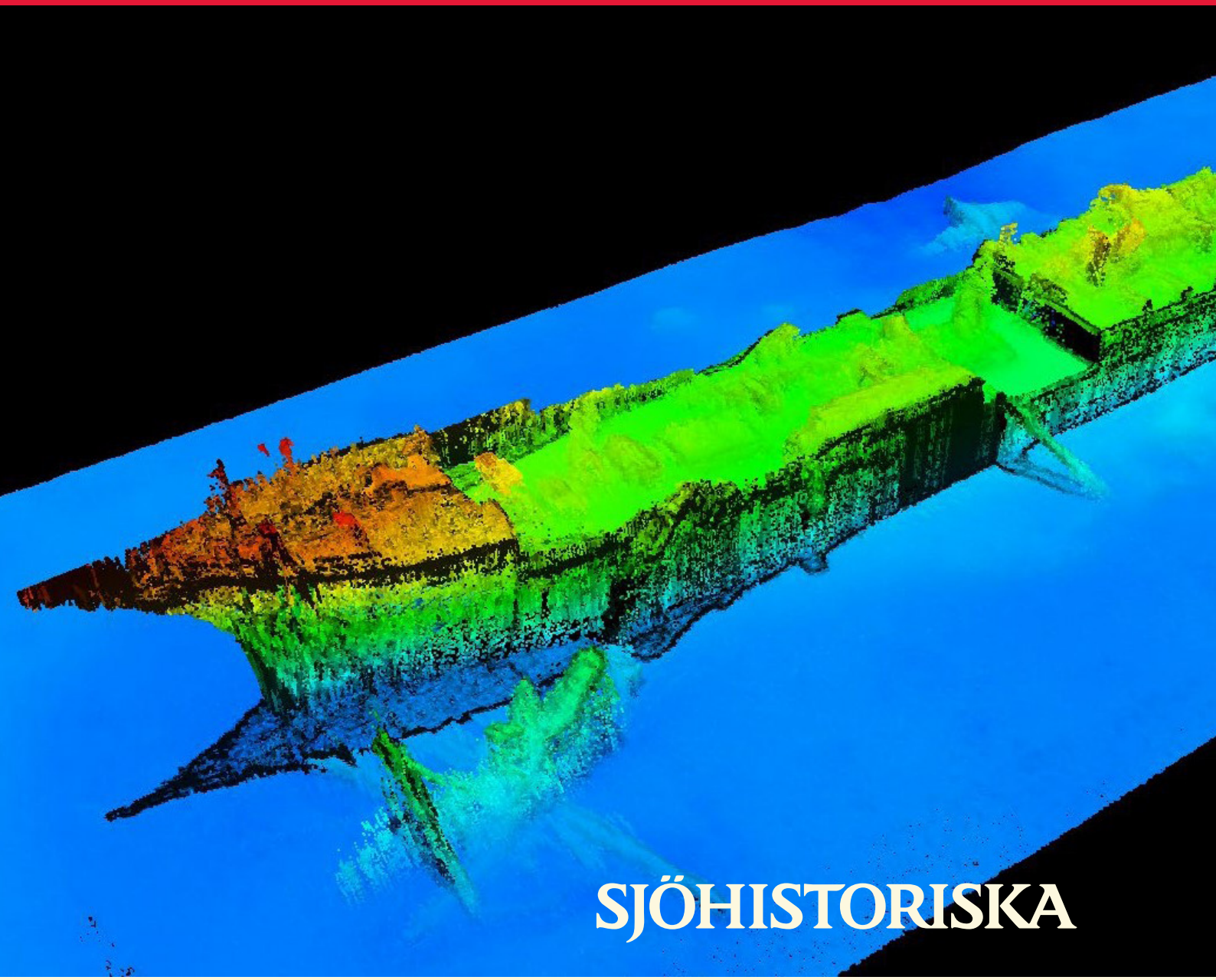
SJÖHISTORISKA MUSEET
ARKEOLOGISK RAPPORT NR 2019:5

Nord Stream 2

Archaeological analysis of ROV-films

Baltic Sea, Swedish EEZ

MIKAEL FREDHOLM



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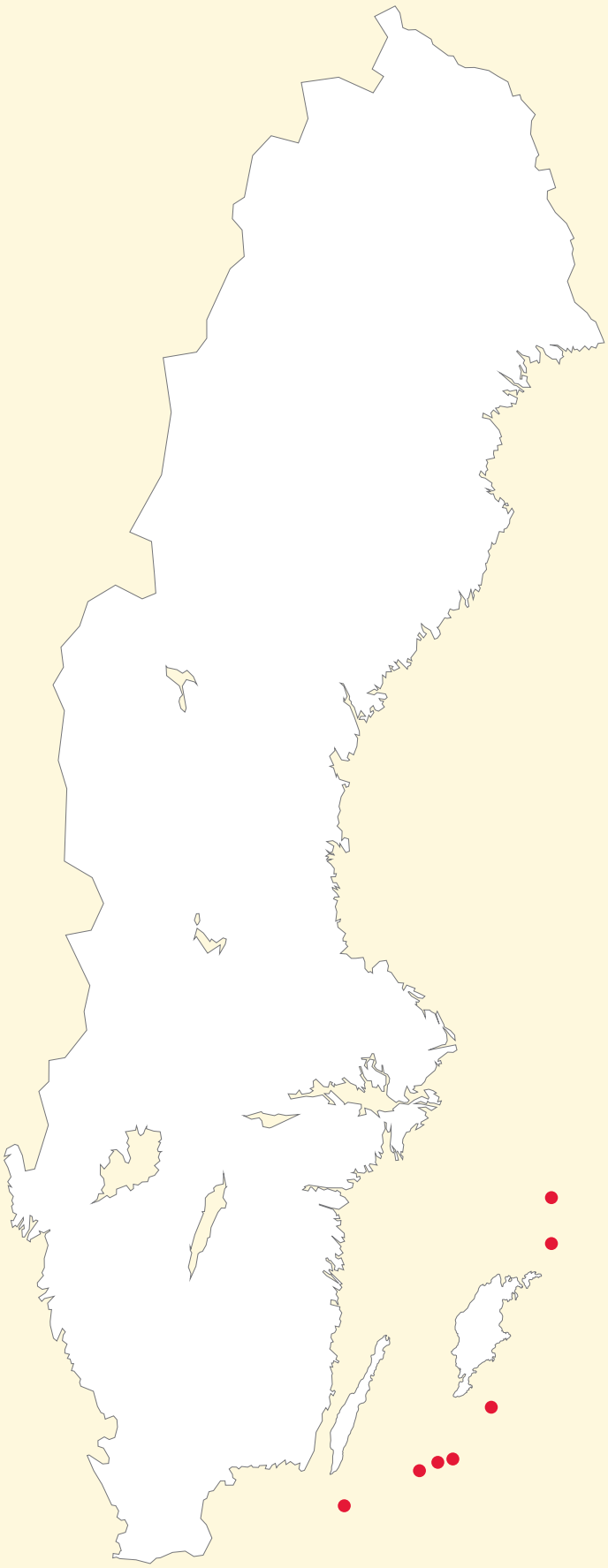

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Content

Svensk sammanfattning

Av de sju analyserade objekten så är fem fartygslämningar och två naturliga stenformationer (S-R27-0640 och S-R27-5051). Tre fartygslämningar (S-R17-4285, S-R28-5046 och S-R30-0997) bedömer Statens maritima och transporthistoriska museer (SMTM) ha förlist före 1850, vilket gör att de räknas som fornlämningar enligt kulturmiljölagen (1988:950).

Summary

Out of the analysed seven objects, five are wrecks and two objects (S-R27-0640 and S-R27-5051) are rock outcrops. Three wrecks (S-R17-4285, S-R28-5046 and S-R30-0997) are estimated by The Swedish National Maritime and Transport Museums (SMTM) to have foundered before 1850, and therefore these shipwrecks are to be considered ancient monuments, according to the definitions in the Swedish Heritage Conservation Act (1988:950).

Background

Construction including surveys are ongoing for the new gas pipeline Nord Stream 2 (NSP2), which will run in parallel with the existing gas pipeline Nord Stream.

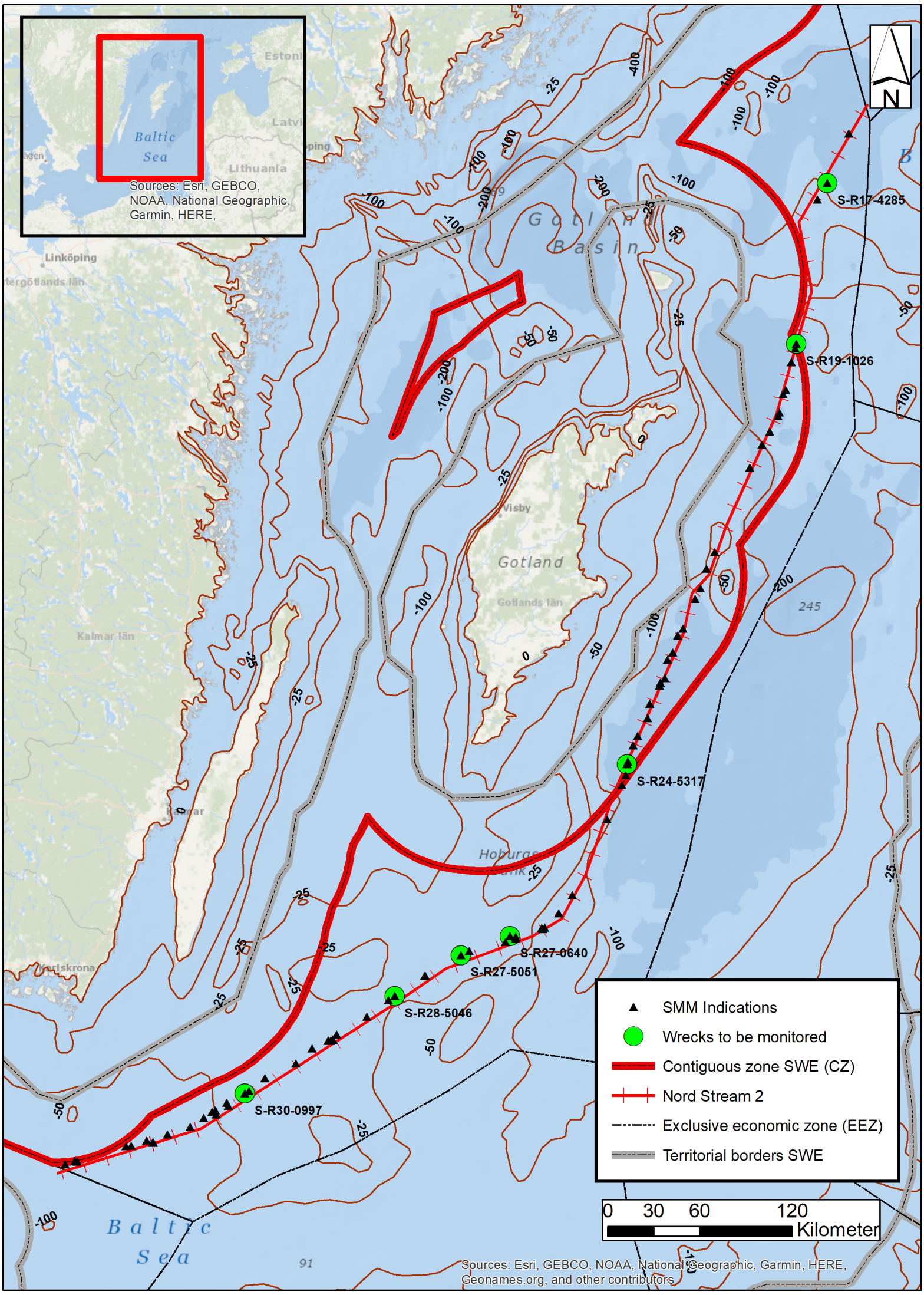
The Swedish National Maritime and Transport Museums (SMTM) has during 2016 performed an archaeological analysis of geophysical data from the planned NSP2-route. The analysis resulted in 23 clear wrecks and several other possible man-made objects (Fredholm 2016).

When constructing the gas pipeline NSP2 will use ships with "Dynamic positioning" and therefore the impact on the surrounding seabed and objects will be less than Nord Stream, when anchoring ships were used for the construction. Therefore NSP2 together with SMTM have estimated that seven objects from the archaeological analysis (Fredholm 2016) need to be checked before construction and after the construction of the pipeline. In order to see if the construction work has had any effect on their state of preservation.

In January 2019 SMTM presented an investigation plan for Nord Stream 2 AG and an agreement was later signed for SMTM:s analysis of ROV-films before and after the construction of the pipeline.

SMTM is hereby presenting an archaeological report for the analysis of ROV-film of seven shipwrecks or possible ancient heritage objects near the planned NSP2-route. This analysis of ROV-films is performed before the pipe lay. The analysis of ROV-films from the wrecks after the pipe lay will be performed and presented in a later report.

FIG. 1. The NSP2 pipeline in the Swedish economic zone, Contiguous zone and the distribution of sonar indications (Fredholm 2016).The seven wrecks that are to be monitored before and after the pipeline construction are marked. © ESRI, processed by Mikael Fredholm, Swedish national maritime and transport history museums.


Baltic Sea
Estonia
Latvia
Lithuania
Sources: Esri, GEBCO, NOAA, National Geographic, Garmin, HERE,
N
S-R17-4285
S-R19-1026
S-R24-5317
S-R27-0640
S-R27-5051
S-R28-5046
S-R30-0997
Gotland Basin
Gotland
Visby
Gotlands län
Kalmar län
Linköping
Hoburgs bank
SMM Indications
Wrecks to be monitored
Contiguous zone SWE (CZ)
Nord Stream 2
Exclusive economic zone (EEZ)
Territorial borders SWE
0 30 60 120
Kilometer
Sources: Esri, GEBCO, NOAA, National Geographic, Garmin, HERE, Geonames.org, and other contributors

Purpose, method and evaluation

This is the first out of two reports during 2019. In this first report the main purpose of the analysis is to determine if the seven objects in the pipeline corridor can be considered to be ancient monuments according to the definitions in the Swedish Heritage Conservation Act (1988:950). If these objects are wrecks or other significant ancient monuments, the second purpose is to further describe and date these objects.

The second purpose of this analysis is to document the condition of the wrecks before construction, so their status can be analysed after the construction of the pipeline, which will be analysed in the second report, later during 2019.

The ROV-filming has been done by Marin Mätteknik AB (MMT), and their reports includes high resolution bathymetry/multibeam-images as well as still pictures of the wrecks, with "events" (photo stations). These "events" will be filmed again for comparison after the gas pipe line has been laid down and these events will be compared in the second SMTM report.

For a shipwreck to be defined as an ancient monument it should have foundered before 1850 according to the definitions in the Swedish Heritage Conservation Act. A younger monument may be given an ancient monument status by the county administrative board if there are special reasons. To an ancient monument belongs an area on the ground, sea or ocean floor that is needed to preserve the ancient monument and give it a sufficient space with regard to its nature and importance. This area is referred to as an ancient monument area (1988: 950, 2013:548).

Ancient environment and history

The approximately 510 km long stretch of NSP2 through the Swedish EEZ and CZ has a varied bottom topography, bottom types and depth of about 30 meters in the waters at the southern EEZ to over 200 meters in the northern part of the EEZ (Fig. 1). The known ancient monuments registered in the National Heritage Boards database (FMIS) close to NSP2 were found mainly in the Nord Stream project. Except for these wrecks the Swedish Maritime Administration has registered other wrecks in the Swedish EEZ.

SMTM has during 2016 performed an archaeological analysis of geophysical data from the planned NSP2-route. The analysis resulted in 23 clear wrecks, 36 indications that potentially are fragmented wrecks and 59 indications that might be part of wrecks or other man-made objects (Fredholm 2016). During 2017 ROV-film from two objects were analysed by SMM and it was concluded that they are not ancient monuments (Fredholm 2017).

Seven wrecks has been ROV-filmed. Six wrecks lies within 250 meters from the planned pipeline. One other wreck (S-R-30-0997) lies 730 meters from the pipeline and it seems to be an old wooden wreck, and will therefore be included in the monitoring program.

TABLE 1. The seven objects/ wrecks that are to be analysed before the pipe lay of NSP2.

ID No.	Distance to pipeline (m)	Description in Fredholm 2016
S-R17-4285	203	Wreck
S-R19-1026	238	Wreck
S-R24-5317	93	Wreck
S-R27-0640	232	Possible wreck
S-R27-5051	171	Possible wreck
S-R28-5046	142	Wreck known since NSP1; RAÄ 2:48, also known as S-29-93462
S-R30-0997	730	Wreck

Previous investigations

The only known investigations made along NSP2 has been by Nord Stream for the gas pipe and the Swedish Maritime Administrations surveys.

The wreck S-R17-4285 was found by the Swedish Maritime Administration in 2009 and the rest by Nord Stream 1 and 2.

In 2017 SMTM analysed ROV-films from two sonar indications along NSP2. The indications where concluded to be a rock and some rope/textile (Fredholm 2017).

In the 2016 SMTM-analysis two of the now analysed seven wrecks/objects (table 1) were concluded to be actual wrecks. The ROV-films showed that S-R30-0997 is a wooden wreck,

S-R24-5317 a steel wreck and S-R28-5046 an older wooden wreck known since Nord Stream (Fredholm 2016).

Results

Out of the seven analysed objects, five are wrecks, S-R27-0640 and S-R27-5051 are rock outcrops. SMTM estimate that the wrecks S-R17-4285, S-R28-5046 and S-R30-0997 have sunk before 1850, and therefore these three shipwreck are to be considered ancient monuments, according to the definitions in the Swedish Heritage Conservation Act.

TABLE 2. The seven objects/wrecks that are analysed. Ancient monuments; ship wrecks that have foundered before 1850 according to the definitions in the Swedish Heritage Conservation Act. * Although SMTM argues that it has sunk after 1850, a younger wreck can be classified as an ancient monument by the County Administrative board.

ID No.	Ancient monument	Description
S-R17-4285	Yes	Wreck
S-R19-1026	No	Wreck
S-R24-5317	No*	Wreck
S-R27-0640	No	A rock outcrop
S-R27-5051	No	A rock outcrop
S-R28-5046	Yes	Wreck
S-R30-0997	Yes	Wreck

S-R17-4285

This is a wooden wreck that is 17 meters long and 5 meters wide. Based on the details and construction SMTM estimate that is has sunk before 1850, and therefore the shipwreck is to be considered an ancient monument. The construction, anchor, ships boat, capstan, details etc. indicates a 17th or an 18th century date.

On war ships this type of capstan generally disappear in the early 18th century, but for a merchant ship this type of capstan might have been in use longer (Höglund 2019).

The wreck is carvel-built, it has two standing masts, a mainmast and the foremast in the bow. The anchor hanging on the starboard side near the bow and one stands on the seafloor just off the bow. A "ships boat" lies on deck on the port side. The ships boat has a flat bottom and the sides are clinker built.

In Stockholm a flat bottomed boat (Boat III) from the 17th century has been excavated. The boat is built in a tradition from the Dutch or German area, and the type is depicted from the 17th century. The boat (Boat III) has some similarities with Vasa's ships boat. But as in the case with Vasa, Dutch shipbuilders worked outside Holland during the time (Cederlund & Söderberg 1980:30f). This wrecks flat bottomed ships boat seems to have some similarities with the above described boat in Stockholm.

FIG. 2. Photo from the starboard side. From the left: the capstan, the flat-bottomed ships boat, the bilge pump and to the right end the main mast. Photo: MMT/Nord Stream 2.

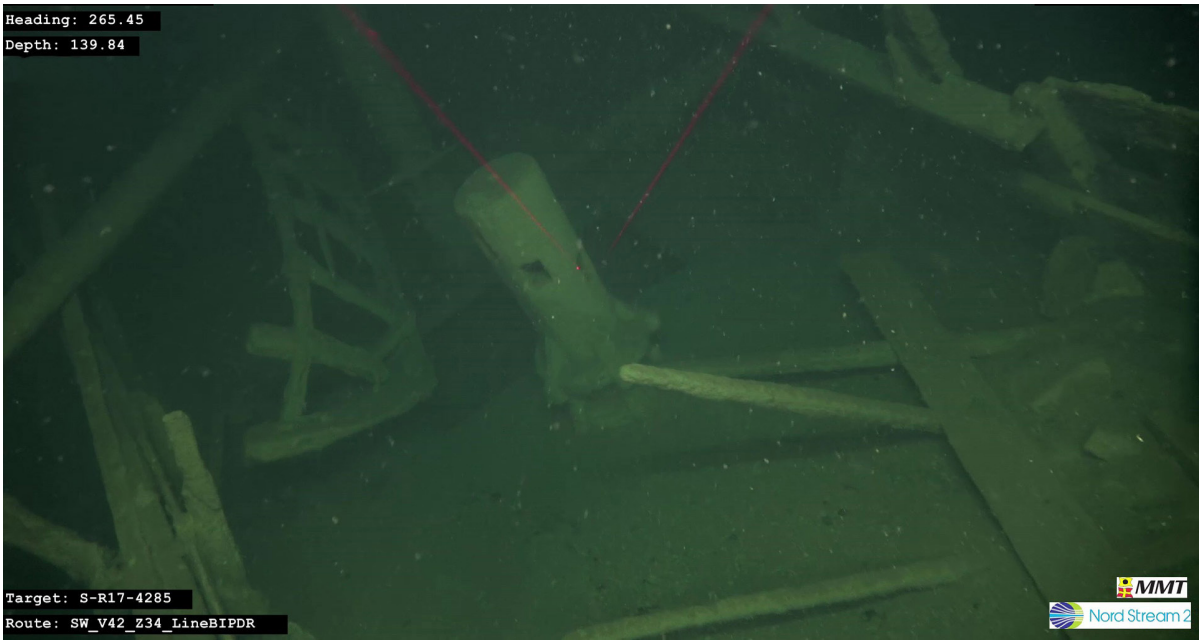


FIG. 3. Photo from the stern. From the left: the flat-bottomed ships boat, the bilge pump, the main mast and the capstan (Event G). Photo: MMT/Nord Stream 2.

FIG. 4. The flat-bottomed ships boat and the capstan (Event G). Photo: MMT/Nord Stream 2.

FIG. 5. The bow and the bowsprit (Event H). Photo: MMT/Nord Stream 2.

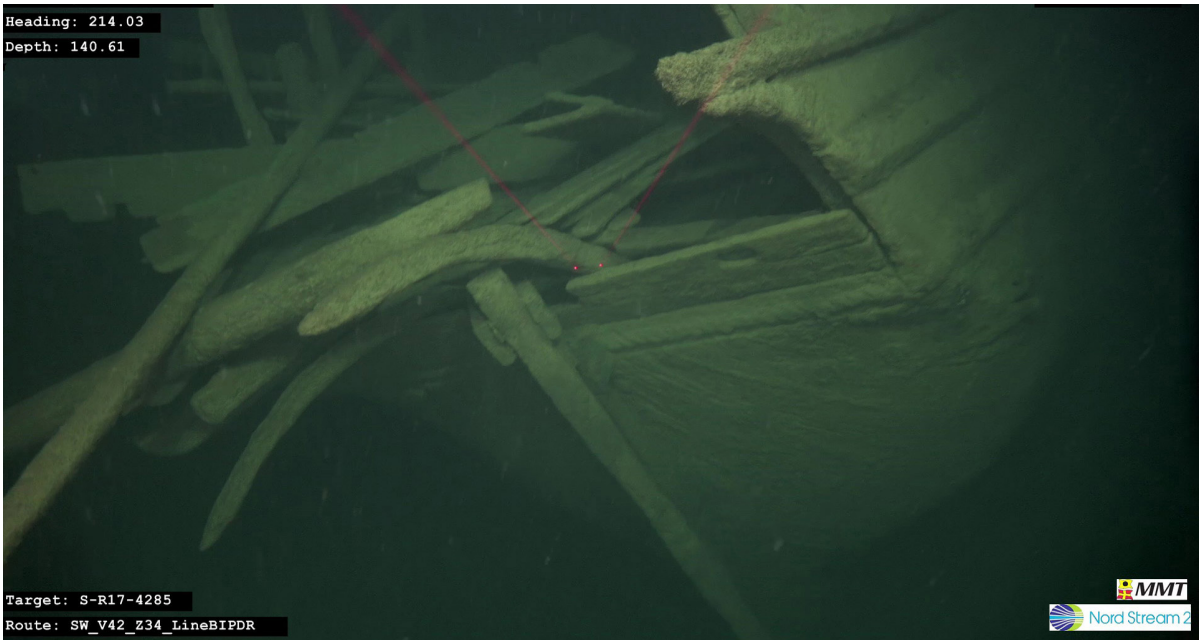


FIG. 6. The stern. Photo: MMT/Nord Stream 2.

FIG. 7. The anchor on the starboard side (Event I). Photo: MMT/Nord Stream 2.

FIG. 8. The anchor on the starboard side (Event I). Photo: MMT/Nord Stream 2.

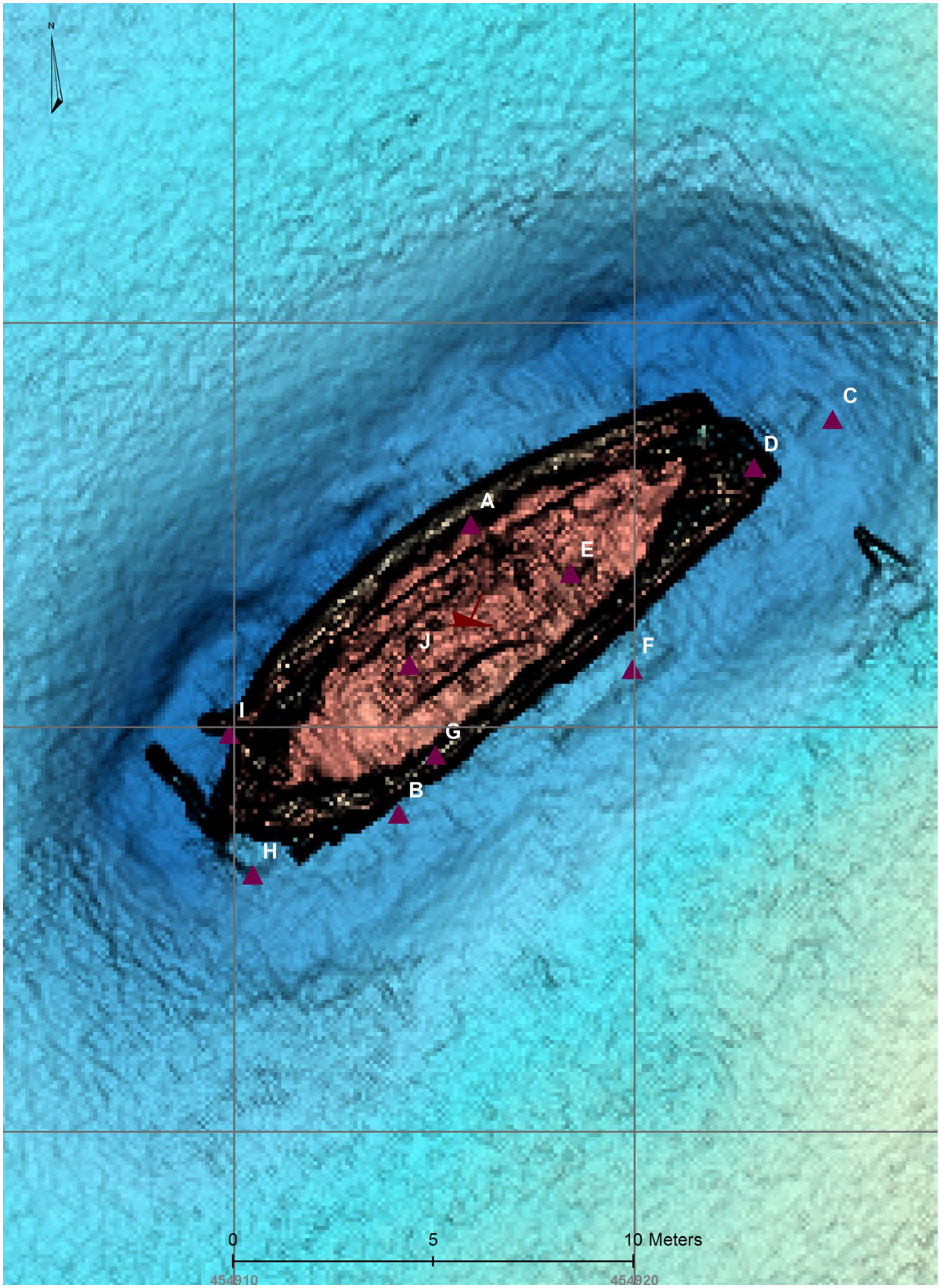


FIG. 9. Multibeam image of wreck S-R17-4285. MMT Events A-J. A: Beam and railing of the wreck (starboard), B: Possible rigging nail, C: Wooden drawer or part of the cargo, D: Wooden debris, E: Winch (Capstan), F: Top of main mast, G: Lifeboat (Ships boat) on deck, H: Bow of wreck (portside), I: Anchor (Bow starboard), J: Possibly a cargo hatch. MMT/Nord Stream 2.

S-R19-1026

This is a wooden wreck that is 17 meters long and 7 meters wide. The bridge is built of metal and the hull seems to be white panted or plastic coated.

Based on the details and construction SMTM estimate that is some kind of fishing boat that it probably has sunk after 1950 and therefore the shipwreck is not to be considered an ancient monument.

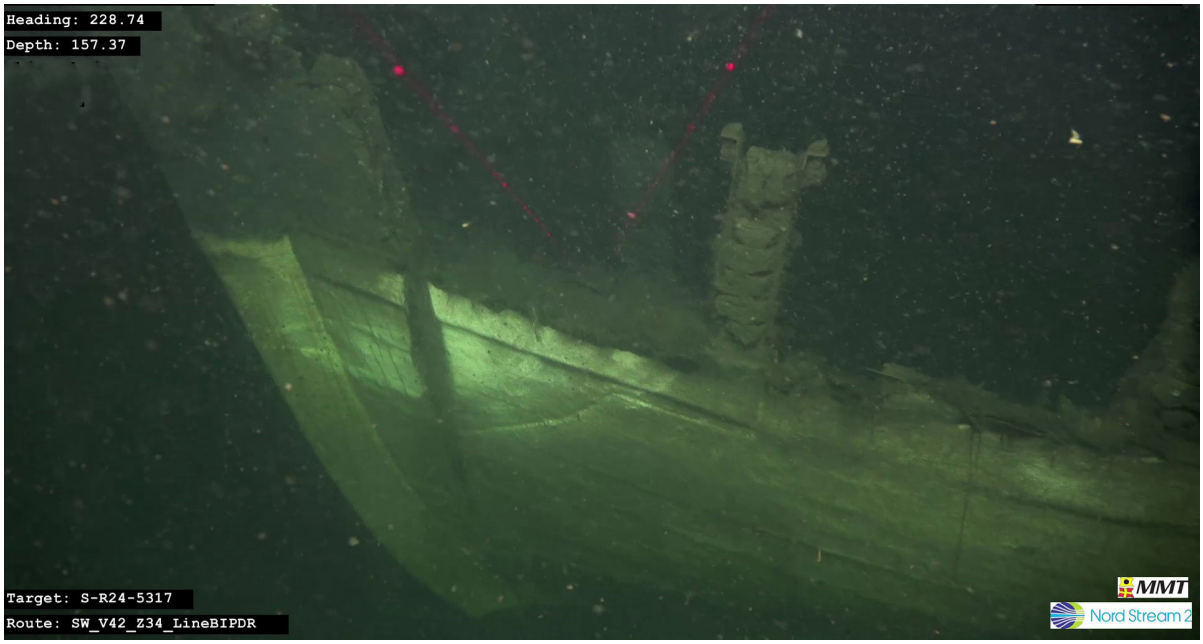


FIG. 10. Port side of the bow. The painted/plastic coated hull is clearly visible. Photo: MMT/Nord Stream 2.

FIG. 11. The Bridge, with steel railing and lantern (Event E). Photo: MMT/Nord Stream 2.

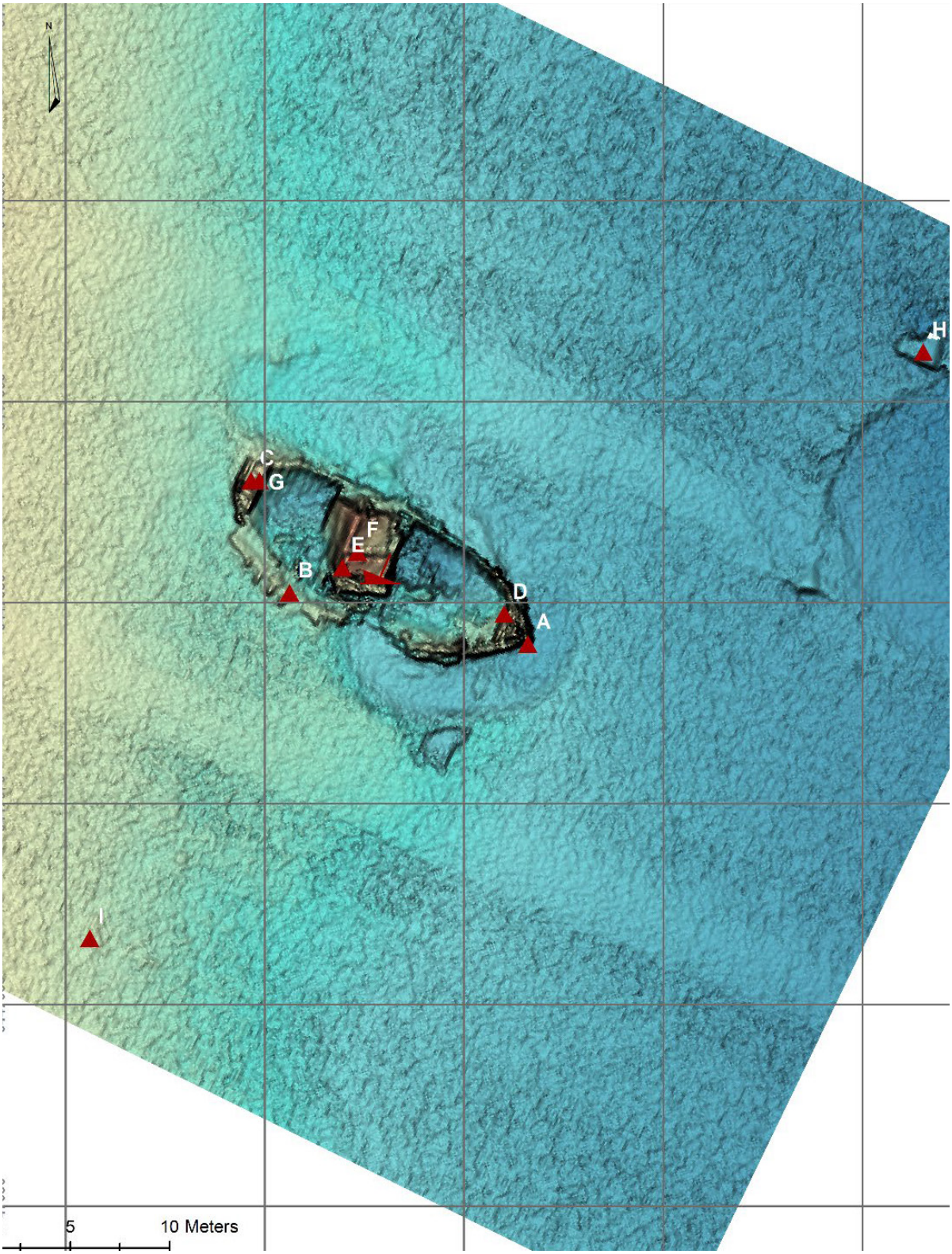


FIG. 12. Multibeam image of wreck S-R19-1026. MMT Events A-J. A: Bow of the wreck B: Container, C: Stern of the wreck, D: View of the bow, E: Bridge and the navigation light, F: Steel ladder, G: View of the stern, H: Concrete, I: Wooden beam. MMT/Nord Stream 2.

S-R24-5317

It´s a well preserved wreck of a steel ship of around 87 meters length and 10 meters width. The hull and the most of the deck structures are well preserved. Although SMTM argues that it most likely has sunk after 1850, a younger wreck (in the contiguous zone, CZ) can be classified as an ancient monument by the County Administrative board, according to the definitions in the Swedish Heritage Conservation Act, if certain criteria's are fulfilled.

Based on earlier ROV-pictures the foundering of the wreck was dated by SMTM to the early 20th century. Based on the earlier multi-beam-images, measurements and ROV-pictures of the wreck, SMTM thought it could be a sail ship, possible a bark ship (Fredholm 2016:12).

On the new ROV-films a chimney, steering wheel, a machine telegraph, navigation light etc. is visible (Fig. 13-15). In the stern (Fig. 19) the construction indicates that the ship had a propeller, there are remains of a rudder post and propeller post. In the bow there is a figure head and a bowsprit (Fig. 16). So it´s now clear that it was a sailing ship that was fitted with an (steam) engine, possible both for propulsion and for the many winches on deck.

The hull is made of steel plates as well as deckhouses and the forecastle, where a wooden deck is visible. On the forecastle deck there are winches with steel cables and anchors with davits. The wreck has a "Clipper-shaped" bow (see cover image) with a figurehead in the shape of a woman (fig. 16). The deck is at least partly suspended by steel beams.

Around 1850 when steamships started to appear, the sailing vessel of "Clipper-type" started to be successful. These fast sailing vessels had figureheads, first in the form of animal or human heads, then half busts and later full figures. The clipper "violin bow" often had their figurehead's in almost horizontal position (for similar figure head's see for example; Costa 1981:114).

The figure head indicates a dating to around 1880-1890, as these types of figureheads later became smaller on bark ships (Hedlund 2019).

The type of lanterns (fig. 15) might be from 19th or the early 2oth century. Similar shaped lanterns was in use during the first half of the 20th century (see for example; Kilhlberg 1978:65).

Through a port hole a cargo of planks are visible, but except that it´s hard to see more of the cargo on the wreck.

There are collapsed masts and rigging details lying on the wreck and on the seafloor, especially on the port side close to the bow. There is a ten meter high rest of a standing mast forward of the life boat and ladder on deck (event H-I), close to a deckhouse in the aft part of the wreck. The wreck has three lifeboats, one upside down on the starboard side outside the wreck and one hanging on the starboard side. This type of lifeboat can either be from the 19th or the early 20th century.

For now it´s hard to give a more accurate time of foundering of the ship, than late 19th century or first half of the 20th century.

FIG. 13. The chimney and steering wheel (Event O and J). Photo: MMT/Nord Stream 2.

FIG. 14. The machine telegraph (Event N). Photo: MMT/Nord Stream 2.

FIG. 15. Port navigation light (Event P). Photo: MMT/Nord Stream 2.

FIG. 16. The figurehead in the bow (Event B). Photo: MMT/Nord Stream 2.

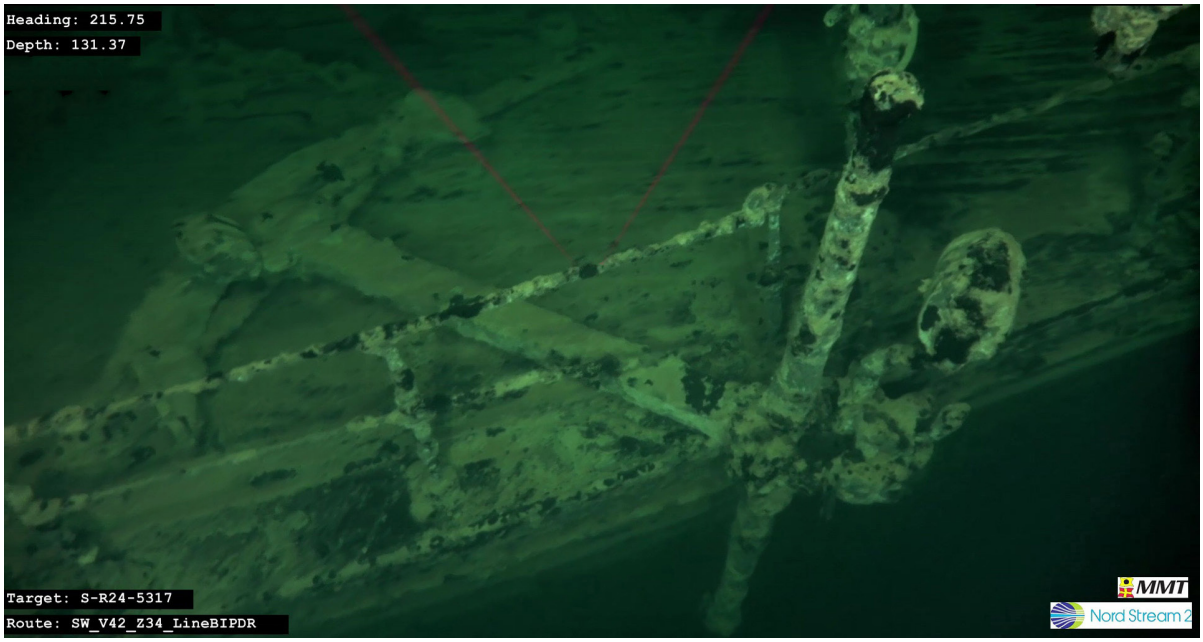


FIG. 17. Anchor made of iron, on the starboard side in the bow. Photo: MMT/Nord Stream 2.

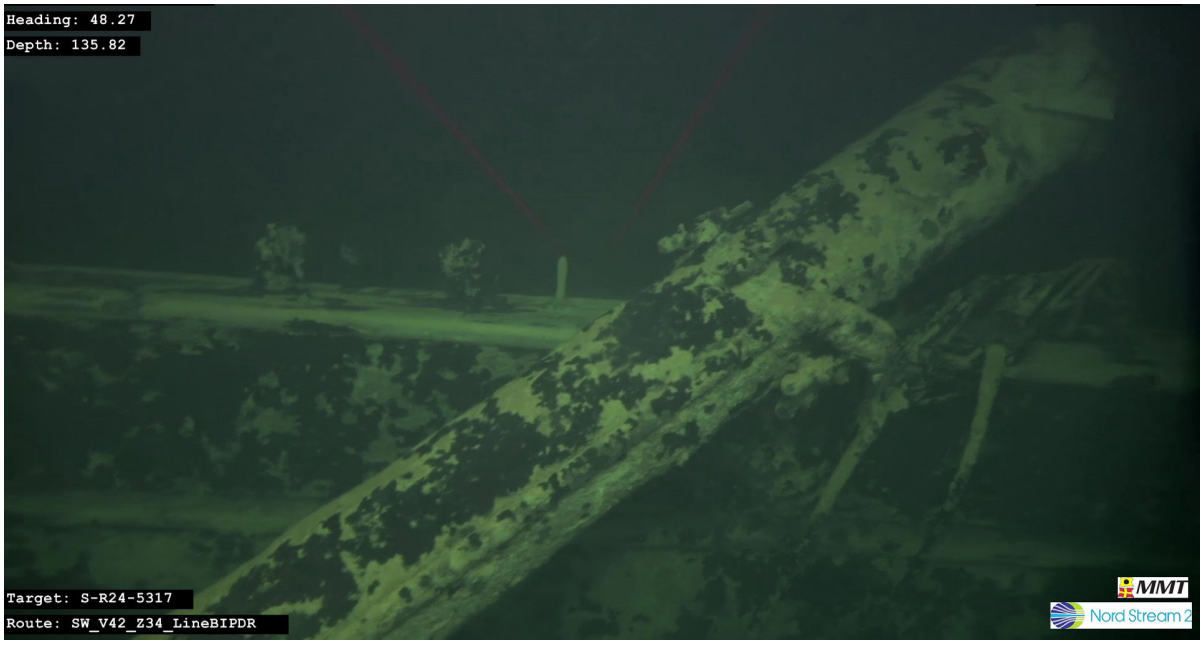


FIG. 18. A part of a mast hanging over the port side, close to the bow. There is also a pin rail with nails for the ropes in the rigging. Photo: MMT/Nord Stream 2.

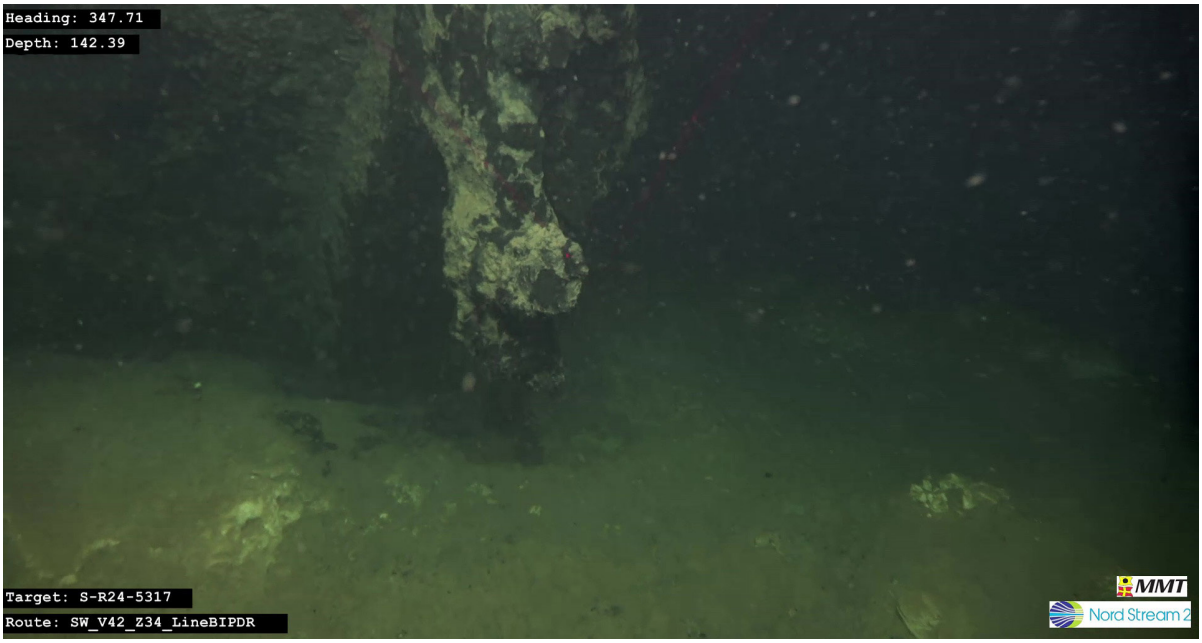


FIG. 19. The remains of a rudder post and propeller post. Photo: MMT/Nord Stream 2.

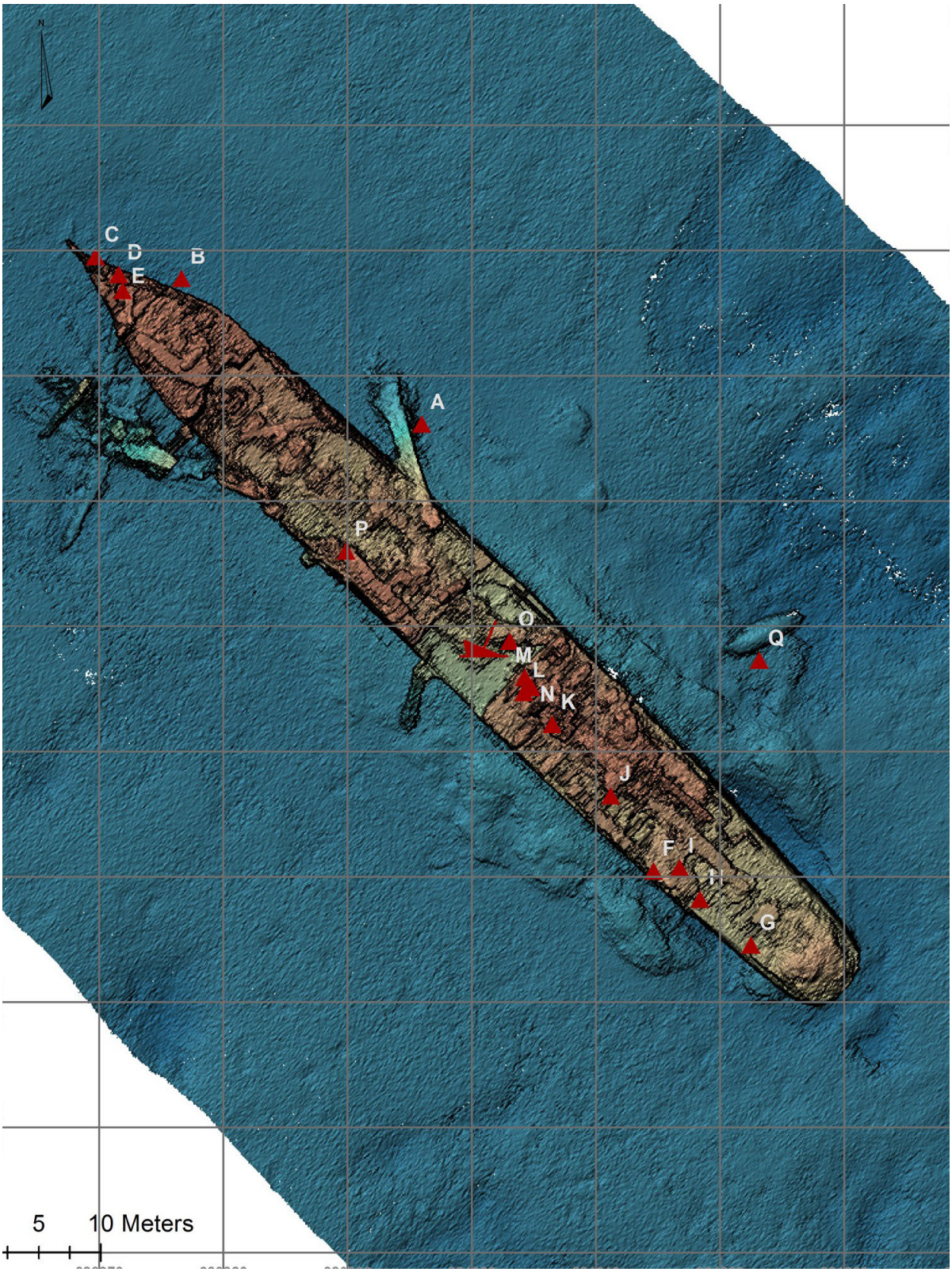


FIG. 20. Multi-beam image of wreck S-R24-5317. MMT "Events A-Q. A: Collapsed mast of the wreck, B: Figurehead, C: Anchor on the main deck, D: Bow of the wreck, E: Main deck of the shipwreck, F: Debris item, a cup, G: Port hole, H: Wooden ladder, I:Upside down life boat on the main deck of the wreck, J: Part of a chimney, K: Steel frame windows, L: Ship's bell, M: Compass, N: Davit (Machine telegraph) , O: Wooden steering wheel, P: Port navigation light, Q: Upside down life boat to the starboard side of the wreck. MMT/Nord Stream 2.

S-R27-0640 and S-R27-5051

The objects are natural formations, rock outcrops.

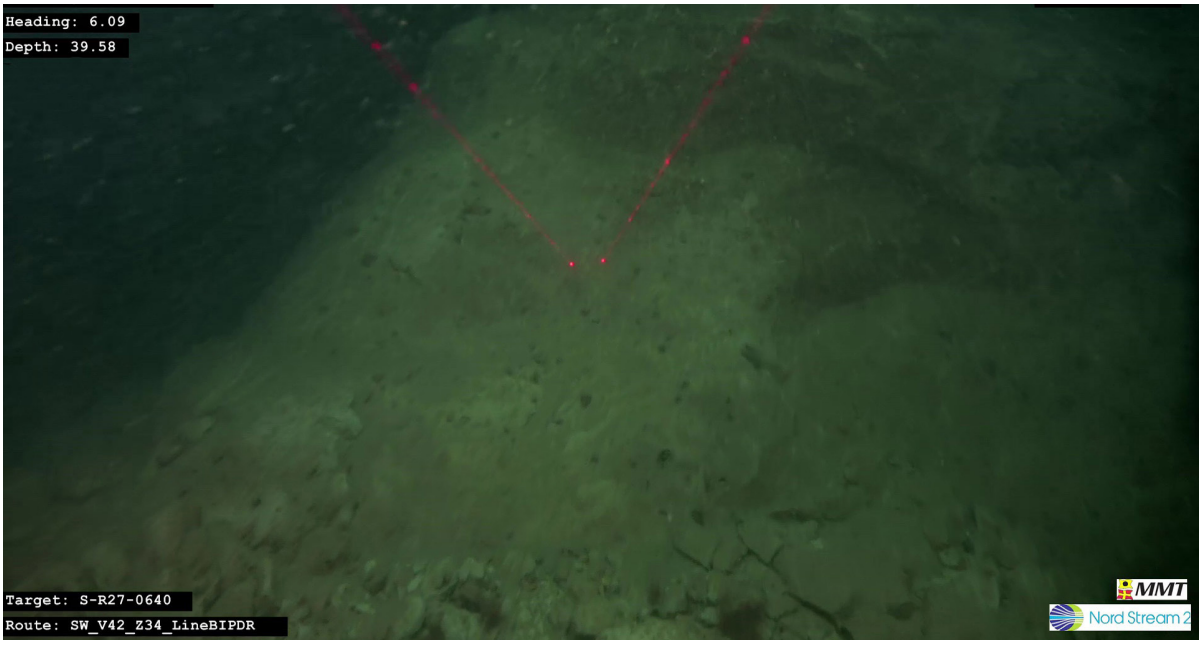


FIG. 21. Rock outcrop S-R27-0640. Photo: MMT/Nord Stream 2.

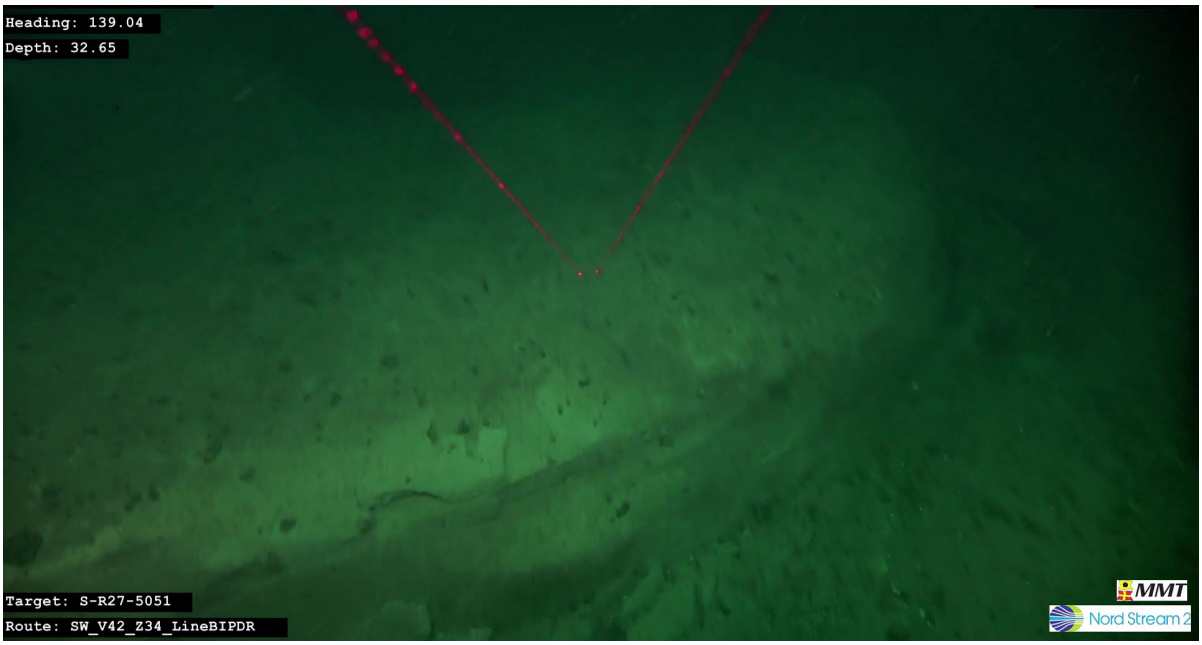


FIG. 22. Rock outcrop S-R27-5051. Photo: MMT/Nord Stream 2.

S-R28-5046/S-29-93462

This wreck was already investigated for the Nord Stream and as S-29-93462. It´s a clinker built ship with a cargo (ballast) of lime stones and barrels with iron, possible so called Osmund iron that became a common export commodity from Sweden in medieval times. The ship's cargo and construction indicated a possible medieval ship (Fredholm 2010:27). Osmund iron was exported from Sweden in to the 17th century. Based on the details and construction SMTM still estimate that it probably a medieval ship, and therefore the shipwreck is still to be considered an ancient monument.

There are some medieval clinker-built wrecks with cargo of Osmund iron found in the Baltic Sea. One example is a medieval clinker-built ship that sunk in Gdansk harbour, probably 1424. The wooden casks of the Gdansk wreck are around 70 cm long and cask heads 30 cm (similar to this wreck). Another wreck was found at Rügen, Greifswalder Boddens 2010 during the Nord Stream investigations. The wreck is dated to around 1448. Except Osmund iron the Rügen-wreck also had copper-plates that came from Falun, Sweden (Wallander 2018:53-54).

The Swedish Osmund-iron was exported to several parts of Europe during the late middle Ages. At the end of the 16th century Danzig was the largest importer of Swedish Osmund iron, where it was refined to iron bars. When iron bars replaces Osmund iron in Sweden during the 17th century, the export was focused more to the west (Hildebrand 1987: 17).

The first inspection took place in December 2009 (Fredholm 2010:27), just over nine years before this last inspection in January 2019. On the ROV-inspection 2012 after the construction of Nord Stream it was also noticed that the sedimentation was different than 2009, but the wreck itself was unchanged since 2009 (Fredholm 2013:13). The wreck as a whole does looks unchanged between 2009 and 2019.

An unknown circular object, a small wheel (Fig. 23, diameter approx. 20 cm) was filmed by ROV 2019. This object was not noticed during the first surveys in 2009. The wheel seems to be of a more modern type (probably metal) than the wreck itself. So it might have been dropped on the site after 2009 (probably after 2012), or maybe sediments have moved since 2009/2012, so it has been visible. The sedimentation between 2009, 2012 and 2019 differs in some way. In the 2019 inspection a thin dark sediment lies on the wreck and lime stones, and some parts of the wreck seems to have less sediment. Why is unclear, if it´s part of a natural cycle or not SMTM can't judge.

FIG. 23. The cargo or ballast stones and an unknown small wheel (MMT event F) was filmed by ROV 2019. Photo: MMT/ Nord Stream 2.

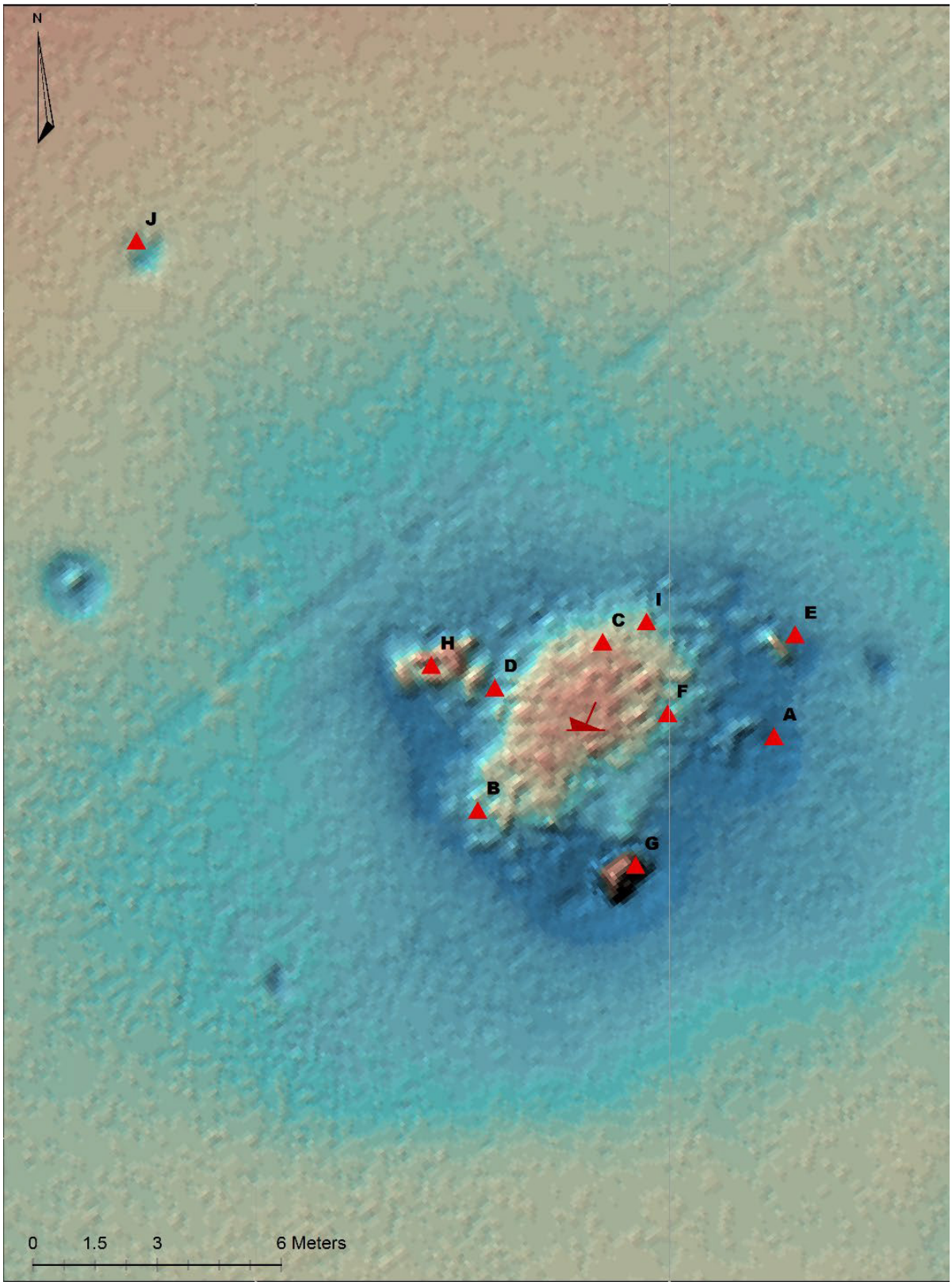


FIG. 24. Multibeam image of wreck S-R28-5046/S-R-29-93462. MMT "Events A-J. A: Wooden detail, B: Wooden detail and ballast stone, C: Ballast stones, D: Probably part of the cargo on top of ballast stone, E: Possible container (Barrel) that belonging to the cargo, F: Unknown circular item, G: Possibly part of the cargo, H: Few barrel shape objects, I: Wooden detail and ballast stones, J: Elongated wooden part that related to wreck. MMT/Nord Stream 2.

S-R30-0997

This is a wooden wreck, 24 meters long and 6 meters wide.

Based on earlier ROV-pictures and bathymetry the wreck was preliminary dated to the 18-19th century and the size and hull shape has similarities with the fluit ship "Jutholmsvraket" from around 1700, or galiots from 18-19th century (Fredholm 2016:17-18). The hull shape on fluit ships has a relatively flat bow and a rounded stern, which is the case on this wreck. Based on the details and construction SMTM still estimate that is has sunk before 1850, and therefore the shipwreck is to be considered an ancient monument.

It has a height of just 1, 4 meter, so it´s highly degraded, and because it lies on just 38 meters depth it´s probably affected both by waves, currents and trawling, as parts of fishing nets are visible on the wreck.

Most of the interior of the wreck is full with loose ship timbers, frames, planking and some blocks. Outside the wreck on the starboard side there is a gaff beam ("forked boom", fig. 25, event D). Pictures of gaff-rigged sails appears in the mid-17th century and in the 18th century it became more common with gaff-rigged sail (Kihlberg 1963:98)

Just inside the hull, a few meters from the stern on the starboard side there are an area with some bricks, ceramics, one ceramic strainer (Fig 26, event A). A similar strainer at Skeppsholmen, Stockholm was dated to 18th century (Hansson 2016:81). Just forward of the strainer is a ceramic plate (event B). This area is probably the remains of the ships galley.

It´s hard to date the ceramics more exactly, but in all the type of bricks, the strainer and plate makes indicates an 18th century dating (Bäck 2018).

So in all the wreck is probably not older than late 17th century, more likely 18th century.

FIG. 25. Gaff beam ("forked boom", event D). Photo: MMT/Nord Stream 2.

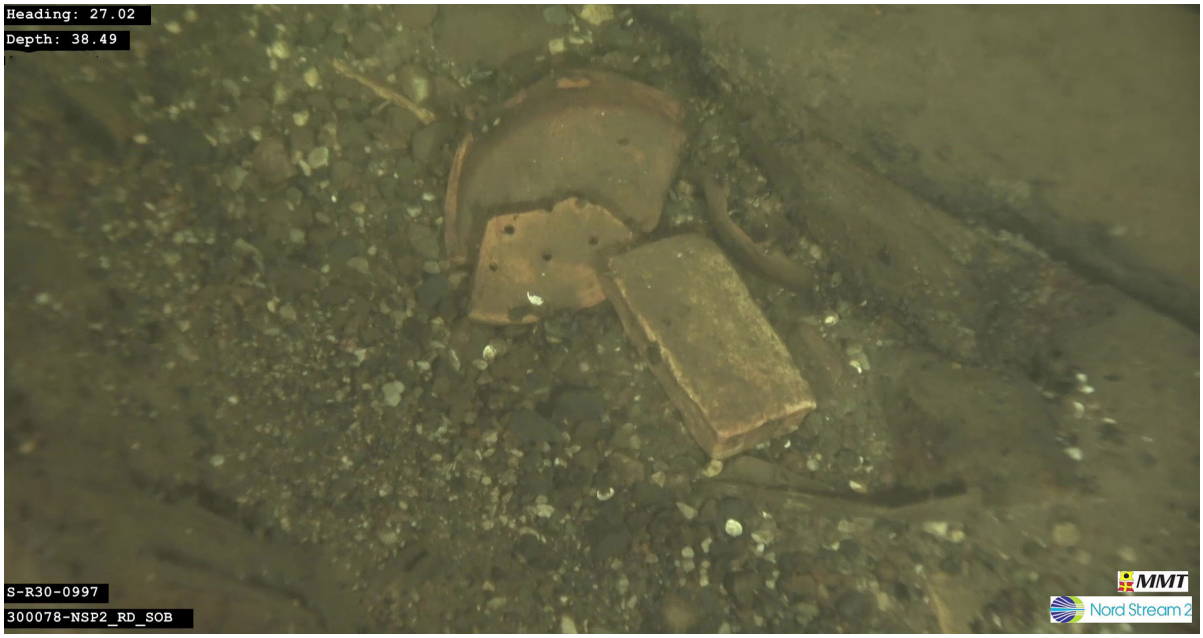


FIG. 26. One of several bricks (possible rest from ships galley), ceramics, a strainer (event A) was filmed by ROV 2019. Photo: MMT/Nord Stream 2.

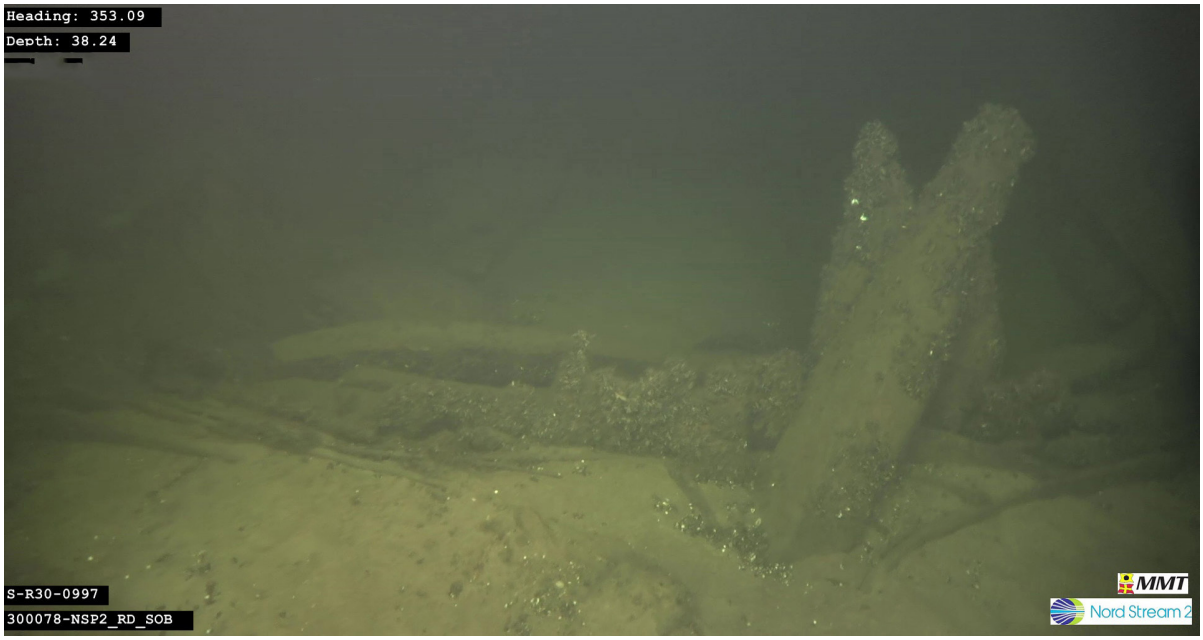


FIG. 27. The relatively flat bow, Photo: MMT/Nord Stream 2.

FIG. 28. The rounded stern. The loose rudder is partly visible on the far lower right.
Photo: MMT/Nord Stream 2.

FIG. 29. The rudder. Photo: MMT/Nord Stream 2.

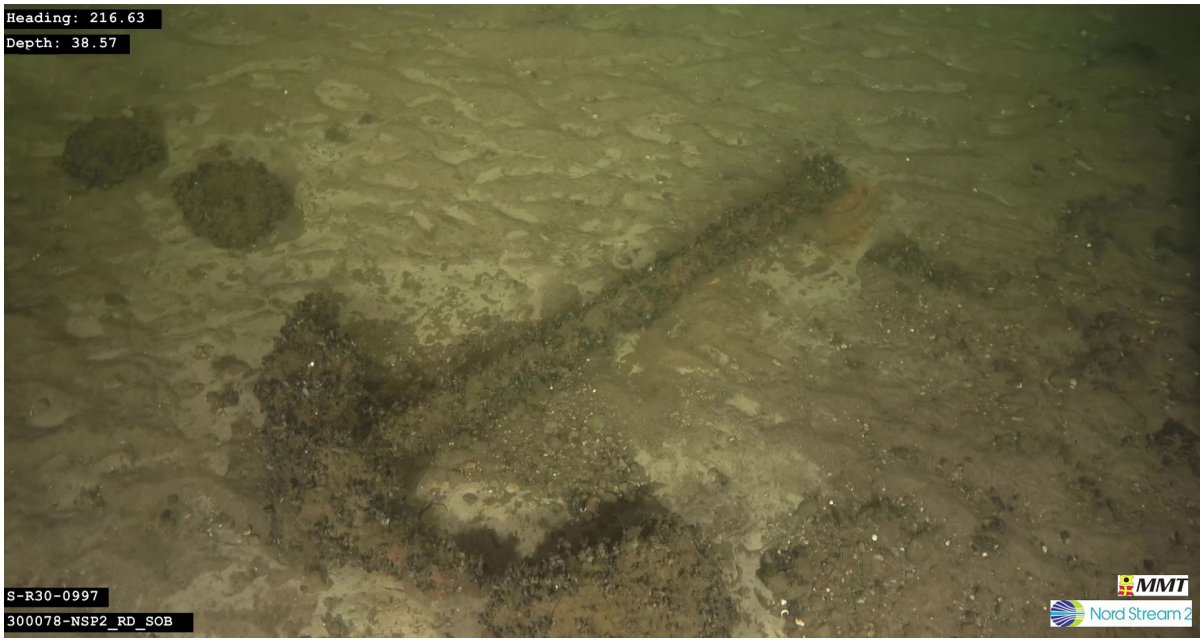


FIG. 30. Anchor (Event G). Photo: MMT/Nord Stream 2.

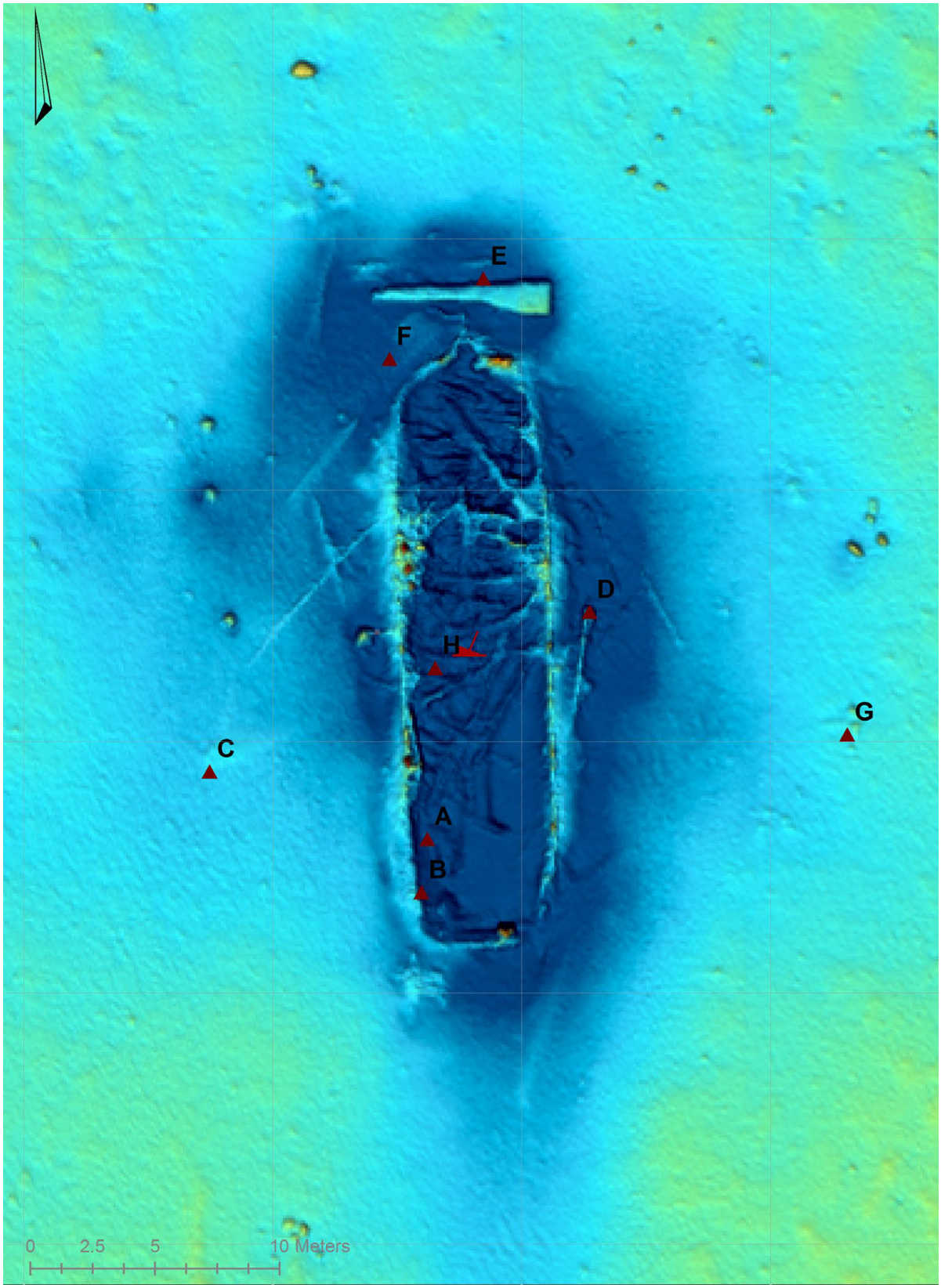


FIG. 31. Multibeam image of wreck S-R30-0997. MMT "Events A-H. A: Broken ceramic pieces, B: Pot lid (ceramic plate), C: Wooden board, D: Port beam - Forked boom, E: Rudder, F: Starboard aft quarter – wreck structure, G: Anchor, H: Block / pulley. MMT/Nord Stream 2.

Conclusion

Out of the analysed seven objects, five are wrecks and two objects (S-R27-0640 and S-R27-5051) are rock outcrops.

Three wrecks (S-R17-4285, S-R28-5046 and S-R30-0997) The Swedish National Maritime and Transport Museums (SMTM) estimate have sunk before 1850, and therefore these shipwrecks are to be considered ancient monuments, according to the definitions in the Swedish Heritage Conservation Act (1988:950). The other two wrecks are younger and therefore not considered as ancient monuments by SMTM. However those wrecks could be classified as an ancient monument by the County Administrative board.

References

Printed sources

Cederlund, Carl Olof & Söderberg, Sverker (1980). *Båtar i 1600-talets Stockholm: om sex båtfynd i kv Hästen*. Statens sjöhistoriska mus., Stockholm.

Costa, G. (1981). *Figureheads: carving on ships from ancient times to twentieth century*. Lymington, Hampshire: Nautical Publishing Co.

Fredholm, M. (2010). *Gasledning genom Östersjön, arkeologisk analys av ankringskorridoren, Östersjön, svenska ekonomisk zon*. Stockholm: National Maritime Museum. Maritime Museum Report 2010: 15.

Fredholm, M. (2013). *Efterkontroll av vrak i ankringskorridoren*
Arkeologisk analys av ROV-film från gasledningen Nord Stream. Stockholm: National Maritime Museum. Maritime Museum Report 2013: 6.

Fredholm, M. (2016). *Nord Stream 2: archaeological analysis of geophysical data, Baltic Sea, Swedish EEZ*. Stockholm: National Maritime Museum. Maritime Museum Report 2016: 11.

Fredholm, M. (2017). *Nord Stream 2: archaeological analysis of ROV-film from S-R19-0202 and S-R28-5301, Baltic Sea, Swedish EEZ*. Stockholm: National Maritime Museum. Maritime Museum Report 2017: 7.

Hansson, J. (2016). *Vraken vid Skepps- och Kastellholmarna – stormaktstidens bakgård?* Stockholm: National Maritime Museum. Maritime Museum Report 2016: 6.

Hildebrand, K.G. (1987). *Svenskt järn: sexton- och sjuttonhundratal: exportindustri före industrialismen*. Stockholm: Jernkontoret.

Kihlberg, B. (red.) (1963). *Nautiskt bildlexikon*. Göteborg: Tre tryckare.

Wallander, A. (2018). *Osmundjärn: inventeringar och analyser av osmundar från arkeologiska undersökningar i Sverige*. Stockholm: Jernkontorets Berghistoriska utskott.

Unprinted sources

Bäck Mathias (2019-03-13), Arkeologerna, Statens historiska museer

Hedlund Benjamin (2019-03-14) SMTM.

Höglund Patrik (2019-03-12) SMTM.

MMT Wreck reports 2019:

ANCIENT HERITAGE OBJECT INSPECTION REPORT SWEDEN
S-R17-4285

ANCIENT HERITAGE OBJECT INSPECTION REPORT SWEDEN
S-R19-1026

ANCIENT HERITAGE OBJECT INSPECTION REPORT SWEDEN
S-R24-5317

ANCIENT HERITAGE OBJECT INSPECTION REPORT SWEDEN
S-R27-0640

ANCIENT HERITAGE OBJECT INSPECTION REPORT SWEDEN
S-R27-5051

ANCIENT HERITAGE OBJECT INSPECTION REPORT SWEDEN
R-29-93462

ANCIENT HERITAGE OBJECT INSPECTION REPORT SWEDEN
S-R30-0997

Internet sources

FMIS Riksantikvarieämbetet (National Heritage Board), www.fmis.raa.se

FMIS is migrated during 2018-2019 to Fornreg: https://www.raa.se/hitta-information/fornreg/

Kulturmiljölagen (Swedish Heritage Conservation Act 1988:950), http://www.raa.se/lagar-och-stod/kml-kulturminneslagen/

Technical and administrative data

Swedish National Maritime and Transport Museums (SMTM) dnr: 5.3.1–2018-1599
SMTM Project no: 2081158
SMTM Project leader: Mikael Fredholm
Area of investigation: Baltic Sea, Swedish EEZ and CZ.
Cause of survey: Construction of gas pipeline
Client: Nord Stream 2
Nord Stream 2 ref: W-PE-MSC-PSE-REP-965-CULEV1EN-01
Coordinate system: UTM 33N and 34N

Documentation: The report is kept on SMTM:s webpage and other documents at the SMTM:s archives in Stockholm. Storage of digital documentation materials: video, still photographs and digital drawings are stored digitally on SMTM:s servers. All storage is redundant and backup copies stored on physically separate location from the main storage. The hardware for the storage is replaced by 3 to 4 year intervals to maintain the fault tolerance and the storage capacity. In the digital management of the documentation material and report preparation has been used the following software: ESRI ArcMap 10.3, Microsoft Word 2007, Photo Shop CS3, Deep View 4 others.

GIS / measurement data: are archived at the SMTM:s servers.

Participants SMTM

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Appendix

1. Analysed Objects

ID No.	Distance to pipeline (m)	FMIS (RAÄ-no)	Ancient monument	Description
S-R17-4285	203	61:3	Yes	Wreck
S-R19-1026	238	2:160	No	Wreck
S-R24-5317	93	2:164	No*	Wreck
S-R27-0640	232	-	No	A rock outcrop
S-R27-5051	171	-	No	A rock outcrop
S-R28-5046	142	2:48	Yes	Wreck
S-R30-0997	730	2:165	Yes	Wreck

The seven objects/wrecks that is analysed. Ancient monuments; ship-wrecks that have foundered before 1850 according to the definitions in the Swedish Heritage Conservation Act. * Although SMTM argues that it has sunk after 1850, a younger wreck can be classified as an ancient monument by the County Administrative board.

Nord Stream 2 – Archaeological analysis of ROV-films

Out of the analysed seven objects, five are wrecks and two objects (S-R27-0640 and S-R27-5051) are rock outcrops. Three wrecks (S-R17-4285, S-R28-5046 and S-R30-0997) are estimated by The Swedish National Maritime and Transport Museums (SMTM) to have foundered before 1850, and therefore these shipwrecks are to be considered ancient monuments, according to the definitions in the Swedish Heritage Conservation Act (1988:950).

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