Pre-Holocene volcanic ash in sediments near Jan Mayen

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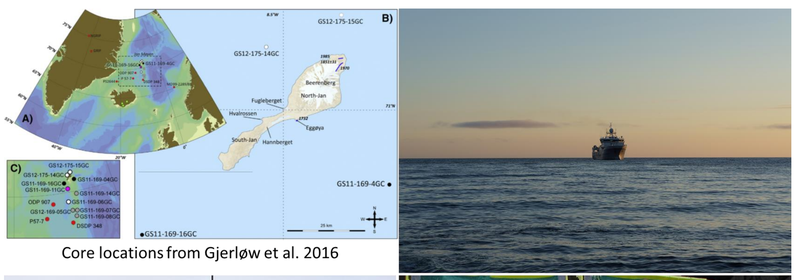
Poster number: P17

Abstract

Volcanic ash attributed to Jan Mayen has been found in many distal sites in the North-Atlantic region however, descriptions of tephra horizons in the proximity of Jan Mayen are few and this study aims to increase the knowledge of tephra producing eruptions from Jan Mayen. In this poster we show some preliminary results from investigations of the pre-Holocene intervals of one sediment core (GS11-169-04GC) retrieved from the sea floor less than 50 km from Jan Mayen. The Holocene interval of these cores has already been studied and our preliminary examinations of the pre-Holocene intervals include: XRF core-scanning, tephra concentrations (for selected intervals), tephra geochemistry and CT-scanning of the core sections.

Sample material

Sediment cores retrieved from the sea floor close Jan Mayen, the northernmost active surface volcano of the world.



The Holocene interval of this core was described in Gjerløw et al. 2016, and in this poster, we have worked on the pre-Holocene material.

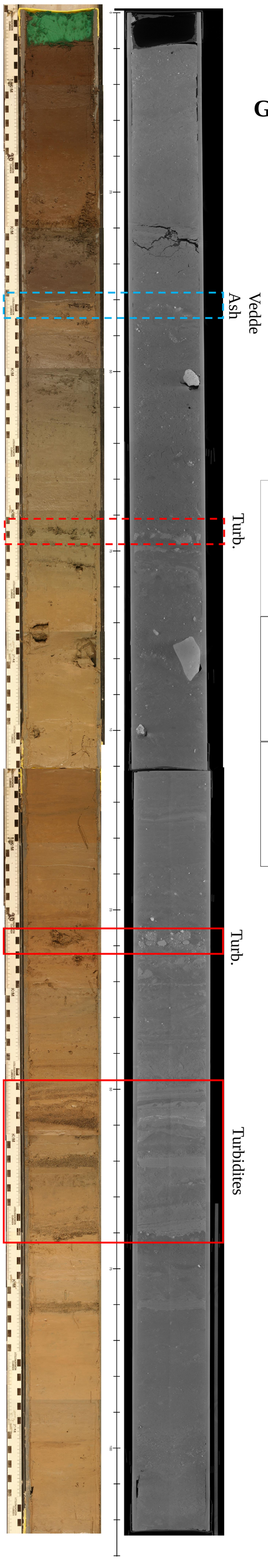
Analytical methods

The cores were analysed by XRF core-scanning, CT-scanning and Magnetic susceptibility measurements. Sediments have been extracted in 5 mm tall horizontal slices from top to bottom. This material was dried, weighed and sieved on 1mm, 125- and 63-micron sieves.

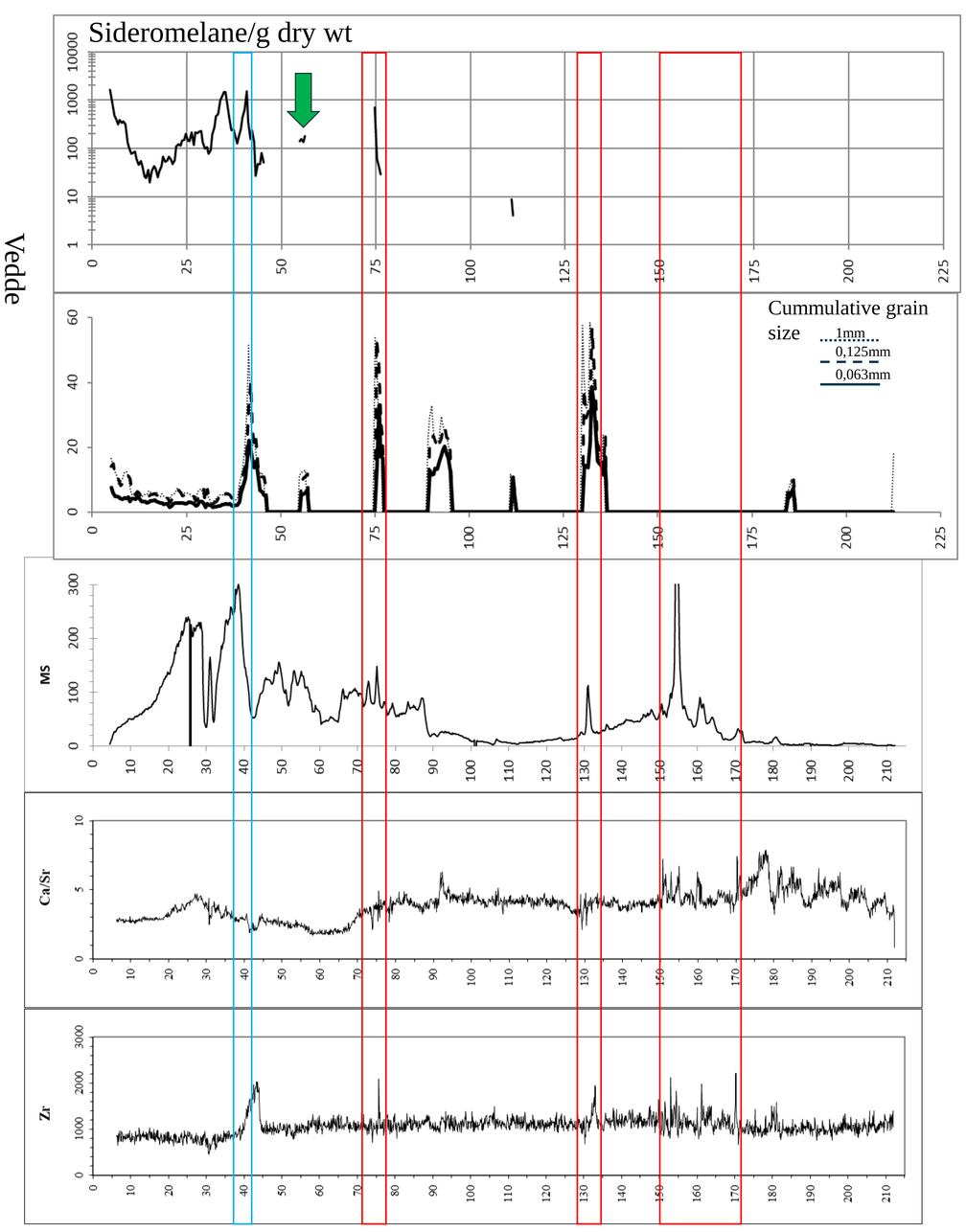
Material from the 125 micron to 1 mm grain size in selected horizons has been counted under a microscope to measure tephra concentrations compared to dry weight.

The major element chemistry of individual tephra grains has been measured with EPMA and show similar geochemistry to the compositional envelope of recent Jan Mayen tephra.

EPMA picture and data coming on Thursday
(probably)



Grain size, tephra counts, magnetic susceptibility and selected elements from the XRF core scanner.



A little mystery

What might these grains be? They are flaky and in the 125 micron to 1 mm size fraction and are found in a short interval.
They don't appear to be vesicular, although some vesicular grains appear alongside them.

Preliminary results

These results are only from a single sediment core, another longer sediment core also awaits processing. Like what has been seen in other sediments from the last glaciation in the Northern North-Atlantic Ocean, the tephra concentrations are much lower than during the Holocene (e.g. Voelker and Haflidason 2015). So far, we have only discovered a few horizons with elevated tephra concentration, some probably related to turbidites instead of primary deposits, but this number should increase as more of the sediments are processed.

References

Gjerløw E, Haflidason H, Pedersen RB (2016), Holocene explosive volcanism of the Jan Mayen (island) volcanic province, North-Atlantic

Voelker A, and Haflidason H (2015), Refining the Icelandic tephrachronology of the last glacial period – The deep-sea core PS2644 record from the southern Greenland Sea.