

## **History of human activity in last 800 years reconstructed from combined archive data and high-resolution analyses of varved lake sediments from Lake Czechowskie, Northern Poland**

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The aim of the study was to reconstruct human and landscape development in the Tuchola Pinewoods (Northern Poland) during the last 800 years. We apply an approach that combines historic maps and documents with pollen data. Pollen data were obtained from varved lake sediments at a resolution of 5 years. The chronology of the sediment record is based on varve counting, AMS 14C dating, 137Cs activity concentration measurements and tephrochronology (Askja AD 1875). We applied the REVEALS model to translate pollen percentage data into regional plant abundances. The interpretation of the pollen record is furthermore based on pollen accumulation rate data. The pollen record and historic documents show similar trends in vegetation development. During the first phase (AD 1200-1412), the Lake Czechowskie area was still largely forested with *Quercus*, *Carpinus* and *Pinus* forests. Vegetation was more open during the second phase (AD 1412-1776), and reached maximum openness during the third phase (AD 1776-1905). Furthermore, intensified forest management led to a transformation from mixed to pine dominated forests during this period. Since the early 20th century, the forest cover increased again with dominance of the Scots pine in the stand. While pollen and historic data show similar trends, they differ substantially in the degree of openness during the four phases with pollen data commonly suggesting more open conditions. We discuss potential causes for this discrepancy, which include unsuitable parameters settings in REVEALS and unknown changes in forest structure. Using pollen accumulation data as a third proxy record we aim to identify the most probable causes. Finally, we discuss the observed vegetation change in relation the socio-economic development of the area.

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