EGU 2020 – Session ITS2.2/GM12.5 Co-production and evolution in human-landscape interaction: from geoarchaeological records to geomorphological dynamics and human influence
https://doi.org/10.5194/egusphere-egu2020-19139

Exploration of submerged Mesolithic landscapes around the Brown Bank, southern North Sea

Merle Muru[1,2], Rachel Harding[2], Simon Fitch[2], Tine Missiaen[3], and Vince Gaffney[2]

[1]Department of Geography, Institute of Ecology and Earth Sciences, University of Tartu, Tartu, Estonia (merle.muru@ut.ee)
[2]School of Archaeological and Forensic Sciences, University of Bradford, Bradford, United Kingdom
[3]Flanders Marine Institute (VLIZ), Oostende, Belgium

Postdoctoral project "Coastal Change: modelling submerged landscapes and prehistoric human colonisation of the southern North Sea basin", grant no PUTJD829, Estonian Research Council

Project "Europe's Lost Frontiers", Advanced Grant no 670518, European Research Council

Study area

During the late glacial and early Holocene, vast areas of dry land stretched from the British Isles to continental Europe over what is now the **southern part of the North Sea**. Whilst it is known that this landscape was inhabited, little is known about the cultures that lived there and the surrounding environment. The **Brown Bank area**, between the coasts of the UK and the Netherlands, has provided many **Mesolithic ex-situ finds**.

Figure 1. Location of the study area in the North Sea, on the continental shelf, western Europe. Map by Google.

In the surveyed area, the seafloor lies in the depth of 25 to 35 m b.s.l., lowering towards the west. Main seafloor features visible in the bathymetry are north-south-trending ridges and troughs of which the Brown Bank is the most significant.

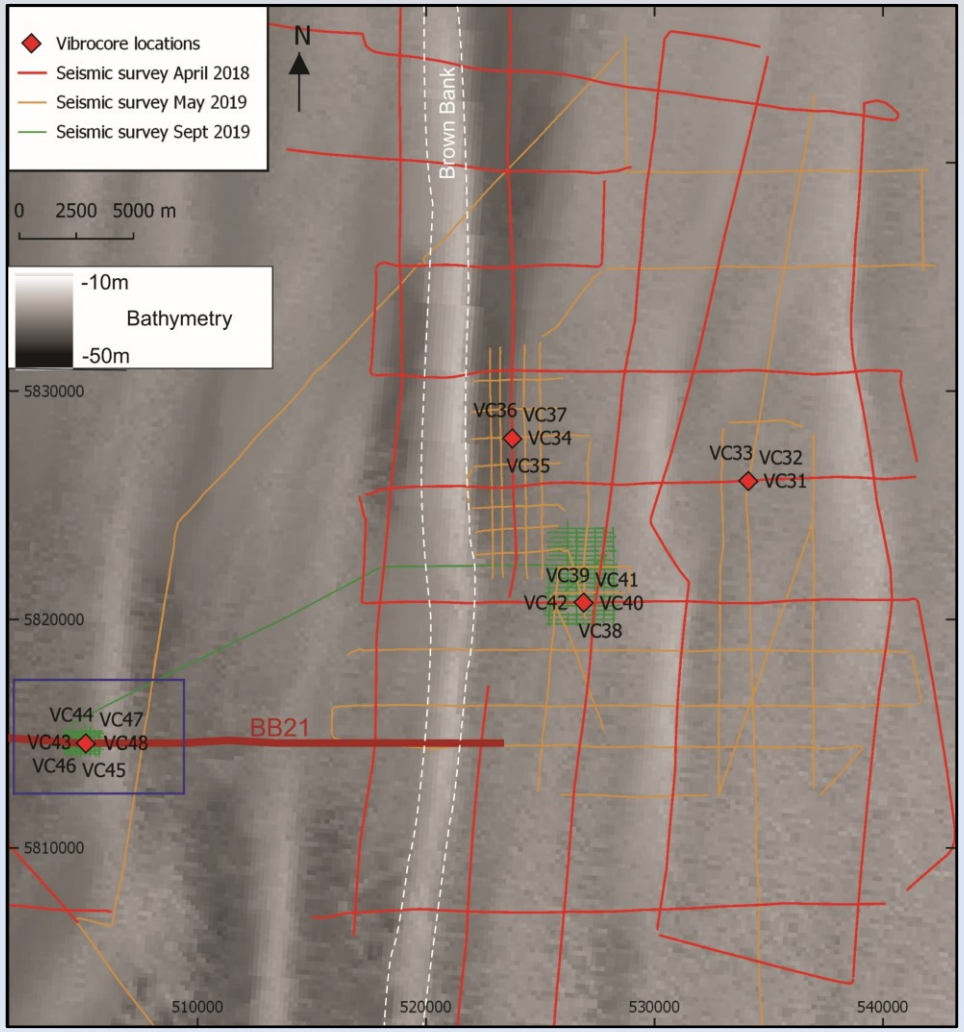


Figure 2. Map of the seismic surveys and viborocoring undertaken during 2018-2019. The blue box indicates the area of interest. Bathymetry by EMODnet. (Figure from Fitch et al., in press)

Eesti Teadusagentuur
Estonian Research Council
Grant PUTJD829

Aim of the study

By mapping terrestrial features, **reconstructing the palaeolandscape** and its inundation, **potential locations** from which this **archaeological material** derives, and where it may still be preserved in-situ are determined.

Methods

High-resolution Multi-transducer Parametric Echosounder (MPES) surveys in a dense survey network provided decimetre level resolution up to 12-15 m below the seafloor with a frequency of 8-10 kHz. 4-meter vibrocorer was deployed to acquire 18 cores.

Dredge sampling using a beam trawl over promising targets.

Seismic facies mapping and interpretation was carried out. In the area of interest, a peat layer was radiocarbon dated and Holocene palaeogeography was reconstructed.

Figure 3. Marine expeditions: Parametric echosounder survey (left) and dredging (right). Images courtesy of "Europe's Lost Frontiers" project.

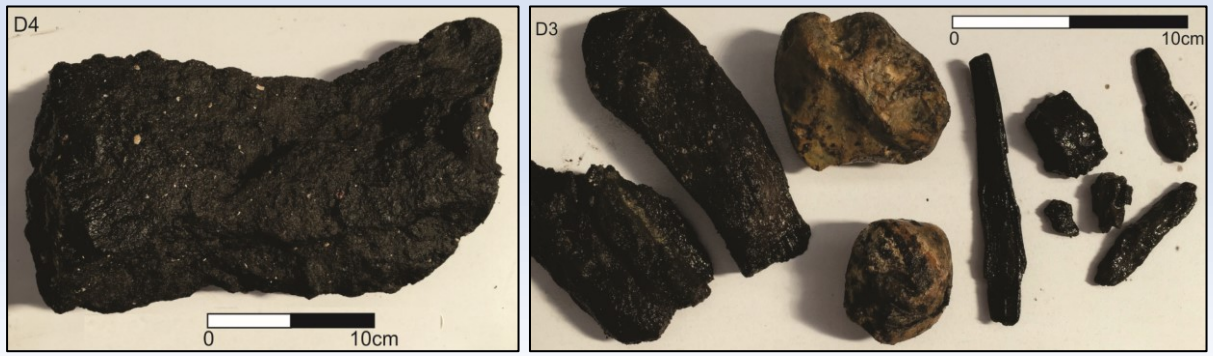


Figure 4. Examples of the block of peat and wood and raw flint finds recovered by targeted dredging in the area of interest (for locations see Fig. 7).

Eesti Teadusagentuur
Estonian Research Council
Grant PUTJD829

Results

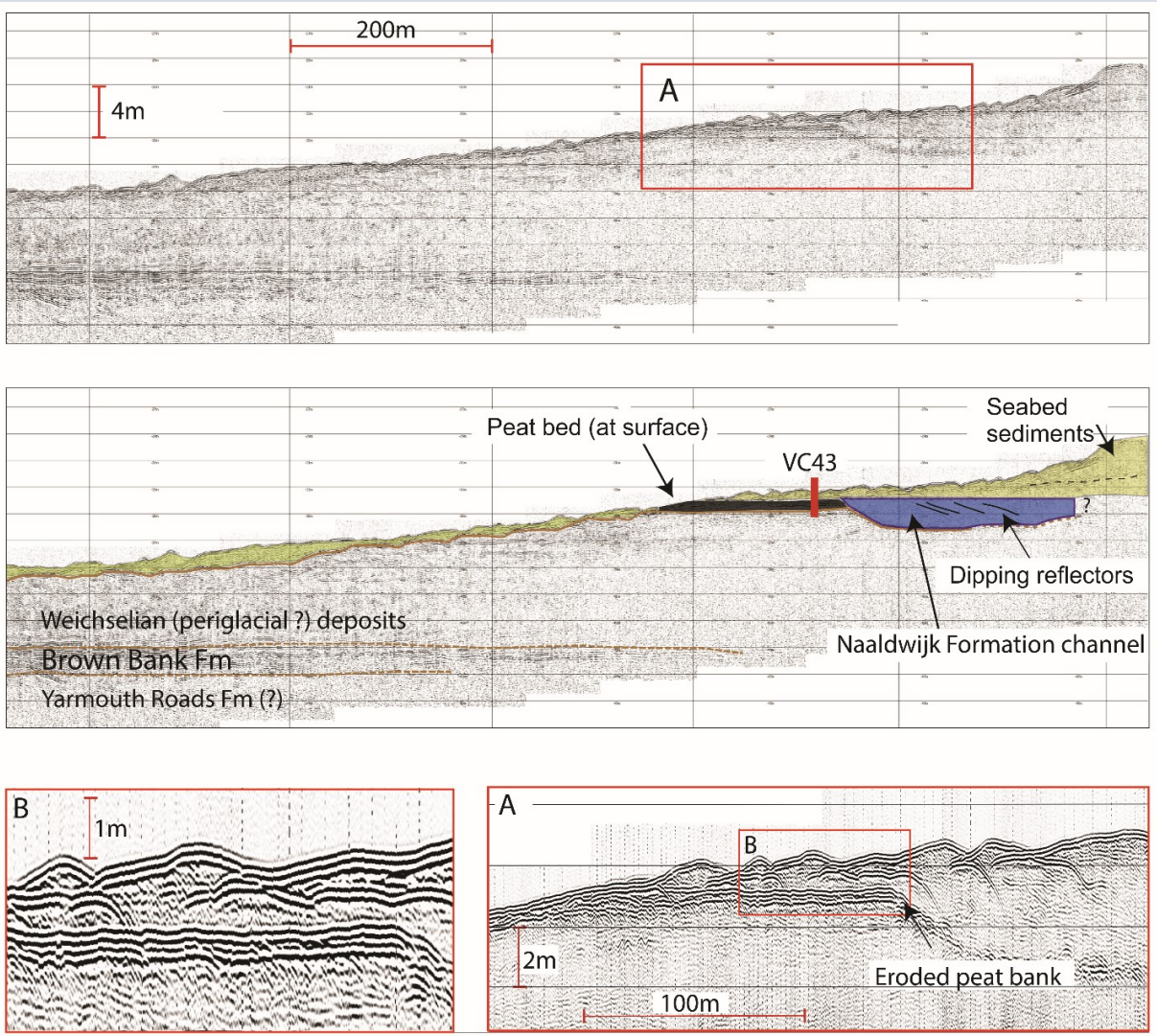


Figure. 5. Part of MPES survey line BB21 across the area of interest (for location see Figure 2). A close-up view of the peat bed in boxes A and B. (Figure from Fitch et al., in press)

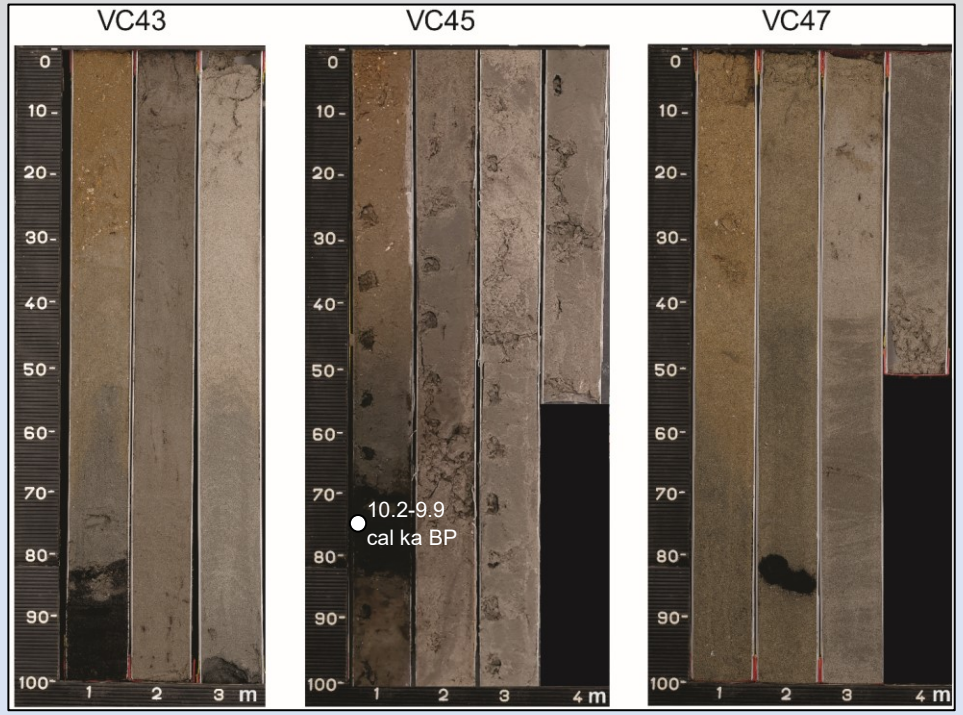


Figure 6. The Holocene peat bed can be clearly seen in VC43 and VC45, and a block of eroded peat within the sand fill of the channel in VC47 (for relative locations of the cores see Figure 7). Images courtesy of TNO.

A palaeolandscape with a peat bed and channel was recovered.

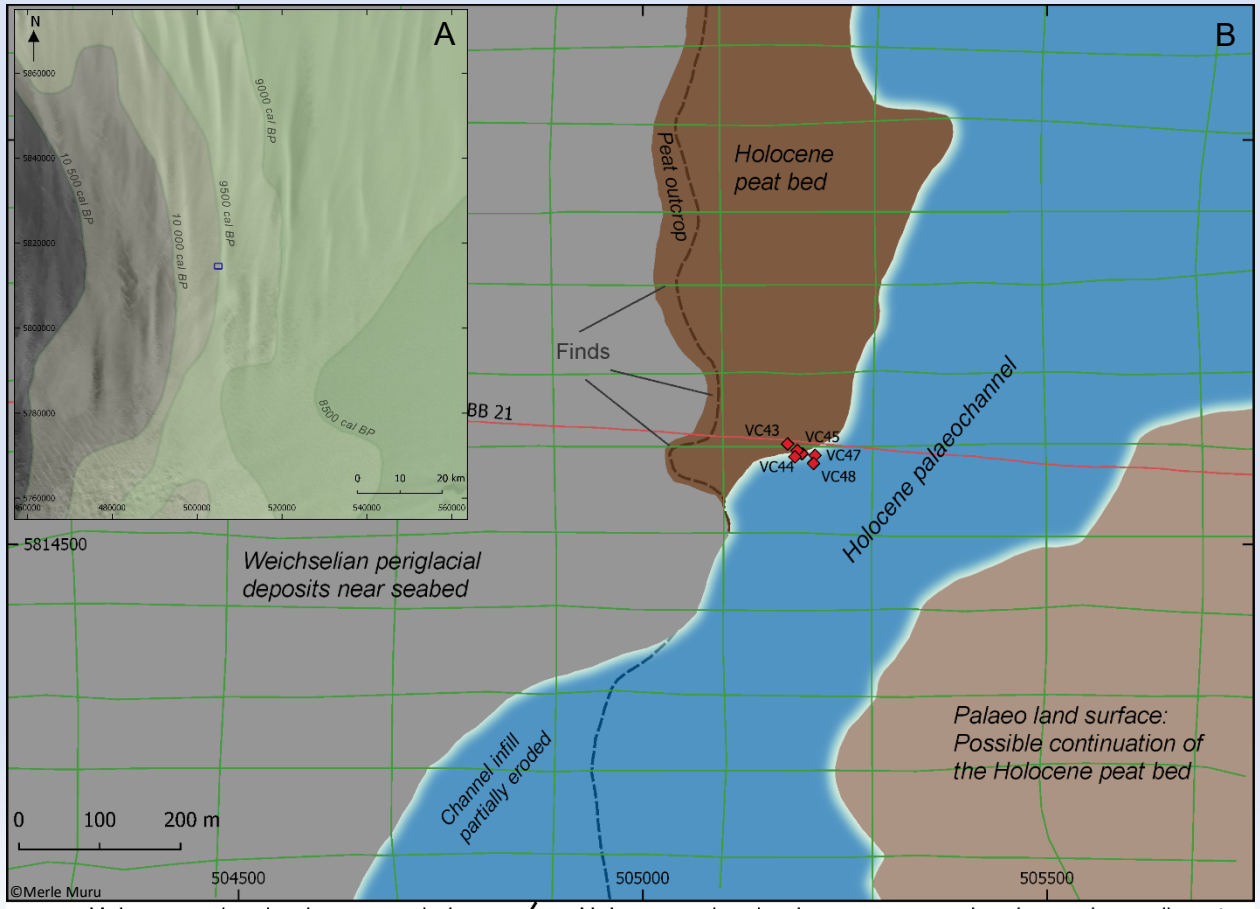
In seismic images, the erosional contact between the channel and the peat bed can be seen clearly. The peat bed has been radiocarbon dated to early Holocene. The bottom of the channel is filled with fluvial sediments, marked by faint shallowly dipping reflections, and covered with modern marine sediments.

Probable channel evolution: Riverine → estuarine → tidal.

Eesti Teadusagentuur
Estonian Research Council
Grant PUTJD829

Results

Reconstruction using a glacial isostatic adjustment model and eustatic sea-level curve is in agreement with the radiocarbon age from the peat bed suggesting the final inundation of the area around 9500 cal BP. Detailed paleolandscape reconstructions indicate the shape and depth of the channel and potential source for preserved terrestrial organic material and Mesolithic finds.



Altitude of the peat surface 34.5 m b.s.l. Relative depth of the channel 2-3 m.

Figure 7. Palaeogeography of the area of interest. A) Holocene marine transgression (approximate locations of palaeocoastlines adapted from Sturt, Garrow, Bradley 2013 J. of Arch. Sci. 40). B) Holocene palaeolandscape interpreted based on stratigraphy from vibrocores (red diamonds) and seismic mapping (survey lines in green and red). *Unpublished.*

Conclusions

Submerged Holocene **palaeolandscapes are preserved** in the eastern part of the area of interest under the marine sediments. It means **good preservation conditions** for possible Mesolithic sites and in-situ archaeological material.

The mapped outcrop of the peat bed on the seafloor is the source of the organic terrestrial finds and a **potential source for Mesolithic** archaeological material.

This study provides **new insights into the palaeogeography and** the timing of the **inundation** of the Brown Bank area and gives the landscape context to the potential Mesolithic habitation of this part **of the southern North Sea**.

Eesti Teadusagentuur
Estonian Research Council
Grant PUTJD829

More about the study in:

Fitch S., Missiaen T., Muru M., Harding R., Fraser A., De Clercq M., Garcia Moreno D., Versteeg W. and Gaffney V. (in press) Targeting the Mesolithic: interdisciplinary approaches to archaeological prospection in the Brown Bank area, southern North Sea. *Quaternary International*

Acknowledgements

Flanders Marine Institute (VLIZ), Bradford University, Ghent University, The Netherlands Organisation for Applied Scientific Research (TNO) and the crews of RV Belgica, RV Simon Stevin and RV Pelagia.
The study was supported by a European Research Council Advanced Grant (project number 670518) “Europe’s Lost Frontiers Project” and by an Estonian Research Council grant (project number PUTJD829) “Coastal Change: modelling submerged landscapes and prehistoric human colonisation of the southern North Sea basin“.

https://lostfrontiers.teamapp.com/ https://www.researchgate.net/profile/Merle_Muru