



Similarities and discrepancies of sessile oak performance along a topographic gradient

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In recent decades, lake level fluctuations have been observed in the lake area of north eastern Germany. However our knowledge on these fluctuations mostly date back until the 1970ies when gauge records were initiated. To deepen our understanding of the observed lake level fluctuations, proxies which provide longer records of measurement would be of help.

Here, we dendrochronologically investigate whether sessile oak (*Quercus petraea*) is a suitable proxy for lake-level fluctuations. Several specimen were investigated at two sites along a steep topographical gradient, ranging from the lake shore of lake Hinnensee to a nearby situated glacial sander deposition. By this, we assume to represent differing tree sensitivities to lake level fluctuations (at the lake shore) and summer droughts (on top of the sander). For the ring porous oak it has been shown in various studies that earlywood vessel structures store different climatic- or ecological information than ring-width or earlywood/latewood-width alone. Therefore in addition to the ring width chronologies (spanning 1750-2010) series of earlywood vessel parameters (number of cells, average lumen area, total lumen area, spanning 1900-2010) were developed and used to compare the growth trends and climate growth relationships between the two topographical positions. Preliminary results indicate a differing low frequency behavior between the two sites in both ring-widths and earlywood vessel parameters. Possible causes (lake level fluctuations, human impact, and climate change) are discussed and the potential of sessile oak as a proxy for lake level fluctuations is evaluated.