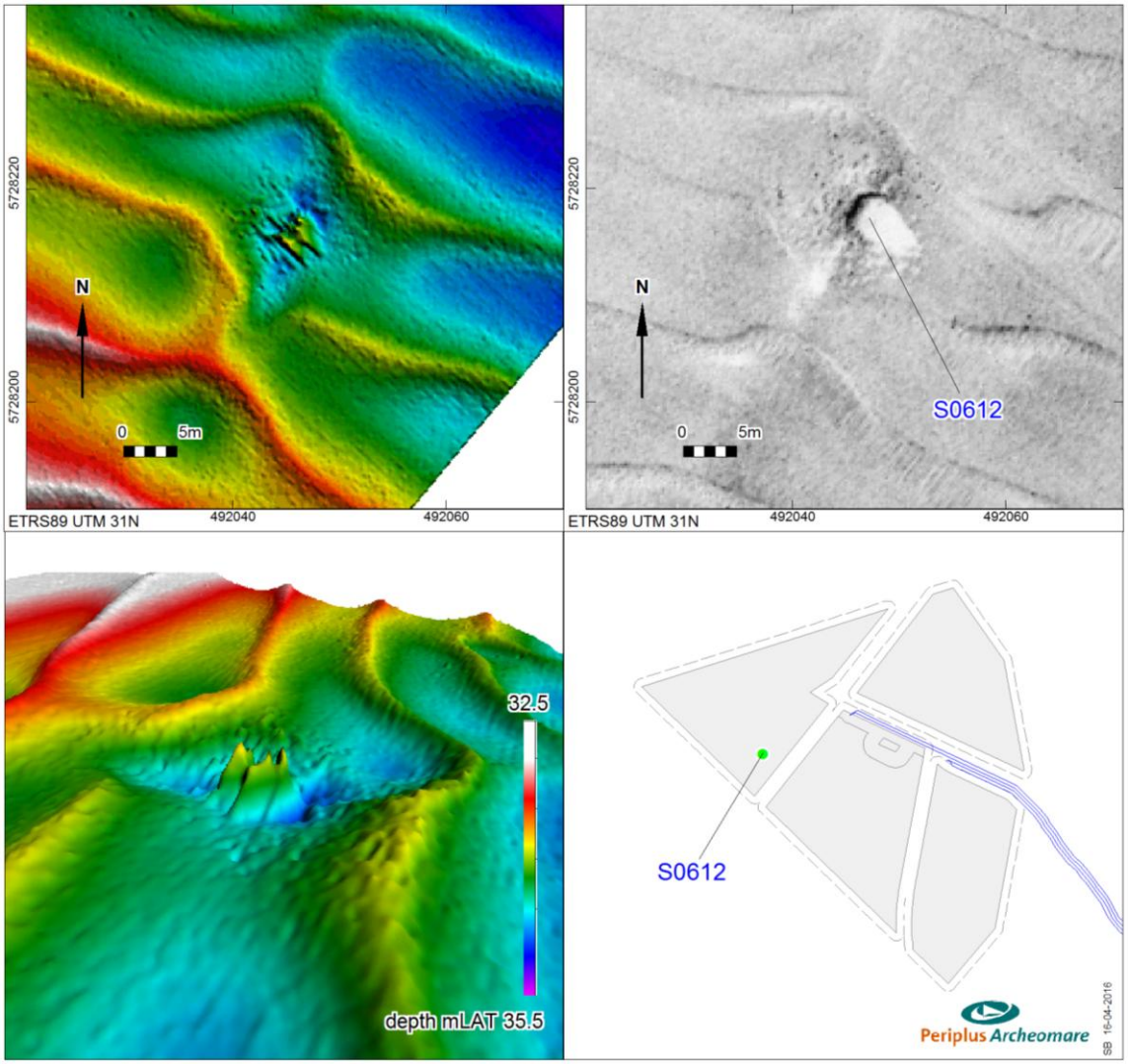


Figure 7. Side scan sonar contact S0612 in BWFSIV possible wreck site

Known objects

At four (4) sites *side scan sonar* contacts have been observed which can be linked to wrecks (3) and a foul (1) known from the databases consulted prior to this assessment. Three of the sites are very likely to be the wreck sites known from the databases. The location of the fourth, contact SSS-WFS2-712, exactly corresponds to the location of contact NCN2935/NLhono3658 which is labelled as 'foul' in the databases.

BWFS	Contact nr	NCN / NLhono	Name
I	SSS-WFS1-117	1690/1738	unknown wreck
I	SSS-WFS1-120		
I	SSS-WFS1-122		
I	SSS-WFS1-129		
I	SSS-WFS1-130		
I	SSS-WFS1-131		
I	SSS-WFS1-132		
II	SSS-WFS2-693	2496/2902	HMS Simoom
II	SSS-WFS2-698		
II	SSS-WFS2-712	2936/3658	unknown / foul
III	S0639	1684/1723	Alca Torda

Table 7. Known objects

SSS-WFS1-122: unknown wreck

Contact SSS-WFS1-122 reflects the presence of a ship wreck. The wreck location resembles closely the location of NCN1690/NLhono1783. Based on the current MBES-data the centre location is determined at 501848E/5733986N Also the length and width of the wreck correspond to a large extend with the database figures. The wreck dimensions based on MBES data are: L=42.0 meter (measured along the starboard side) / L=46.0 meter (measured along the portside); W=8.0 meter; H=7.0 meter. No identification of the ship that has sunk at this location. Based on the he wreck could be that of a fishing trawler. *Magnetometer* anomalies are observed at two lines sailed parallel to the wreck site.

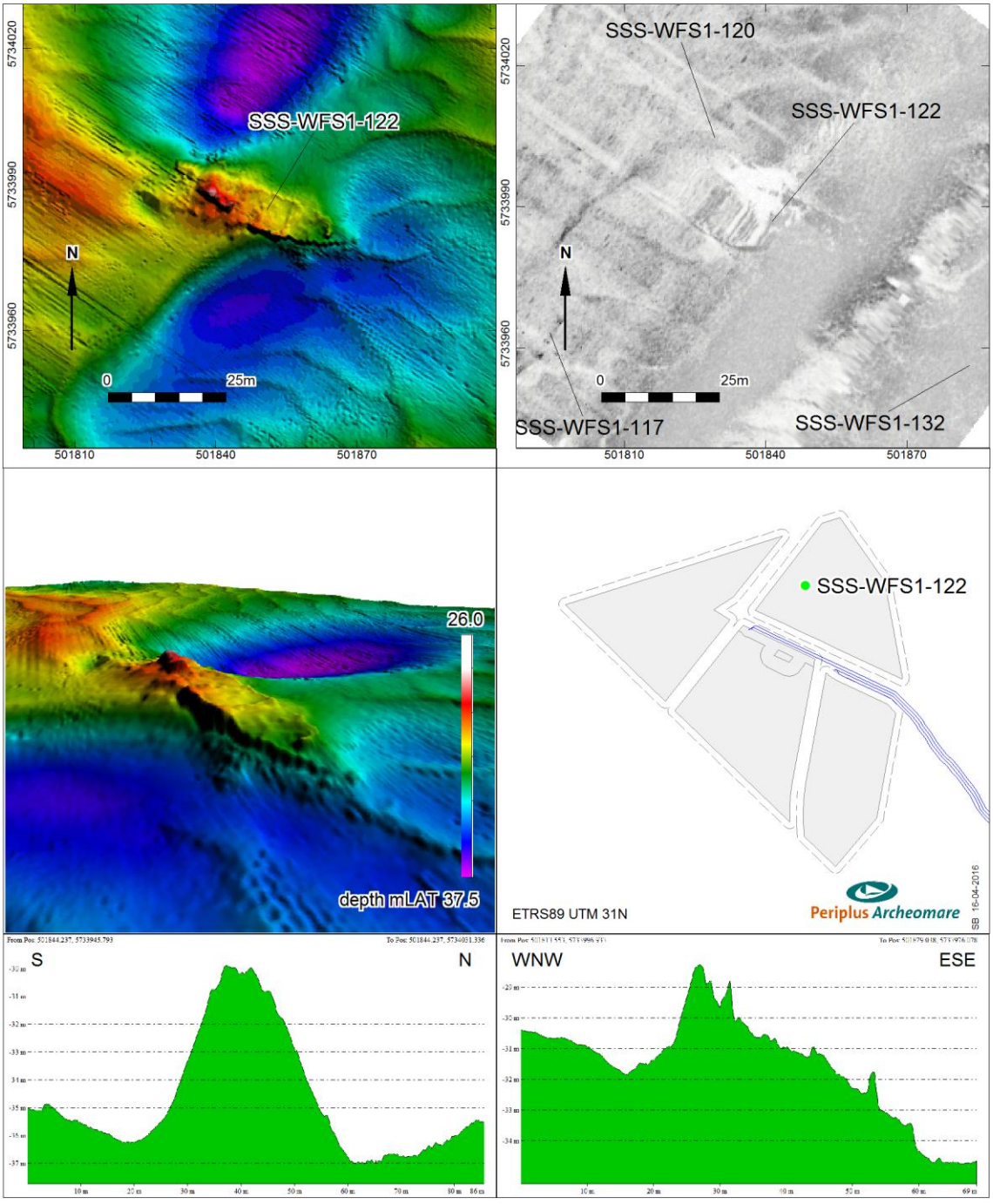


Figure 8. Contact SSS-WFS1-122 wreck (NCN 1690)

SSS-WFS1-693: wreck HMS Simoom?

Contact SSS-WFS-693 indicates the presence of a large ship wreck. The database location of this wreck is 518435E/5727220N. The wreck lies sixty nine (69) meters outside BWFSII. The dimensions of the wreck

determined in the sonar data are: L=41.9 x W=8.4 x H=2.8. The width and height of the wreck are in correspondence with the dimensions of the HMS Simoom as registered at wrecksite.eu. The length registered in wrecksite.eu however, is considerably larger: 84.1m. Unfortunately no *multibeam*data are available to provide us with additional information on the dimensions. Possibly part of the wreck is buried, or the wreck at this location is not the Simoom.

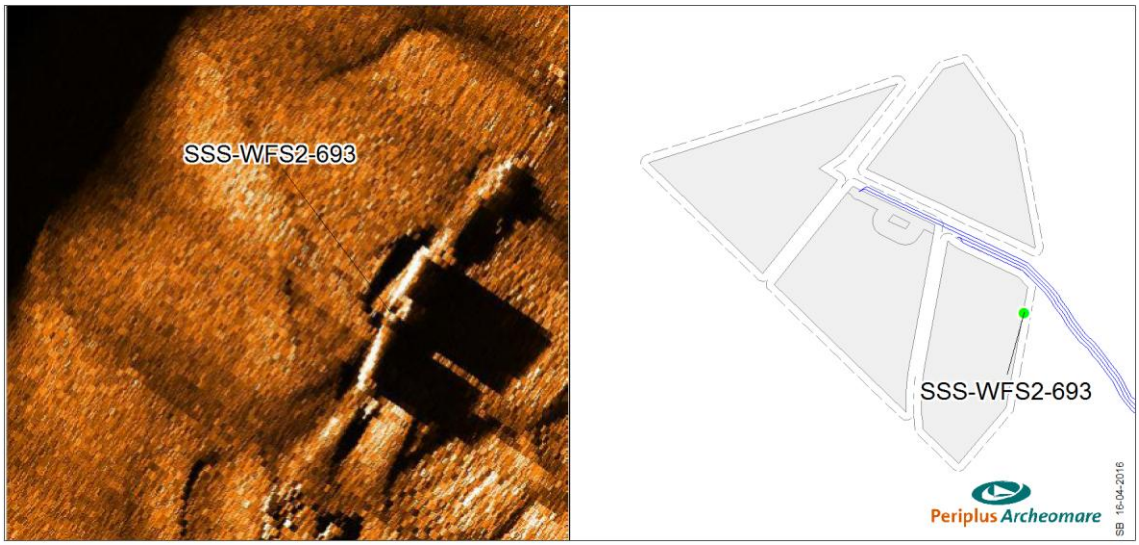


Figure 9. Contact SSS-WFS2-636 wreck (NCN2496)

SSS-WFS2-712: possible wreck

From the *side scan sonar* image of contact SSS-WFS2-712 can be seen that the contact only displays only a slightly harder reflection than the surrounding seabed. The shadow however is very marked. The *multibeam* image is consistent with the *side scan sonar* image as a prominent depression is seen with only a slight elevation with respect to the surrounding seabed. At this location most likely a buried object is present. This object could be a wreck, though the interpretation has to be labelled ‘uncertain’. As indicated before this location corresponds with the location of NCN2936/NLhono3658. The position based on MBES data is 506164 E/5720017N. The dimensions are L=9.8; W=4.3; H=1.9.

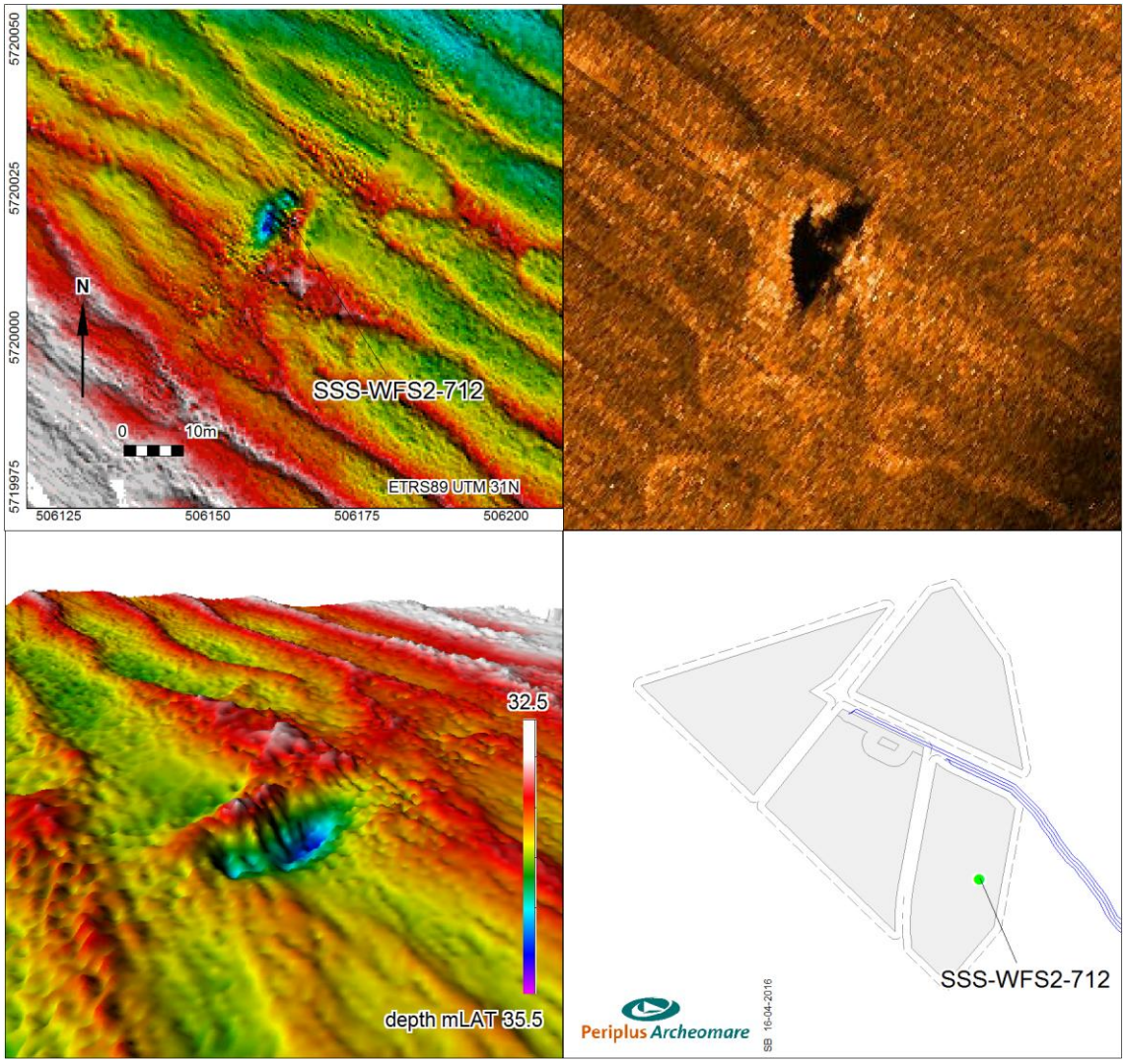


Figure 10. contact SSS-WFS2-712 (NCN2936)

S0639: wreck Alca Torda

The Fugro report of BWFSIII assumes that the NLhono locations 3644, 2645 and 3646 contains shipwrecks, while they are actually described by the Hydrographic Office as unknown objects causing possible obstructions.

Within BWFSI and BWFSII only one clear shipwreck is found (location NLhono 1723). Additional research of historical data prove this to be the wreck of the 'Alca Torda'. The initial location of the 'Alca Torda' was placed 6.8 km to the south (NLhono 1723), with a position accuracy of 1 km. At this location, no evidence was found of a ship wreck. From the data and additional research it may be concluded the unknown wreck at location 1723 is actually the wreck of the 'Alca Torda', and there is no wreck at location 1703.

The quality of the data set suffices for the identification of the ship wreck as such. The identification is supported by the integration of the different types of geophysical data available: SSS, MBES, MAGGY and SBP. The wreck is embedded in sandy sediments. The seabed is characterized by the presence of mega-ripples. Considerable scouring caused by tidal currents is observed both northeast as southwest of the wreck. In the surroundings *side scan sonar* contacts are observed which possibly are linked to the wreck site.

The centre location of the site determined from MBES data is 500728E/5727924. The dimensions of the wreck are L=17.5 x W=3.9 x H=2.8.

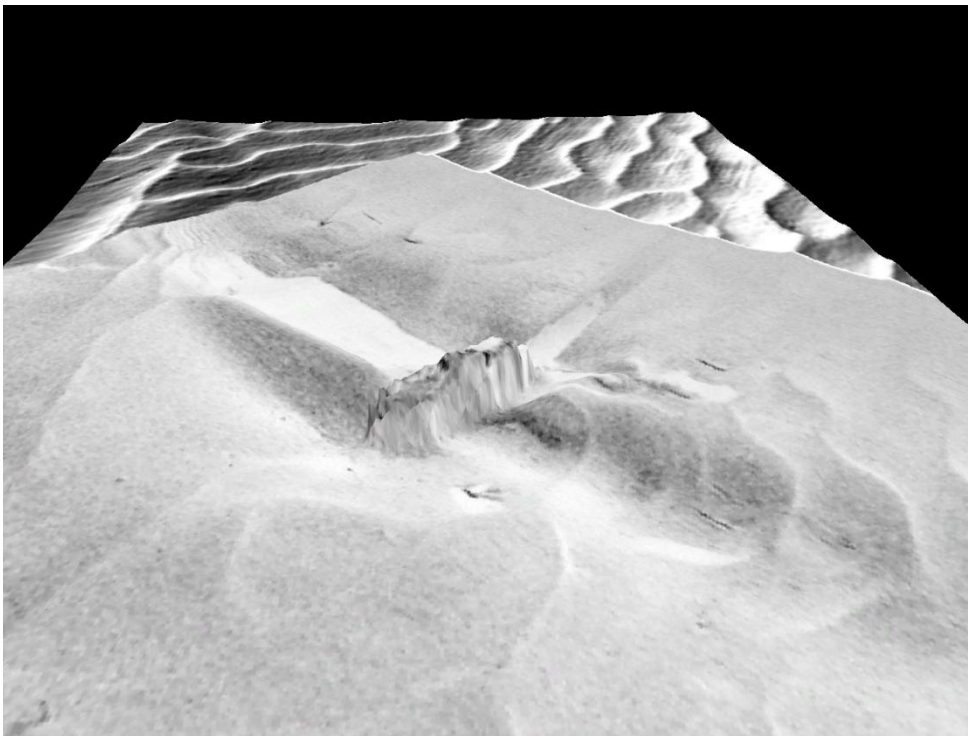


Figure 11. Side scan sonar image of the wreck draped over the multibeam model

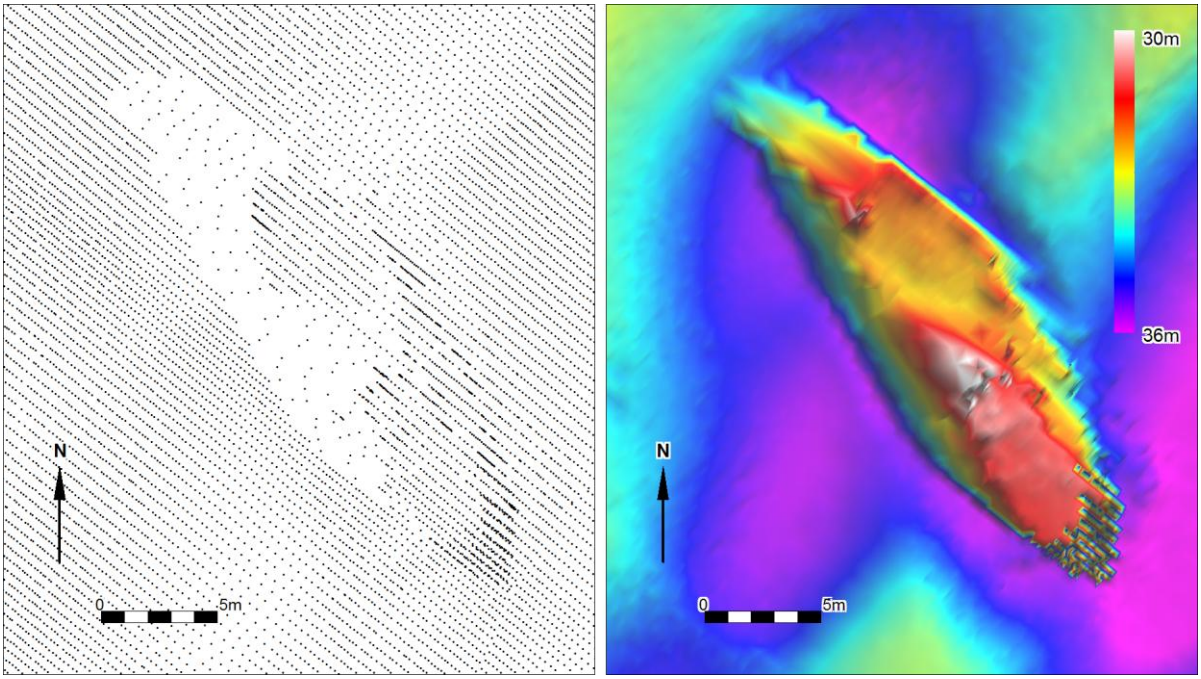


Figure 12. Raw multibeamsoundings (left) and colour image of the multibeamdata of the wreck Alca Torda

4.3 Magnetometer

Besides the objects that are visible on the geophysical data and are selected as possibly archaeological valuable there also are large *magnetometer* anomalies which are not observed on the *side scan sonar* or *multibeam* data. Although the nature of these objects is not known it is possible that the anomalies represent archaeological remains buried in the seabed, and therefore have to be taken into account within this assessment.

The survey companies themselves made a correlation between *side scan sonar* contact and *magnetometer* contacts. This resulted in nineteen (19) *side scan sonar* contacts with coherent *magnetometer* contacts. From these eighteen (19) three (1) are related to known cables, one (1) to the Zeepipe pipeline and one (1) to a wreck, leaving sixteen (16) contacts which reflect the presence of unknown presumably man-made objects.

Two (2) *magnetometer* anomalies (WFS1-MAG-130 and WFS1-MAG-132) have been linked to wreck site NCN1690NLhono/1738, but no connection has been made between the *side scan sonar* contacts present at this site, despite the observation that the location of sonar contact SSS-WFS1-122 (wreck) corresponds with the database location of this wreck.

Correlation between *side scan sonar* and *magnetometer* contacts is poor. However, a lot of the *magnetometer* contacts can be traced to existing pipelines, cables and (parts of) cables that are out of use. Also part of the *magnetometer* anomalies can be linked to *side scan sonar* contacts which all have been archaeologically assessed. This correlation provides us with information on the magnetic object present and its potential archaeological value. However, it should be noted that the *magnetometer* contacts plot on the sailed lines. Therefore, the actual object causing the anomaly can be located at some distance both on the starboard side and on port side of the sailed line. Given a line spacing of one hundred (100) meter it is clear that from the proximity of *side scan sonar* and *magnetometer* contacts not necessarily can be concluded that those contacts reflect one and the same object.

Correlating *magnetometer* anomalies and *side scan sonar* contacts
Periplus Archeomare has made a spacial correlation has been made between the observed *side scan sonar* contacts and *magnetometer* anomalies. This spacial correlation concerns both *side scan sonar* contacts which plot within a radius of 50 meter of a *magnetometer* anomaly and *magnetometer* anomalies which plot within a radius of 50 meter of a *side scan sonar* contact.

This exercitation results a total of three hundred and two (302) *side scan sonar* contacts which are encountered within 50 meters from a *magnetometer* anomaly and three hundred and fifty five (355) *magnetometer* anomalies which are located within 50 meters from a *side scan sonar* contact. In some cases two *magnetometer* anomalies are related to one *side scan sonar* object, which is located in between two sailed lines. At some locations on the other hand, two or more *side scan sonar* contacts have been found within 50 meters of a *magnetometer* anomaly.

Out of the three hundred and two (302) *side scan sonar* contacts two hundred and five (205) are located within 50 meters from known existing cables and (parts of) cables that are out of use; thirteen (13) more are part of a range of *magnetometer* contacts lining up and are therefore also considered to reflect the presence of cables or pipelines. So, eighty four (84) *side scan sonar* contacts are not related to known or assumed cables or pipelines. Eight (8) out of these eighty four (84) contacts can be correlated with *magnetometer* anomalies induced by the three known wreck sites in the area. Five (5) *side scan sonar* contacts can be correlated with a 1963nT magnetic anomaly induced by the unknown wreck in WFS I (SSS-WFS1-122); two (2) *side scan sonar* contacts can be correlated with a 166nT magnetic anomaly induced by the supposed wreck of the HMS Simoom in WFS II; one (1) *side scan sonar* contacts can be correlated with two magnetic anomalies (32nT and 47nT) induced by the wreck of the Alca Torda. The remainder of contacts, seventy six (76) in total, are unknown objects.

Isolated *magnetometer* anomalies

In order to identify objects which could be of archaeological value a selection is made of magnetic anomalies larger than 50nT. A total of three hundred and seventy five (375) anomalies meet the criterion of 50nT including one hundred and ninety (190) cable anomalies and ninety eight (98) pipeline anomalies. The remaining eighty four (84) anomalies include magnetic anomalies at the known wreck sites and unidentified objects.

Seventy four (74) of the three hundred and seventy five (375) anomalies are not within 50 meter from a *side scan sonar* contact; also those contacts have not been interpreted by the survey companies as an existing pipeline or cable.

Periplus has compared the seventy four (74) *magnetometer* anomalies in GIS with the existing infrastructure.[9] Thus another nine (9) anomalies could be linked with existing pipelines and cables in the area. From the remaining sixty five (65) anomalies are considered to be of possible archaeological interest. Forty eight (42) of these *magnetometer* anomalies are in the range of 50 – 100nT; Twenty five (22) in the range of 100 – 500 and one (1) in the range larger than 500 nT.

Three (3) anomalies are possibly related to known objects. Two (2) of these anomalies (MAG-WFS3-M1447 and MAG-WFS3-M1624) possibly correlate with wreck NCN1666/ NLhono1693, though it has to be said that the database position of this wreck is very inaccurate (less than 1000 meter) and therefore also the link between the anomalies tagged and this wreck is uncertain. One (1) anomaly (MAG-WFS4-M0862) possibly concerns debris related to NCN2924/NLhono3644 which according to the databases is considered to be 'foul'.

The *magnetometer* contacts of potential archaeological interest are shown in figure 13 and summarised in table 8. A listing of all *magnetometer* anomalies can be found in Appendix 3.

BWFS	>50 and <100nT	>100 and <500nT	>500nT	Total
I	3	-	-	3
II	7	1	-	8
III	13	12	1	26
IV	19	9	-	28
Total				**65**

Table 8. Number of magnetic anomalies of potential archaeological interest: larger than 50nT and not correlated with side scan sonar contacts

[9] Rijkswaterstaat North Sea database, update July 1, 2015.

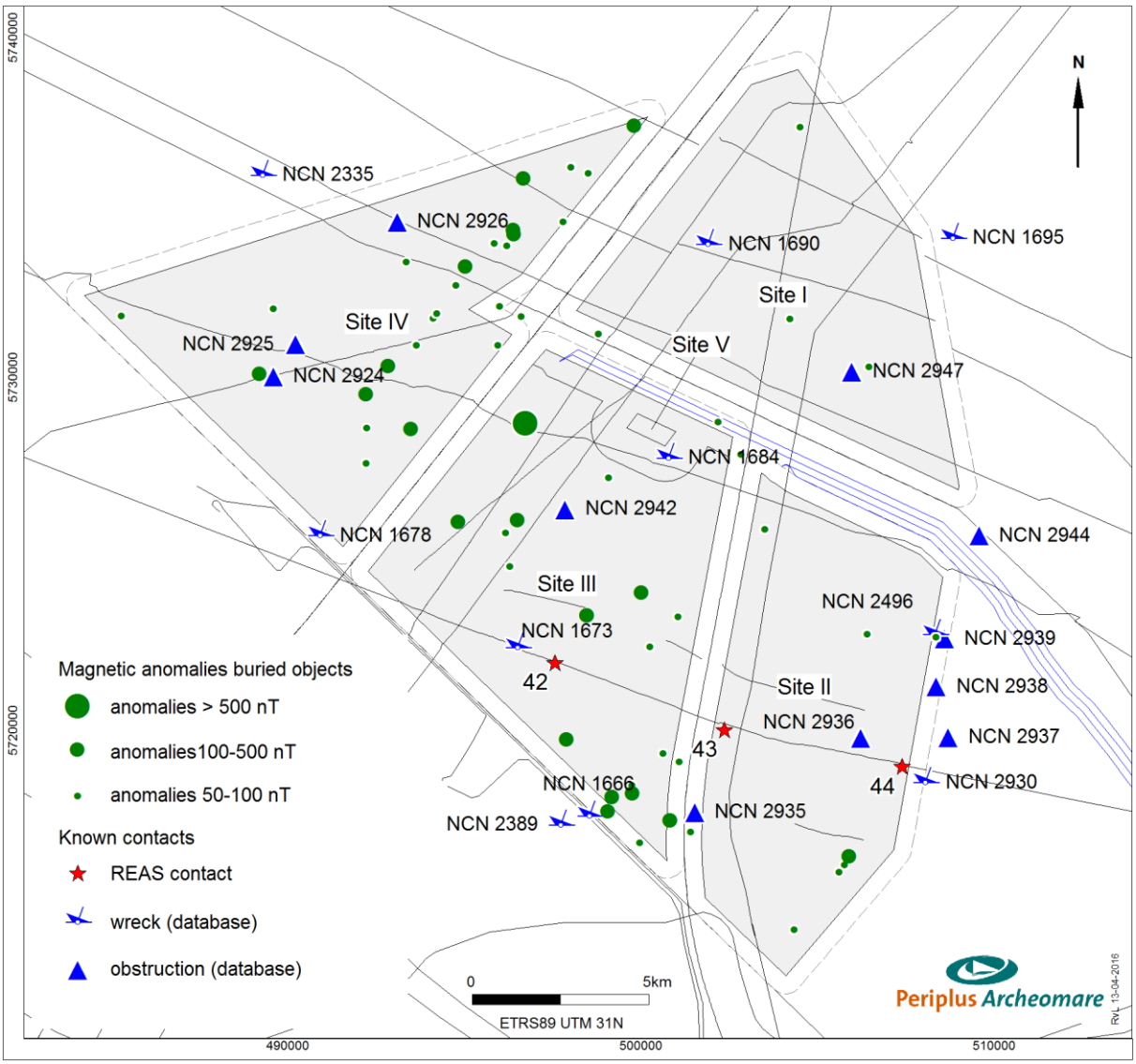


Figure 13. Magnetometer contacts of potential archaeological interest

5 Synthesis

For this investigation different research questions are defined in the authorized Schedule of Requirements:

Are there any phenomena visible on the seabed?
Within the BWFZ including a 500 meter safety zone one thousand three hundred and twenty two (1322) *side scan sonar* contacts and two thousand five hundred and fifty three (2553) *magnetometer* contacts are recorded and reported by both the survey companies Fugro and DEEP. For the archaeological assessment an interpretation has been carried out to distinguish natural from man-made and the possible archaeological value.

Within the survey area three (3) known wrecks and two (2) possible wrecks have been found. At the wreck sites twelve (12) side scan contacts have been identified which possibly are part of the wreck sites.

BWFS	SSS-nr	E_ETRS89	N_ETRS89	Interpretation	L (m)	W (m)	H (m)	NCN/ NLhono	Name
I	SSS-WFS1-122	501844	5733983	wreck	42.0	8.0	7.0	1690/1738	unknown
II	SSS-WFS2-693	508262	5722942	wreck	41.9	8.4	2.8	2496/2902	HMS Simoom
II	SSS-WFS2-712	506164	5720017	possible wreck	9.8	4.3	1.9	2936/3658	unknown/foul
III	S0639	500728	5727924	wreck	17.5	3.9	2.8	1684/1723	Alca Torda
IV	S0612	492046	5728215	possible wreck	7.0	5.0	0.9	-	unknown

Table 9. Summary of (possible) wreck sites

From the *magnetometer* data sixty five (65) extra objects were selected with an anomaly of 50 nT or more which could not be correlated with *side scan sonar* contacts or known pipelines and cables. These anomalies could represent larger objects buried in the seabed with a possible archaeological value.

If so:
How are these phenomena described?
The observed phenomena can be characterized as both natural and man-made.

Do these phenomena reflect the presence of anthropogenic or natural objects or structures?
Three (3) wrecks and two (2) possible wreck sites have been identified. At those five (5) sites a total of twelve (12) *side scan sonar* contacts have been tagged which supposedly comprise wrecks or wreck related remains. One (1) anchor is recognised, two hundred and ninety six (296) *side scan sonar* contacts are related to exposures of pipelines and cables within the area and the rest are smaller man-made and natural contacts. The observed *magnetometer* contacts are considered to be anthropogenic, though the presence of natural phenomena causing magnetic anomalies cannot be excluded. For instance outcrops of clayey Tertiary deposits alternating with sand ripples could result in local fluctuations in the earth magnetic field inducing apparent magnetic anomalies. This might explain the difference in the amount of magnetic anomalies found in BWFS I/II and BWFS III/IV.

If these phenomena are identified as anthropogenic:
Do the anthropogenic objects or structures represent potential archaeological remains?
At four (4) locations objects are observed which could reflect the presence of possible archaeological remains.

If there are archaeological objects:
Is it possible to identify these objects and prioritize them?
No, in this stadium it is not possible to identify these objects and prioritize these objects. One (1) object might be the 1916 built war ship HMS Simoom, but the identification cannot be considered to be certain.

If these phenomena are identified as natural:
What kind of natural phenomena are identified?

The natural phenomena are related to geological or geomorphological phenomena, ripple fields, shell beds and trawler scars. The natural phenomena are not selected and reported in this archaeological assessment, because they do not contain an archaeological value.

Is it possible, according the acoustic images, to describe morphological zones with a high, middle or low sedimentary activity of the seabed?
Different zones can be recognised. Overall the Borssele consists of a sandy seabed. Were shell beds are present a higher reflection is recognised. Very locally outcrops of clay may be present.

If so: How is this activity interpreted?
In general the sedimentary activity of the seabed is considered uniform throughout the area, with a predominant bottom current direction SSW-NNE.

General questions:
What is the relation between recorded objects and the morphology of the seabed?
Where objects are protruding from the seabed a scour mark is visible on the NNE side of the objects, indicating the predominant current direction near the seabed.

Is it - according to this relationship - possible to identify areas in which anthropogenic objects are to be expected?
Within the *multibeam* data some areas are recognised as scouring which are directly related to the presence of objects in the seabed.

When no acoustic phenomena are found, can this be the result of erosion, sedimentation or human interfering?
There is no indication that human interfering has had any influence on the acoustic nature of the seabed.

Which precautions are necessary to prevent the disturbance of possible archaeological remains?
For the two wreck site areas an initial buffer zone of 100 meters is to be respected around the possible archaeological objects as long as the actual nature is of these objects is not established. If these objects are indeed of archaeological nature more investigation on these objects need to be performed to determine whether these objects are of value.

Buried objects:
Do seismic data indicate the presence of buried objects?
No objects are known to be detected from the seismic data.

If so:
Can - by correlating the SBP targets with SSS, MBES and MAG data - be concluded upon the character of the buried object?
Not applicable.

Should measures to be taken in order to prevent detoriation of possible archaeological values?
Concerning the three reported visible structures at the seabed surface. As long as the archaeological value of the remains is not determined, it is advised not to conduct disturbing activities on the locations (including a buffer zone of 100 meters around). This also applies cable trenching and anchorages of work vessels.

The buffer zone of 100 meters is a standard that applies to the protection of cultural heritage, this distance may be reduced if it can be substantiated that the applied disturbance has no effect on the archaeological object.
For example, when no anchoring is used during cable lay operations the buffer zone can be decreased. Consent may be obtained after consultation with Rijkswaterstaat and the Cultural Heritage Agency.

Concerning the buried ferrous structures, it is advised to avoid such areas whilst constructing wind turbines or a trench for the cables.

If it is not feasible to avoid the reported magnetometer locations, additional research is required in order to determine the actual archaeological value of the reported locations. It is advised that the UXO research within 100 meter of the 65 magnetometer anomalies are carried out under onboard archaeological supervision. Depending on the outcome of the UXO research can be decided if additional research (for instance by means of ROV or dive investigations) is needed. If the UXO research indicates that the object has no archaeological value, the location can be omitted.

6 Conclusion and recommendations

A large quantity of survey data (*side scan sonar magnetometer* and *multibeam* echosounder) was analysed in order to conduct an archaeological assessment. A comparison was made with information about known objects in the area.

Four (4) of the assessed contacts are assigned with an archaeological expectation based on the dimensions and shapes of the contacts and supplemented information from existing observations. The wreck of the fishing cutter Alca Torda which sunk in the seventies of the 20th century is not considered to be of archaeological value.

A summary of the locations with possible archaeological value are presented in the table and figure below.

Location type	Total	Corresponding to known objects (NCN)	Identified in survey data
Visible structures at surface	4	3	1
Buried ferrous structures	65	0	65

Table 10. Summary of locations with a possible archaeological value

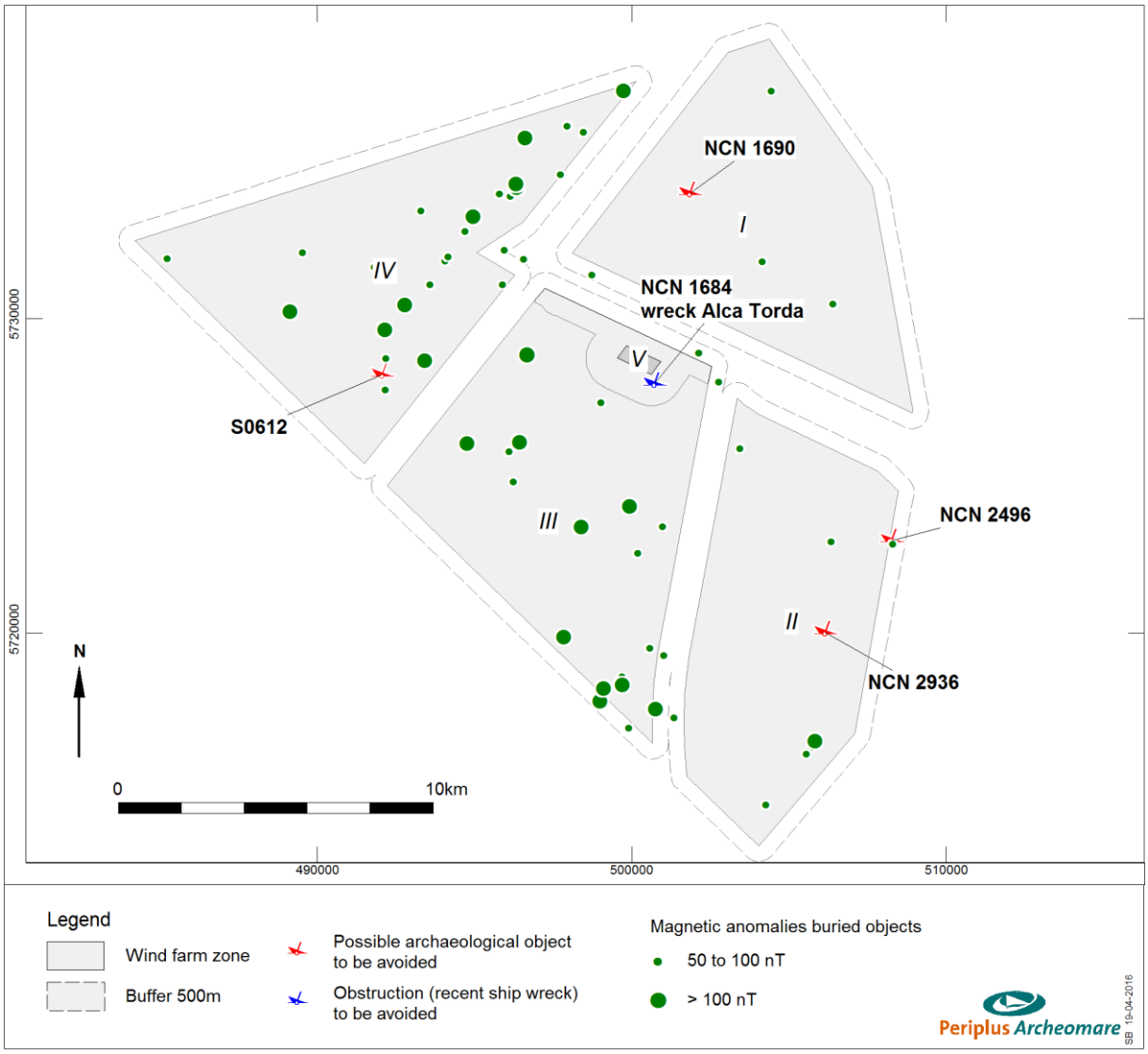


Figure 14. Overview of locations with a possible archaeological value

Concerning the visible structures at the seabed surface. As long as the archaeological value of the remains is not determined, it is advised not to conduct disturbing activities on the locations including a buffer zone of 100 meters around. This also applies to cable trenching and anchorages of work vessels.

The buffer zone of 100 meters is a standard that applies to the protection of cultural heritage, this distance may be reduced if it can be substantiated that the applied disturbance has no effect on the archaeological object.
For example, when no anchoring is used during cable lay operations the buffer zone can be decreased. Consent may be obtained after consultation with Rijkswaterstaat and the Cultural Heritage Agency.

Concerning the buried ferrous structures, it is advised to avoid such areas whilst installing wind turbines and constructing a trench for the cables. It should be stressed that the origin of the magnetic anomalies is unknown and apart from possible archaeological remains any type of man-made objects can be encountered including unexploded ammunition, anchors, pieces of chains and cables, debris, etcetera. The presence of local natural phenomena, for instance local outcrops or subcrops of Tertiary clay, might partly account for the difference in the amount of anomalies encountered in BWFS I/II and BWFS III/IV.

If it is not feasible to avoid the reported magnetometer locations, additional research is required in order to determine the actual archaeological value of the reported locations. It is advised that the UXO research within 100 meter of the 65 magnetometer anomalies are carried out under onboard archaeological supervision. Depending on the outcome of the UXO research can be decided if additional research (for instance by means of ROV or dive investigations) is needed. If the UXO research indicates that the object has no archaeological value, the location can be omitted.

During the installation of the wind turbines and cable lay operations, archaeological objects may be discovered which were completely buried or not recognized as an archaeological object during the geophysical survey. We recommend passive archaeological supervision based on an approved program of requirements. Passive archaeological supervision means that an archaeologist is not present during the execution of the work but always available on call. Conducting this recommendation would prevent delays during the work when unexpectedly archaeological remains are found. In accordance with the Monuments Act 1988 (Revised 2007), it is required to report those findings to the competent authority. This notification must also be included in the scope of work.

List of figures

List of tables

Glossary

Term	Description
Anthropogenic	Caused or produced by humans
Cone Penetration Test	Technique to determine the attributes of a ground layer (like resistance)
Ferromagnetic	Material which is magnetic or can be magnetized; known types are iron and nickel
In situ	Locally, in the original condition
KNA	*Kwaliteitsnorm Nederlandse Archeologie*, Dutch Quality Standard for Archaeology
Magnetometer	Method to measure deviations in the earth's magnetic field (caused by the presence of ferromagnetic or ferruginous objects)
Multibeam	Acoustic meter which with several beams measures with surface coverage the water depth below a vessel, after which a detailed topographic model of the seabed can be created
ROV	Remotely Operated Vehicle
Side scan sonar	Acoustic meter that measures the strength of a reflecting signal that is send out to the seabed below a survey vessel. It is comparable with a black/ white photograph of the seabed and used to map objects and to classify the soil morphology and type
Subbottom profiler	Acoustic system with which in two dimension can be looked into the seabed. The system is similar to seismic profiles used in the oil-industry
Trenching	Construction of a trench to bury a cable or pipeline
Vibrocore	Vibrocore drill is a special drilling technique used by research of the seabed where the core with the aid of vibration energy is put into the bottom. Within the core suction is created so the material doesn't fall out.

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- Databases Periplus Archeomare
- KNA Waterbodems 3.2
- Nationaal Contactnummer Nederland (NCN)

Appendix 1. Listing of selected side scan sonar contacts

Reported figure by survey companies DEEP (BWFSI and II) and Fugro (BWFSIII and IV)													Interpretation Periplus Archeomare				
WFS	TargetName	LineName	Easting	Northing	Length	Width	Height	Description	Interpretation	MB	MAG	Notes	SSS	MBES	MAG	Interpretation	Remark
I	SSS-WFS1-028	1-100	498189	5733039	8.4	2	HNM	Contact	Unknown contact				shadow at 'wrong' side; no contact;	no clear disturbance of natural morphology;		natural phenomenon	
I	SSS-WFS1-087	3-300	497616	5731775	7.6	6.6	HNM	Contact	Unknown contact				isolated zone with granular hard reflection;	no clear disturbance of natural morphology;	no anomaly tagged	natural phenomenon	possible shell layer
I	SSS-WFS1-088	4-400	500309	5735055	9.1	5.6	HNM	Contact	Unknown contact				highly reflective zone; no shadow behind target	no signs of morphological disturbances or scouring;		natural phenomenon	possible shell layer
I	SSS-WFS1-117	23-2300	501794	5733963	4.3	1.4	HNM	Wreck	Wreck debris (1738)								
I	SSS-WFS1-120	23-2300	501829	5734005	5.6	0	HNM	Wreck	Wreck debris (1738)	Found							
I	SSS-WFS1-122	24-2400	501844	5733983	48.5	15.5	HNM	Wreck	Wreck site (1738)	Found							
I	SSS-WFS1-129	25-2500	501908	5733956	11.7	7.8	HNM	Wreck	Wreck debris (1738)								
I	SSS-WFS1-130	25-2500	501890	5733997	12.5	2.9	HNM	Wreck	Wreck debris (1738)								
I	SSS-WFS1-131	25-2500	501874	5733938	16.8	5.7	HNM	Wreck	Wreck debris (1738)								
I	SSS-WFS1-132	25-2500	501883	5733956	3.6	0	HNM	Wreck	Wreck debris (1738)	Found							
I	SSS-WFS1-147	81-8100	504883	5728468	25.2	0	HNM	Object	Linear object				very thin intermitted linear contact; clear reflection and shadow;	no signs of morphological disturbances or scouring;	no anomalies tagged;	cable	uncertain
I	SSS-WFS1-148	82-8200	504868	5728443	30.7	0	HNM	Object	Linear object				no SSS target visible			no object	
I	SSS-WFS1-158	41-4100	505827	5736186	4.5	0.9	HNM	Contact	Linear contact				clear straight elongated contact w/ clear shadow;	no signs of morphological disturbances or scouring;	no anomaly tagged;	unknown object	possible beam
I	SSS-WFS1-160	46-4600	502599	5731471	10.3	4.2	HNM	Contact	Unknown contact					no signs of morphological disturbances or scouring;		natural phenomenon	
I	SSS-WFS1-182	56-5600	504596	5732378	8.6	3.3	HNM	Contact	Unknown contact				reflection alike surrounding seabed;	no signs of morphological disturbances or scouring;	no anomaly tagged:	natural phenomenon	sand ripple
I	SSS-WFS1-192	62-6200	506266	5733300	72.2	3.5	HNM	Contact	Linear contact				no SSS target visible			no object	
I	SSS-WFS1-204	65-6500	506606	5733314	4.1	3.5	0.5	Object	Unknown object				no difference between refelction of contact and surrounding sediment;	no signs of morphological disturbances or scouring;	no magnetic anomaly tagged;	natural phenomenon	possibly remnant of outcropping clay
I	SSS-WFS1-206	71-7100	504039	5729040	11.2	9.6	HNM	Contact	Unknown contact					parellel to sand wave crest. No signs of morphological disturbances or scouring;		natural phenomenon	
I	SSS-WFS1-207	73-7300	505206	5730425	6.5	6.5	HNM	Contact	Unknown contact				T-shaped contactl clear reflection; only small internal shadow	no clear disturbance of natural morphology;	no anomaly tagged	unknown object	
I	SSS-WFS1-208	73-7300	506192	5731747	6.2	1.6	HNM	Contact	Unknown contact				high reflective zone; no shadow;	no morphological anomalies;	no anomaly tagged;	natural phenomenon	
I	SSS-WFS1-209	85-8500	506498	5729838	12	0	HNM	Object	Possible cable					no signs of morphological disturbances or scouring;		cable	
I	SSS-WFS1-210	94-9400	508250	5730893	7.1	0	0.4	Object	Unknown object				linear reflection; no shadow;	no disturbance of natural morphology;	no anomaly tagged	cable	uncertain
I	SSS-WFS1-211	95-9500	507520	5729519	5	0.8	0.1	Object	Unknown object				clear straight elongated contact; hard reflection; clear shadow;	no morphological anomalies;	no anomaly tagged;	unknown object	possible beam
I	SSS-WFS1-212	96-9600	507631	5729863	5.3	0.9	0.1	Object	Unknown object				elongated contact; hard reflection; no shadow;	no morphological anomalies;	no anomaly tagged;	unknown object	
I	SSS-WFS1-213	97-9700	507112	5728983	9.9	6.7	HNM	Object	Unknown object	Found			poor quality image; two reflections with shadow visible;	two-legged contact within depression. L=2.6; W=1.5; H=0.4m		unknown object	
I	SSS-WFS1-214	98-9800	506966	5728307	5.1	0.8	HNM	Object	Unknown object				clear straight elongated contact; hard reflection; thin shadow;	no morphological anomalies;	no anomaly tagged;	unknown object	possible beam
I	SSS-WFS1-215	106-10600	507120	5727249	11.2	6.7	0.3	Object	Unknown object				probably SSS disturbance due to sudden pull at cable	no morphological anomalies;	no anomalies tagged;	natural phenomenon	
I	SSS-WFS1-219	42-4200	501318	5730431	6.3	1.6	0.4	Object	Unknown object				reflection of contact and surrounding sebed are alike; clear shadow;	contact at natural sediment ridge;	no anomaly tagged	natural phenomenon	sand ripple
II	SSS-WFS2-504	144-14400	504187	5717344	6.6	3.6	0.9	Contact	Unknown contact				no clear reflection; clear shadow; poor quality SSS-image; much striping;	no signs of morphological disturbances or scouring; top of sand wave crest;	no magnetic anomalies tagged;	natural phenomenon	possible disturbance of SSS-image
II	SSS-WFS2-508	65-6500	502766	5728601	12.1	10.9	HNM	Contact	Unknown contact				hard parallel reflections; distortion of SSS-image; striping;	no data available;	no anomalies tagged;	natural phenomenon	possible exposure of shell bed
II	SSS-WFS2-543	92-9200	503066	5724571	20.9	6.8	HNM	Object	Unknown object				no shadow visible	no signs of morphological disturbances or scouring;	no anomaly tagged;	natural phenomenon	possible shell concentration

Reported figure by survey companies DEEP (BWFSI and II) and Fugro (BWFSIII and IV)													Interpretation Periplus Archeomare				
WFS	TargetName	LineName	Easting	Northing	Length	Width	Height	Description	Interpretation	MB	MAG	Notes	SSS	MBES	MAG	Interpretation	Remark
II	SSS-WFS2-552	94-9400	503159	5724103	4.6	3.5	0.4	Object	Unknown object	Found			spherical contact; hard reflection; clear shadow;	spherical structure surrounded by scoured area on top of sand wave;		unknown object	man-made
II	SSS-WFS2-553	96-9600	503040	5723920	6.5	0.9	HNM	Object	Unknown object				poor quality SSS-image; much striping;	no signs of morphological disturbances or scouring; top of sand wave crest;	no magnetic anomalies tagged;	natural phenomenon	possible disturbance of SSS-image
II	SSS-WFS2-555	97-9700	502476	5723012	8	0	HNM	Object	Possible cable				linear contact; thin shadow; poor quality SSS-record;	no signs of morphological disturbances or scouring;	no magnetic anomaly tagged;	cable	
II	SSS-WFS2-556	98-9800	503839	5724574	32.2	16.6	HNM	Object	Unknown object				high reflective zone; no shadow; disturbance possibly due to sudden pull at cable;	no signs of morphological disturbances or scouring;	no anomalies tagged;	no object	
II	SSS-WFS2-564	100-10000	503685	5724073	4.1	1.4	HNM	Object	Unknown object				much striping in SSS-image; linear contact; moderate reflection; clear shadow;	no signs of morphological disturbances or scouring;		natural phenomenon	phenomenon possibly induced by disturbance of SSS recording
II	SSS-WFS2-566	102-10200	502310	5721970	16	0	HNM	Object	Possible cable				hard reflections only; no shadows;	no signs of disturbances of natural morphological or scouring;	no anomalies tagged:	unknown object	uncertain; possibly natural
II	SSS-WFS2-568	102-10200	501703	5720952	6.7	0.7	0.1	Object	Unknown object				clear reflection; no clear shadow;	no signs of morphological disturbances or scouring; top of sand wave crest;	no anomaly tagged;	natural phenomenon	
II	SSS-WFS2-570	103-10300	502363	5721952	8	0	HNM	Object	possible cable				faint linear contact; no shadow; parallel to bedding; much striping;		no anomalies tagged;	natural phenomenon	no contact
II	SSS-WFS2-571	103-10300	504337	5724149	6	1.1	HNM	Object	Unknown object		MAG-WFS2-229		clear reflection; no shadow;	no signs of morphological disturbances or scouring;	coincides with 5nT contact MAG-WFS2-229	unknown object	
II	SSS-WFS2-574	104-10400	503626	5723364	6.4	1.7	0.1	Object	Unknown object				reflection of sediment ridge; no shadow;	no signs of morphological disturbances or scouring; coincides with sand ripple crest;	magnetic anomaly tagged at 18m from SSS-target;	natural phenomenon	sand ripple
II	SSS-WFS2-575	104-10400	504271	5724122	13.4	5.8	0.1	Object	Unknown object				moderately hard reflections only; no shadows;	no signs of morphological disturbances or scouring;	no anomalies tagged:	natural phenomenon	probably shell bed
II	SSS-WFS2-576	104-10400	505944	5726013	7	2.3	0.2	Object	Unknown object				elongated contact; granular reflection; faint shadow;	no signs of morphological disturbances or scouring;	no anomalies tagged:	natural phenomenon	possible shell ridge
II	SSS-WFS2-583	106-10600	501740	5720338	7.2	0	0.3	Object	Possible Cable				elongated bended contact; much striping;	coincides with bended crest of current ripple;	no anomaly tagged;	natural phenomenon	sedimentary structure; current ripple
II	SSS-WFS2-587	108-10800	502616	5721345	6	2.5	HNM	Object	Unknown object				faint reflection; no shadow;	no signs of morphological disturbances or scouring; edge of current ripple;	no anomalies tagged;	natural phenomenon	edge of current ripple
II	SSS-WFS2-588	108-10800	503394	5722152	12.9	0	HNM	Object	Unknown object				clear reflections of irregular contact	no signs of morphological disturbances or scouring;	no anomalies tagged;	rope or cable	entangled
II	SSS-WFS2-590	109-10900	502155	5720394	11.8	1.6	0.2	Object	Unknown object				hard elongated reflections; much striping;	no signs of morphological disturbances or scouring	no anomalies tagged;	natural phenomenon	possible sediment ridges
II	SSS-WFS2-593	110-11000	505246	5724461	17.2	4.1	0.4	Object	Unknown object				elongated ridge partly with hard reflection;	structure part of natural morphology;	no anomalies tagged;	natural phenomenon	sand ridge; possibly with shell cover
II	SSS-WFS2-594	110-11000	502931	5721160	10.6	6.8	0.2	Object	Unknown object				poor quality highly reflective SSS-image; much striping;	no signs of morphological disturbances or scouring;	no anomalies tagged;	no object	
II	SSS-WFS2-598	110-11000	505166	5724309	4.9	1.6	0.3	Object	Unknown object				sigmoidal shaped contact; much disturbance on SSS record;	no signs of morphological disturbances or scouring;at crest of sand wave;		natural phenomenon	current ripple superposed on sand wave
II	SSS-WFS2-604	112-11200	505654	5724632	4.3	2	0.2	Object	Unknown object				hard reflective zone; no clear shadow;	no signs of morphological disturbances or scouring;at crest of sand ripple;		natural phenomenon	possible exposure of shell
II	SSS-WFS2-608	113-11300	506973	5726202	17.2	10.5	HNM	Object	Unknown object				hard reflections only; no shadows;	no signs of morphological disturbances or scouring;	no anomalies tagged;	natural phenomenon	possible shell bed
II	SSS-WFS2-609	113-11300	507492	5726863	6	5.3	HNM	Object	Unknown object				very clear isolated reflective zone; no shadow;	no signs of morphological disturbances or scouring;	no anomalies tagged;	natural phenomenon	possible shell layer
II	SSS-WFS2-610	112-11200	503923	5722190	5.2	1.5	0.5	Anchor	Contact	Found			isolated v-shaped contact clear reflection and shadow; amidst depression;	slighty elevated structure perpendicular to natural current ripple; L=4.5m; W=2.4m; H=0.4m;	no anomalies tagged;	unknown object	man-made; possible anchor
II	SSS-WFS2-614	114-11400	507484	5726412	18	8.9	0.1	Object	Unknown object				hard granualr reflections only; no shadows;		no anomalies tagged;	natural phenomenon	possible exposed shell bed
II	SSS-WFS2-622	116-11600	502587	5719834	5.6	3.7	0.2	Object	Unknown object				very clear isolated reflective zone; no shadow;	no signs of morphological disturbances or scouring;	no anomalies tagged;	natural phenomenon	possible shell layer
II	SSS-WFS2-623	116-11600	506684	5725077	10.1	6.5	0.2	Object	Unknown object				hard reflections only; no shadows;	no signs of morphological disturbances or scouring;	no anomalies tagged:	natural phenomenon	probably shell bed

Reported figure by survey companies DEEP (BWFSI and II) and Fugro (BWFSIII and IV)													Interpretation Periplus Archeomare				
WFS	TargetName	LineName	Easting	Northing	Length	Width	Height	Description	Interpretation	MB	MAG	Notes	SSS	MBES	MAG	Interpretation	Remark
II	SSS-WFS2-625	117-11700	506201	5724509	13.2	5.2	0.1	Object	Possible cable				heterogenic reflections;	no signs of morphological disturbances or scouring; structure located at flank of megaripple;	no anomalies tagged:	natural phenomenon	unknown origin
II	SSS-WFS2-634	121-12100	505232	5722445	5.3	1.2	0.2	Object	Unknown object	Found			rectangular contact; clear reflection and shadow;	isolated elevated patch; L=3.0; W=1.5m; H=0.6m;	no anomalies tagged;	unknown object	man-made
II	SSS-WFS2-637	122-12200	507096	5724794	10.3	8.9	0.1	Object	Unknown object				hard reflections only; no shadows;	no signs of morphological disturbances or scouring;	no anomalies tagged:	natural phenomenon	probably shell bed
II	SSS-WFS2-638	123-12300	507623	5725422	10	1.1	0.1	Object	Unknown object				poor quality SSS-image; much striping;	no signs of morphological disturbances or scouring; target at crest of current ripple;	no anomalies tagged;	unknown object	
II	SSS-WFS2-639	123-12300	506766	5724070	5.1	0.7	0.2	Object	Unknown object				elongated contact; very clear reflection and shadow;	no signs of morphological disturbances or scouring;		unknown object	
II	SSS-WFS2-640	124-12400	504196	5720847	5.1	0.6	0.2	Object	Unknown object				intermitted linear contact; clear reflection and shadow; cable or pipeline;	no signs of morphological disturbances or scouring; clear megaripples;		cable or pipeline	partly buried under mega-ripples; Refer to SSS-WFS2-641
II	SSS-WFS2-641	124-12400	504186	5720832	5.2	0.4	0.1	Object	Unknown object				intermitted linear contact; clear reflection and shadow; cable or pipeline;	no signs of morphological disturbances or scouring; clear megaripples;		cable or pipeline	partly buried under mega-ripples; Refer to SSS-WFS2-640
II	SSS-WFS2-642	124-12400	503678	5719878	18.1	4.9	0.5	Object	Unknown object	Found			fork shaped contact with clear hard reflection; scouring on two sides;	slightly elevated contact; L=3.2m; W=3.2m; H=0.6m; pronounced scouring at northwest side;	no anomaly tagged;	unknown object	
II	SSS-WFS2-651	126-12600	506333	5723211	4.1	1	0.1	Object	Unknown object				irregular contact; clear reflection; no shadow;	no signs of morphological disturbances or scouring;		natural phenomenon	uncertain
II	SSS-WFS2-658	129-12900	505091	5720960	4.1	0.9	0.3	Object	Unknown object				irregular shaped contact; clear reflection and shadow;	slight disturbance of natural morphology;		unknown object	
II	SSS-WFS2-661	130-13000	506807	5723148	10.9	0	0.5	Object	Possible cable					intersection lineation between exposed sediments of different composition; e.g. clay and sand;	no anomalies tagged;	natural phenomenon	geological structure
II	SSS-WFS2-662	131-13100	502779	5717603	5.2	1.8	0.1	Object	Unknown object				clear reflection an d shadow;	no signs of morphological disturbances or scouring; target at crest of mega-ripple;		unknown object	
II	SSS-WFS2-663	132-13200	503845	5719109	16.2	6.7	0.2	Object	Unknown object				hard reflections only; no shadows;	no signs of disturbances of natural morphological or scouring;	no anomalies tagged:	natural phenomenon	possible shell bed
II	SSS-WFS2-666	168-16800	504656	5714197	6.9	2.9	0.4	Contact	Unknown contact				isolated contact; reflection very alike surrounding seabed;	no signs of morphological disturbances or scouring;	no anomaly tagged;	natural phenomenon	possible outcrop of clay/peat
II	SSS-WFS2-670	166-16600	504144	5713956	20.1	5.3	HNM	Contact	Unknown contact	Found			S-shaped contact amodts depressions;	elongated contact with scouring at northeast and southwest side; L=5.8m; W=3.2m; H=1.1m;	no anomalies tagged;	unknown object	
II	SSS-WFS2-671	163-16300	504486	5714526	7.8	3.2	HNM	Object	Unknown object				phenomenon possibly induced by disturbance of SSS recording;	no signs of morphological disturbances or scouring;	no anomalies tagged;	no object	possible disturbance of SSS recording
II	SSS-WFS2-676	160-16000	504400	5715257	9.2	0	HNM	Contact	Linear contact				clear hard reflection parallel to bedding; no shadow;	no signs of morphological disturbances or scouring;	no anomalies tagged;	natural phenomenon	edge of sediment ridge
II	SSS-WFS2-679	155-15500	507335	5719586	4.3	0	HNM	Object	Linear object				much striping in SSS-image; linear contact; moderate reflection; clear shadow; parallel to sedimentary bedding;	no signs of morphological disturbances or scouring;at crest of sand ripple;		natural phenomenon	sand ripple
II	SSS-WFS2-680	154-15400	507854	5720603	4.5	2.1	0.5	Object	Unknown object				much striping in SSS-image; moderate reflection; clear shadow;	outside area;		unknown object	uncertain
II	SSS-WFS2-684	149-14900	507678	5720970	9	3.2	0.5	Object	Unknown object	Found			irregular reflections; clear shadow;	slightly elongated contact; could be natural;	no anomalies tagged;	unknown object	possible tangled rope
II	SSS-WFS2-686	145-14500	507686	5721598	22.6	21.7	1.3	Object	Unknown object	Found	MAG-WFS2-251		unclear SSS-image; hard reflectors w/ shadow;	isolated compact contact amidst scour depression; L=3.6m; W=2.8m ; H=2.5m;	1565nT	unknown object	possible container
II	SSS-WFS2-689	145-14500	507118	5720943	13.8	7.2	1.3	Object	Unknown object	Found			elevated structure; reflections similar to surrounding seabed; clear shadow;	elevated structure; scouring east and west of contact; L=9.0m; W=5.5; H=1.0m;	no anomalies tagged;	unknown object	
II	SSS-WFS2-690	146-14600	504295	5717381	23.5	0.7	HNM	Contact	Linear contact				intermitted linear contact;	no morphological anomalies;	no anomalies tagged;	cable	partly buried
II	SSS-WFS2-693	142-14200	508262	5722942	41.9	8.4	2.8	Wreck	Wreck debris area (possibly 2902)								

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WFS	TargetName	LineName	Easting	Northing	Length	Width	Height	Description	Interpretation	MB	MAG	Notes	SSS	MBES	MAG	Interpretation	Remark
II	SSS-WFS2-694	138-13800	502537	5716328	10.8	5.1	HNM	Object	Unknown object	Found			isolated structure with identical reflections as surrounding seabed; slightly elevated.	isolated structure; some scouring around the structure;	no anomalies tagged;	natural phenomenon	possible exposure of clay
II	SSS-WFS2-698	142-14200	508242	5722932	0	0	0.3	Wreck	Wreck debris (possibly 2902)								
II	SSS-WFS2-699	140-14000	503958	5717728	4.6	2.7	0.8	Object	Unknown object				much striping in SSS-image; no clear reflection; clear shadow;	no signs of morphological disturbances or scouring;at crest of sand ripple;		natural phenomenon	sand ripple
II	SSS-WFS2-701	139-13900	505391	5719631	17.5	0.7	HNM	Contact	Linear contact				hard reflections only; no shadows;		no anomalies tagged;	natural phenomenon	possible exposed shells parallel to sediment ripple
II	SSS-WFS2-712	144-14400	506164	5720021	9.8	4.3	1.9	Wreck	Possible wreck debris (3657)	Found							
III	S0514	A34029_SH_NavMerged	497935	5729694	6.4	0.3	0.1	debris					linear contact; thin reflection; clear shadow;	no signs of morphological disturbances or scouring; at crest of sand wave;		rope or cable	
III	S0515	A31083_SH_NavMerged	495958	5729695	7.8	1.5	0.56	debris	Possibly natural	Found			contact; relative hard reflection compared to surrounding seabed;	no signs of morphological disturbances or scouring;		natural phenomenon	
III	S0530	A34026_SH_NavMerged	499158	5729455	6.9	0.3	0.38	linear debris		Found			linear contact; intermitted;			rope or cable	intermitted
III	S0531	A34026_SH_NavMerged	499141	5729450	4.6	0.5	0.3	debris					rounded elongated contact; moderate reflection; no clear shadow;	no signs of morphological disturbances or scouring;		natural phenomenon	sedimentary structure; sand ripple
III	S0550	A34020_SH_706_NavMerged	502088	5729145	4.7	3.3	0.6	debris		Found			elongated contact; hard reflection; no clear shadow;	outside *multibeam* range; possibly within scoure;		unknown object	man made
III	S0584	A34025_SH_NavMerged	499132	5728668	9.1	0.4	0.07	linear debris					linear contact; disturbance of SSS-image; striping;	no signs of morphological disturbances or scouring;		natural phenomenon	uncertain
III	S0628	A31047_SH_NavMerged	500796	5727961	5.5	0.9	0.56	debris			M0044		L-shaped contact, only spotted reflection; no shadow;	no signs of morphological disturbances or scouring;		unknown object	possibly related to S0639 (wreck)
III	S0639	A31048_SH_707_NavMerged	500728	5727924	17.6	3.9	2.8	wreck 1723		Found	M0046						
III	S0651	A31080_SH_NavMerged	495127	5727898	6.7	1.5	0.3	linear debris		Found			clear target embedded in sediment; clear reflection and shadow;	small (2m) and undeep scouring around contact;		unknown object	man-made
III	S0734	A31070_SH_NavMerged	495465	5726433	8.2	0.4	0.12	linear debris			M0712		linear contact; disturbance of SSS-image; striping;	no signs of morphological disturbances or scouring;		rope or cable	
III	S0753	A31041_SH_NavMerged	496010	5726093	4.4	2	0.71	debris		Found			depression; hard reflection at 'wrong' side;	no signs of morphological disturbances or scouring;		unknown object	buried
III	S0756	A31071_SH_NavMerged	495006	5726044	6.1	0.4	0.03	linear debris					linear contact, intermitted; thin reflection; clear shadow;	no signs of morphological disturbances or scouring;		cable	partly buried
III	S0766	A31083_SH_NavMerged	492759	5725662	7.5	1.4	0	debris					elongated contact; relative hard reflection; no shadow; much disturbance of SSS record;	no signs of morphological disturbances or scouring; at edge of sand wave;		natural phenomenon	probably natural sedimentary structure
III	S0770	A31074_SH_NavMerged	494168	5725635	5	0.9	0.16	debris					elongated contact; moderate reflection; clear shadow;	slight depression near tagged contact;		unknown object	
III	S0772	A31060_SH_NavMerged	496602	5725620	4.2	0.3	0.1	linear debris					linear contact; clear reflection and shadow;	no signs of morphological disturbances or scouring;		natural phenomenon	natural sedimentary structure; sand ripple
III	S0788	A34033_SH_NavMerged	492291	5725316	4.4	0.8	0.38	debris					elongated contact; moderate reflection; clear shadow;	no signs of morphological disturbances or scouring;		natural phenomenon	natural sedimentary structure; sand ripple
III	S0799	A31079_SH_NavMerged	492883	5725108	5.4	0.3	0.11	linear debris					linear contact; thin reflection and shadow;	no signs of morphological disturbances or scouring; near sand wave crest;	proximate to M0521	cable	
III	S0803	A31074_SH_NavMerged	493836	5725020	5.7	0.2	0.08	linear debris					linear contact, intermitted; thin reflection; clear shadow;	no signs of morphological disturbances or scouring;	no anomalies tagged; possible alignment with M0730 and M0537	cable	partly buried
III	S0806	A3SB008_SH_NavMerged	500498	5724978	5.1	0.5	0.1	linear debris					linear contact; thin reflection and shadow;	no signs of morphological disturbances or scouring; near sand wave crest;		cable	uncertain; might be natural phenomenon;
III	S0807	A34032_SH_NavMerged	492489	5724926	4.1	0.9	0.25	debris					elongated contact; hard reflection; clear shadow;	distinct sigar-shaped contact emedded in surrounding sediments; on top two pointed structures; slight scouring; L=4.2m; W=1.5m; H=0.8m;		unknown object	man-made

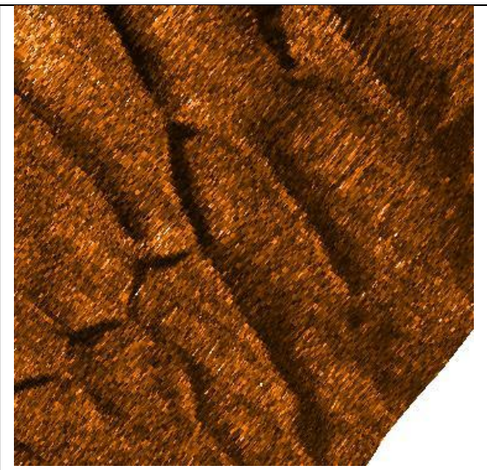
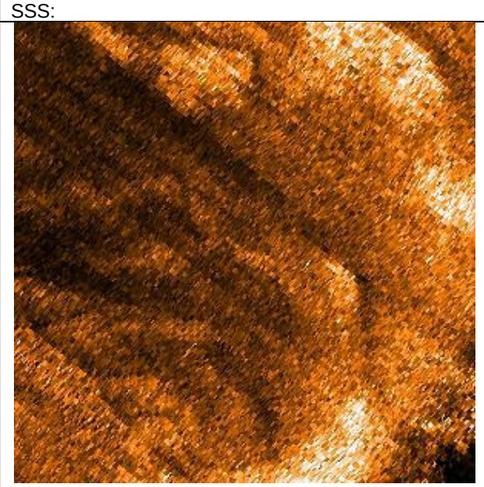
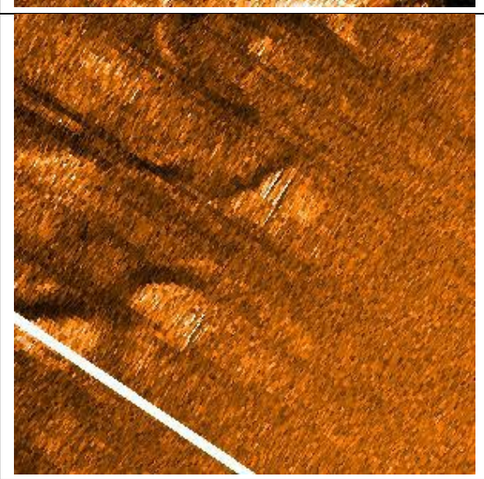
Reported figure by survey companies DEEP (BWFSI and II) and Fugro (BWFSIII and IV)													Interpretation Periplus Archeomare				
WFS	TargetName	LineName	Easting	Northing	Length	Width	Height	Description	Interpretation	MB	MAG	Notes	SSS	MBES	MAG	Interpretation	Remark
III	S0817	A31040_SH_NavMerged	501240	5724590	5	0.8	0.23	debris					rounded contact; small shadow;	slight depression near tagged contact;		unknown object	
III	S0820	A31076_SH_NavMerged	492956	5724410	6.4	0.8	0.19	debris					rectangular contact; clear reflection and shadow;	no signs of morphological disturbances or scouring; at crest of sand wave;		unknown object	
III	S0822	A34030_SH_NavMerged	492968	5724263	7.8	0.4	0.08	linear debris					linear debris;	no signs of morphological disturbances or scouring;		unknown object	possible rope
III	S0823	A31074_SH_NavMerged	493047	5724239	9.7	0.2	0.08	linear debris	Cable?		M0729		linear contact;		M0729	cable or pipeline	
III	S0832	A3SB016_SH_NavMerged	498854	5723863	9.4	0.6	0.23	debris					rectangular contact; moderate reflection; shadow at 'wrong' side; possible scour;	no signs of morphological disturbances; possible slight scouring;		unknown object	
III	S0835	A34026_SH_NavMerged	494518	5723655	6.2	0.3	0.14	linear debris		Found			spherical contact combined with linear structure;	scouring around apparently two parallel elongated contacts; L=2.3m; W=1.0m; H=0.2m;		unknown object	man-made
III	S0837	UHRINF008_SH2_NavMerged	501967	5723531	4.6	0.3	0.08	debris		Found	M1597		contact reflection alike surrounding seabed; no shadow; parallel to sedimentary structure;	morphology slightly disturbed;		natural phenomenon	natural structure; e.g. outcrop of clay
III	S0844	A31050_SH_NavMerged	496527	5723244	4.4	0.3	0.07	debris					linear contact; thin reflection and shadow;;	no signs of morphological disturbances or scouring;		cable	
III	S0854	A31053_SH_NavMerged	495444	5722543	4.4	0.5	0	linear debris					no clear contact; no shadow; possible distortion in SSS image;	no signs of morphological disturbances or scouring;		no object	uncertain
III	S0856	UHRINF012_SH2_NavMerged	496837	5722354	6.1	0.7	0.08	linear debris	Possible exposure UK - NL11	Found	M1477		linear contact;	linear structure and depression;	contact in between and in alignment with two magnetic anomalies;	cable	exposure UK - NL11 cable
III	S0859	A31035_SH_NavMerged	499884	5721702	4	4	0.43	debris		Found			rectangular contact; hard reflection; clear shadow;	elevated contact attached with sand ripple; L2.3m; W2.0m;		natural phenomenon	
III	S0870	A31018_SH_NavMerged	500805	5719203	6.5	1	0.13	debris	Linear debris				thin linear reflection; clear shadow;	no signs of morphological disturbances or scouring;		rope or cable	uncertain
III	S0876	A31013_SH_NavMerged	500627	5718182	5.7	3.6	0.87	debris		Found			rectangular contact, hard reflection; clear small shadow;	clear angular contact; slight scouring; L=5.0; W=3.0; H=0.6m;		unknown object	man-made
III	S0880	A31011_SH_NavMerged	500897	5717838	4.2	0.7	0	debris					V-saped contact; clear reflection; no shadow;	no signs of morphological disturbances or scouring;		unknown object	
III	S0882	A31008_SH_701_NavMerged	500762	5717072	4.4	1.5	0.3	debris	Possibly natural	Found			elongated contact; hard reflection; clear shadow;	rectangular contact; L=3.4m; W=2.0m; H=0.2m;		unknown object	probably man-made
III	S0883	A31004_SH_701_NavMerged	501158	5716728	7.8	1.4	0.68	debris		Found		In scour	linear contact; hard reflection;	amidst scouring;		pipeline	Zeepipe exposure
IV	S0014	A41126_SH_NavMerged	493503	5735724	6.6	0.2	0.23	debris		Not Found			halter-shaped contact clear reflection and shadows; at end of contact larger shadows;	linear contact;		unknown object	man-made
IV	S0023	A41100_SH_NavMerged	497543	5735317	7.4	0.4	0.08	linear debris		Not Found			linear contact; faint thin reflection and shadow;	no signs of morphological disturbances or scouring;		cable	uncertain
IV	S0030	A44048_SH_NavMerged	492593	5735201	4.7	0.2	0.11	linear debris		Not Found			no clear contact;	no signs of morphological disturbances or scouring;		natural phenomenon	
IV	S0058	A41136_SH_NavMerged	490842	5734633	5	0.4	0.27	linear debris		Not Found			elongated contact; sshadow at 'wrong' side;	no signs of morphological disturbances or scouring;		natural phenomenon	
IV	S0078	A41137_SH_NavMerged	490249	5734053	5.7	0.3	0.12	linear debris		Not Found			much striping in SSS-image; linear contact; thin reflection and shadow;	no signs of morphological disturbances or scouring;		cable	uncertain
IV	S0085	A44053_SH_NavMerged	488983	5733931	7.9	0.7	0.16	debris		Not Found			linear contact; reflection at 'wrong'side;	no signs of morphological disturbances or scouring; at crest of sand ripple;		natural phenomenon	current ripple
IV	S0087	A41087_SH_NavMerged	498728	5733897	6.2	0.8	0.1	linear debris		Not Found			elongated contact; moderate reflection; weak shadow;	no signs of morphological disturbances or scouring;		natural phenomenon	natural sedimentary structure; sand ripple
IV	S0095	A41121_SH_NavMerged	492881	5733792	4.2	2	0.32	debris		Found			rectangular contact; hard reflection; clear shadow;	irregular distortion of seabed morphology;		unknown object	man-made
IV	S0101	A41097_SH_NavMerged	496895	5733669	4.1	0.4	0.08	linear debris		Not Found			rectangular contact; moderate reflection; faint shadow; on sand ripple;	no signs of morphological disturbances or scouring;		natural phenomenon	natural sedimentary structure; sand ripple
IV	S0106	UHRINF006_SH2_NavMerged	493817	5733541	4.5	0.5	0.58	debris		Found			spherical contact with attached elongated structure; embedded in sediment; moderate reflection;	elevated spherical contact; linear structure nearby;		anchor	possibly with chain

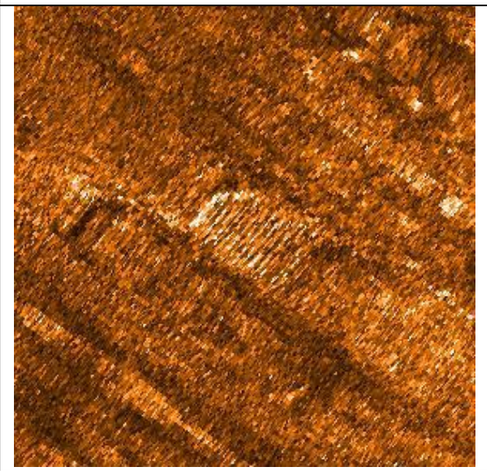
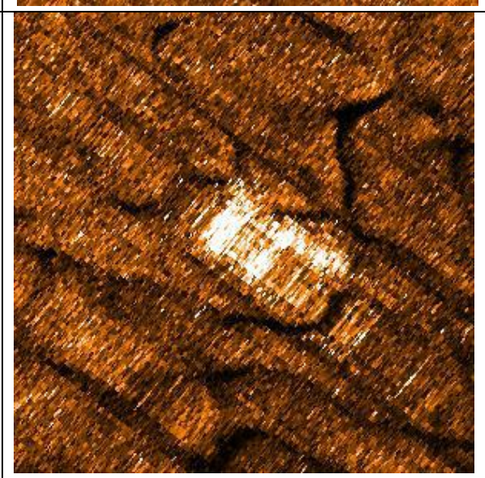
Reported figure by survey companies DEEP (BWFSI and II) and Fugro (BWFSIII and IV)													Interpretation Periplus Archeomare				
WFS	TargetName	LineName	Easting	Northing	Length	Width	Height	Description	Interpretation	MB	MAG	Notes	SSS	MBES	MAG	Interpretation	Remark
IV	S0111	A41097_SH_NavMerged	496676	5733448	5.1	1.5	0.32	linear debris		Not Found			elongated ; hard reflection; no shadow; embedded in sediment;	no signs of morphological disturbances or scouring;		natural phenomenon	
IV	S0129	A44044_SH_NavMerged	492874	5733194	6.4	0.6	0.37	linear debris		Not Found			elongated contact; clear reflection and shadow;	slightly elevated structure; L=4.9m; W=2.3; H=0.1m;		unknown object	
IV	S0145	A44059_SH_701_NavMerged	485059	5732938	4.6	0.6	0.43	debris		Not Found			poor quality SSS-record; elongated contact; hard reflection; clear shadow;	outside recorded area;		unknown object	
IV	S0156	A41160_SH_701_NavMerged	485206	5732755	5.8	0.9	0.44	linear debris		Found			elongated contact; hard reflection; clear shadow;	no signs of morphological disturbances or scouring;		unknown object	possibly natural
IV	S0157	A44051_SH_NavMerged	488868	5732745	6.1	0.3	0.1	debris	linear debris. Possibly natural				linear structure; reflection alike surrounding seabed; clear shadow;	no signs of morphological disturbances or scouring;		natural phenomenon	natural sedimentary structure
IV	S0174	A41155_SH_NavMerged	485900	5732572	4.2	0.8	0.29	debris		Not Found			elongated structure rounded; parallel to sand ripple; much striping in sonar record;	no signs of morphological disturbances or scouring;		natural phenomenon	natural sedimentary structure; sand ripple
IV	S0189	A3A4XL002_SH2_NavMerged	487882	5732433	6	0.8	0.74	debris		Found			spherical contact; hard reflection; clear shadow; embedded in sediment;	spherical contact; amidst scoure; L=3.3m; W=1.5m; H=0.2m;		unknown object	man-made
IV	S0223	A44059_SH_701_NavMerged	484469	5732223	5.5	0.6	0.11	linear debris		Not Found			linear contact; hard reflection; clear shadow;	slightly elevated with respect to surrounding seabed;		natural phenomenon	
IV	S0235	A41154_SH_NavMerged	485810	5732162	7.7	1.7	0.28	debris		Found			elongated contact; moderate reflection; thin clear shadow;	slightly elevated with respect to surrounding seabed;		natural phenomenon	possible outcrop of clay Kreftenheye/Eem Fm
IV	S0246	A44056_SH_NavMerged	485819	5732119	4	0.4	0.39	linear debris		Not Found			drop-shaped contact; moderate reflection; thin shadow;	slightly elevated with respect to surrounding seabed;		natural phenomenon	possible outcrop of clay Kreftenheye/Eem Fm
IV	S0261	A44056_SH_NavMerged	485854	5732066	4.6	0.6	0.56	debris		Not Found			elongated contact; moderate reflection comparable with surrounding seabed; no clear shadow;	slightly elevated with respect to surrounding seabed;		natural phenomenon	
IV	S0275	A41151_SH_NavMerged	486085	5732015	6.5	0.4	0.07	linear debris		Not Found			intermitted linear contact; thin reflection and shadow;	no signs of morphological disturbances or scouring;	no anomalies tagged; proximate to anomalies tagged and interpreted to represent UK_NL8	cable	coherent with S0279 and S0282
IV	S0279	A41152_SH_NavMerged	486081	5732002	5.3	0.5	0	debris		Not Found			linear contact; thin reflection no clear shadow;	no signs of morphological disturbances or scouring;	no anomalies tagged; proximate to anomalies tagged and interpreted to represent UK_NL9	cable	coherent with S0275 and S0282
IV	S0282	A41152_SH_NavMerged	486069	5731991	35.5	0.3	0.13	debris		Not Found			intermitted linear contact; thin reflection and shadow;	no signs of morphological disturbances or scouring;	no anomalies tagged; proximate to anomalies tagged and interpreted to represent UK_NL10	cable	coherent with S0279 and S0282
IV	S0285	A44056_SH_NavMerged	485814	5731986	5.9	1.5	0.18	debris		Not Found			no clear target; moderate reflection; shadow at 'wrong' side;	no signs of morphological disturbances or scouring;		natural phenomenon	
IV	S0301	A44056_SH_NavMerged	485778	5731892	5.6	0.6	0.1	debris		Not Found			elongated contact; hard reflection on 'wrong side'; no shadow; poor quality SSS-image;	edge of sand ripple;		natural phenomenon	sand ripple
IV	S0308	A41137_SH_NavMerged	488492	5731867	5.6	0.6	0.47	debris		Found			spherical contact; moderate reflection; weak shadow;	contact not visible; scouring 2.8m in diameter next to contact location;		unknown object	
IV	S0311	A44044_SH_NavMerged	491912	5731850	7.2	0.4	0	linear debris		Found			elongated contact; moderate reflection; shadow at 'wrong' side;	no signs of morphological disturbances or scouring;		natural phenomenon	sand ripple

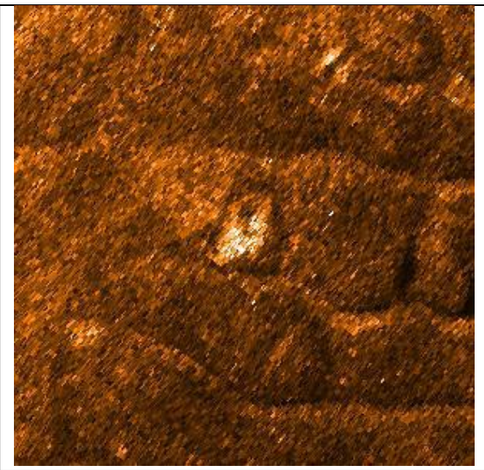
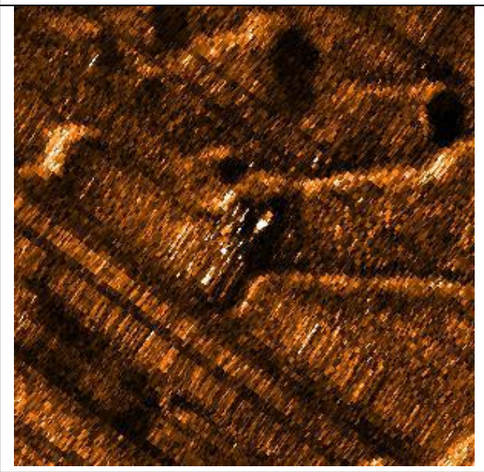
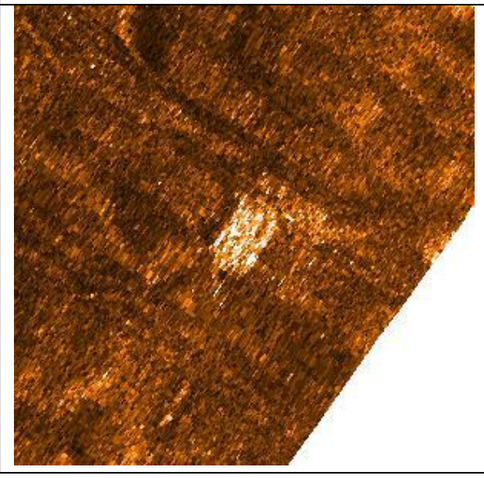
Reported figure by survey companies DEEP (BWFSI and II) and Fugro (BWFSIII and IV)													Interpretation Periplus Archeomare				
WFS	TargetName	LineName	Easting	Northing	Length	Width	Height	Description	Interpretation	MB	MAG	Notes	SSS	MBES	MAG	Interpretation	Remark
IV	S0313	A41147_SH_NavMerged	486887	5731855	5	0.4	0.16	debris		Found			linear contact; hard thin reflection; small shadow;	no signs of morphological disturbances or scouring;	no anomalies tagged; proximate to anomalies tagged and interpreted to represent UK_NL8	cable	possible exposure of UK_NL8
IV	S0343	A44038_SH1_NavMerged	494861	5731658	5.5	1.8	0.95	debris		Not Found			rectangular contact; hard reflection; clear shadow;	set of two parallel elevated contacts amidst scouring; L= 4.5m; W= 2.6m; H= 0.5m;		unknown object	man-made
IV	S0347	A44057_SH_NavMerged	485065	5731650	4.5	0.5	0.23	debris		Not Found			spherical contact; moderate reflection; small shadow;	no signs of morphological disturbances or scouring;		unknown object	possibly natural phenomenon
IV	S0351	A41144_SH_NavMerged	487081	5731637	4.9	1.3	0.17	debris		Not Found			elongated contact; moderate reflection; clear shadow; much striping in SSS-record; coincides with sand ripple;	slightly elevated structure;		natural phenomenon	sand ripple
IV	S0364	A41157_SH_701_NavMerged	484808	5731513	4.5	0.6	0.33	debris		Not Found			drop-shaped contact; moderate reflection; clear shadow;	outside *multibeam* recordings;		unknown object	possibly natural phenomenon
IV	S0377	A41109_SH_NavMerged	492851	5731262	6.7	1.3	0.4	debris		Found			elongated contact; moderate granular reflection; clear shadow;	slightly elevated contact;		unknown object	possibly natural
IV	S0387	A41096_SH_NavMerged	495084	5731177	4.6	1.3	1.02	debris		Not Found			elongated contact; moderate reflection; depression;	elongated elevated contact amidst scouring; L=4.0m; W=1.6m; H=0.5m		unknown object	
IV	S0434	A41127_SH_NavMerged	489300	5730841	4.4	1.4	0.33	debris		Found			spherical contact; hard reflection; small shadow;	no signs of morphological disturbances or scouring;		unknown object	
IV	S0444	A41123_SH_NavMerged	489889	5730655	4.5	0.4	0.22	linear debris		Not Found			elongated rounded contact; hard reflection; clear shadow;	edge of sand ripple; no signs of morphological disturbances or scouring;		natural phenomenon	sand ripple
IV	S0448	A44043_SH_NavMerged	491228	5730571	6.4	0.6	0.17	debris		Not Found			distorted SSS-image; linear reflections parallel to heading; much striping perpendicular heading;	edge of sand ripple; no signs of morphological disturbances or scouring;		no object	disturbance of sonar image
IV	S0501	A41109_SH_NavMerged	491524	5729795	4.4	1	1	debris		Not Found			elongated contact; hard reflection; clear large shadow;	elevated elongated contact;parallel to sand wave crest; 9m southwest on tagged SSS-contact;		natural phenomenon	intersection outcropping clay?
IV	S0506	A41097_SH_NavMerged	493741	5729763	4.2	1.2	0.31	debris		Found			spherical contact; moderate reflection; no clear shadow;	elevated contact amidst scouring area; L=4.2m; W=3.4m; H=0.6m; boulder like appearance;		unknown object	
IV	S0572	A41117_SH_NavMerged	489425	5728827	4.8	0.4	0.11	linear debris		Not Found			linear contact; thin reflection; slim shadow;	no signs of morphological disturbances or scouring;		cable	
IV	S0581	A41097_SH_NavMerged	492835	5728711	7	1.1	0	linear debris		Not Found			elongated zone; moderately hard granular reflection; no shadow;	no signs of morphological disturbances or scouring;		natural phenomenon	possible shell layer
IV	S0587	A41109_SH_NavMerged	490660	5728608	4.7	0.9	0.77	debris		Found			compact contact; hard reflection; clear shadow;	no signs of morphological disturbances or scouring;		unknown object	man-made
IV	S0590	A41111_SH_NavMerged	490260	5728567	4.3	0.9	0.3	debris		Found			elongated contact; moderate reflection; faint shadow; poor quality SSS-record; much striping;	no signs of morphological disturbances or scouring; seabed around 34.40m slightly 'bumpy';		natural phenomenon	possible outcrop of clay
IV	S0602	A41119_SH_NavMerged	488809	5728342	6.8	0.8	0.42	debris		Not Found			elongated contact; hard reflection; shadow visible;	connection between two sand ripples;		natural phenomenon	sand ripple
IV	S0612	A41099_SH_NavMerged	492044	5728217	6.5	1.4	1.37	debris		Not Found			elongated contact; hard reflection; pronounced shadow;	contact with internal northwest-seatheast trending elongated structures; some scouring on north and south side of contact		wreck	uncertain
IV	S0630	A41111_SH_NavMerged	489742	5727968	4.1	1.4	0.35	debris		Found			rectangular contact; moderate reflection; shadow present;	elevated elongated contact; L=2.2m; W= 1.3m; H=0.2m;		unknown object	
IV	S0671	A44042_SH_NavMerged	489603	5727700	6.2	0.7	0.3	linear debris		Found			elongated contact; moderate reflection; clear shadow;	slight scarring of seabed;		natural phenomenon	
IV	S0688	A41107_SH_NavMerged	489958	5727405	9	4.3	1.32	debris		Found			spherical contact; moderate granular reflection; no shadow;	no signs of morphological disturbances or scouring;		natural phenomenon	possible outcrop of clay
IV	S0693	A41105_SH_NavMerged	490358	5727289	4.3	1.2	0.52	debris		Found			drop-shaped contact; hard reflection; clear shadow;	elevated aequidimentional contact; embedded in sand; L=2.0m; W=2.0m; H=0.3m;		unknown object	man-made
IV	S0709	A41088_SH1_NavMerged	492863	5726996	4.3	0.4	0.09	linear debris		Not Found			linear contact; thin reflection; very slim shadow;	no signs of morphological disturbances or scouring;		cable	

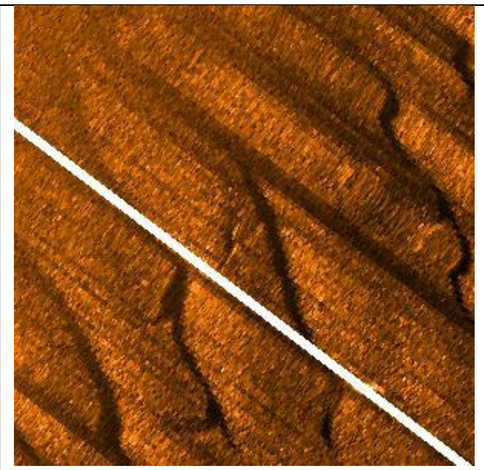
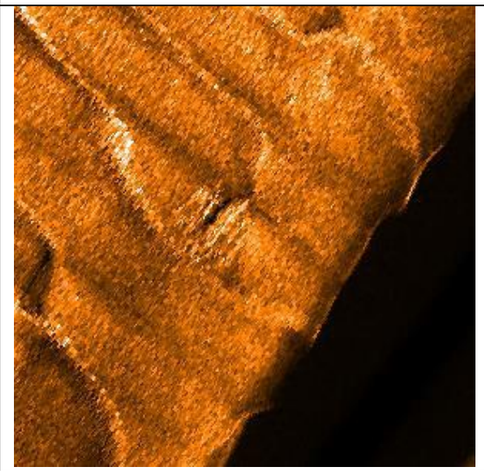
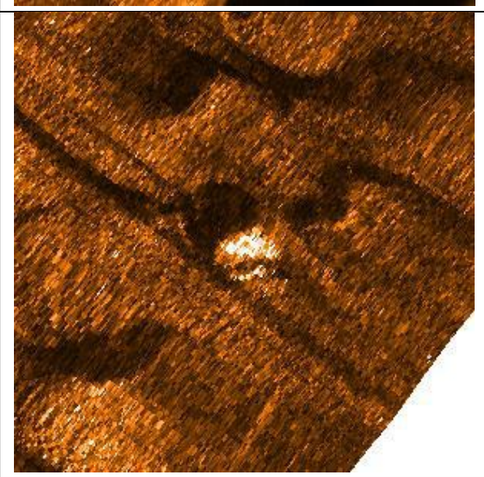
Reported figure by survey companies DEEP (BWFSI and II) and Fugro (BWFSIII and IV)													Interpretation Periplus Archeomare				
WFS	TargetName	LineName	Easting	Northing	Length	Width	Height	Description	Interpretation	MB	MAG	Notes	SSS	MBES	MAG	Interpretation	Remark
IV	S0721	A44039_SH_NavMerged	490376	5726803	5.5	0.5	0.07	linear debris		Not Found			elongated structure; shadow at 'wrong' side;	no signs of morphological disturbances or scouring;		no object	seabed disturbance
IV	S0722	A41090_SH_NavMerged	492536	5726792	4.4	0.6	0.24	debris		Found			poor quality SSS-record; striping; shadow at 'wrong' side;	no signs of morphological disturbances or scouring;		natural phenomenon	seabed disturbance
IV	S0747	A41096_SH_NavMerged	490928	5726258	4	1.4	0.37	debris		Found			parallel structure; granular hard reflection; no clear shadow;	no signs of morphological disturbances or scouring;		natural phenomenon	
IV	S0771	A41086_SH_NavMerged	492113	5725626	6.7	1.1	0.37	debris		Found			elongated contact; hard reflection; no clear shadow;	slight distortion of seabed;		unknown object	

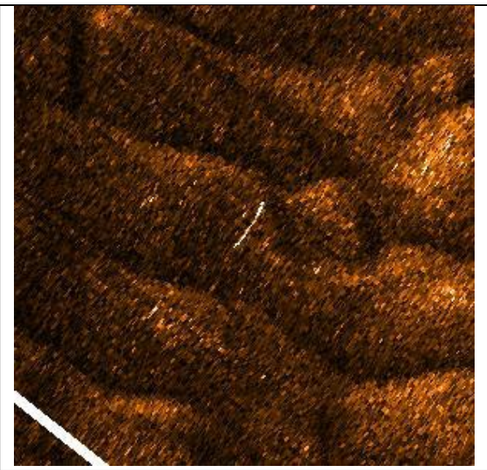
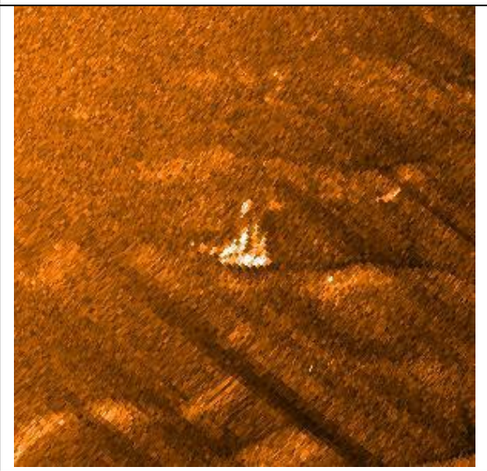
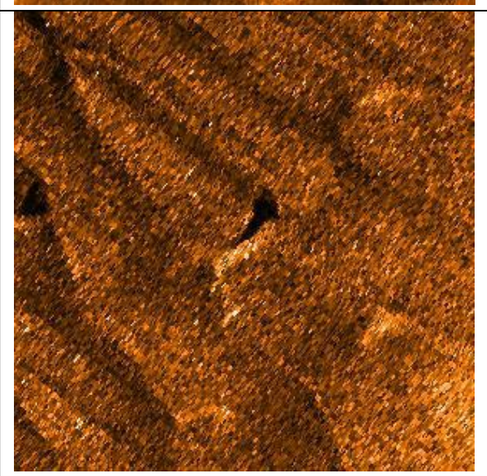
Appendix 2. Description of selected side scan sonar contacts

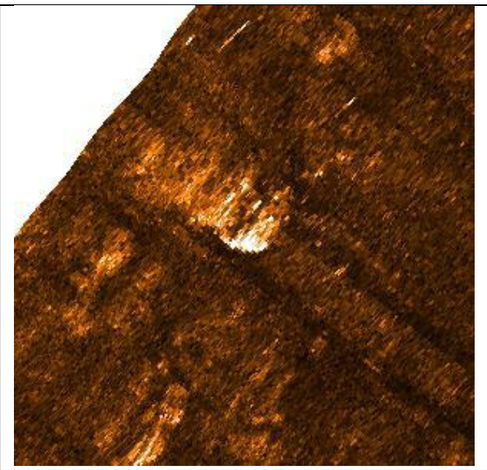
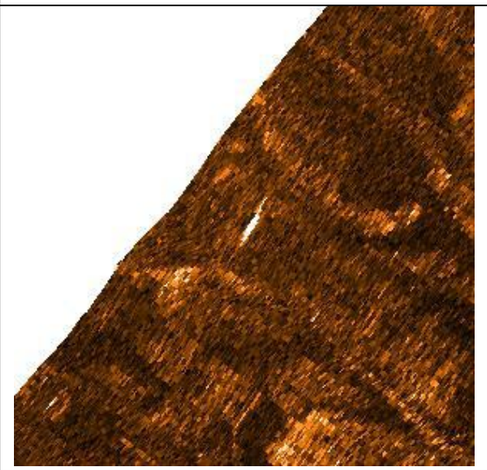
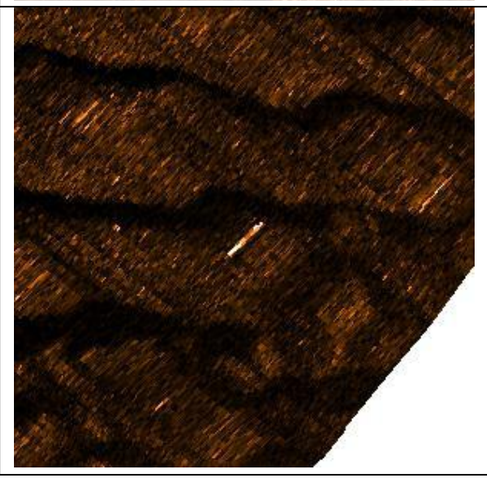
1	SSS-WFS1-192	62-6200	506266	5733300	72.2	3.5	HNM	Contact	Linear contact	 SSS:	SSS: no SSS target visible;
1	SSS-WFS1-148	82-8200	504868	5728443	30.7	0.0	HNM	Object	Linear object		SSS: no SSS target visible;
1	SSS-WFS1-147	81-8100	504883	5728468	25.2	0.0	HNM	Object	Linear object		SSS: very thin intermitted linear contact; clear reflection and shadow; MBES: No signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: possible cable;

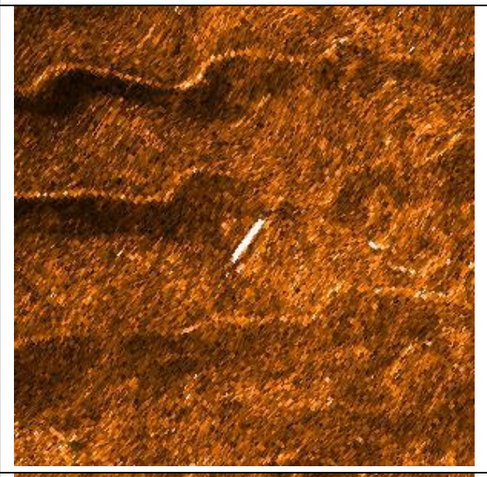
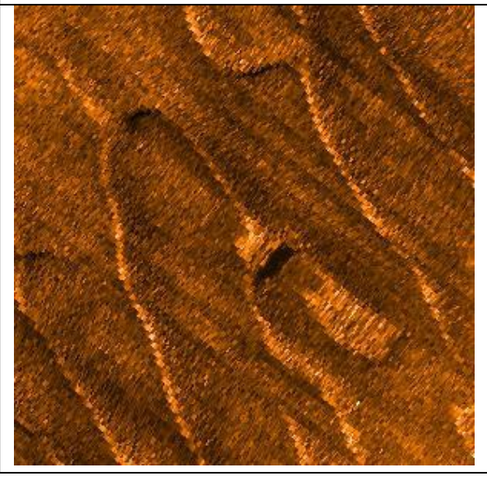
1	SSS-WFS1-209	85-8500	506498	5729838	12.0	0.0	HNM	Object	Possible cable		MBES: no signs of morphological disturbances or scouring; PP: probably cable
1	SSS-WFS1-206	71-7100	504039	5729040	11.2	9.6	HNM	Contact	Unknown contact		MBES: parellel to sand wave crest. No signs of morphological disturbances or scouring; PP: natural phenomenon;
1	SSS-WFS1-215	106-10600	507120	5727249	11.2	6.7	0.3	Object	Unknown object		SSS: probably SSS disturbance due to sudden pull at cable MBES: no morphological anomalies; MAG: no anomalies tagged; PP: natural phenomenon;

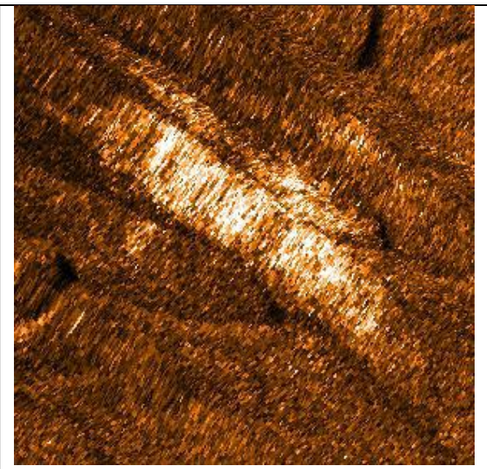
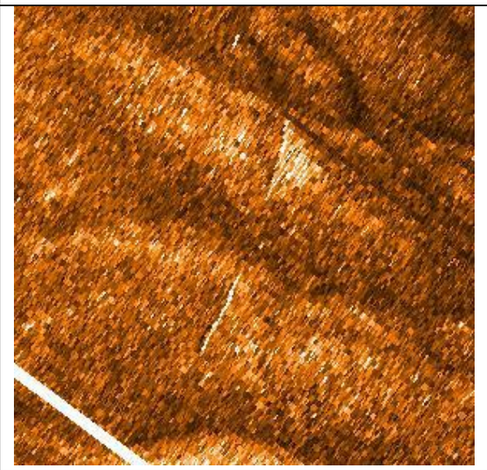
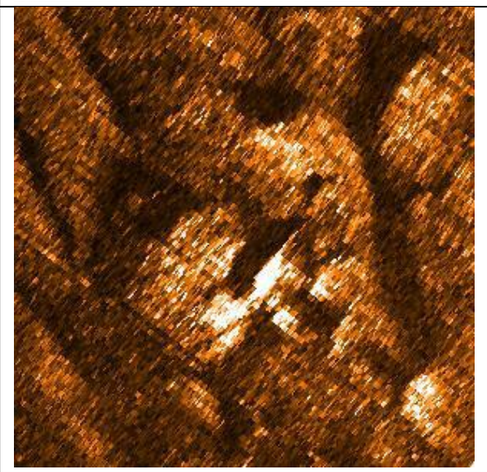
1	SSS-WFS1-160	46-4600	502599	5731471	10.3	4.2	HNM	Contact	Unknown contact		MBES: no signs of morphological disturbances or scouring; PP: natural phenomenon;
1	SSS-WFS1-213	97-9700	507112	5728983	9.9	6.7	HNM	Object	Unknown object		SSS: poor quality image; two reflections visible; MBES: two-legged contact within depression. L=2.6; W=1.5; H=0.4m; MAG: no anomaly tagged; PP: unknown object;
1	SSS-WFS1-088	4-400	500309	5735055	9.1	5.6	HNM	Contact	Unknown contact		SSS: highly reflective zone; no shadow behind target MBES: no signs of morphological disturbances or scouring; PP: natural phenomenon; possible shell layer;

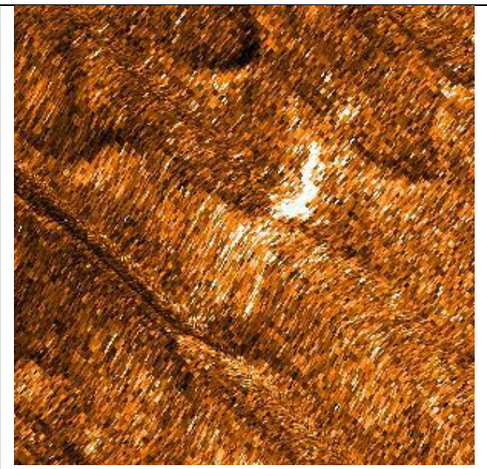
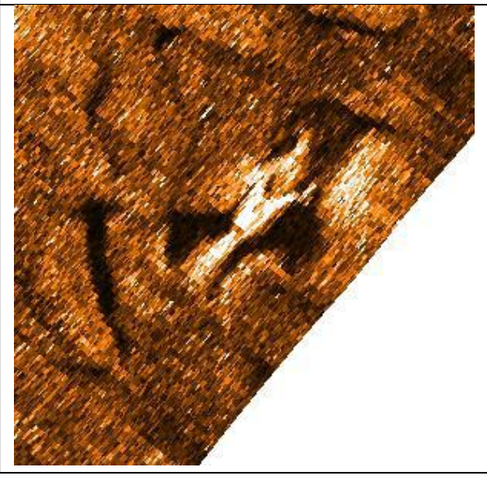
1	SSS-WFS1-182	56-5600	504596	5732378	8.6	3.3	HNM	Contact	Unknown contact		SSS: reflection alike surrounding seabed MBES: no signs of morphological disturbances or scouring; MAG: no anomaly tagged; PP: natural phenomenon; sand ripple;
1	SSS-WFS1-028	1-100	498189	5733039	8.4	2.0	HNM	Contact	Unknown contact		SSS: shadow at 'wrong' side; no contact; MBES: no clear disturbance of natural morphology; MAG: no anomaly tagged PP: natural phenomenon;
1	SSS-WFS1-087	3-300	497616	5731775	7.6	6.6	HNM	Contact	Unknown contact		SSS: isolated zone with gran MBES: no clear disturbance of natural morphology; MAG: no anomaly tagged PP: natural phenomenon; possible shell layer;

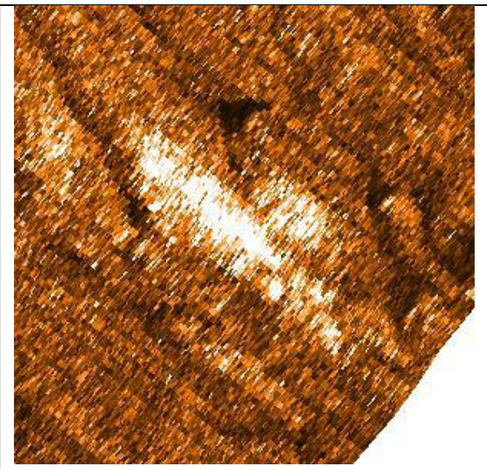
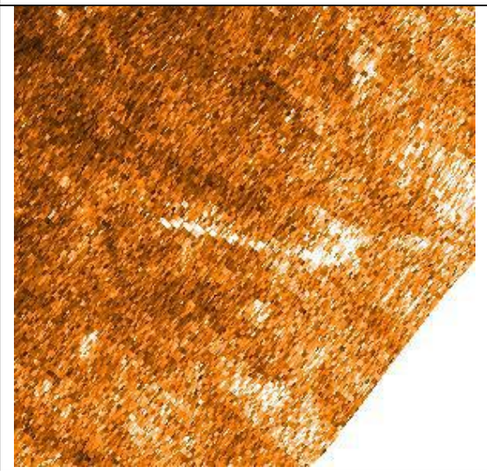
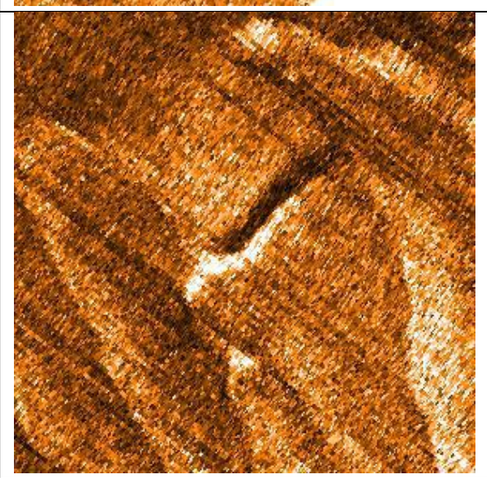
1	SSS-WFS1-210	94-9400	508250	5730893	7.1	0.0	0.4	Object	Unknown object		SSS: linear reflection; no shadow; MBES: no clear disturbance of natural morphology; MAG: no anomaly tagged SSS: linear object
1	SSS-WFS1-207	73-7300	505206	5730425	6.5	6.5	HNM	Contact	Unknown contact		MBES: no clear disturbance of natural morphology; MAG: no anomaly tagged PP: unknown object;
1	SSS-WFS1-219	42-4200	501318	5730431	6.3	1.6	0.4	Object	Unknown object		SSS: reflection of contact and surrounding sebed are alike; clear shadow; MBES: contact at natural sediment ridge; MAG: no anomaly tagged PP: natural morphology

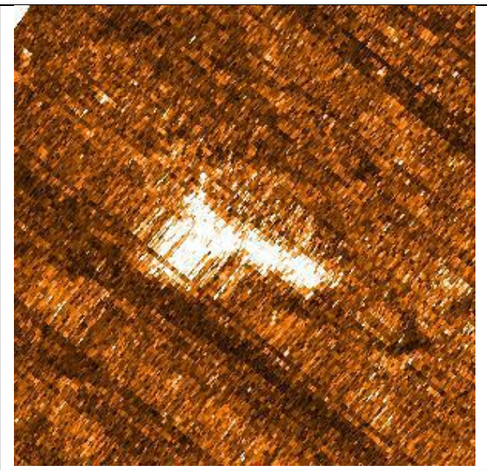
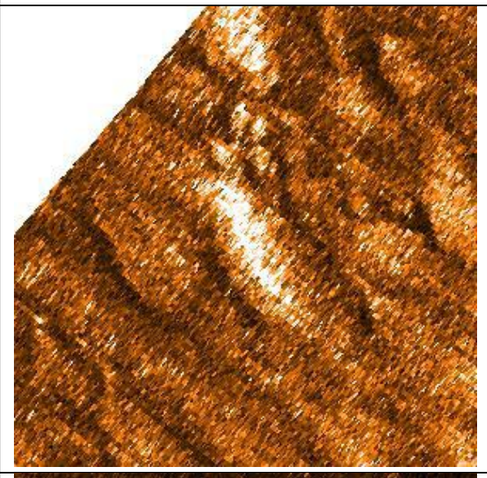
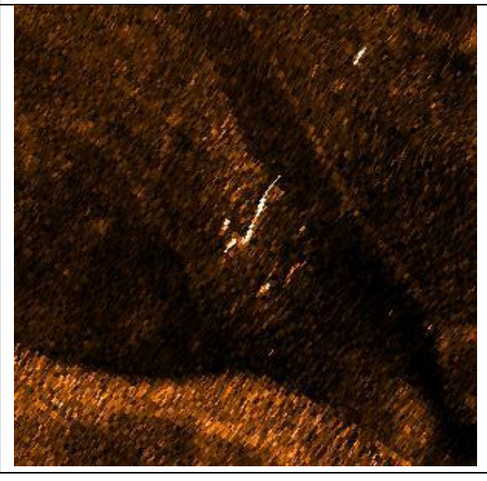
1	SSS-WFS1-208	73-7300	506192	5731747	6.2	1.6	HNM	Contact	Unknown contact		SSS: high reflective zone; no shadow; MBES: no morphological anomalies; MAG: no anomaly tagged; PP: natural phenomenon;
1	SSS-WFS1-212	96-9600	507631	5729863	5.3	0.9	0.1	Object	Unknown object		MBES: no morphological anomalies; MAG: no anomaly tagged; PP: unknown ocject
1	SSS-WFS1-214	98-9800	506966	5728307	5.1	0.8	HNM	Object	Unknown object		SSS: clear straight elongated contact; hard reflection; thin shadow; MBES: no morphological anomalies; MAG: no anomaly tagged; PP: unknown object

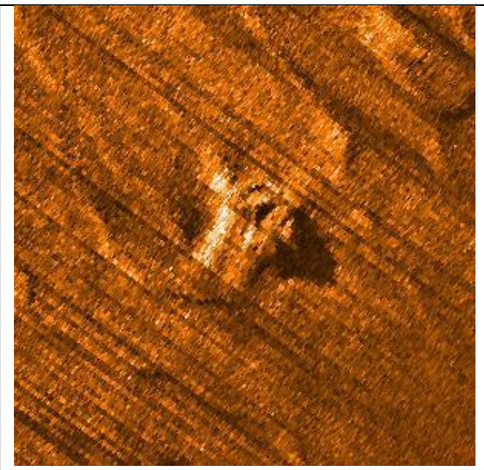
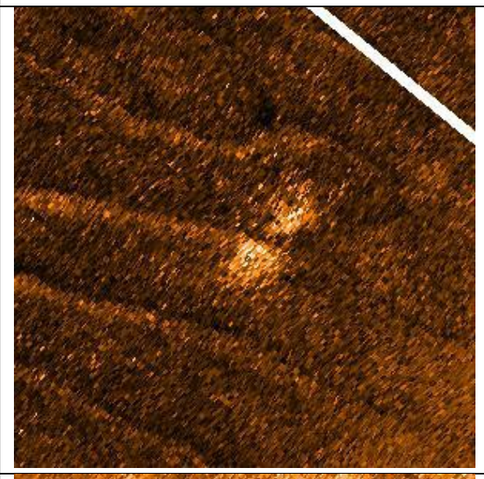
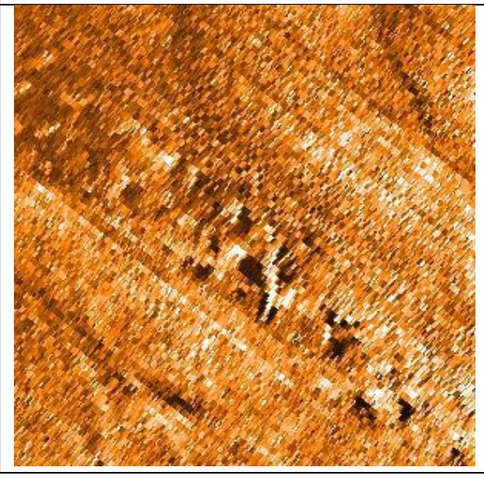
1	SSS-WFS1-211	95-9500	507520	5729519	5.0	0.8	0.1	Object	Unknown object		SSS: clear straight elongated contact; MBES: no morphological anomalies; MAG: no anomaly tagged; PP: unknown object
1	SSS-WFS1-158	41-4100	505827	5736186	4.5	0.9	HNM	Contact	Linear contact		SSS: clear straight elongated contact w/ clear shadow; MBES: no signs of morphological disturbances or scouring; MAG: no magnetic anomaly tagged; PP: unknown object
1	SSS-WFS1-204	65-6500	506606	5733314	4.1	3.5	0.5	Object	Unknown object		SSS: no difference between refelction of contact and surrounding sediment; MBES: no signs of morphological disturbances or scouring; MAG: no magnetic anomaly tagged; PP: natural phenomenon; possibly remnant of outcropping clay;

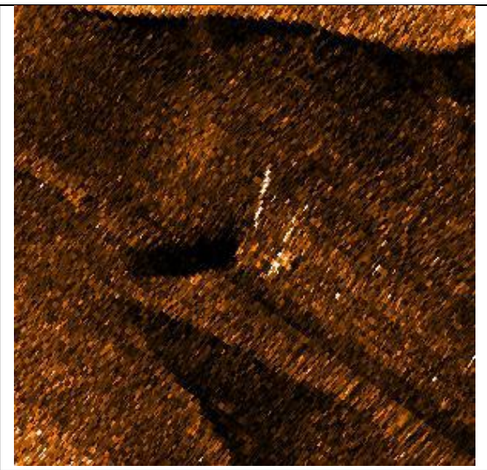
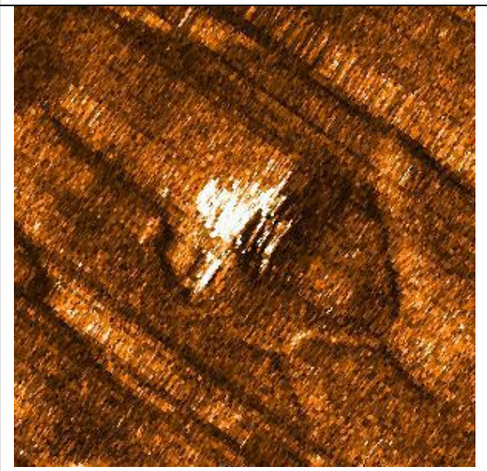
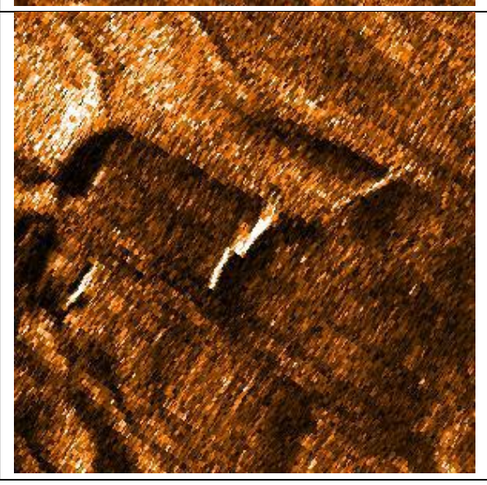
2	SSS-WFS2-556	98-9800	503839	5724574	32.2	16.6	HNM	Object	Unknown object		SSS high reflective zone; no shadow; disturbance possibly due to sudden pull at cable; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: no contact;
2	SSS-WFS2-690	146-14600	504295	5717381	23.5	0.7	HNM	Contact	Linear contact		SSS: intermitted linear contact; MBES: no morphological anomalies; MAG: no anomalies tagged; PP: cable, partly buried
2	SSS-WFS2-686	145-14500	507686	5721598	22.6	21.7	1.3	Object	Unknown object		SSS: unclear SSS-image; hard reflectors w/ shadow; MBES: isolated compact contact amidst scour depression; L=3.6m; W=2.8m ; H=2.5m; MAG=1565nT; PP: unknown object; possible container

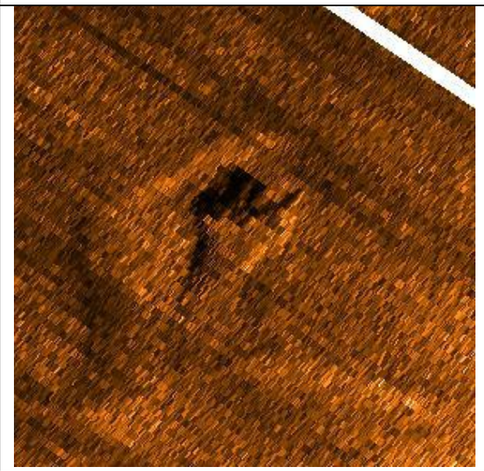
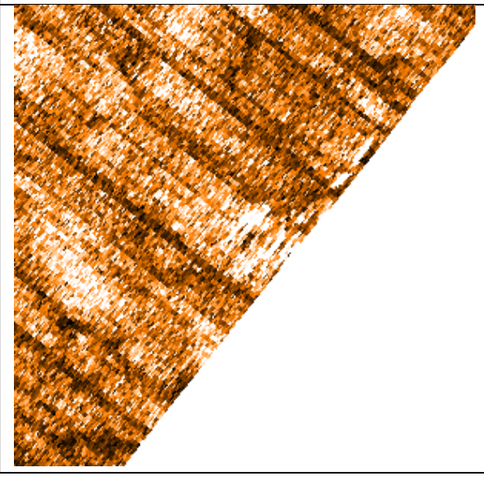
2	SSS-WFS2-543	92-9200	503066	5724571	20.9	6.8	HNM	Object	Unknown object		SSS: no shadow visible; MBES: no signs of morphological disturbances or scouring; MAG: no anomaly tagged; PP:natural phenomenon; possible shell concentration
2	SSS-WFS2-670	166-16600	504144	5713956	20.1	5.3	HNM	Contact	Unknown contact		MBES: elongated contact with scouring at northeast and southwest side; L=5.8m; W=3.2m; H=1.1m; MAG: no anomalies tagged; PP: unknown object
2	SSS-WFS2-642	124-12400	503678	5719878	18.1	4.9	0.5	Object	Unknown object		SSS: fork shaped contact with clear hard reflection; scouring on two sides; MBES: slightly elevated contact; L=3.2m; W=3.2m; H=0.6m; pronounced scouring at northwest side; MAG: no anomaly tagged PP: unknown object;

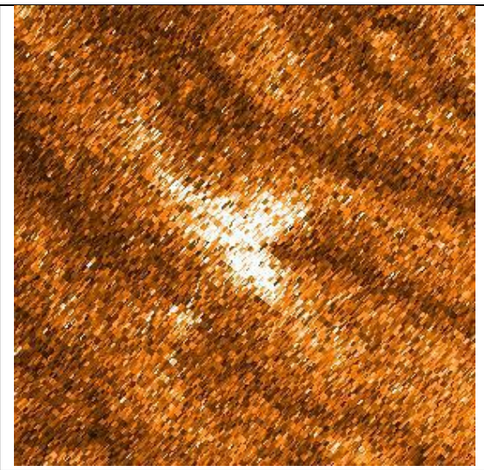
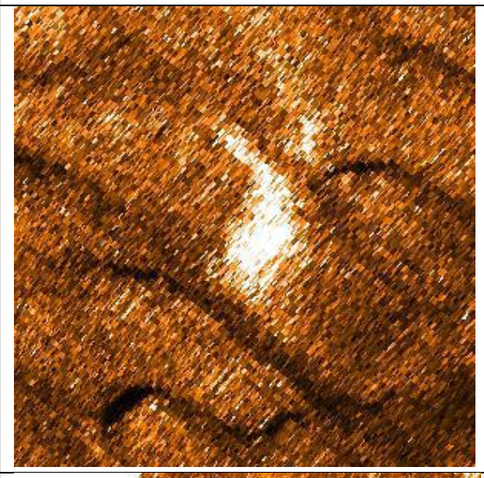
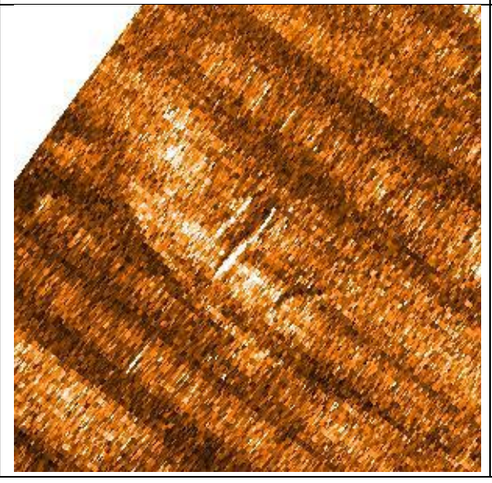
2	SSS-WFS2-614	114-11400	507484	5726412	18.0	8.9	0.1	Object	Unknown object		SSS: hard granular reflections only; no shadows; MAG: no anomalies tagged; PP: natural phenomenon; possible exposed shell bed;
2	SSS-WFS2-701	139-13900	505391	5719631	17.5	0.7	HNM	Contact	Linear contact		SSS: hard reflections only; no shadows; MAG: no anomalies tagged; PP: natural phenomenon; possible exposed shells parallel to sediment ripple;
2	SSS-WFS2-593	110-11000	505246	5724461	17.2	4.1	0.4	Object	Unknown object		SSS: elongated ridge partly with hard reflection; MBES: structure part of natural morphology; MAG: no anomalies tagged; PP: natural phenomenon; sand ridge; possibly with shell cover;

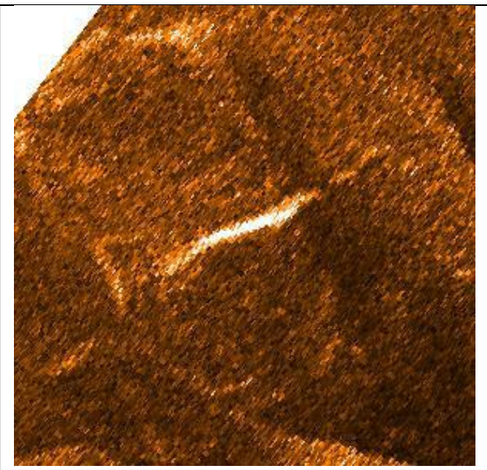
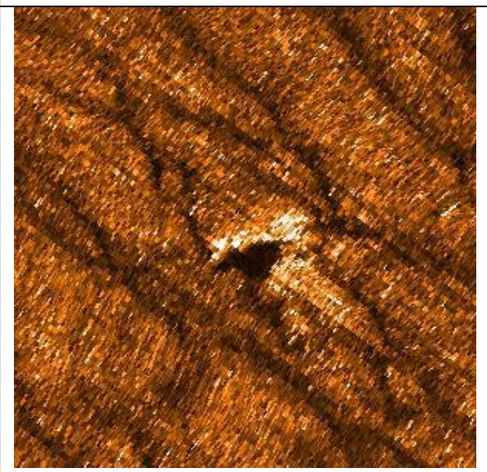
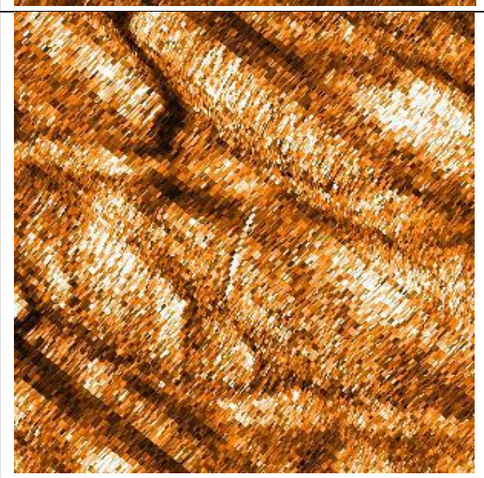
2	SSS-WFS2-608	113-11300	506973	5726202	17.2	10.5	HNM	Object	Unknown object		SSS: hard reflections only; no shadows; MAG: no anomalies tagged: MBES: no signs of morphological disturbances or scouring; PP: natural phenomenon; possible shell bed;
2	SSS-WFS2-663	132-13200	503845	5719109	16.2	6.7	0.2	Object	Unknown object		SSS: hard reflections only; no shadows; MAG: no anomalies tagged: MBES: no signs of disturbances of natural morphological or scouring; PP: natural phenomenon; possible shell bed;
2	SSS-WFS2-566	102-10200	502310	5721970	16.0	0.0	HNM	Object	Possible cable		SSS: hard reflections only; no shadows; MAG: no anomalies tagged: MBES: no signs of disturbances of natural morphological or scouring; PP: unknown object; possibly natural

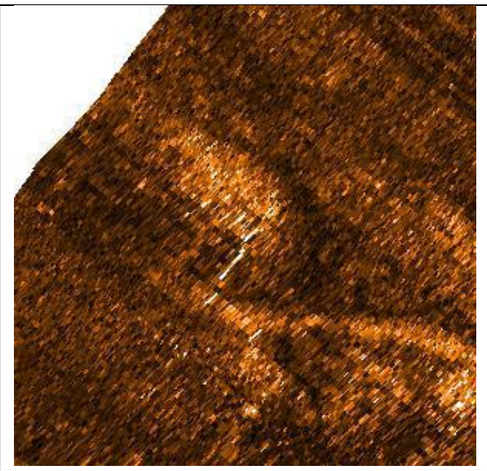
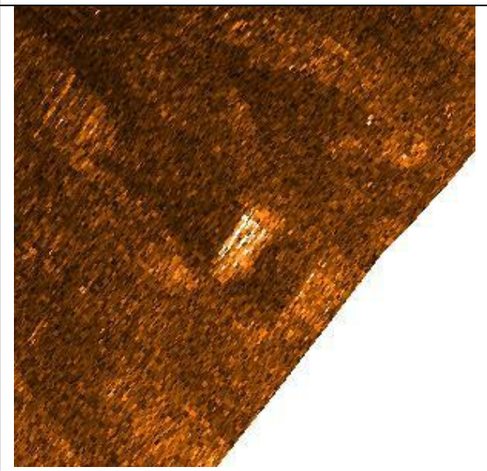
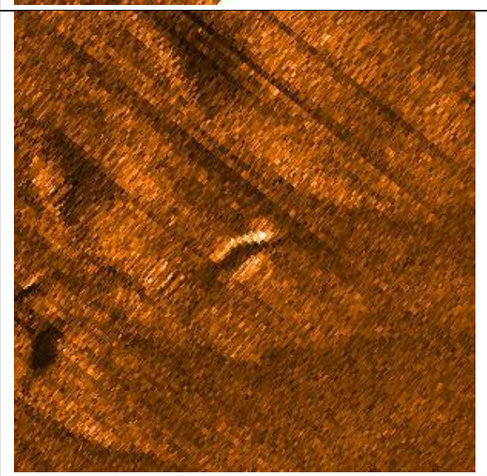
2	SSS-WFS2-689	145-14500	507118	5720943	13.8	7.2	1.3	Object	Unknown object		SSS: elevated contact; reflections similar to surroundings; clear shadow; MB: : elevated structure; scouring east and west of contact; L=9.0m; W=5.5; H=1.0m; MAG: no anomalies tagged; PP: unknown object;
2	SSS-WFS2-575	104-10400	504271	5724122	13.4	5.8	0.1	Object	Unknown object		SSS: moderately hard reflections only; no shadows; MAG: no anomalies tagged: MBES: no signs of morphological disturbances or scouring; PP: natural phenomenon; probably shell bed;
2	SSS-WFS2-625	117-11700	506201	5724509	13.2	5.2	0.1	Object	Possible cable		SSS: heterogenic reflections; MBES: no signs of morphological disturbances or scouring; structure located at flank of megaripple; MAG: no anomalies tagged: PP: natural phenomenon; unknown origin;

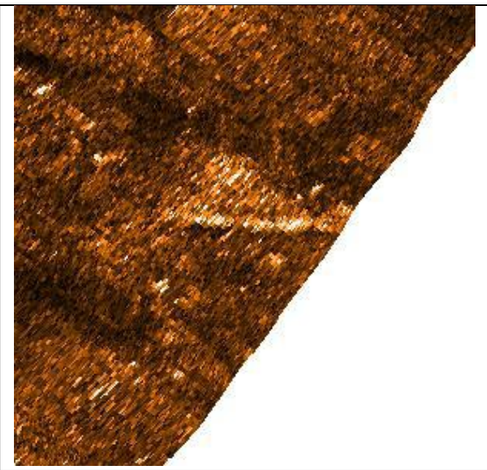
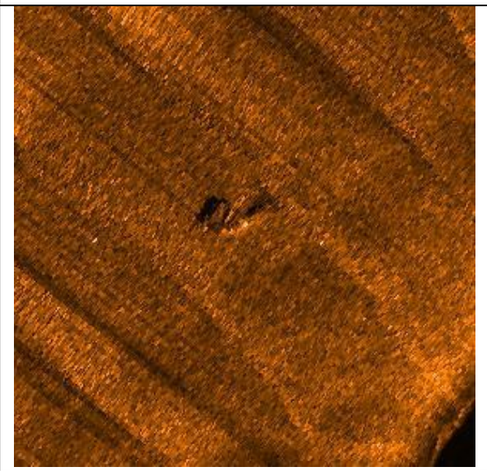
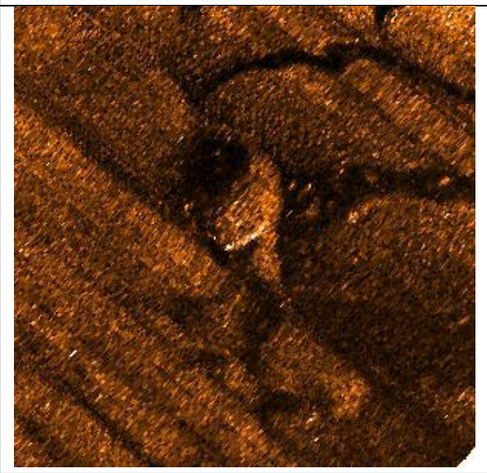
2	SSS-WFS2-588	108-10800	503394	5722152	12.9	0.0	HNM	Object	Unknown object		SSS: clear reflections of irregular contact; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: possible fish gear;
2	SSS-WFS2-508	65-6500	502766	5728601	12.1	10.9	HNM	Contact	Unknown contact		SSS: hard parallel reflections; distortion of SSS-image; striping; MBES: no data available; MAG: no anomalies tagged; PP: natural phenomenon; possible exposure of shell bed;
2	SSS-WFS2-590	109-10900	502155	5720394	11.8	1.6	0.2	Object	Unknown object		SSS: hard elongated reflections; much striping; MBES: no signs of morphological disturbances or scouring MAG: no anomalies tagged; PP: natural phenomenon; possible sediment ridges;

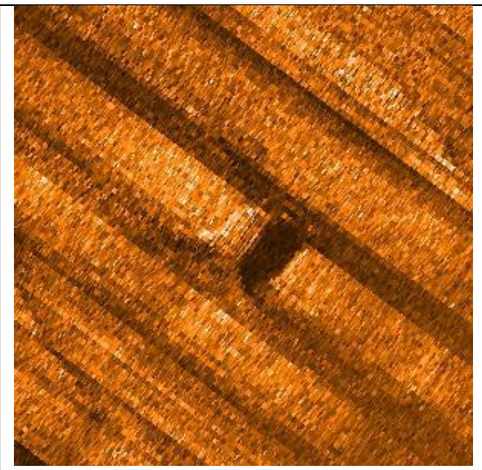
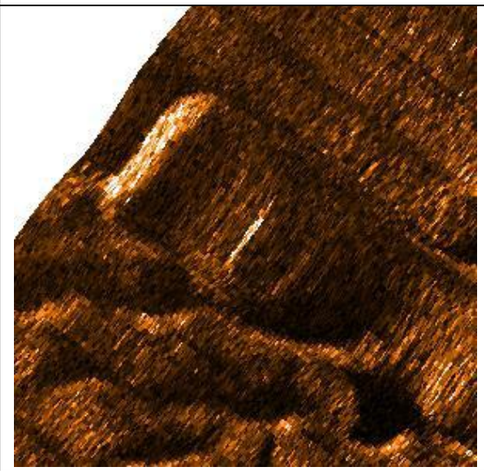
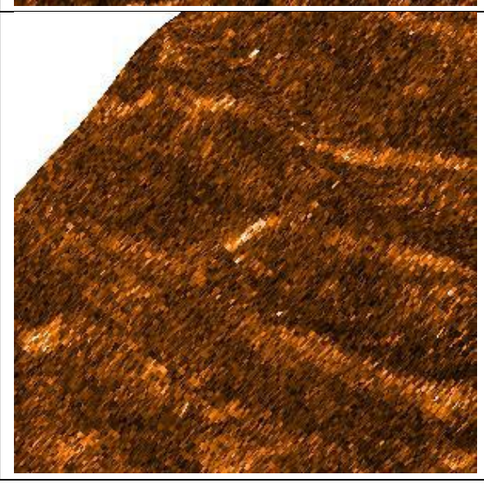
2	SSS-WFS2-661	130-13000	506807	5723148	10.9	0.0	0.5	Object	Possible cable		MBES: intersection lineation between exposed sediments of different composition; e.g. clay and sand; MAG: no anomalies tagged; PP: natural phenomenon; geological structure;
2	SSS-WFS2-694	138-13800	502537	5716328	10.8	5.1	HNM	Object	Unknown object		SSS: isolated structure with identical reflections as surrounding seabed; slightly elevated. MBES: isolated structure; some scouring around the structure; MAG: no anomalies tagged; PP: natural structure; possible exposure of clay;
2	SSS-WFS2-594	110-11000	502931	5721160	10.6	6.8	0.2	Object	Unknown object		SSS: poor highly reflective SSS-image; much striping;

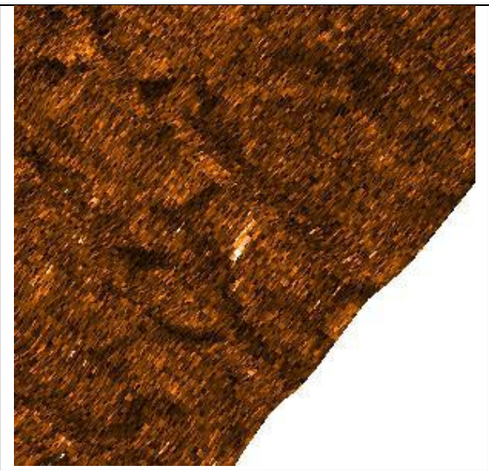
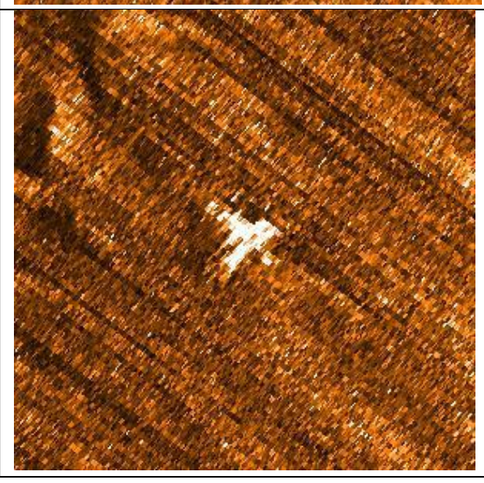
2	SSS-WFS2-637	122-12200	507096	5724794	10.3	8.9	0.1	Object	Unknown object		SSS: hard reflections only; no shadows; MAG: no anomalies tagged: MBES: no signs of morphological disturbances or scouring; PP: natural phenomenon; probably shell bed;
2	SSS-WFS2-623	116-11600	506684	5725077	10.1	6.5	0.2	Object	Unknown object		SSS: hard reflections only; no shadows; MAG: no anomalies tagged: MBES: no signs of morphological disturbances or scouring; PP: natural phenomenon; probably shell bed;
2	SSS-WFS2-638	123-12300	507623	5725422	10.0	1.1	0.1	Object	Unknown object		SSS: poor quality SSS-image; much striping; MBES: no signs of morphological disturbances or scouring; target at crest of current ripple; MAG: no anomalies tagged; PP: unknown object

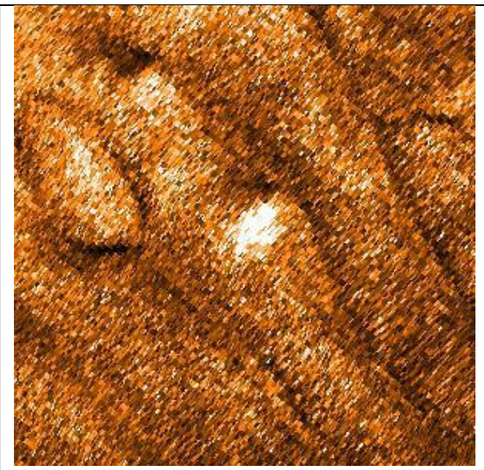
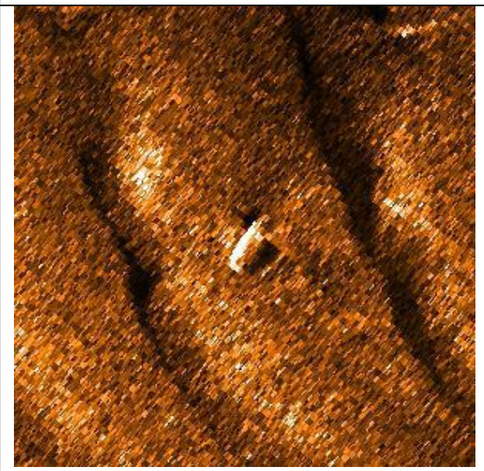
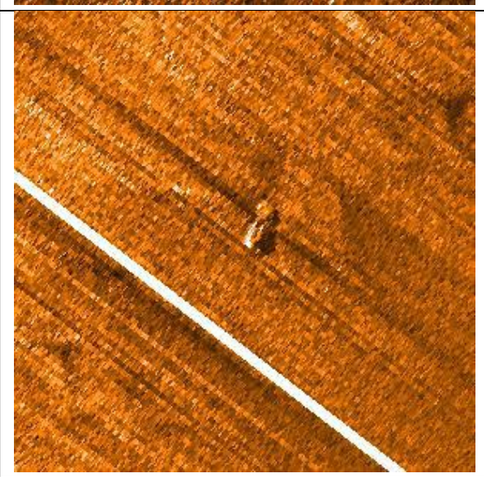
2	SSS-WFS2-676	160-16000	504400	5715257	9.2	0.0	HNM	Contact	Linear contact		SSS: poor quality SSS-image; much striping; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural phenomenon; edge of sediment ridge;
2	SSS-WFS2-684	149-14900	507678	5720970	9.0	3.2	0.5	Object	Unknown object		SSS: irregular reflections; clear shadow; MBES: slightly elongated; could be natural; MAG: no anomalies tagged; PP: debris, possible tangled fishing net;
2	SSS-WFS2-555	97-9700	502476	5723012	8.0	0.0	HNM	Object	Possible cable		SSS: linear contact; thin shadow; poor quality SSS-record; MBES: no signs of morphological disturbances or scouring; MAG: no magnetic anomaly tagged; PP: cable;

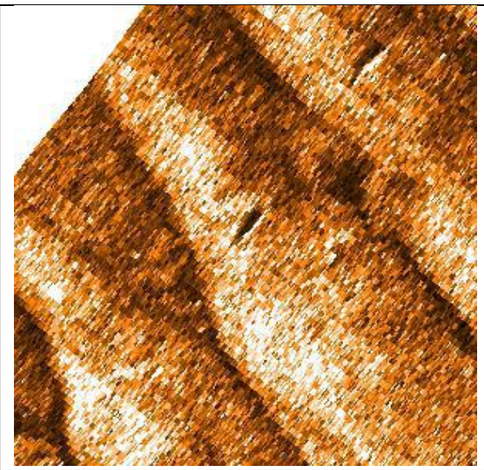
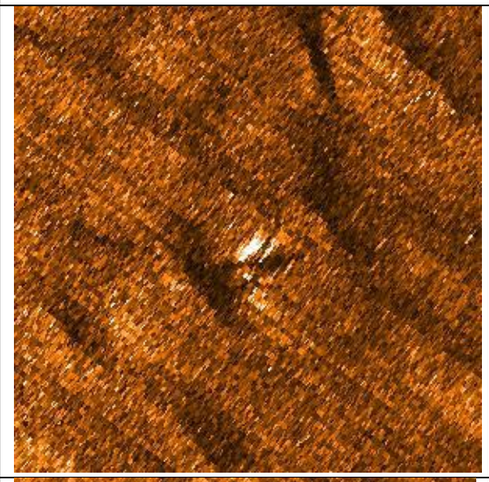
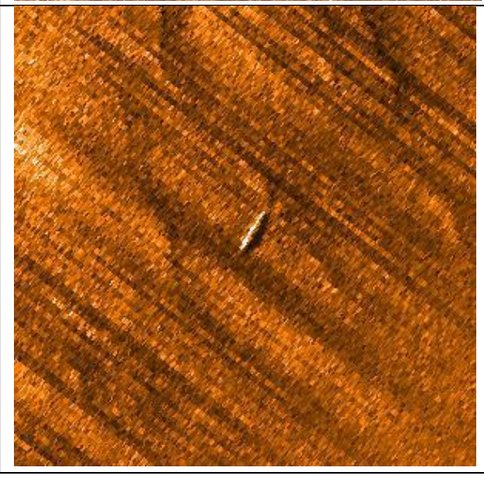
2	SSS-WFS2-570	103-10300	502363	5721952	8.0	0.0	HNM	Object	possible cable		SSS: faint linear contact; no shadow; parallel to bedding; much striping; MAG: no anomalies tagged; PP: natural phenomenon; no contact;
2	SSS-WFS2-671	163-16300	504486	5714526	7.8	3.2	HNM	Object	Unknown object		SSS: phenomenon possibly induced by disturbance of SSS recording; MAG: no anomalies tagged: MBES: no signs of morphological disturbances or scouring; PP: no object; possible disturbance of SSS recording;
2	SSS-WFS2-583	106-10600	501740	5720338	7.2	0.0	0.3	Object	Possible Cable		SSS: elongated bended contact; much striping; MAG: no anomaly tagged; MBES: coincides with bended crest of current ripple; PP: natural phenomenon; sedimentary structure; current ripple;

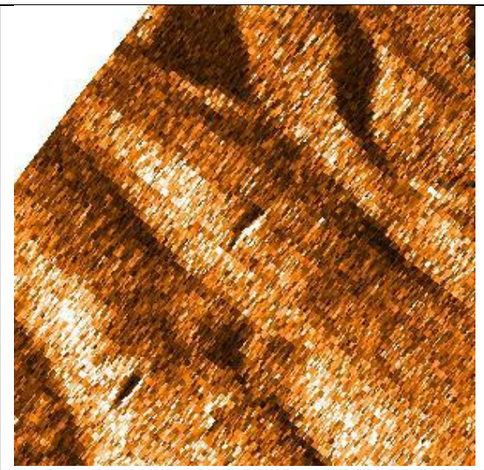
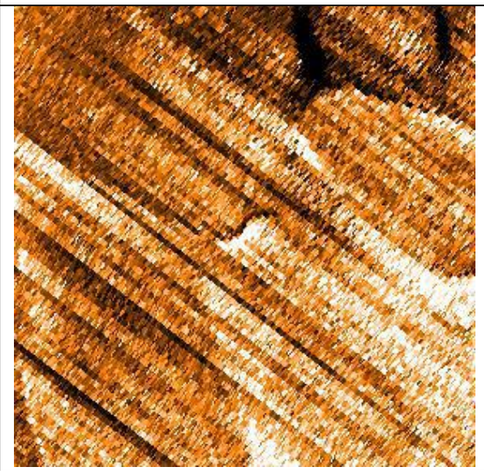
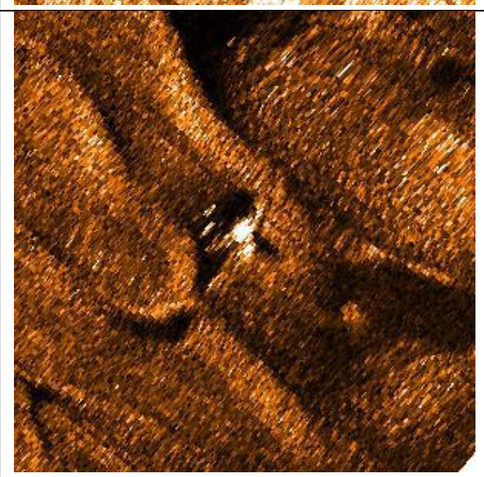
2	SSS-WFS2-576	104-10400	505944	5726013	7.0	2.3	0.2	Object	Unknown object		SSS: elongated contact; granular reflection; faint shadow; MAG: no anomalies tagged: MBES: no signs of morphological disturbances or scouring; PP: natural phenomenon; possible shell ridge;
2	SSS-WFS2-666	168-16800	504656	5714197	6.9	2.9	0.4	Contact	Unknown contact		SSS: isolated contact; reflection very alike surrounding seabed; MAG: no anomaly tagged; MBES: no signs of morphological disturbances or scouring; PP: natural phenomenon; possible outcrop of clay/peat;
2	SSS-WFS2-568	102-10200	501703	5720952	6.7	0.7	0.1	Object	Unknown object		SSS: clear reflection; no clear shadow; MAG: no anomaly tagged; MBES: no signs of morphological disturbances or scouring; top of sand wave crest; PP: natural phenomenon;

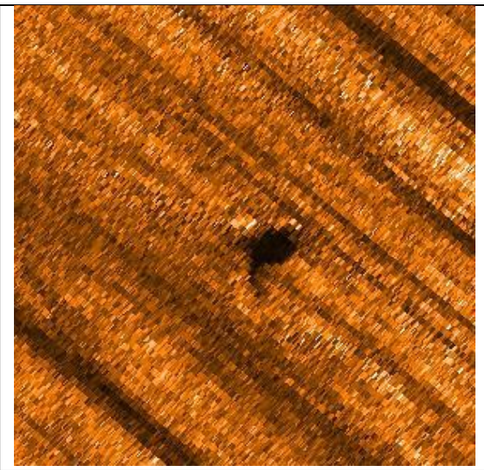
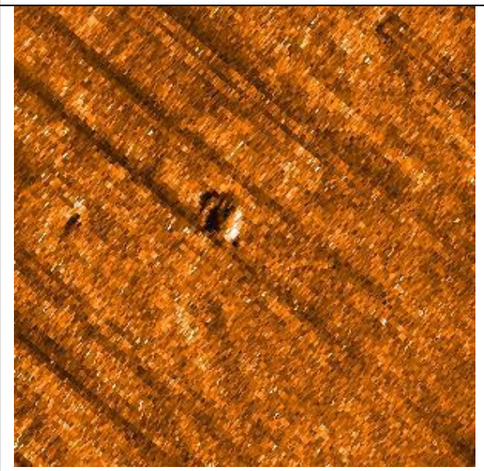
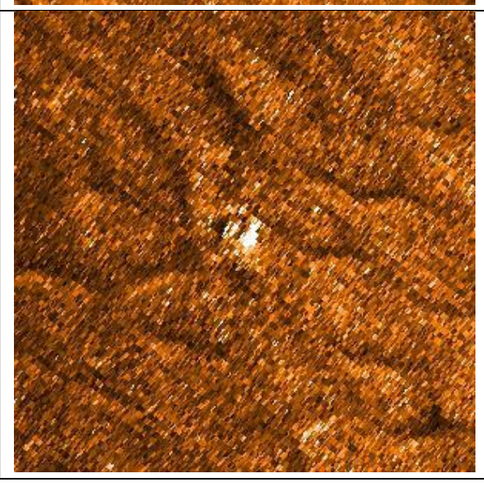
2	SSS-WFS2-504	144-14400	504187	5717344	6.6	3.6	0.9	Contact	Unknown contact		SSS: no clear reflection; clear shadow; poor quality SSS-image; much striping; MAG: no magnetic anomalies tagged; MBES: no signs of morphological disturbances or scouring; top of sand wave crest; PP: natural phenomenon; possible disturbance of SSS-image;
2	SSS-WFS2-553	96-9600	503040	5723920	6.5	0.9	HNM	Object	Unknown object		SSS: poor quality SSS-image; much striping; MAG: no magnetic anomalies tagged; MBES: no signs of morphological disturbances or scouring; top of sand wave crest; PP: natural phenomenon; possible disturbance of SSS-image;
2	SSS-WFS2-574	104-10400	503626	5723364	6.4	1.7	0.1	Object	Unknown object		SSS: reflection of sediment ridge; no shadow; MAG: magnetic anomaly tagged at 18m from SSS-target; MBES: no signs of morphological disturbances or scouring; coincides with sand ripple crest; PP: natural phenomenon; sand ripple;

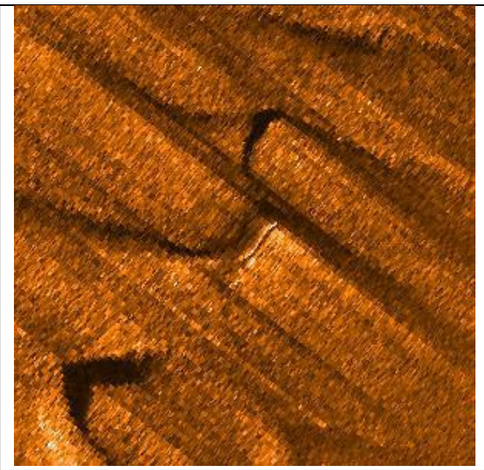
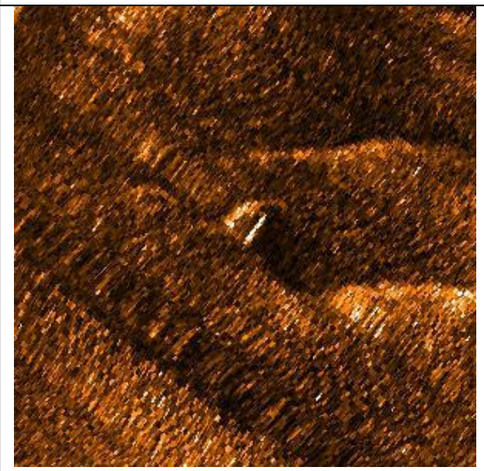
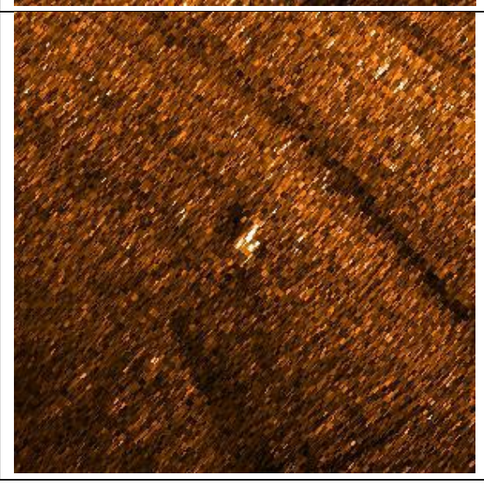
2	SSS-WFS2-571	103-10300	504337	5724149	6.0	1.1	HNM	Object	Unknown object		SSS: clear reflection; no shadow; MAG: coincides with 5nT contact MAG-WFS2-229 MBES: no signs of morphological disturbances or scouring; PP: unknown object;
2	SSS-WFS2-587	108-10800	502616	5721345	6.0	2.5	HNM	Object	Unknown object		SSS: faint reflection; no shadow; MBES: no signs of morphological disturbances or scouring; edge of current ripple; MAG: no anomalies tagged; PP: natural phenomenon; edge of current ripple;
2	SSS-WFS2-609	113-11300	507492	5726863	6.0	5.3	HNM	Object	Unknown object		SSS: very clear isolated reflective zone; no shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural phenomenon;possible shell layer;

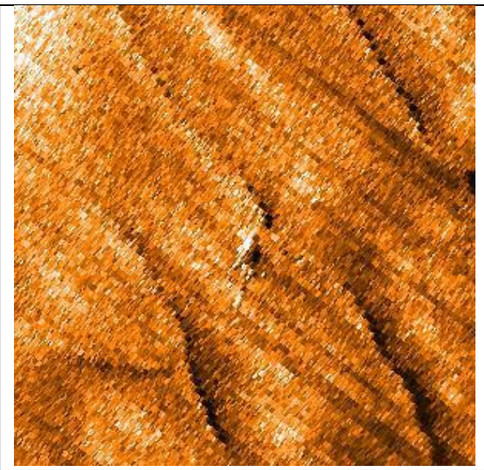
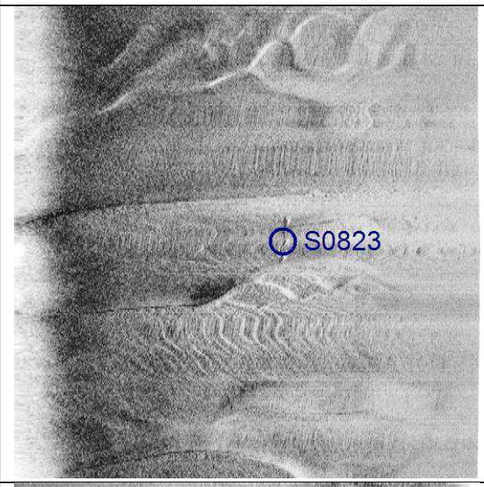
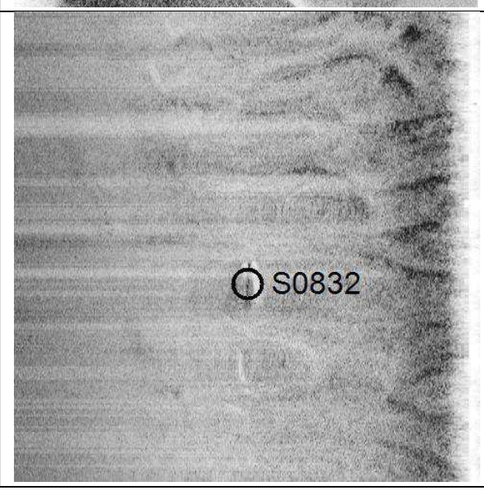
2	SSS-WFS2-622	116-11600	502587	5719834	5.6	3.7	0.2	Object	Unknown object		SSS: very clear isolated reflective zone; no shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural phenomenon;possible shell layer;
2	SSS-WFS2-634	121-12100	505232	5722445	5.3	1.2	0.2	Object	Unknown object		SSS: rectangular contact; clear reflection and shadow; MBES: isolated elevated patch; L=3.0; W=1.5m; H=0.6m; MAG: no anomalies tagged; PP: unknown object; man-made;
2	SSS-WFS2-610	112-11200	503923	5722190	5.2	1.5	0.5	Anchor	Contact		SSS: isolated v-shaped contact clear reflection and shadow; amidst depression; MBES: slighty elevated structure perpendicular to natural current ripple; L=4.5m; W=2.4m; H=0.4m; MAG: no anomalies tagged; PP: man-made object; possibly anchor;

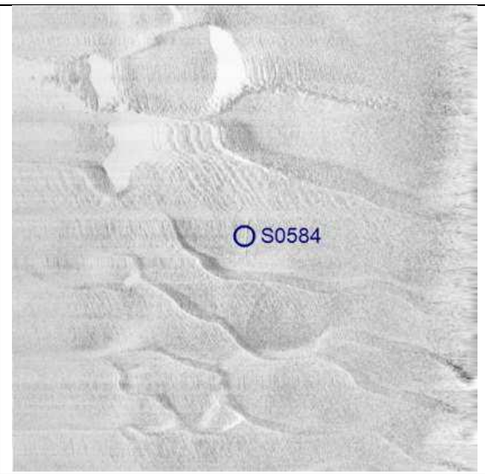
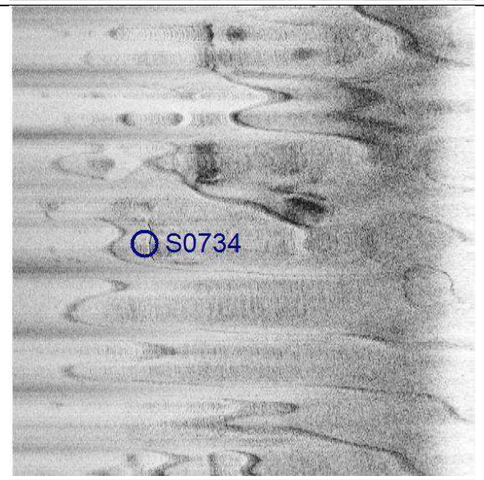
2	SSS-WFS2-641	124-12400	504186	5720832	5.2	0.4	0.1	Object	Unknown object		SSS: intermitted linear contact; clear reflection and shadow; cable or pipeline; MBES: no signs of morphological disturbances or scouring; clear megaripples; MAG: no anomalies tagged; PP: cable or pipeline; partly buried under mega-ripples; NOTE: Refer to SSS-WFS2-640
2	SSS-WFS2-662	131-13100	502779	5717603	5.2	1.8	0.1	Object	Unknown object		SSS: clear reflection an d shadow; MBES: no signs of morphological disturbances or scouring; target at crest of mega-ripple; MAG: no anomalies tagged; PP: unknown object;
2	SSS-WFS2-639	123-12300	506766	5724070	5.1	0.7	0.2	Object	Unknown object		SSS: elongated contact; very clear reflection and shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: unknown object;

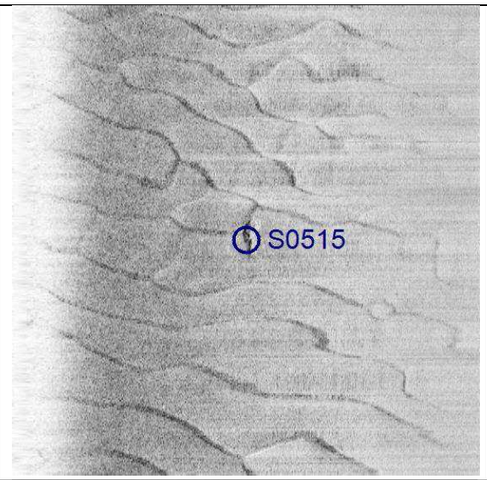
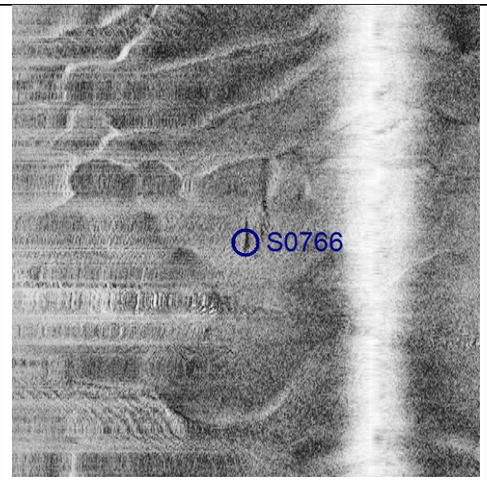
2	SSS-WFS2-640	124-12400	504196	5720847	5.1	0.6	0.2	Object	Unknown object		SSS: intermitted linear contact; clear reflection and shadow; cable or pipeline; MBES: no signs of morphological disturbances or scouring; clear megaripples; MAG: no anomalies tagged; PP: cable or pipeline; partly buried under mega-ripples; NOTE: Refer to SSS-WFS2-641
2	SSS-WFS2-598	110-11000	505166	5724309	4.9	1.6	0.3	Object	Unknown object		SSS: sigmoidal shaped contact; much disturbance on SSS record; MBES: no signs of morphological disturbances or scouring;at crest of sand wave; MAG: no anomalies tagged; PP: natural phenomenon; current ripple superposed on sand wave;
2	SSS-WFS2-552	94-9400	503159	5724103	4.6	3.5	0.4	Object	Unknown object		SSS: spherical contact; hard reflection; clear shadow; MBES: spherical structure surrounded by scoured area on top of sand wave; MAG: PP: unknown object; man-made;

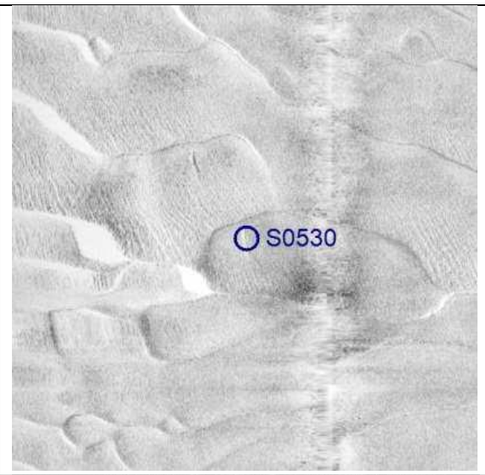
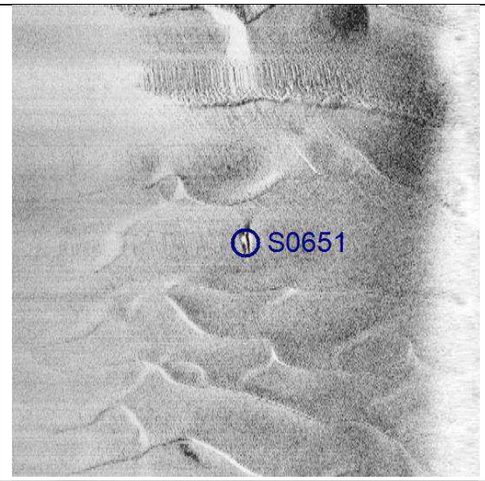
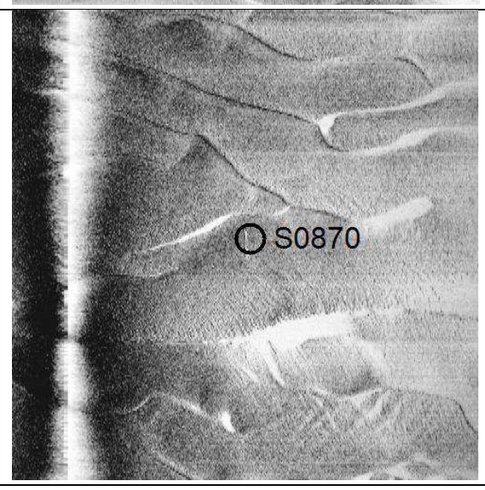
2	SSS-WFS2-699	140-14000	503958	5717728	4.6	2.7	0.8	Object	Unknown object		SSS: much striping in SSS-image; no clear reflection; clear shadow; MBES: no signs of morphological disturbances or scouring;at crest of sand ripple; MAG: no anomalies tagged; PP: natural phenomenon; sand ripple;
2	SSS-WFS2-680	154-15400	507854	5720603	4.5	2.1	0.5	Object	Unknown object		SSS: much striping in SSS-image; moderate reflection; clear shadow; MBES: outside area; MAG: no anomalies tagged; PP: possible unknown object;
2	SSS-WFS2-604	112-11200	505654	5724632	4.3	2.0	0.2	Object	Unknown object		SSS: hard reflective zone; no clear shadow; MBES: no signs of morphological disturbances or scouring;at crest of sand ripple; MAG: no magnetic anomalies tagged; PP: natural phenomenon; possible exposure of shell;

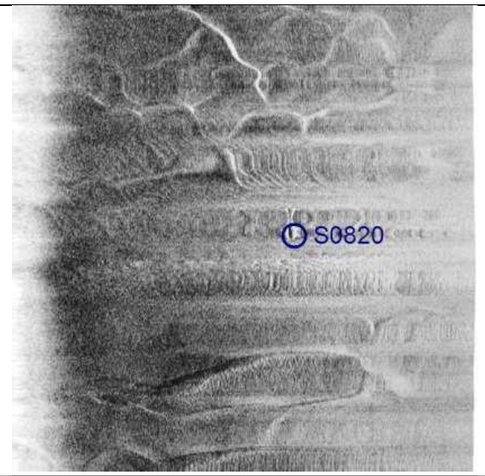
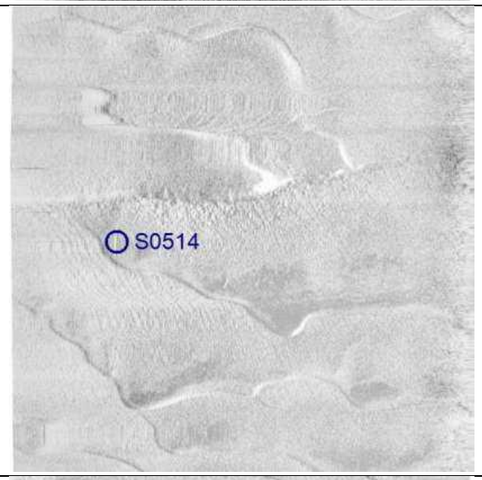
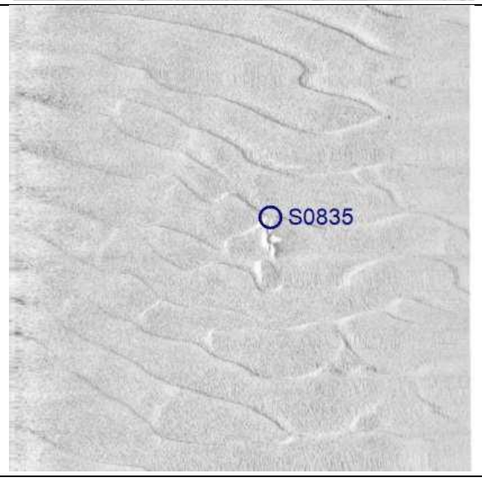
2	SSS-WFS2-679	155-15500	507335	5719586	4.3	0.0	HNM	Object	Linear object		SSS: much striping in SSS-image; linear contact; moderate reflection; clear shadow; parallel to sedimentary bedding; MBES: no signs of morphological disturbances or scouring;at crest of sand ripple; MAG: no magnetic anomalies tagged; PP: natural phenomenon; sand ripple;
2	SSS-WFS2-564	100-10000	503685	5724073	4.1	1.4	HNM	Object	Unknown object		SSS: much striping in SSS-image; linear contact; moderate reflection; clear shadow; MBES: no signs of morphological disturbances or scouring; MAG: no magnetic anomalies tagged; PP: phenomenon possibly induced by disturbance of SSS recording;
2	SSS-WFS2-651	126-12600	506333	5723211	4.1	1.0	0.1	Object	Unknown object		SSS: irregular contact; clear reflection; no shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: possible natural phenomenon;

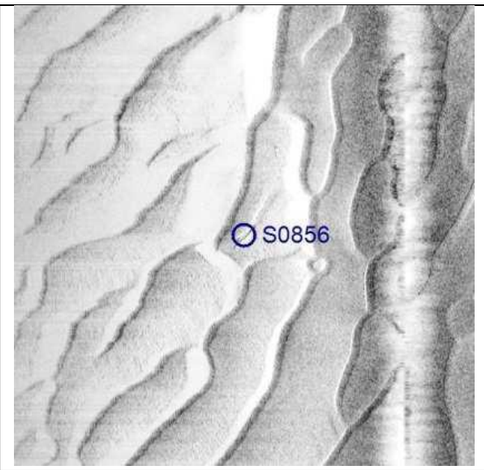
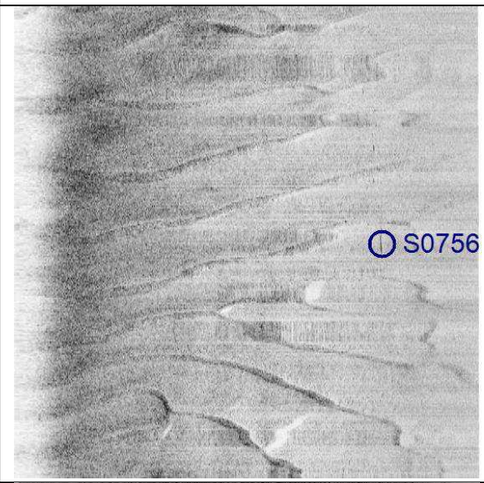
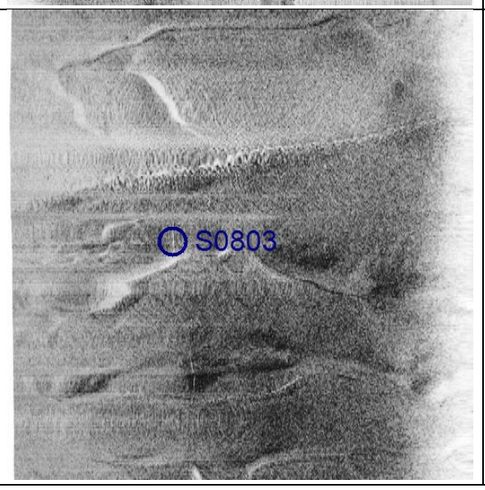
2	SSS-WFS2-658	129-12900	505091	5720960	4.1	0.9	0.3	Object	Unknown object		SSS: irregular shaped contact; clear reflection and shadow; MBES: slight disturbance of natural morphology; MAG: no anomalies tagged; PP: unknown object;
3	S0823	A31074_SH_Nav Merged	493047	5724239	9.7	0.2	0.1	linear debris	Cable?		SSS: linear contact; MAG: M0729 PP: cable or pipe
3	S0832	A3SB016_SH_NavMerged	498854	5723863	9.4	0.6	0.2	debris			SSS: rectangular contact; moderate reflection; shadow at ‘wrong’ side; possible scour; MAG: no magnetic anomaly tagged; MBES: no signs of morphological disturbances; possible slight scouring; PP: unknown object;

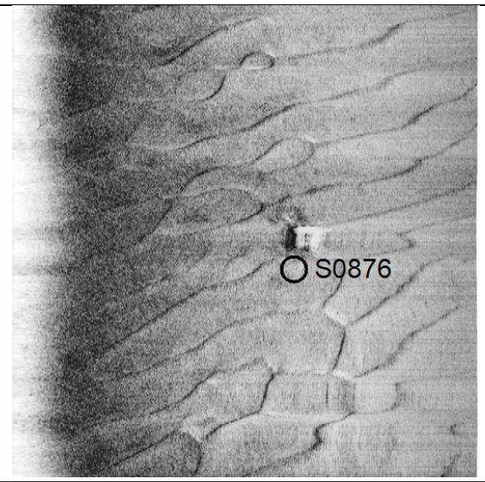
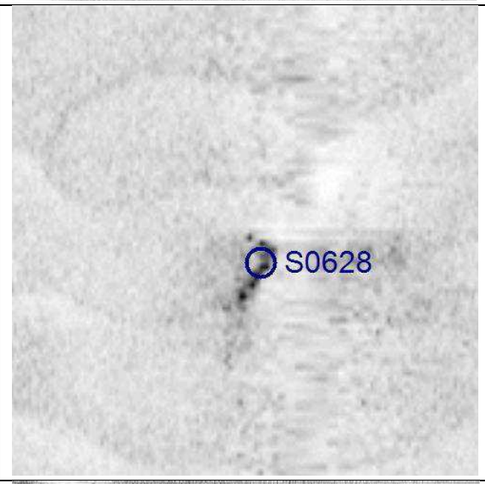
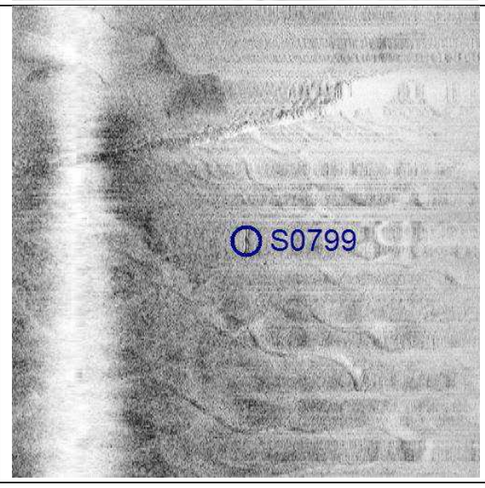
3	S0584	A34025_SH_Nav Merged	499132	5728668	9.1	0.4	0.1	linear debris			SSS: linear contact; disturbance of SSS-image; striping; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: possible natural phenomenon;
3	S0734	A31070_SH_Nav Merged	495465	5726433	8.2	0.4	0.1	linear debris			SSS: linear contact; disturbance of SSS-image; striping; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: rope or cable;
3	S0883	A31004_SH_701_ NavMerged	501158	5716728	7.8	1.4	0.7	debris			SSS: linear contact; hard reflection; MBES: amidst scouring; MG: no anomalies tagged; PP: Zeepipe exposure

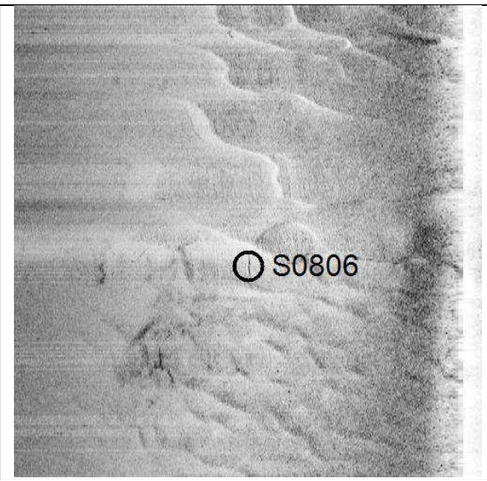
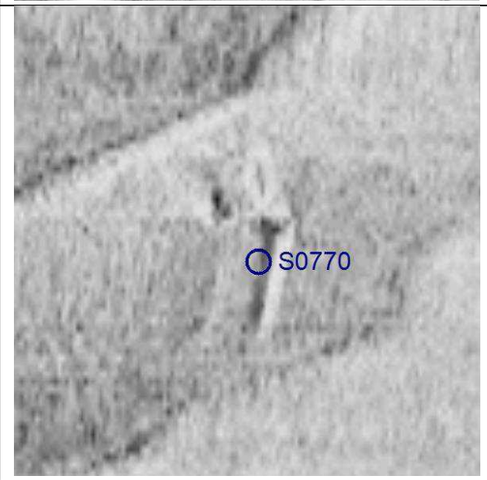
3	S0515	A31083_SH_Nav Merged	495958	5729695	7.8	1.5	0.6	debris	Possibly natural		SSS: contact; relative hard reflection compared to surrounding seabed; MBES: no signs of morphological disturbances or scouring; MAG: no magnetic anomaly tagged; PP: natural phenomenon;
3	S0822	A34030_SH_Nav Merged	492968	5724263	7.8	0.4	0.1	linear debris			SSS: linear debris; MBES: no signs of morphological disturbances or scouring; MAG: no anomaly tagged; PP: unknown object; possible rope;
3	S0766	A31083_SH_Nav Merged	492759	5725662	7.5	1.4	0.0	debris			SSS: elongated contact; relative hard reflection; no shadow; much disturbance of SSS record; MBES: no signs of morphological disturbances or scouring; at edge of sand wave; MAG: no aonmaly tagged; PP: probably natural sedimentary structure;

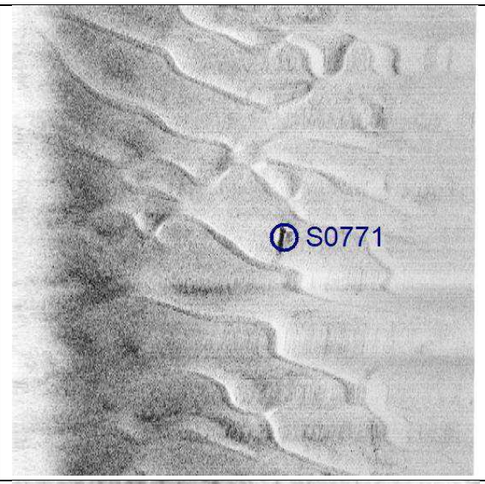
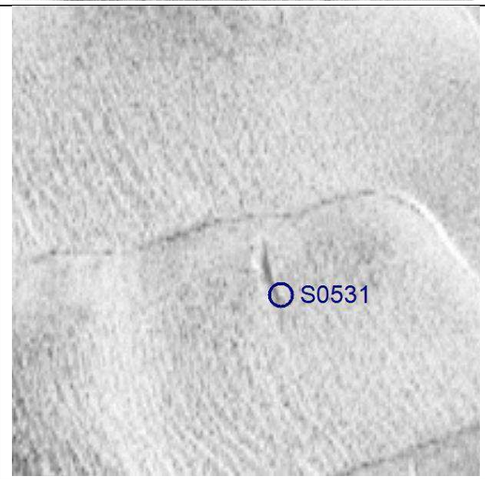
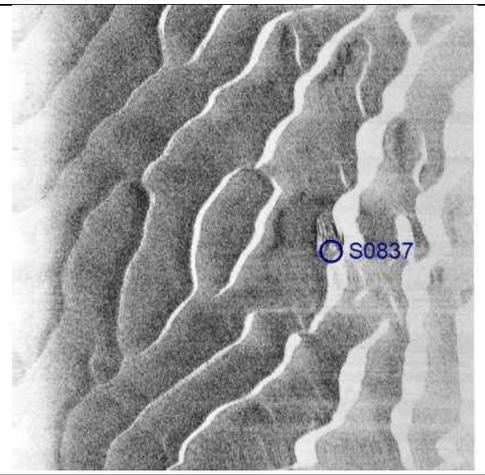
3	S0530	A34026_SH_Nav Merged	499158	5729455	6.9	0.3	0.4	linear debris			SSS: linear contact; intermitted; PP: intermitted piece of rope or cable;
3	S0651	A31080_SH_Nav Merged	495127	5727898	6.7	1.5	0.3	linear debris			SSS: clear target embedded in sediment; clear reflection and shadow; MBES: small (2m) and undeep scouring around contact; MAG: no anomaly tagged; PP: unknown object; man-made;
3	S0870	A31018_SH_Nav Merged	500805	5719203	6.5	1.0	0.1	debris	Linear debris		SSS: thin linear reflection; clear shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: unknown object; possible rope or cable;

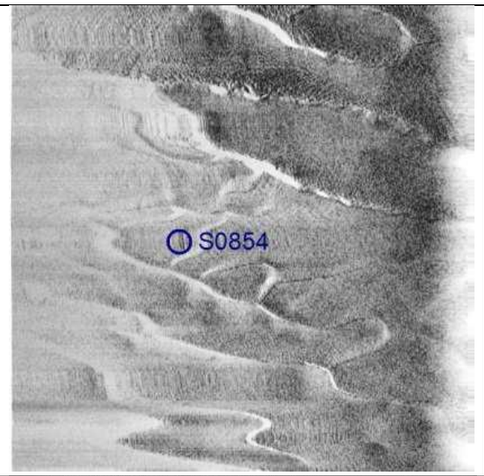
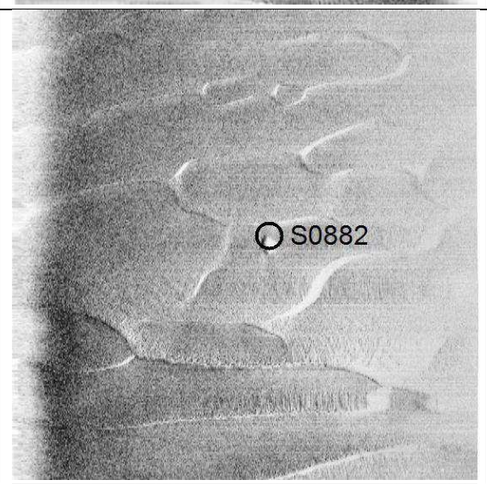
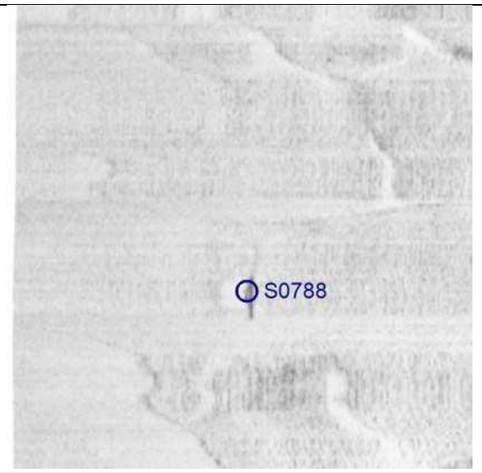
3	S0820	A31076_SH_Nav Merged	492956	5724410	6.4	0.8	0.2	debris			SSS: rectangular contact; clear reflection and shadow; MBES: no signs of morphological disturbances or scouring; at crest of sand wave; MAG: no anomalies tagged; PP: unknown object;
3	S0514	A34029_SH_Nav Merged	497935	5729694	6.4	0.3	0.1	debris			SSS: linear contact; thin reflection; clear shadow; MBES: no signs of morphological disturbances or scouring; at crest of sand wave; MAG: no anomalies tagged; PP: possible rope or cable;
3	S0835	A34026_SH_Nav Merged	494518	5723655	6.2	0.3	0.1	linear debris			SSS: spherical contact combined with linear structure; MBES: scouring around apparently two parallel elongated contacts; L=2.3m; W=1.0m; H=0.2m; MAG: no anomalies tagged; PP: unknown object; man-made;

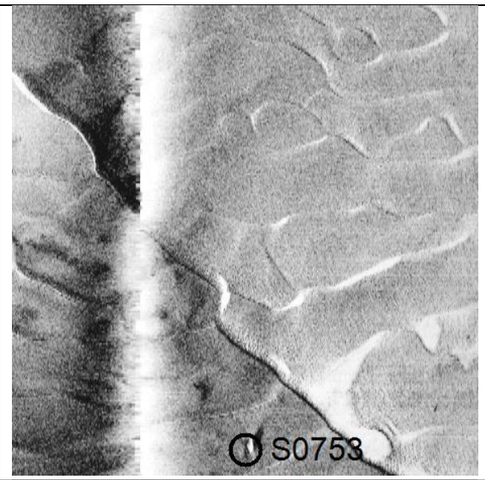
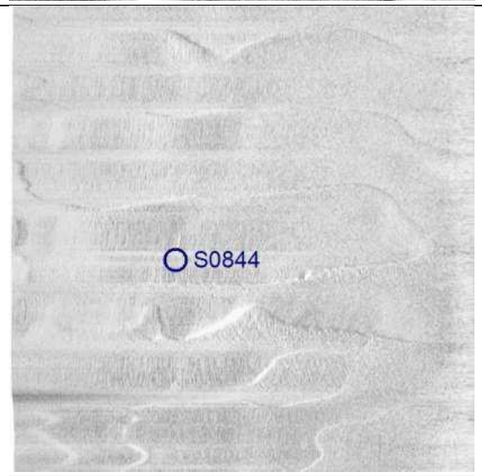
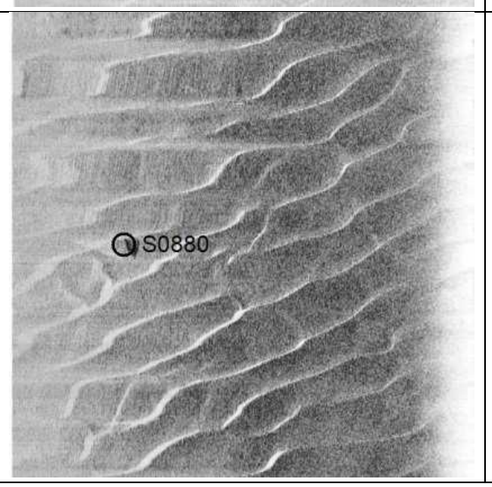
3	S0856	UHRINF012_SH2_NavMerged	496837	5722354	6.1	0.7	0.1	linear debris	Possible exposure UK - NL11		SSS: linear contact; MBES: linear structure and depression; MAG: contact in between and in alignment with two magnetic anomalies; PP: exposure UK - NL11 cable
3	S0756	A31071_SH_Nav Merged	495006	5726044	6.1	0.4	0.0	linear debris			SSS: linear contact, intermitted; thin reflection; clear shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: partly buried piece of cable;
3	S0803	A31074_SH_Nav Merged	493836	5725020	5.7	0.2	0.1	linear debris			SSS: linear contact, intermitted; thin reflection; clear shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; possible alignment with M0730 and M0537 PP: partly buried cable;

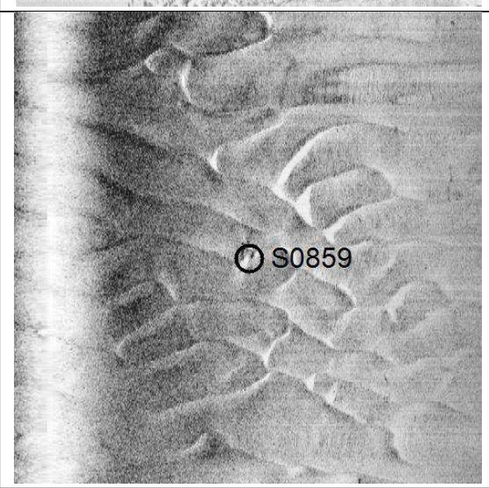
3	S0876	A31013_SH_Nav Merged	500627	5718182	5.7	3.6	0.9	debris			SSS: rectangular contact, hard reflection; clear small shadow; MBES: clear angular contact; slight scouring; L=5.0; W=3.0; H=0.6m; MAG: no anomalies tagged; PP: unknown object; man-made;
3	S0628	A31047_SH_Nav Merged	500796	5727961	5.5	0.9	0.6	debris			SSS: L-shaped contact, only spotted reflection; no shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomaly tagged; PP: possibly related to S0639 (wreck);
3	S0799	A31079_SH_Nav Merged	492883	5725108	5.4	0.3	0.1	linear debris			SSS: linear contact; thin reflection and shadow; MBES: no signs of morphological disturbances or scouring; near sand wave crest; MAG: proximate to M0521; PP: cable;

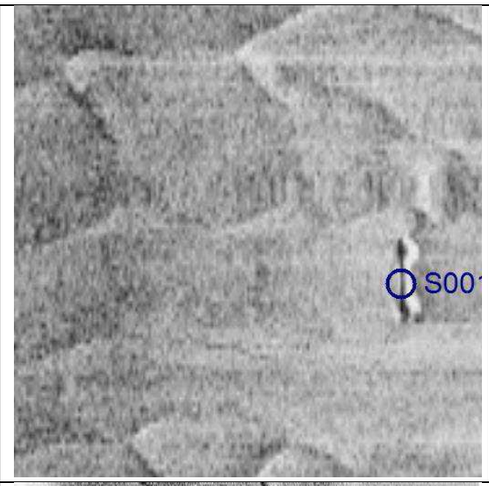
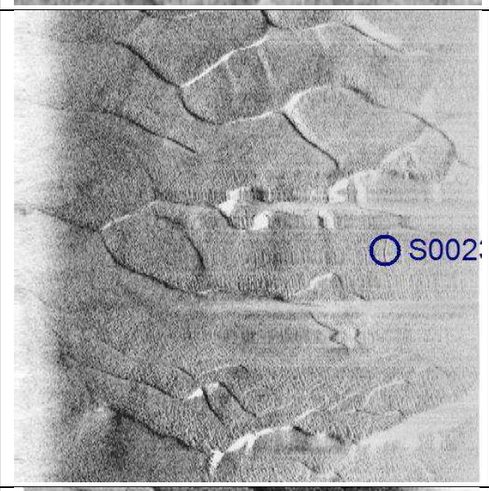
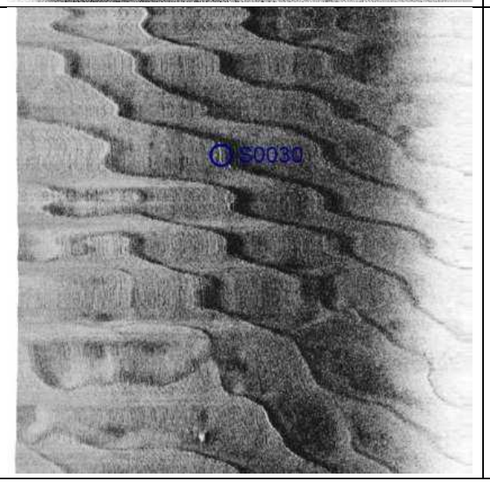
3	S0806	A3SB008_SH_NavMerged	500498	5724978	5.1	0.5	0.1	linear debris			SSS: linear contact; thin reflection and shadow; MBES: no signs of morphological disturbances or scouring; near sand wave crest; MAG: no anomalies tagged; PP: possible cable;
3	S0817	A31040_SH_NavMerged	501240	5724590	5.0	0.8	0.2	debris			SSS: rounded contact; small shadow; MBES: slight depression near tagged contact; MÄG: no anolmalies tagged; PP: unknown object;
3	S0770	A31074_SH_NavMerged	494168	5725635	5.0	0.9	0.2	debris			SSS: elongated contact; moderate reflection; clear shadow; MBES: slight depression near tagged contact; MÄG: no anolmalies tagged; PP: unknown object;

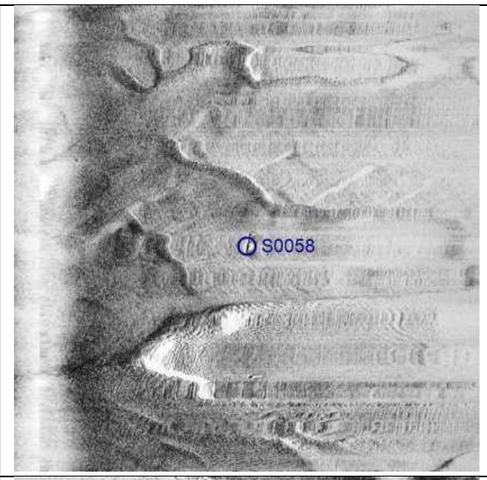
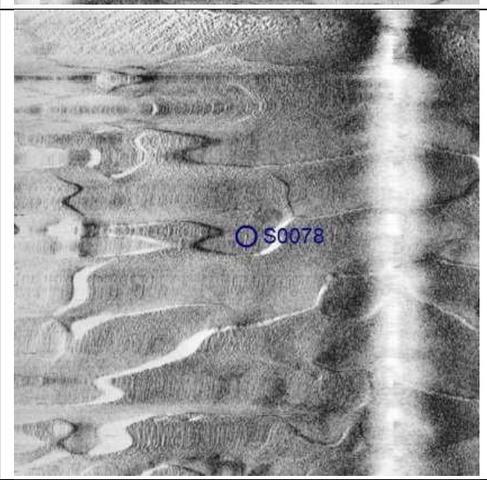
3	S0550	A34020_SH_706_NavMerged	502088	5729145	4.7	3.3	0.6	debris			SSS: elongated contact; hard reflection; no clear shadow; MBES: outside *multibeam* range; possibly within scoure; MÄG: no anolmalies tagged; PP: unknown object; man made;
3	S0531	A34026_SH_Nav Merged	499141	5729450	4.6	0.5	0.3	debris			SSS: rounded elongated contact; moderate reflection; no clear shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural sedimentary structure; sand ripple;
3	S0837	UHRINF008_SH2_NavMerged	501967	5723531	4.6	0.3	0.1	debris			SSS: contact reflection alike surrounding seabed; no shadow; parallel to sedimentary structure; MBES: morphology slightly disturbed; MAG: no anomalies tagged; PP: natural phenomenon; natural structure; e.g. outcrop of clay;

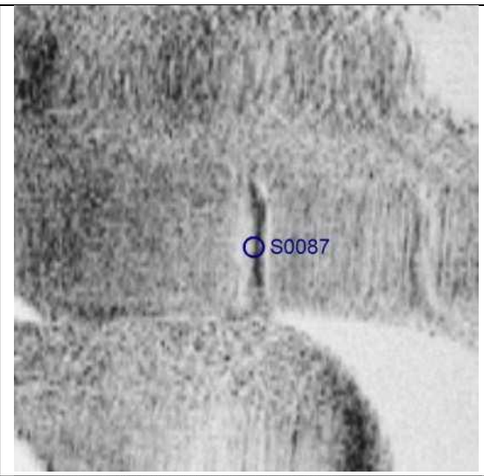
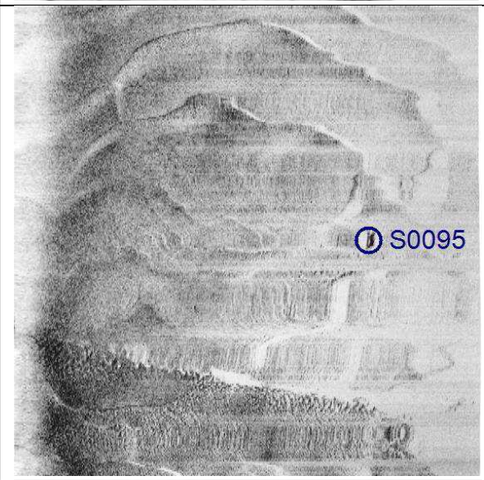
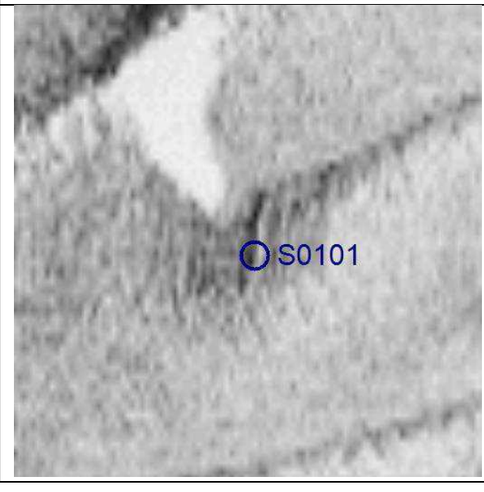
3	S0854	A31053_SH_Nav Merged	495444	5722543	4.4	0.5	0.0	linear debris			SSS: no clear contact; no shadow; possible distortion in SSS image; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: possibly no contact;
3	S0882	A31008_SH_701_ NavMerged	500762	5717072	4.4	1.5	0.3	debris	Possibly natural		SSS: elongated contact; hard reflection; clear shadow; MBES: rectangular contact; L=3.4m; W=2.0m; H=0.2m; MAG: no anomalies tagged; PP: unknown object; probably man-made;
3	S0788	A34033_SH_Nav Merged	492291	5725316	4.4	0.8	0.4	debris			SSS: elongated contact; moderate reflection; clear shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: possible natural structure; sand ripple;

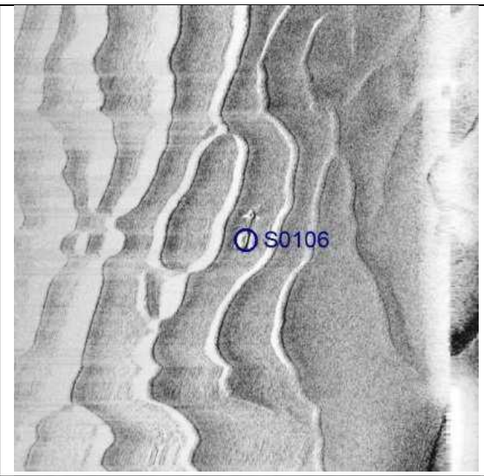
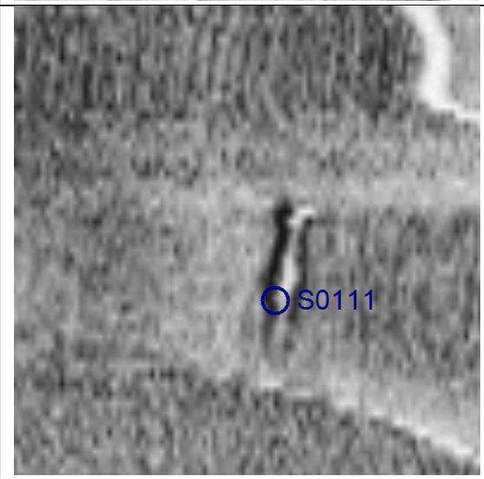
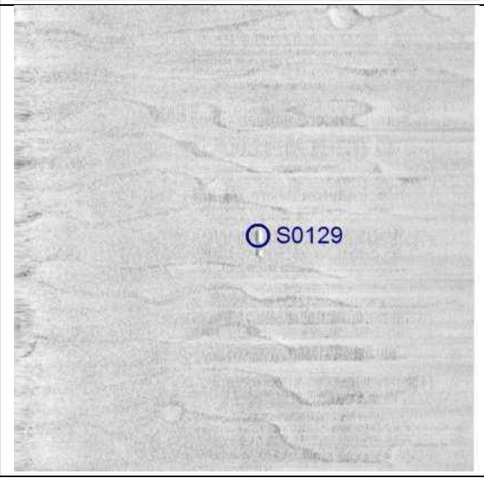
3	S0753	A31041_SH_Nav Merged	496010	5726093	4.4	2.0	0.7	debris			SSS: depression; hard reflection at 'wrong' side; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: possible small buried object;
3	S0844	A31050_SH_Nav Merged	496527	5723244	4.4	0.3	0.1	debris			SSS: linear contact; thin reflection and shadow;; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: piece of cable
3	S0880	A31011_SH_Nav Merged	500897	5717838	4.2	0.7	0.0	debris			SSS: V-shaped contact; clear reflection; no shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: unknown object;

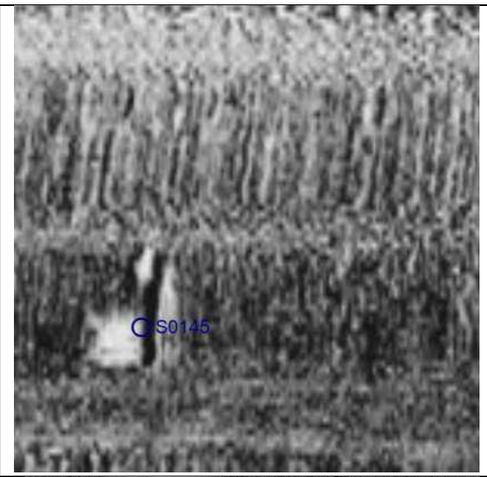
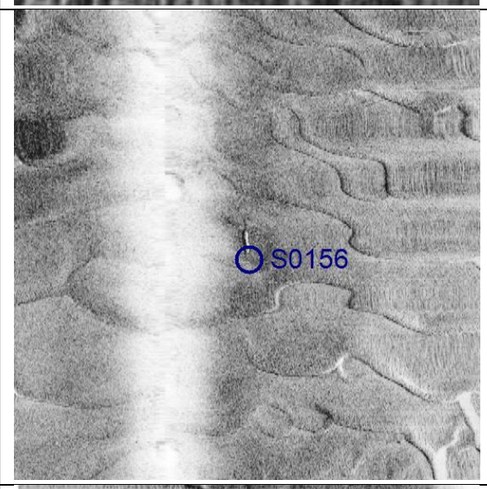
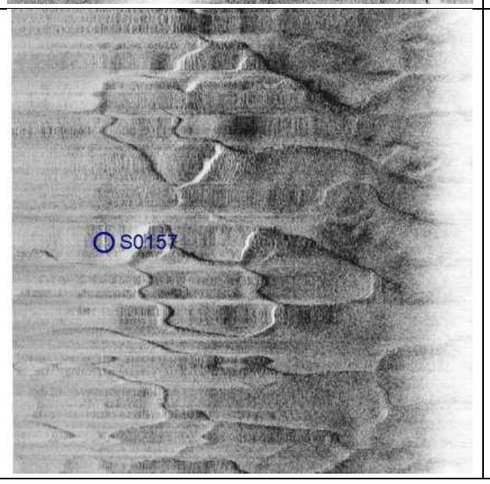
3	S0772	A31060_SH_Nav Merged	496602	5725620	4.2	0.3	0.1	linear debris			SSS: linear contact; clear reflection and shadow;
3	S0807	A34032_SH_Nav Merged	492489	5724926	4.1	0.9	0.3	debris			SSS: elongated contact; hard reflection; clear shadow; MBES: distinct sigar-shaped contact emedded in surrounding sediments; on top two pointed structures; slight scouring; L=4.2m; W=1.5m; H=0.8m; MAG: no anomalies tagged; PP: unknown object; man-made;
3	S0859	A31035_SH_Nav Merged	499884	5721702	4.0	4.0	0.4	debris			SSS: rectangular contact; hard reflection; clear shadow; MBES: elevated contact attached with sand ripple; L2.3m; W2.0m; MAG: no anomalies tagged; no scouring; PP: possible natural structure;

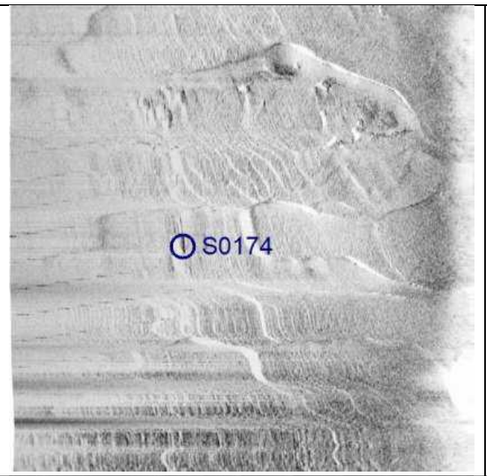
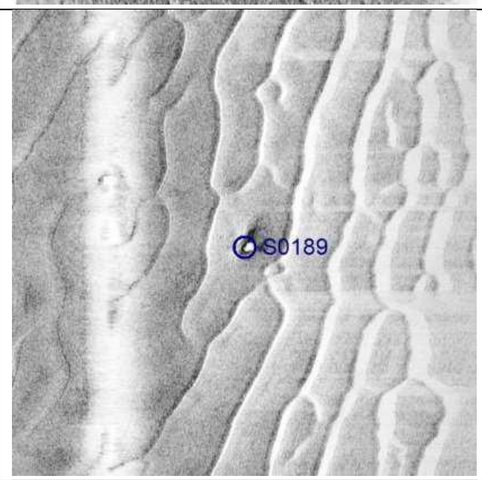
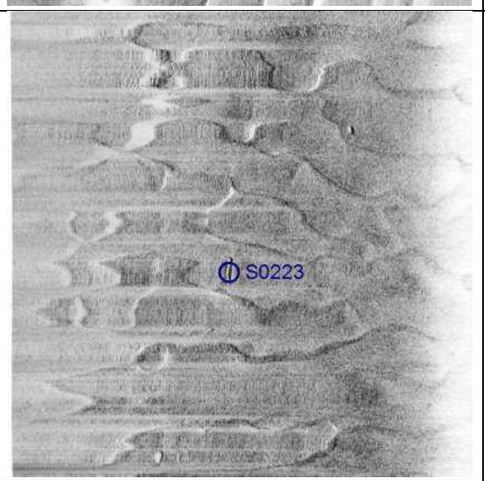
4	S0014	A41126_SH_Nav Merged	493503	5735724	6.6	0.2	0.2	debris			SSS: halter-shaped contact clear reflection and shadows; at end of contact larger shadows; MAG: no anomalies tagged; MBES: linear contact; PP: unknown object; man-made;
4	S0023	A41100_SH_Nav Merged	497543	5735317	7.4	0.4	0.1	linear debris			SSS: linear contact; faint thin reflection and shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: possible cable;
4	S0030	A44048_SH_Nav Merged	492593	5735201	4.7	0.2	0.1	linear debris			SSS: no clear contact; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural phenomenon;

4	S0058	A41136_SH_Nav Merged	490842	5734633	5.0	0.4	0.3	linear debris			SSS: elongated contact; sshadow at 'wrong' side; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: possibly natural structure;
4	S0078	A41137_SH_Nav Merged	490249	5734053	5.7	0.3	0.1	linear debris			SSS: much striping in SSS-image; linear contact; thin reflection and shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: cable; uncertain
4	S0085	A44053_SH_Nav Merged	488983	5733931	7.9	0.7	0.2	debris			SSS: linear contact; reflection at 'wrong'side; MBES: no signs of morphological disturbances or scouring; at crest of sand ripple; MAG: no anomalies tagged; PP: natural structure; current ripple;

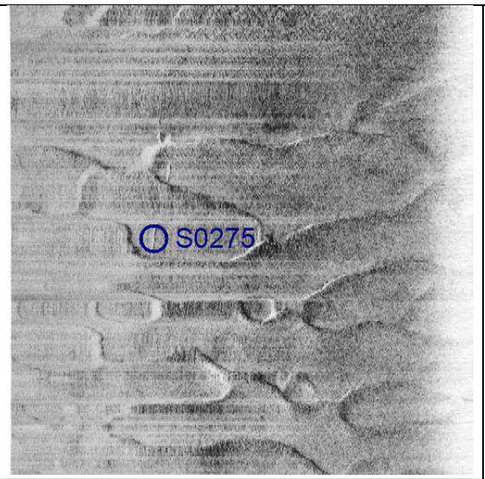
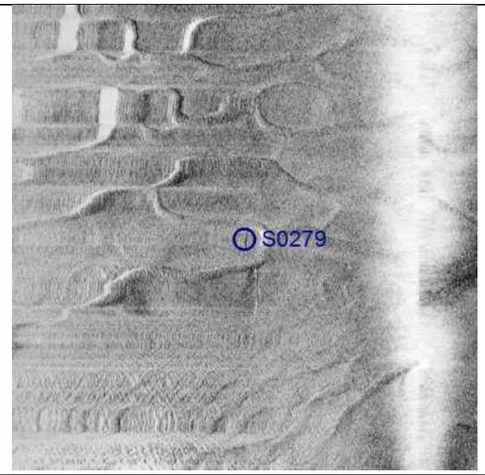
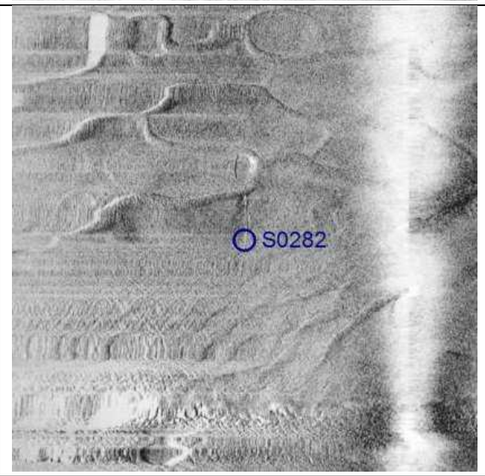
4	S0087	A41087_SH_Nav Merged	498728	5733897	6.2	0.8	0.1	linear debris			SSS: elongated contact; moderate reflection; weak shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural structure; possible sediment ribbon;
4	S0095	A41121_SH_Nav Merged	492881	5733792	4.2	2.0	0.3	debris			SSS: rectangular contact; hard reflection; clear shadow; MBES: irregular distortion of seabed morphology; MAG: no anomalies tagged; PP: unknown object; man-made;
4	S0101	A41097_SH_Nav Merged	496895	5733669	4.1	0.4	0.1	linear debris			SSS: rectangular contact; moderate reflection; faint shadow; on sand ripple; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural structure; possible sediment ribbon;

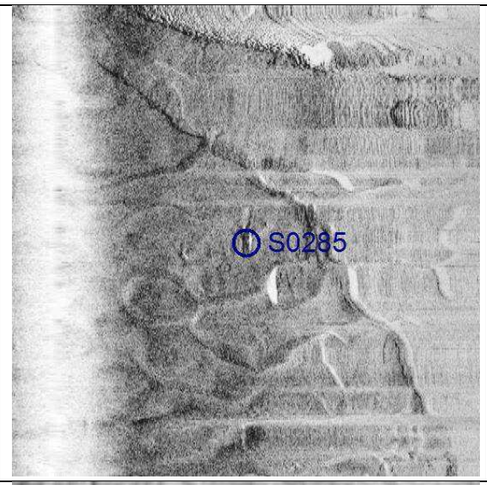
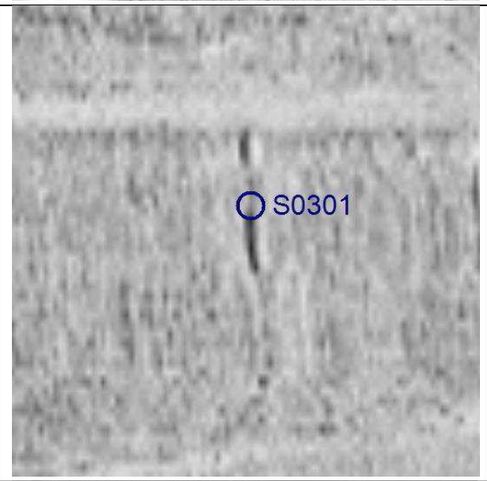
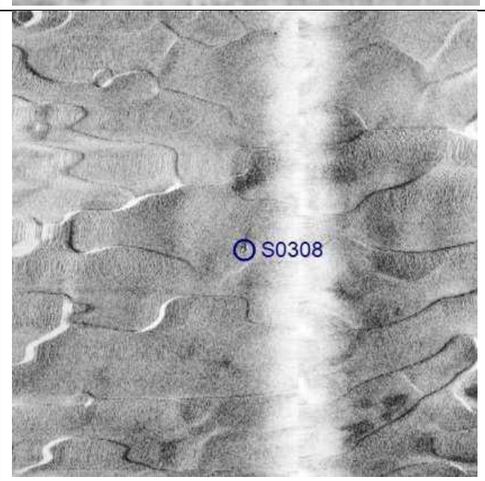
4	S0106	UHRINF006_SH2_NavMerged	493817	5733541	4.5	0.5	0.6	debris			SSS: spherical contact with attached elongated structure; embedded in sediment; moderate reflection; MBES: elevated spherical contact; linear structure nearby; MAG: no anomalies tagged; PP: possible anchor with chain;
4	S0111	A41097_SH_Nav Merged	496676	5733448	5.1	1.5	0.3	linear debris			SSS: elongated ; hard reflection; no shadow; embedded in sediment; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: possible natural structure;
4	S0129	A44044_SH_Nav Merged	492874	5733194	6.4	0.6	0.4	linear debris			SSS: elongated contact; clear reflection and shadow; MBES: slightly elevated structure; L=4.9m; W=2.3; H=0.1m; MAG: no anomalies tagged; PP: unknown object;

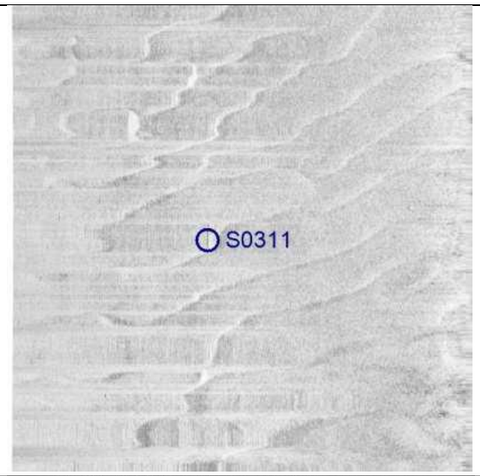
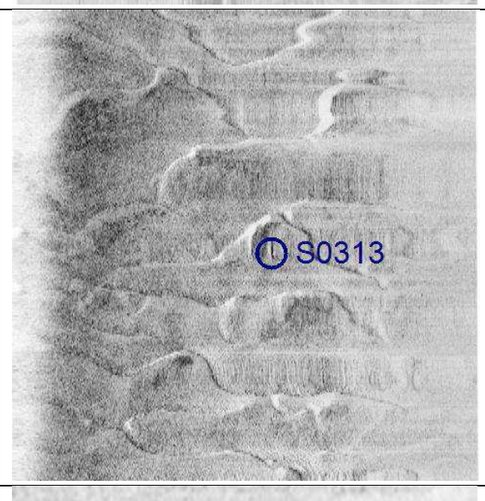
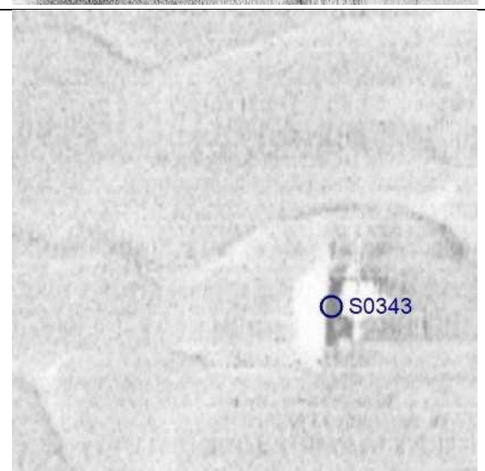
4	S0145	A44059_SH_701_NavMerged	485059	5732938	4.6	0.6	0.4	debris			SSS: poor quality SSS-record; elongated contact; hard reflection; clear shadow; MBES: outside recorded area; MAG: no anomalies tagged; PP: unknown object;
4	S0156	A41160_SH_701_NavMerged	485206	5732755	5.8	0.9	0.4	linear debris			SSS: elongated contact; hard reflection; clear shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: unknown contact; possibly natural;
4	S0157	A44051_SH_Nav Merged	488868	5732745	6.1	0.3	0.1	debris	linear debris. Possibly natural		SSS: linear structure; reflection alike surrounding seabed; clear shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural structure;

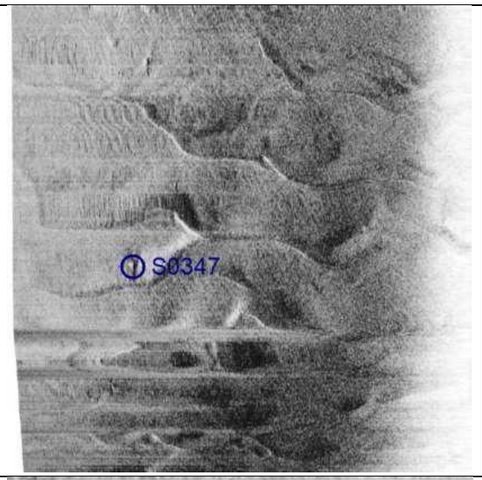
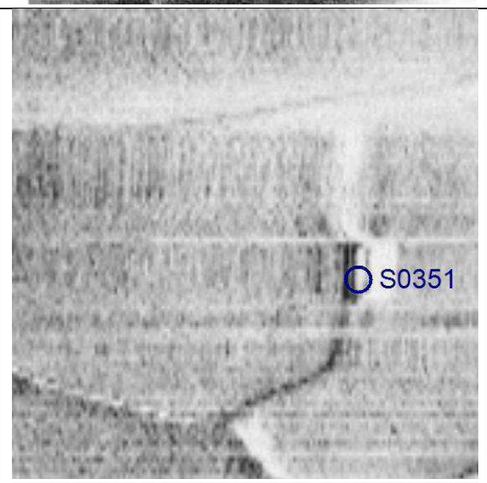
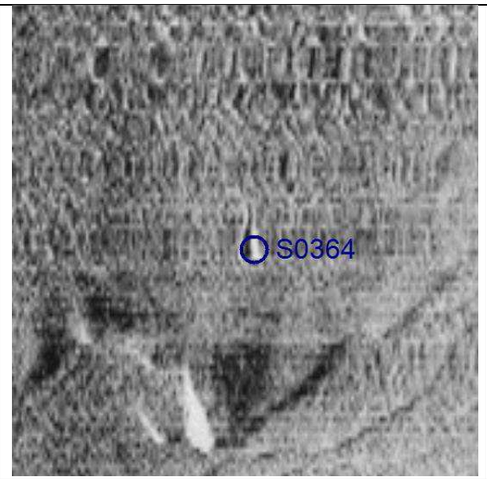
4	S0174	A41155_SH_Nav Merged	485900	5732572	4.2	0.8	0.3	debris			SSS: elongated structure rounded; parallel to sand ripple; much striping in sonar record; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural structure; sand ripple;
4	S0189	A3A4XL002_SH2 _NavMerged	487882	5732433	6.0	0.8	0.7	debris			SSS: spherical contact; hard reflection; clear shadow; embedded in sediment; MBES: spherical contact; amidst scoure; L=3.3m; W=1.5m; H=0.2m; MAG: no anomalies tagged; PP: unknown object; man-made;
4	S0223	A44059_SH_701_ NavMerged	484469	5732223	5.5	0.6	0.1	linear debris			SSS: linear contact; hard reflection; clear shadow; MBES: slightly elevated with respect to surrounding seabed; MAG: no anomalies tagged; PP: natural phenomenon;

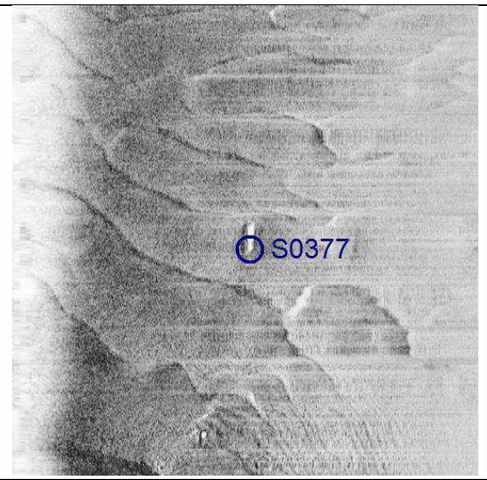
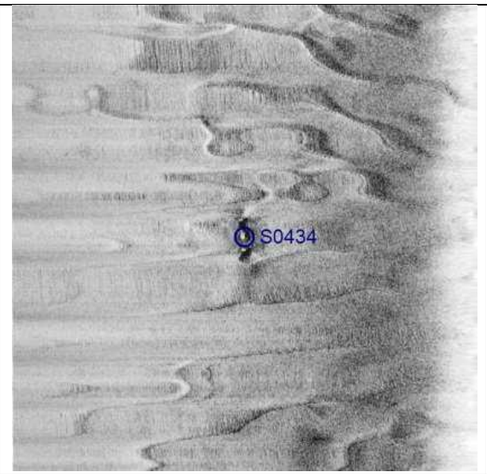
4	S0235	A41154_SH_Nav Merged	485810	5732162	7.7	1.7	0.3	debris		SSS: elongated contact; moderate reflection; thin clear shadow; MBES: slightly elevated with respect to surrounding seabed; MAG: no anomalies tagged; PP: natural phenomenon; possible outcrop of clay Kreftenheye/Eem Fm;
4	S0246	A44056_SH_Nav Merged	485819	5732119	4.0	0.4	0.4	linear debris		SSS: drop-shaped contact; moderate reflection; thin shadow; MBES: slightly elevated with respect to surrounding seabed; MAG: no anomalies tagged; PP: natural phenomenon; possible outcrop of clay Kreftenheye/Eem Fm;
4	S0261	A44056_SH_Nav Merged	485854	5732066	4.6	0.6	0.6	debris		SSS: elongated contact; moderate reflection comparable with surrounding seabed; no clear shadow; MBES: slightly elevated with respect to surrounding seabed; MAG: no anomalies tagged; PP: natural phenomenon;

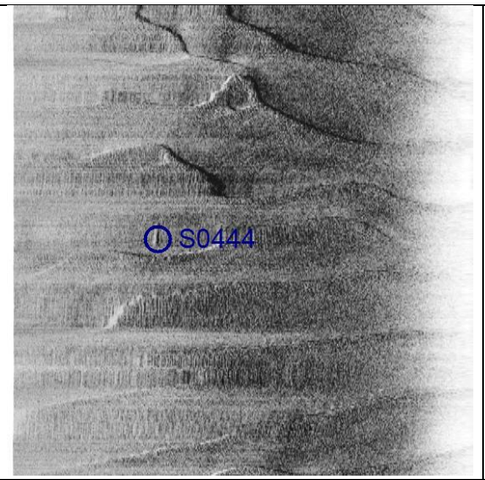
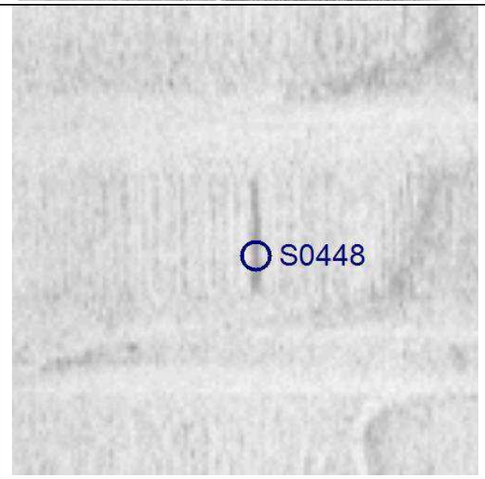
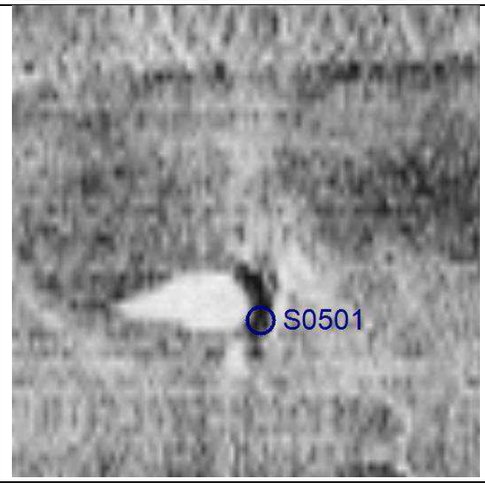
4	S0275	A41151_SH_Nav Merged	486085	5732015	6.5	0.4	0.1	linear debris			SSS: intermitted linear contact; thin reflection and shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; proximate to anomalies tagged and interpreted to represent UK_NL8 PP: cable; coherent with S0279 and S0282;
4	S0279	A41152_SH_Nav Merged	486081	5732002	5.3	0.5	0.0	debris			SSS: linear contact; thin reflection no clear shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; proximate to anomalies tagged and interpreted to represent UK_NL8 PP: cable; coherent with S0275 and S0282
4	S0282	A41152_SH_Nav Merged	486069	5731991	35.5	0.3	0.1	debris			SSS: intermitted linear contact; thin reflection and shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; proximate to anomalies tagged and interpreted to represent UK_NL8 PP: cable; coherent with S0279 and S0275

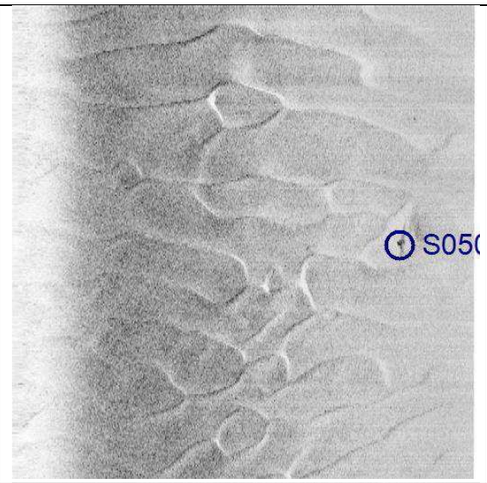
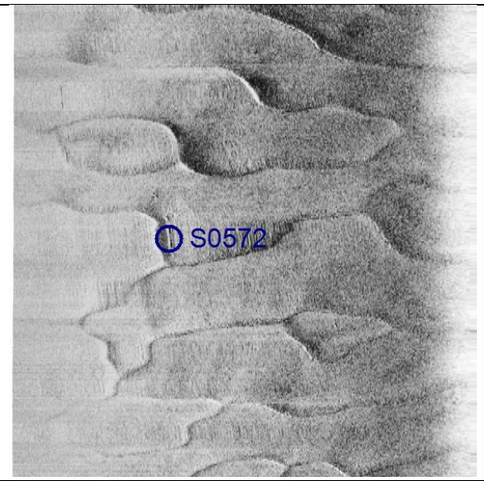
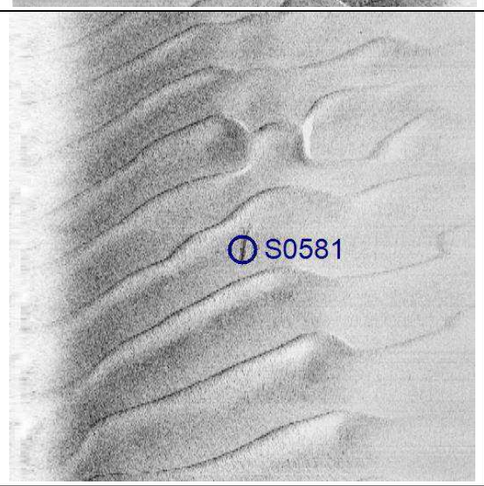
4	S0285	A44056_SH_Nav Merged	485814	5731986	5.9	1.5	0.2	debris			SSS: no clear target; moderate reflection; shadow at 'wrong' side; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural phenomenon;
4	S0301	A44056_SH_Nav Merged	485778	5731892	5.6	0.6	0.1	debris			SSS: elongated contact; hard reflection on 'wrong side'; no shadow; poor quality SSS-image; MBES: edge of sand ripple; MAG: no anomalies tagged; PP: natural phenomenon; sand ripple;
4	S0308	A41137_SH_Nav Merged	488492	5731867	5.6	0.6	0.5	debris			SSS: spherical contact; moderate reflection; weak shadow; MBES: contact not visible; scouring 2.8m in diameter next to contact location; MAG: no anomalies tagged; PP: unknown object;

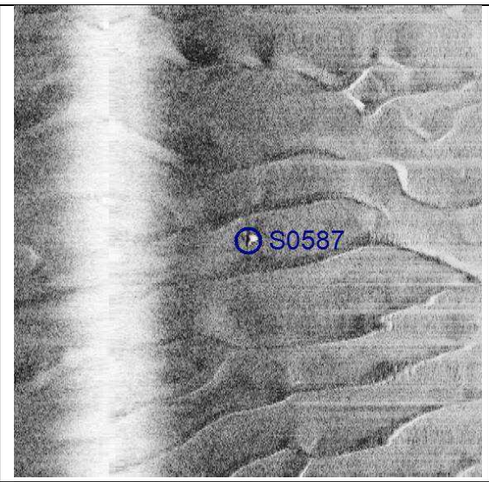
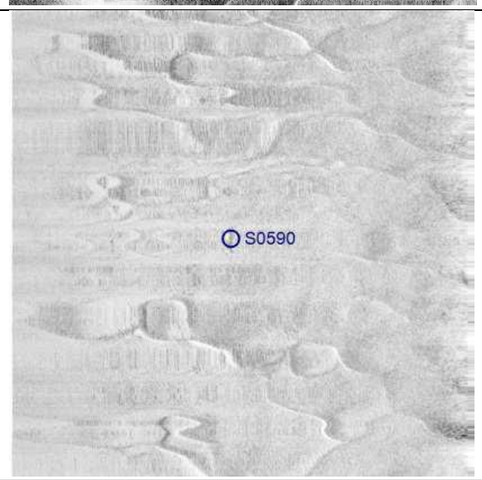
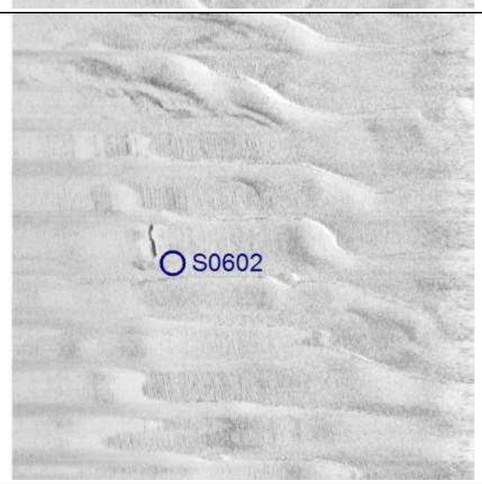
4	S0311	A44044_SH_Nav Merged	491912	5731850	7.2	0.4	0.0	linear debris			SSS: elongated contact; moderate reflection; shadow at 'wrong' side; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural phenomenon; sand ripple;
4	S0313	A41147_SH_Nav Merged	486887	5731855	5.0	0.4	0.2	debris			SSS: linear contact; hard thin reflection; small shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; proximate to anomalies tagged and interpreted to represent UK_NL8 PP: cable; possible exposure of UK_NL8
4	S0343	A44038_SH1_NavMerged	494861	5731658	5.5	1.8	1.0	debris			SSS: rectangular contact; hard reflection; clear shadow; MBES: set of two parallel elevated contacts amidst scouring; L= 4.5m; W= 2.6m; H= 0.5m; MAG: no anomalies tagged; PP: unknown object; man-made;

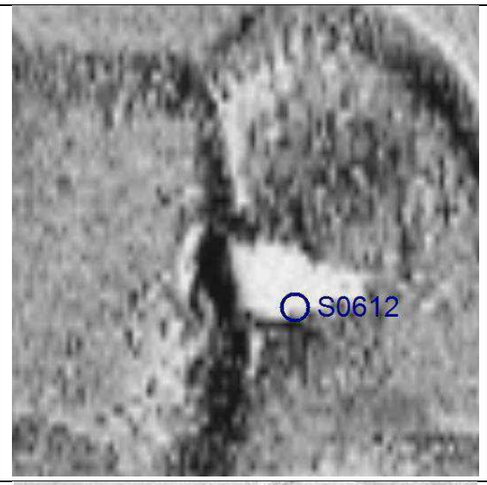
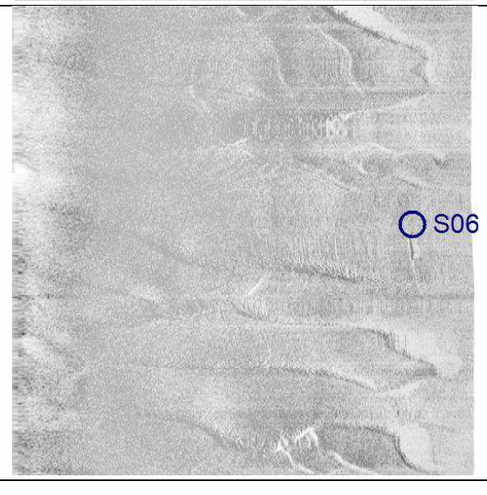
4	S0347	A44057_SH_Nav Merged	485065	5731650	4.5	0.5	0.2	debris			SSS: spherical contact; moderate reflection; small shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: unknown object; possibly natural phenomenon;
4	S0351	A41144_SH_Nav Merged	487081	5731637	4.9	1.3	0.2	debris			SSS: elongated contact; moderate reflection; clear shadow; much striping in SSS-record; coincides with sand ripple; MBES: slightly elevated structure; MAG: no anomalies tagged; PP: natural phenomenon; sand ripple;
4	S0364	A41157_SH_701_ NavMerged	484808	5731513	4.5	0.6	0.3	debris			SSS: drop-shaped contact; moderate reflection; clear shadow; MBES: outside *multibeam* recordings; MAG: no anomalies tagged; PP: unknown object; possibly natural phenomenon;

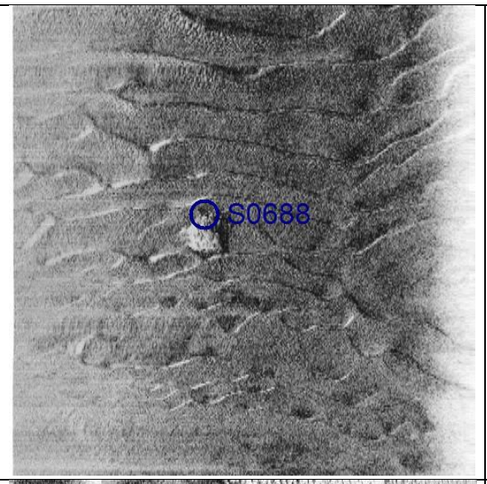
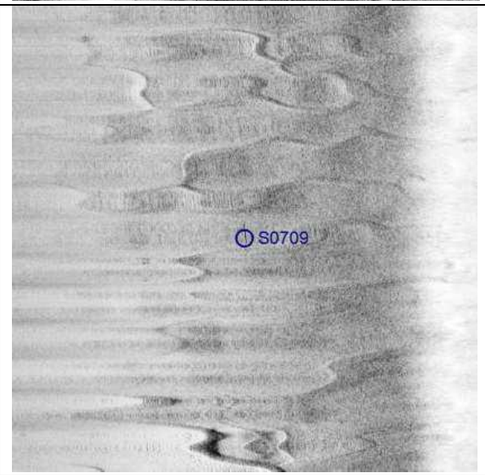
4	S0377	A41109_SH_Nav Merged	492851	5731262	6.7	1.3	0.4	debris			SSS: elongated contact; moderate granular reflection; clear shadow; MBES: slightly elevated contact; MAG: no anomalies tagged; PP: unknown object; possibly natural;
4	S0387	A41096_SH_Nav Merged	495084	5731177	4.6	1.3	1.0	debris			SSS: elongated contact; moderate reflection; depression; MBES: elongated elevated contact amidst scouring; L=4.0m; W=1.6m; H=0.5m MAG: no anomalies tagged; PP: unknown object;
4	S0434	A41127_SH_Nav Merged	489300	5730841	4.4	1.4	0.3	debris			SSS: spherical contact; hard reflection; small shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: unknown object;

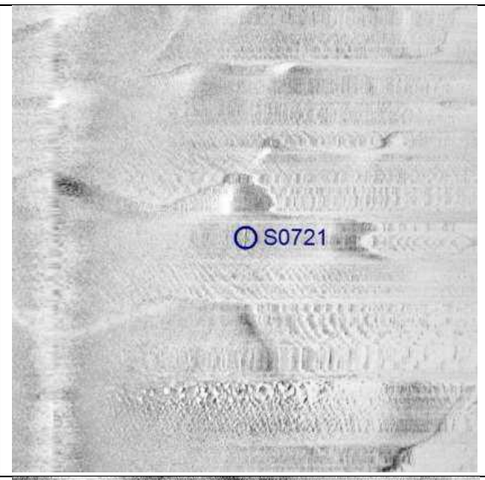
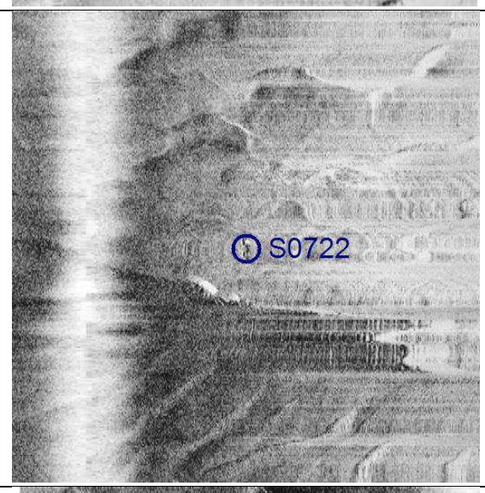
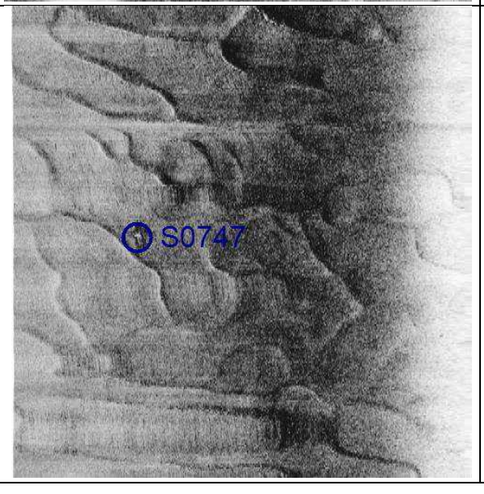
4	S0444	A41123_SH_Nav Merged	489889	5730655	4.5	0.4	0.2	linear debris			SSS: elongated rounded contact; hard reflection; clear shadow; MBES: edge of sand ripple; no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural phenomenon; sand ripple;
4	S0448	A44043_SH_Nav Merged	491228	5730571	6.4	0.6	0.2	debris			SSS: distorted SSS-image; linear reflections parallel to heading; much striping perpendicular heading; MBES: edge of sand ripple; no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: disturbance of sonar image; no contact;
4	S0501	A41109_SH_Nav Merged	491524	5729795	4.4	1.0	1.0	debris			SSS: elongated contact; hard reflection; clear large shadow; MBES: elevated elongated contact;parallel to sand wave crest; 9m southwest on tagged SSS-contact; correct coord. = 491519E/5729786; L=4.3m; W=1.0m; H=0.4m; MAG: no anomalies tagged; PP: natural phenomenon; intersection outcropping clay?

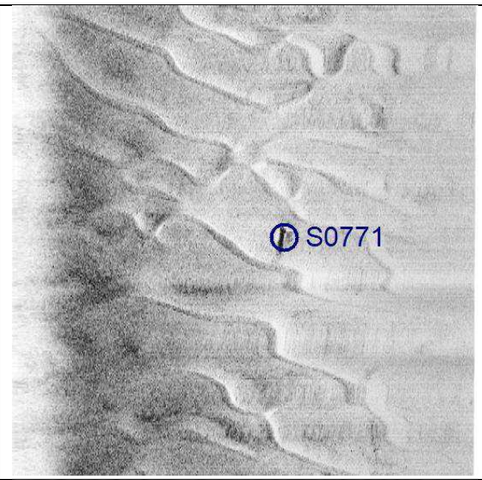
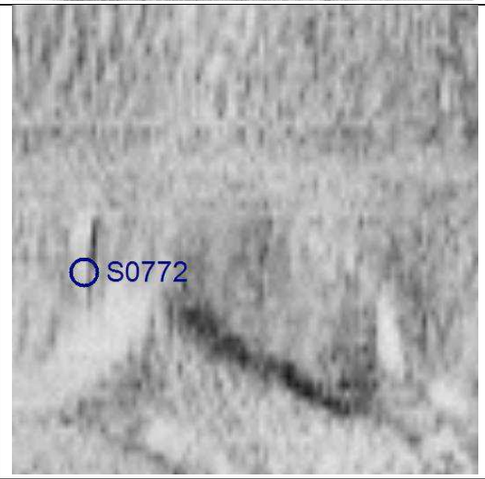
4	S0506	A41097_SH_Nav Merged	493741	5729763	4.2	1.2	0.3	debris			SSS: spherical contact; moderate reflection; no clear shadow; MBES: elevated contact amidst scouring area; L=4.2m; W=3.4m; H=0.6m; boulder like appearance; MAG: no anomalies tagged; PP: unknown object;
4	S0572	A41117_SH_Nav Merged	489425	5728827	4.8	0.4	0.1	linear debris			SSS: linear contact; thin reflection; slim shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: cable;
4	S0581	A41097_SH_Nav Merged	492835	5728711	7.0	1.1	0.0	linear debris			SSS: elongated zone; moderately hard granular reflection; no shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural phenomenon; possible shell layer;

4	S0587	A41109_SH_Nav Merged	490660	5728608	4.7	0.9	0.8	debris			SSS: compact contact; hard reflection; clear shadow; MBES: no signs of morphological disturbances or scouring; MAG: triangular contact; elevated with respect to surrounding seabed; no scouring; L=3.4m; W=2.5m; H=0.2m PP: unknown object; man-made;
4	S0590	A41111_SH_Nav Merged	490260	5728567	4.3	0.9	0.3	debris			SSS: elongated contact; moderate reflection; faint shadow; poor quality SSS-record; much striping; MBES: no signs of morphological disturbances or scouring; seabed around 34.40m slightly 'bumpy'; MAG: no anomalies tagged; PP: natural phenomenon; possible outcrop of clay;
4	S0602	A41119_SH_Nav Merged	488809	5728342	6.8	0.8	0.4	debris			SSS: elongated contact; hard reflection; shadow visible; MBES: connection between two sand ripples; MAG: no anomalies tagged; PP: natural phenomenon; sand ripple;

4	S0612	A41099_SH_Nav Merged	492044	5728217	6.5	1.4	1.4	debris			SSS: elongated contact; hard reflection; pronounced shadow; MBES: contact with internal northwest-seatheast trending elongated structures; some scouring on north and south side of contact; L=7.0m; W=5.0m; H=0.9m; MAG: no anomalies tagged; PP: possible wreck;
4	S0630	A41111_SH_Nav Merged	489742	5727968	4.1	1.4	0.4	debris			SSS: rectangular contact; moderate reflection; shadow present; MBES: elevated elongated contact; L=2.2m; W= 1.3m; H=0.2m; MAG: no anomalies tagged; PP: unknown object;
4	S0671	A44042_SH_Nav Merged	489603	5727700	6.2	0.7	0.3	linear debris			SSS: elongated contact; moderate reflection; clear shadow; MBES: slight scarring of seabed; MAG: no anomalies tagged; PP: natural phenomenon;

4	S0688	A41107_SH_Nav Merged	489958	5727405	9.0	4.3	1.3	debris			SSS: spherical contact; moderate granular reflection; no shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural phenomenon; possible outcrop of clay;
4	S0693	A41105_SH_Nav Merged	490358	5727289	4.3	1.2	0.5	debris			SSS: drop-shaped contact; hard reflection; clear shadow; MBES: elevated aequidimentional contact; embedded in sand; L=2.0m; W=2.0m; H=0.3m; MAG: no anomalies tagged; PP: unknown object; man-made;
4	S0709	A41088_SH1_NavMerged	492863	5726996	4.3	0.4	0.1	linear debris			SSS: linear contact; thin reflection; very slim shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: cable;

4	S0721	A44039_SH_Nav Merged	490376	5726803	5.5	0.5	0.1	linear debris			SSS: elongated structure; shadow at 'wrong' side; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: no contact; seabed disturbance;
4	S0722	A41090_SH_Nav Merged	492536	5726792	4.4	0.6	0.2	debris			SSS: poor quality SSS-record; striping; shadow at 'wrong' side; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural phenomenon; seabed disturbance;
4	S0747	A41096_SH_Nav Merged	490928	5726258	4.0	1.4	0.4	debris			SSS: parallel structure; granular hard reflection; no clear shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural phenomenon;

4	S0771	A41086_SH_Nav Merged	492113	5725626	6.7	1.1	0.4	debris			SSS: elongated contact; hard reflection; no clear shadow; MBES: one point object protruding from the seabed surrounded by a depression caused by scouring, and one elongated object with a length of 4 meters; MAG: no anomalies tagged; PP: unknown object;
4	S0772	A31060_SH_NavMerged	496602	5725620	4.2	0.3	0.1	linear debris			SSS: elongated contact; moderate reflection; no clear shadow; MBES: no signs of morphological disturbances or scouring; MAG: no anomalies tagged; PP: natural phenomenon, natural sedimentary structure; sand ripple;

Appendix 3. Listing of selected magnetometer contacts larger than 50 nanoTesla

BWFS	ID	Survey_line	X	Y	amplitude__nT_	width__m_	Anomaly_type	SSS	Category	Description	Related___txt_file
I	WFS1-MAG-109	24-2400	504443	5737296	58	30	neg. monopole				24-2400
I	WFS1-MAG-145	55-5500	504157	5731873	67	45	dipole				55-5500
I	WFS1-MAG-152	81-8100	506398	5730519	63	25	pos. monopole				81-8100
II	MAG-WFS2-215	86-8600	503450	5725921	58	40	neg. monopole				86-8600
II	MAG-WFS2-242	127-12700	506342	5722961	56	30	dipole				127-12700
II	MAG-WFS2-243	143-14300	508300	5722884	51	210	dipole			Poss. ID MAG-WFS2-241	143-14300
II	MAG-WFS2-273	122-12200	501350	5717369	83	20	dipole				122-12200
II	MAG-WFS2-278	162-16200	505707	5716443	87	15	pos. monopole				162-16200
II	MAG-WFS2-280	162-16200	505551	5716230	70	20	dipole				162-16200
II	MAG-WFS2-291	162-16200	504278	5714606	79	50	dipole				162-16200
III	MAG-WFS3-M0077		499030	5727387	51.79	0	Dipole			unknown/debris	
III	MAG-WFS3-M0109		498740	5731452	69.66	0	Negative Monopole			unknown/debris	
III	MAG-WFS3-M0548		496108	5725828	70.87	0	Dipole			unknown/debris	
III	MAG-WFS3-M0654		496665	5728777	56.44	0	Dipole			unknown/debris	
III	MAG-WFS3-M1361		496236	5724881	63.78	0	Dipole			unknown/debris	
III	MAG-WFS3-M1433		500192	5722608	54.38	0	Dipole			unknown/debris	
III	MAG-WFS3-M1448		499694	5718689	53.16	0	Dipole			unknown/debris	
III	MAG-WFS3-M1472		502767	5728042	76.57	0	Dipole			unknown/debris	
III	MAG-WFS3-M1505		500989	5723456	50.45	0	Dipole			unknown/debris	
III	MAG-WFS3-M1634		500575	5719594	59.2	0	Dipole			unknown/debris	
III	MAG-WFS3-M1644		501018	5719357	56.03	0	Dipole			unknown linear target 2	
III	MAG-WFS3-M1663		499909	5717058	74.51	0	Dipole			unknown/debris	
III	MAG-WFS3-M1687		502130	5728959	62.28	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0015		492164	5727797	89.27	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0024		497745	5734628	97.33	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0125		496555	5731943	60.15	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0128		495895	5731127	50.21	0	Negative Monopole			unknown/debris	
IV	MAG-WFS4-M0144		494708	5732830	62.94	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0196		496140	5733946	95.37	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0207		497957	5736173	60.13	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0208		497969	5736188	50.41	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0266		491825	5731689	50.94	0	Positive Monopole			unknown/debris	
IV	MAG-WFS4-M0267		493295	5733490	81.43	0	Positive Monopole			unknown/debris	
IV	MAG-WFS4-M0376		485232	5731956	63.59	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0635		495951	5732230	72.53	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0721		489534	5732163	53.56	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0930		493594	5731137	72.82	0	Positive Monopole			unknown/debris	
IV	MAG-WFS4-M0946		492182	5728796	52.62	0	Positive Monopole			unknown/debris	
IV	MAG-WFS4-M0958		498457	5735988	61.67	0	Dipole			unknown/debris	
IV	MAG-WFS4-M1095		495793	5734020	65.81	0	Dipole			unknown/debris	
IV	MAG-WFS4-M1096		494060	5731892	91.58	0	Dipole			unknown/debris	
IV	MAG-WFS4-M1097		494170	5732028	82.72	0	Dipole			unknown/debris	
II	MAG-WFS2-276	162-16200	505844	5716626	458	40	dipole				162-16200
III	MAG-WFS3-M0089		496456	5726128	114.24	0	Negative Monopole			unknown/debris	
III	MAG-WFS3-M0107		496673	5728910	521.03	0	Dipole			unknown/debris	
III	MAG-WFS3-M0536		494772	5726084	179.46	0	Dipole			unknown/debris	
III	MAG-WFS3-M0797		498414	5723436	104.72	0	Dipole			unknown/debris	
III	MAG-WFS3-M1437		497846	5719926	132.8	0	Positive Monopole			unknown/debris	
III	MAG-WFS3-M1447		499013	5717895	267.66	0	Dipole			unknown/debris - possible wreck 1693	
III	MAG-WFS3-M1498		498416	5723439	198.29	0	Negative Monopole			unknown/debris	
III	MAG-WFS3-M1502		499951	5724082	108.97	0	Dipole			unknown/debris	
III	MAG-WFS3-M1624		499129	5718294	285.98	0	Dipole			unknown/debris - possible wreck 1693	
III	MAG-WFS3-M1629		499710	5718404	229.4	0	Dipole			unknown/debris	
III	MAG-WFS3-M1669		500770	5717640	107.74	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0001		493426	5728711	146.53	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0131		492159	5729695	102.88	0	Negative Monopole			unknown/debris	
IV	MAG-WFS4-M0134		492796	5730483	144.36	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0189		496624	5735790	173.52	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0198		496355	5734211	191.11	0	Dipole			unknown/debris	
IV	MAG-WFS4-M0862		489142	5730266	211.5	0	Dipole			unknown/debris - possible wreck 3644	
IV	MAG-WFS4-M1004		499750	5737279	102.7	0	Dipole			possible mine	
IV	MAG-WFS4-M1087		496331	5734330	118	0	Dipole			unknown/debris	
IV	MAG-WFS4-M1123		494970	5733297	107.55	0	Dipole			unknown/debris	
III	MAG-WFS3-M1669		500770	5717640	107.74	0	Dipole			unknown/debris	
III	MAG-WFS3-M0107		496673	5728910	521.03	0	Dipole			unknown/debris	

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