

# Palaeomagnetic dating of sediment in Northern of Bothnian bay during the Late Holocene

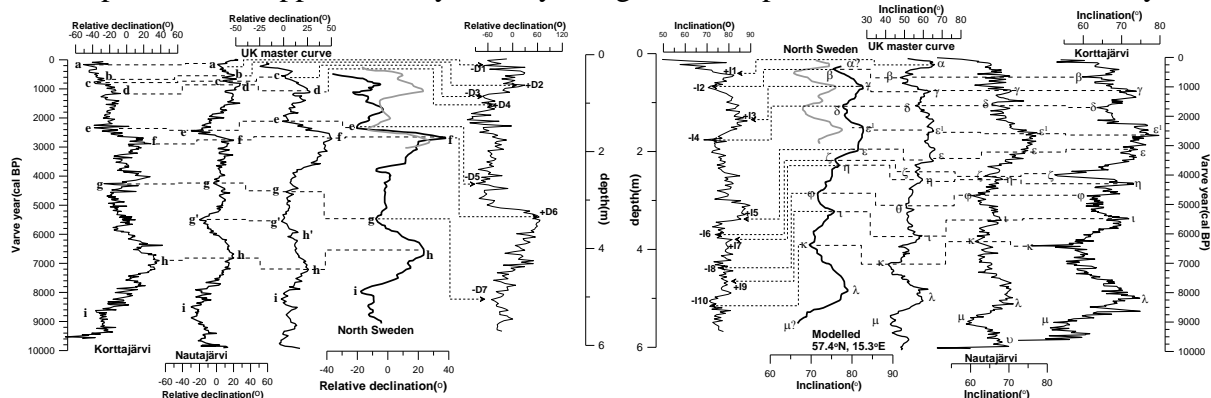
Thongchai Suteerasak\*, Sten-Åke Elming, Johan Ingri and Anders Widelund

Corresponding: thongchai.suteerasak@ltu.se

Division of Geosciences, Luleå University of Technology, SE-971 87 Luleå, Sweden

## Abstract

This study focuses on the secular variation in the Earth's magnetic field used to date sediment cores from the Bothnian bay by palaeomagnetic methods. The dating of the sediment is here related to a geochemical investigation of the palaeo-environment in the late Holocene. Essential for the analyses is to determine the rate and time scale of deposition and since the  $C^{14}$ -method here is uncertain for dating palaeomagnetism is used. The study also includes analyses of anisotropy magnetic susceptibility (AMS) to image the deposition process of ferromagnetic grains and current induced fabric. A 5.8 m long sediment core was collected using a Benthose gravity corer and the specimens were demagnetized in alternating fields (AF) for the analyses of remanent magnetizations. Inclination and declination of the remanent magnetization after 20 mT AF demagnetization is plotted against depth curve and compared with master palaeo-secular-variation (PSV) curves. The PSV master curves used for comparison are the Lake Korttajärvi and Lake Nautajärvi of Finland [1], the North Sweden PSV master curve [2] and the PSV UK master curve [3]. Except for specimens from the very upper part of the core, the AMS data obtained in the specimens show oblate susceptibility ellipsoids with magnetic foliation planes horizontal and parallel to bedding. This suggests that the sediments have not been disturbed after deposition. In the palaeomagnetic data, reflecting secular variations in inclination and declination, seven characteristic extremes of declination, three maxima (+D2, +D4 and +D6) and four minima (-D1, -D3, -D5 and -D7), and five maxima (+I1, +I3, +I5, +I7 and +I9) and five minima in inclination (-I2, -I4, -I6, -I8 and -I10) were identified (see figure) all well correlated to corresponding characteristics in the master curves. These results suggest an age of sediment within the Holocene from the present to at approximately 7,000 year ago and a deposition rate of 1.0 – 2.0 mm/year.



## References

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**Keyword:** Bothnian bay ; Sediments ; Paleomagnetism ; Anisotropy magnetic susceptibility ; Palaeomagnetic dating