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Comparative microfacies studies on annually laminated lake sediments from lakes of different sizes in northern Germany- Palaeolimnological implications

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The composition of annually laminated lake sediments was studied in thin sections. Investigations on recently deposited warves and microfacies indicators known from the literature were used to infer about limnological processes explaining a given mid-Holocene warve sequence. Geochemical analyses were carried out for supplemental information (e.g. aeration of the hypolimnion). The sequences of sediments deposited from ca. 4.900 to 6.900 cal BC in Lake Belau and Lake Poggensee were compared. According to the abovementioned indicators a reconstruction of the storminess (intensity of circulation), summer temperatures, and severity of winters (NAO stage) was carried out ending up with a graph of relative changes for the studied interval. Since the compared lake systems have considerably different sizes (about a magnitude) abrupt changes in sedimentation detected synchronously in both lakes but differing in shape were interpret as varying responses to climatic anomalies. These anomalies are considered to represent extraordinary cold spells during the summers at ca. 5.900 and 5.300 cal BC. Similarly, a short phase of probably unusual warm winters occurred at ca. 5.350 cal. BC. The example illustrates the potential of comparing lakes systems of different dimensions utilizing different system thresholds that result in varying limnological responses to external triggers.