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## A new understanding of Pleistocene glacial events as revealed from mega merge seismic data of the North Sea

**Professor Mads Huuse**

**(Professor of Geophysics – Department of Earth and Environmental Sciences, University of Manchester)**

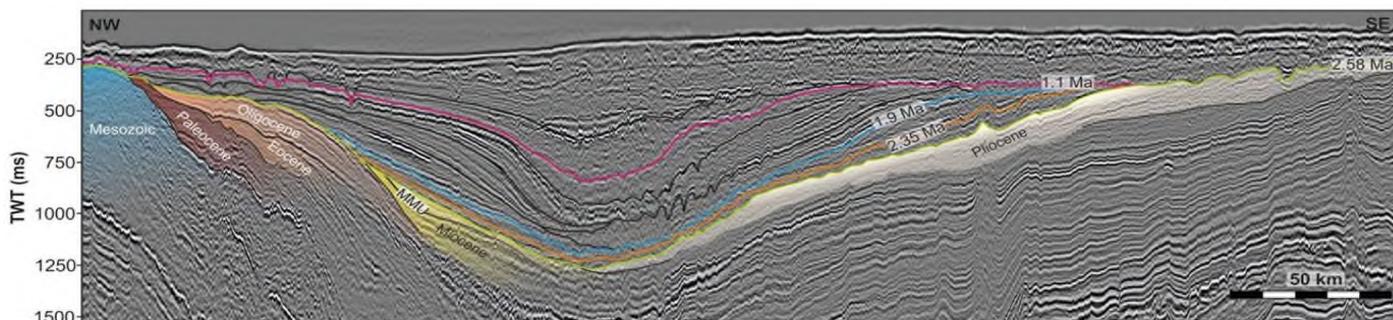
8<sup>th</sup> February 2022 | Zoom Video Conference | 6:30pm start

### **Abstract:**

Since the end of the Eocene, Earth's climate has largely been in an 'ice house' state with glaciation on the poles and varying intensity of glaciation at lower latitudes, as far south as the Scilly Isles during the late Pleistocene. The study of glacial deposits in NW Europe is centuries old and Darwin famously recognised erratics and landforms as caused by extensive glaciations. Despite intense scrutiny of the glacial record onshore by thousands of geographers and geologists over the past centuries, the knowledge of glaciation history beyond the last 3 glaciations (> 0.5 Ma) is largely absent or confined to isolated windows into the deeper past, leaving many unknowns and apparently conflicting pieces of evidence, pitting researchers and country-scale records against each other. This talk will set the glacial record straight by drawing on the expanded, dated and well-imaged offshore record.

For six decades the study of the offshore glacial deposits has been the preserve of site survey companies serving the offshore energy industries. This has resulted in a wealth of local knowledge based on stamp-sized areas whilst a few handfuls of academics have been trying to piece together larger-scale pictures of subglacial drainage systems and glacial tectonic complexes from the last 3 major glaciations. With improved 3D seismic coverage, continuity and image quality across the offshore borders, a more complete picture of the glacial record is now emerging. This can be tied to high-quality chronostratigraphic data from a few key boreholes located in depocentres along the central axis of the North Sea, thus yielding high temporal and spatial resolution and a much finer-scale record of glaciation than hitherto available. The imprints of glaciation include large-scale clinoforms comprising muddy and sandy turbidites, iceberg scour marks, mega-scale glacial lineations and glacio-tectonic thrust complexes. This basin-scale spatial and temporal record reveals that the North Sea and surrounding landmasses were repeatedly glaciated from the onset of the Pleistocene at 2.5 Ma and that grounded glaciation reached the basin centre at 1.8 Ma. This is in agreement with the global context and the occurrence of 2.5 Ma ice rafted debris of British provenance offshore Ireland. However, it is revolutionary when compared with glacial histories and stories based on onshore records, which (we now know) only represents that last 20% of the Quaternary glacial history.

The work on the North Sea glacial record has been done through numerous PhD projects, industry and academic collaborations without which the early Pleistocene would still be just 'overburden' to the North Sea oil, gas and carbon storage resources.



*Lamb et al. 2018: Journal of the Geological Society 175, 275-290*

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### **About the Speakers:**

Mads is Professor of Geophysics at The University of Manchester. After a PhD at the University of Aarhus, he undertook post docs at Aberdeen and Cardiff and a lectureship at the University of Aberdeen before joining Manchester in 2009. Throughout this time, he was actively researching and supervising projects on the subsurface evidence for glaciation in the North Sea.

He currently leads an active research group of over 10 PhDs using seismic data to study the fill, palaeo-environments and fluid flow in sedimentary basins offshore West greenland, the North Sea, North and South Atlantic and SE Asia. About half his published work concerns the North Sea Cenozoic, with particular emphasis on glacial geology and fluid flow in basins. His published papers, many of which are OPEN ACCESS and led by PhDs and post docs, can be found here: [Google Scholar profile](#)

### **Forthcoming Talks:**

DATE	TITLE	SPEAKER	VENUE
8 <sup>th</sup> March 2022 6:30pm	Cenozoic Climate Change	Dr. Tom Dunkley Jones (University of Birmingham)	Zoom - Virtual Meeting
12 <sup>th</sup> April 2022 6:30pm	Diversity in Geoscience	Lisa Pinney (The Coal Authority)	Zoom - Virtual Meeting

The WMRG is constantly on the lookout for fascinating talks. If you would like to present, know someone who is willing, or would like to request a subject please contact the WMRG committee (details below) and we will try our very best to accommodate your requests.

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