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Lake ecosystem response to late Allerød climatic fluctuation (northern Poland)

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The aim of this study is a better understanding, how local lake ecosystems responded to climate changes during the late Allerød - Younger Dryas transition. Therefore, we carried out a detailed high-resolution multi-proxy case study on the partly laminated sediments from the Trzechowskie palaeolake, located in the Pomeranian Lakeland, northern Poland (53°52'40"N, 18°12'93"E).

We reconstructed the ecosystem response to climatic and environmental changes using biotic proxies (macrofossils, pollen, Cladocera, diatoms) and classical geochemical proxies (δ18O, δ13C, loss-on-ignition, $CaCO_3$ content) in combination with high-resolution μ-XRF element core scanning. The core chronology has been established by biostratigraphy, AMS 14C-dating on plant macro remains, varve counting within the laminated intervals and the Laacher See Tephra (12880 varve yrs BP) as a precise isochrone.

Framework of our investigation is a period covering 367 varve years of the late Allerød and the beginning of the Younger Dryas period where varve preservation gradually ceases. The pronounced changes at the late Allerød - Younger Dryas transition is well-reflected in all environmental indicators but with conspicuous leads and lags reflecting complex responses of lake ecosystems to climate variation.

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