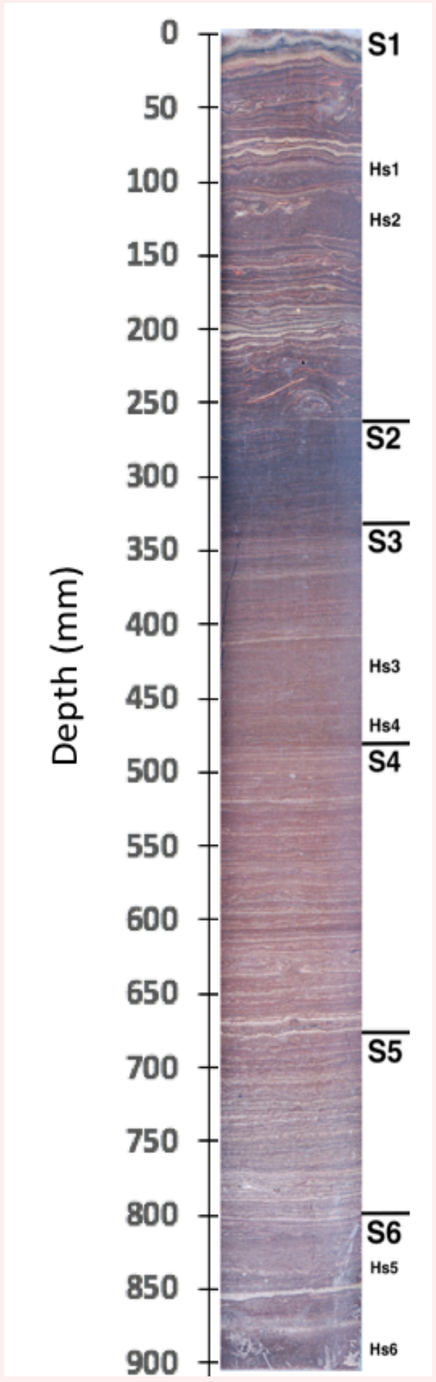
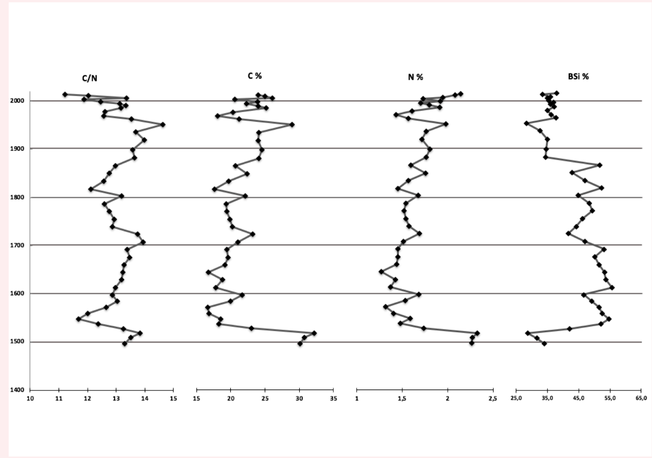
Lake Odensjön – A new varved sediment record from southern Sweden



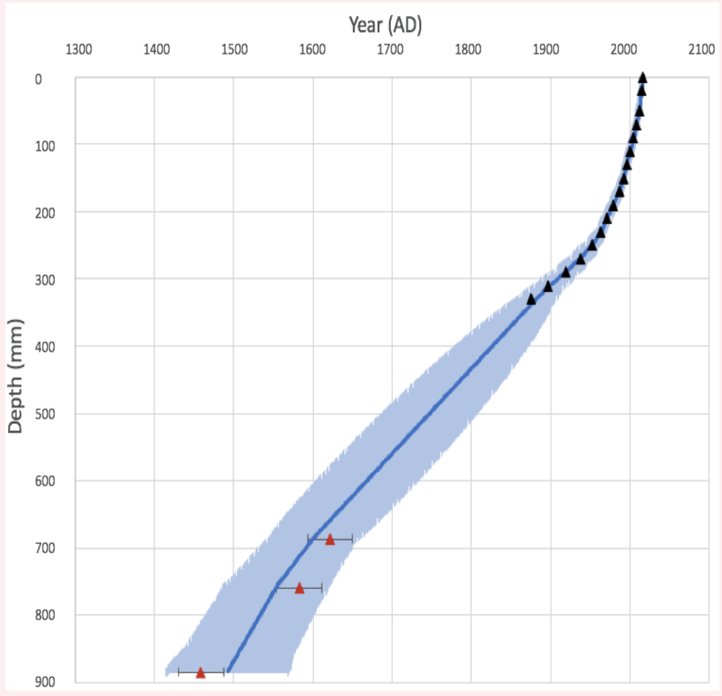
Annually laminated (varved) sediments provide opportunities to reconstruct climate change and human impact on the environment with high temporal resolution. Depending on the character of the varves, such sediments can provide insight into the delivery of both autochthonous and allochthonous material from the lake and its catchment and answer questions regarding both regional and local responses to climate- and land-use changes.

This thesis examines a new sediment record from the small Lake Odensjön in southern Sweden. The sampled sequence, collected with a freeze-corer at 20 m water depth in the deepest part of the lake, spans the uppermost 91-cm of the sediment sequence.



Dating with ^{210}Pb and ^{137}Cs in combination with identification of the distinctive and well-documented pollution Pb peak associated with the use of leaded petrol in the mid 1970's confirms that the sediments partly consist of laminations representing annual varves. Radiocarbon dating of the lower part of the record demonstrates its extension to around 500 years before present.

The chronology was established with independent dating using ^{210}Pb, radiocarbon dating and laminae counting. The results were later modelled with OxCal and the final age-depth model is based on calibration using the P-sequence with only depth and assumptions about sedimentations as prior. This conservative model was chosen because of the difficulties found when trying to count the laminations between the radiocarbon-dated levels.



The sediments are characterized by X-ray fluorescence, biogenic silica content, total carbon and nitrogen content and microscopic analyses are showing high contents of biogenic silica and organic matter, abundant diatoms and low minerogenic content, demonstrating that the varves are of biogenic origin. The conditions for varve formation have changed through time and substantial variations in the content of macroscopic plant remains give evidence of pronounced changes in catchment land-use.

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