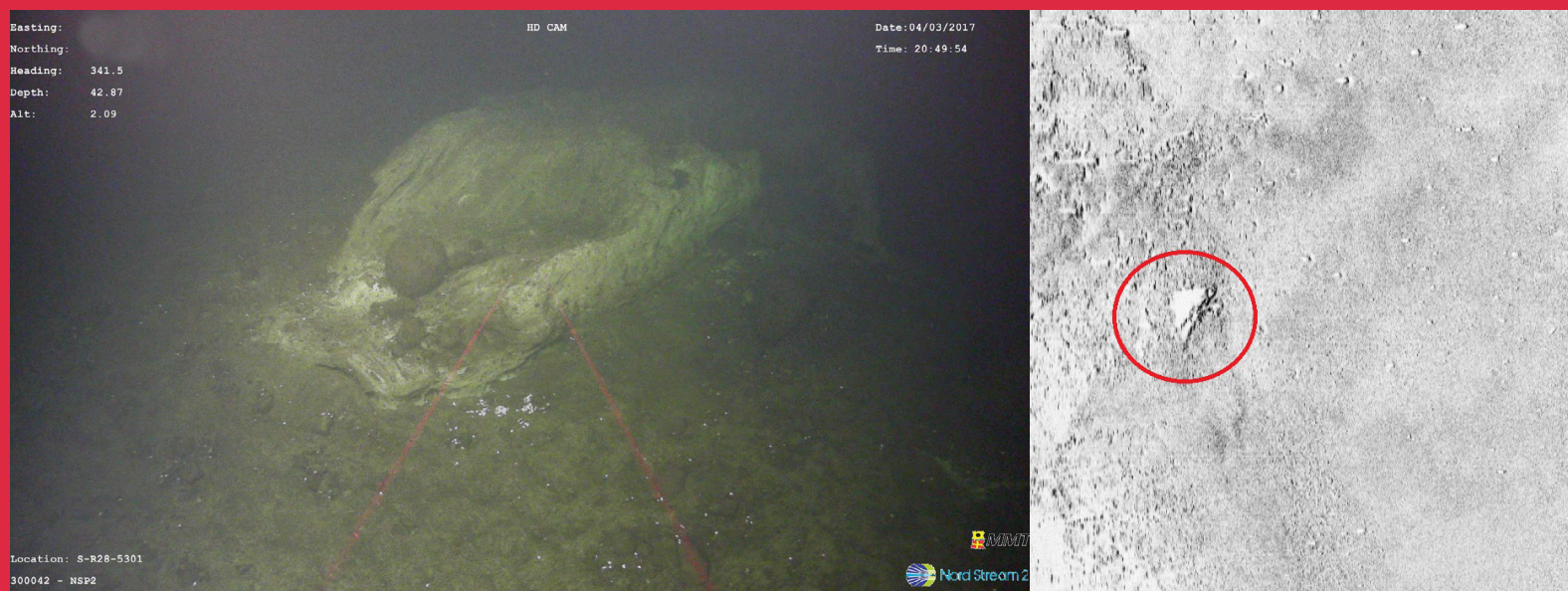


# Nord Stream 2

Archaeological analysis of ROV-film  
from S-R19-0202  
and S-R28-5301

Baltic Sea  
Swedish EEZ

*Mikael Fredholm*



**SJÖHISTORISKA**



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Archaeological analysis of ROV-film from

S-R19-0202 and S-R28-5301

**Baltic Sea  
Swedish EEZ**

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*Maps* © ESRI



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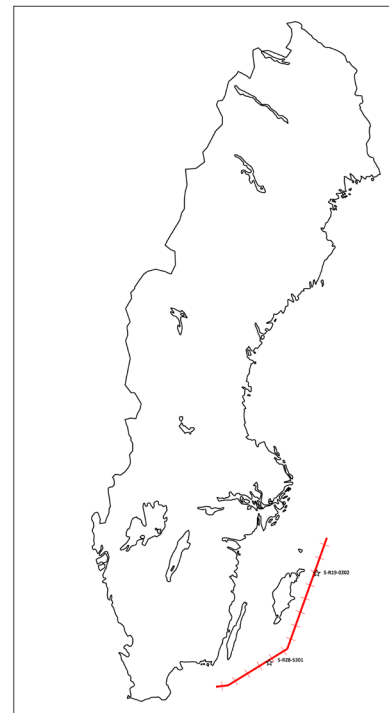
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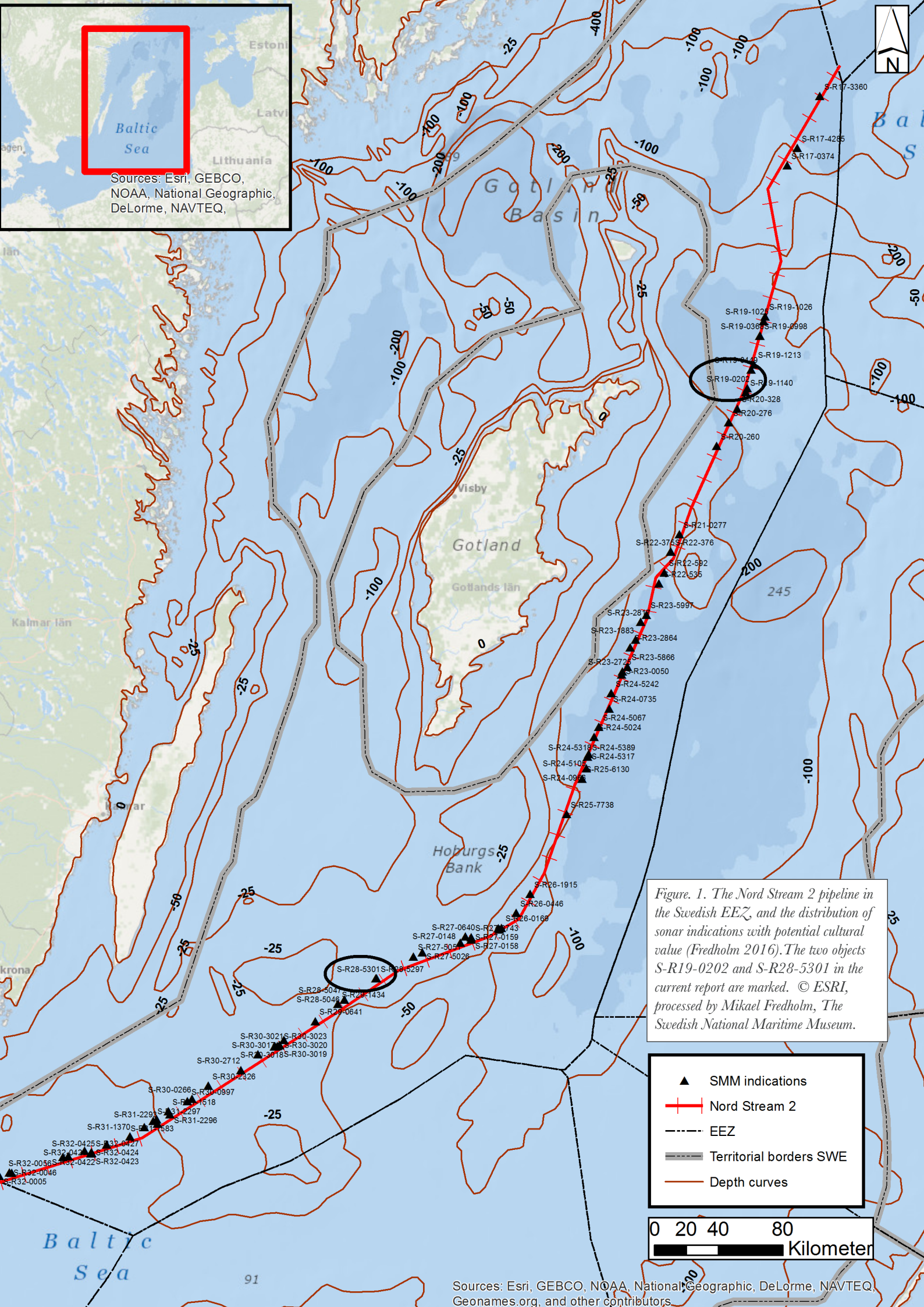
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Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, NAVTEQ,

Figure 1. The Nord Stream 2 pipeline in the Swedish EEZ, and the distribution of sonar indications with potential cultural value (Fredholm 2016). The two objects S-R19-0202 and S-R28-5301 in the current report are marked. © ESRI, processed by Mikael Fredholm, The Swedish National Maritime Museum.

- ▲ SMM indications
- +— Nord Stream 2
- - - EEZ
- ▬ Territorial borders SWE
- Depth curves

0 20 40 80  
Kilometer

## Summary

Nord Stream 2 has commissioned The Swedish National Maritime Museum to perform an archaeological analysis of ROV-film from two objects (S-R19-0202 and S-R28-5301). These two objects are within 50 meters of the planned pipeline route in the Swedish economic zone (EEZ).

SMM's assessment of the indications has concluded the indication S-R19-0202 to be rope and textile and S-R28-5301 to be a rock outcrop.

## Background

Planning and surveys are ongoing for a new gas pipeline, Nord Stream 2 (NSP2), which will run in parallel with the existing gas pipeline Nord Stream (NSP). Due to this The Swedish National Maritime Museum (SMM) 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 (Fig. 1 and Fredholm 2016).

Now NSP2 has commissioned SMM to perform an archaeological analysis of ROV-film from two objects (S-R19-0202 and S-R28-5301) found in the 2016 analysis of geophysical data. The ROV-filming has been performed by Marin Mät-

teknik (MMT). These two objects are within 50 meters of the planned pipeline route in the Swedish EEZ. Four other objects within 50 meters of the pipeline (S-R20-328, S-R22-375, S-R23-2725 and S-R31-2297) has after SMM's analysis of NSP2:s detailed sonar survey 2016 been concluded by SMM not to be ancient monuments and was therefore not ROV-filmed/analysed further.

When constructing the gas pipeline NSP2 will use ships with dynamic positioning, therefore the impact on the surrounding seabed/objects will be less than Nord Stream, when anchored ships were used for the construction. Therefore NSP2 has estimated that only these two objects (S-R19-0202 and S-R28-5301) must be checked before the construction of the gas pipeline.

## Cultural environment and History

The approximately 510 km long stretch of NSP2 through the Swedish EEZ has a varied bottom topography and bottom types. It has a depth from about 30 meters in the waters at the southern Midsjöbankarna in the southern Baltic, to over 200 meters in the northern part of the EEZ (Fig. 1).

The approximately twenty known wrecks registered in the National Heritage Boards database FMIS close (about 1 km) to NSP and NSP2 where found mainly in the NSP project. Except these

wrecks the Swedish Maritime Administration has registered a few wrecks in the Swedish EEZ.

The knowledge of the antiquities in the Baltic Sea is deficient, they consists mainly of shipwrecks, but no overall assessment has been made of the Baltic Sea. The previous investigations for Nord Stream and other surveys has given us some information of what to expect in this archaeological analysis in the Baltic Sea.

## Previous investigations

### Nord Stream 2010–2014

In 2010–2012 the laying of the Nord Stream gas pipeline was completed. Nord Stream runs from Russia through the Swedish EEZ to Greifswald in Germany. Due to this SMM performed two archaeological analyses in 2009–2010. Marin Mätteknik AB (MMT) performed the mayor sonar surveys and investigations. In the Nord Stream project the marine surveyors at MMT encountered around 7000 sonar indications throughout the whole corridor. When SMM gained access to all sonar indications several were already filmed with ROV and concluded as “not man made”. About 4000 sonar indications remained for SMM’s archaeological analysis of the anchor corridor.

An analysis were made of the 2 km wide Nord Stream anchoring corridor in the Swedish EEZ. Out of 32 ROV-inspected indications twelve ships wrecks where found, of which nine constituted ancient monuments (Fredholm 2010: page 4).

The analysis of the Nord Stream sonar indications and ROV-filming yielded twelve wrecks in total. Ten wrecks were already in MMT’s sonar analysis classified as clear wrecks. Two of the unclear indications chosen by SMM as potential wrecks, were concluded as wrecks by the ROV inspection. These two wrecks shows how difficult it is to find older, broken and decomposed wrecks with side scan sonar (Fredholm 2010).

### Nord Stream 2, 2016–2017

SMM has during 2016 performed an archaeological analysis of geophysical data from the planned NSP2-route (Fredholm 2016). Two objects (S-R19-0202 and S-R28-5301) are within 50 meters of the planned pipeline route in the Swedish EEZ and will therefore be analysed in this report.

## Purpose and method

The purpose of the analysis of the ROV-films is to determine if two objects S-R19-0202 and S-R28-5301 in the pipeline corridor are 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 purpose is to describe and date these objects.

ROV-film and other data will be analysed and evaluated according to the definitions in the Swedish Heritage Conservation Act (1988:950). For a shipwreck to be defined as an ancient monument it must have foundered before 1850.

## Results and conclusion

SMM's assessment of the indications has concluded the indications S-R19-0202 to be rope and textile and S-R28-5301 a rock outcrop. The indications S-R19-0202 and S-R28-5301 are not considered to be cultural monuments, according to the definitions in the Swedish Heritage Conservation Act.

### S-R19-0202

S-R19-0202 was based on the ROV-film assessed to be rope and possible textile. The objects also seems to be have caused a change in the bottom structure, with lumps of clay or stone on the otherwise smooth bottom.

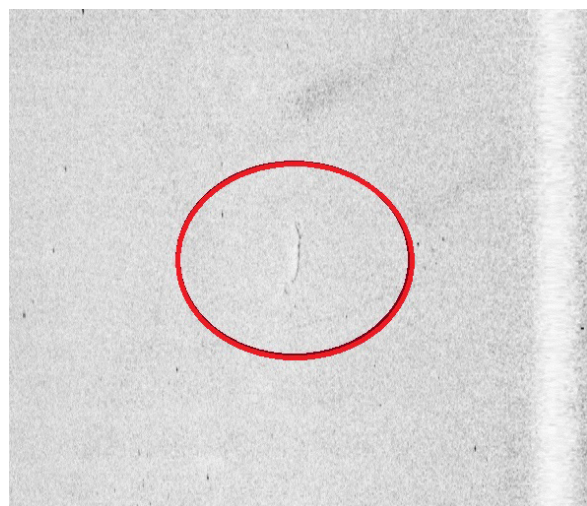


Figure 2. Sonar image of indication S-R19-0202. Indication length 12,7m. © Fugro.





Figure 3. Two ROV-photos of indication S-R19-0202. The photos shows probable textile and rope.  
© Fugro, MMT edited by Mikael Fredholm, Maritime Museum.



## S-R28-5301

S-R28-5301 was based on the ROV-film concluded to be a rock outcrop on the sandy seabed.



Figure 4. Sonar image of indication S-R28- 5301. Indication length 13,1m © Fugro.



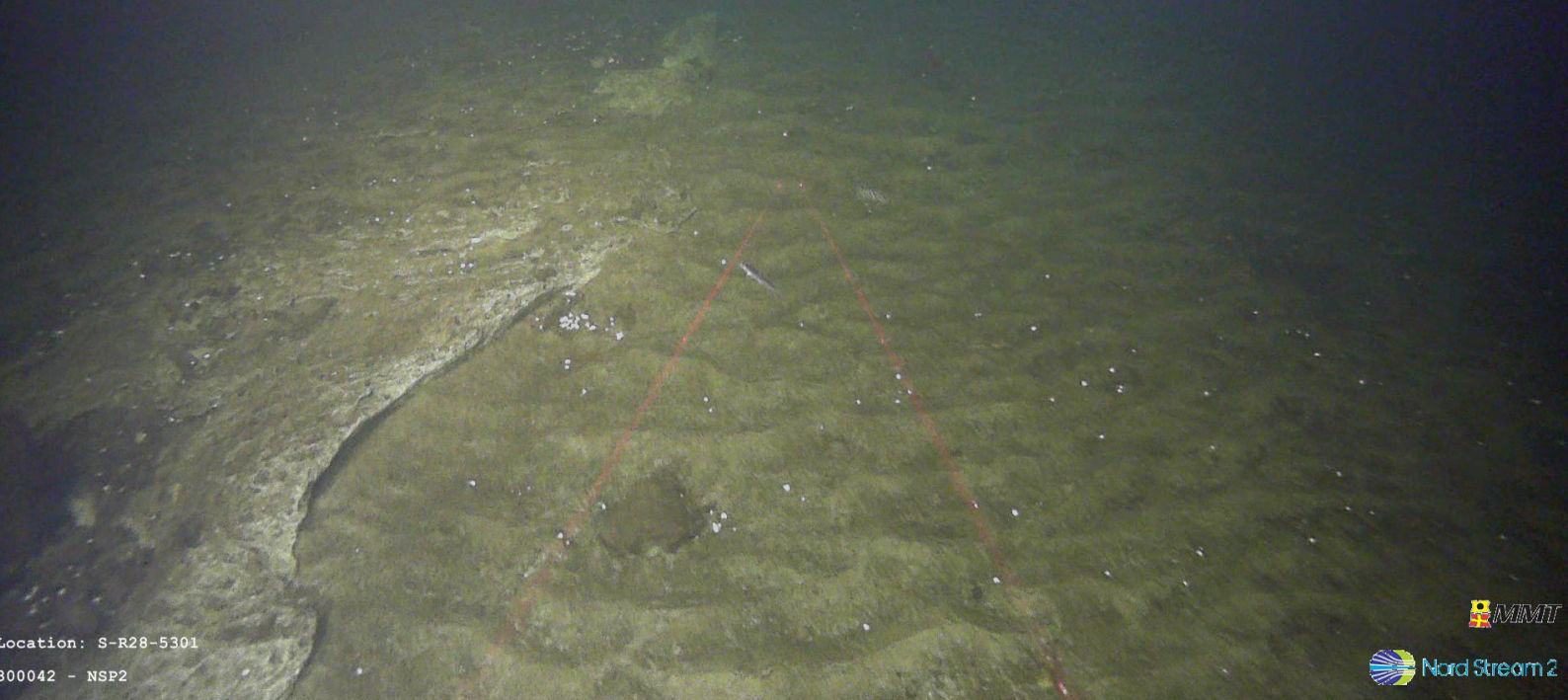
Figure 5. Two ROV-photos of indication S-R28- 5301. The photos shows seabed of sand and the rock outcrop. © MMT.



asting:  
Northing:  
Heading: 239.6  
Depth: 43.27  
Alt: 1.32

HD CAM

Date: 04/03/2017  
Time: 21:07:02



Location: S-R28-5301  
300042 - NSP2



Figure 5. (Continued.) Two ROV-photos of indication S-R28- 5301. The photos shows seabed of sand and the rock outcrop. © MMT.

## References

Fredholm, Mikael, 2010. *Gasledning genom Östersjön: arkeologisk analys av ankringskorridoren, Östersjön, svensk ekonomisk zon*. Stockholm: Sjöhistoriska museet.

Fredholm, M. 2016. *Nord Stream 2: archaeological analysis of geophysical data, Baltic Sea, Swedish economic zone*. Stockholm: National Maritime Museum.

### ROV-Photos

© Marin Mätteknik (MMT).

### Sonar images

© FUGRO.

### Maps

© ESRI.



## Technical and administrative data

Place: Baltic Sea, Swedish Economic Zone Type of Investigation: Archaeological analysis

Cause of the survey: Construction of gas pipeline Client: Nord Stream 2.

Swedish National Maritime Museums ref: 5.3.1-2016-433 Nord Stream 2 ref: W-PE-MSC-PSE-SOW-806-CHOROVEN-01.

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Documentation: The report will be available at The National Maritime Museums webpage

and other documents at the National Maritime Museum's archives in Stockholm.

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### Participant in the work, SMM

Mikael Fredholm





## Nord Stream 2

*Planning and surveys are ongoing for the new gas pipeline Nord Stream 2, which will run in parallel with the gas pipeline Nord Stream.*

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