

Interactive comment on “Dendrochronologically dated pine stumps document phase wise bog expansion at a northwest German site between c. 6700 BC and c. 3400 BC” by Inke Elisabeth Maike Achterberg et al.

Anonymous Referee #1

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The paper by Achterberg et al focuses on the reconstruction of the temporal development of a mire/bog system in northwest Germany, using dendrochronologically dated pine stumps preserved in the peat. I will comment the aspects relative to peat development/dynamic, and the implications for the Holocene climate history, leaving to more dendro specialists a more insightful assessment of the accuracy and scope of the crossdating approach.

This study produces a nice dataset of dendrochronologically dated pine stumps, and allow assessing the temporal and spatial evolution of the bog, together with its relative

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drivers (mainly hydrological changes), tracked by distinct episodes of tree mortality.

In general I found the paper difficult to follow in many parts, and I suggest major restructuring (see below) and a more careful editing by an English native speaker. Just to mention few examples: “In situ finds were later separated from ex situ finds” (P. 3), “A second type of root system, being spread out flat and without downward rooting to speak of, is also common at the site however” (P.6), “The following alignments are a few examples only” (P. 9). I have difficulty to understand what the authors mean in these and other parts of the text. In addition, many statements seem not to be supported by data evidence, or not fully justified, as for e.g. “which may be more dependent on a reduced evapotranspiration than the actual precipitation alone”. (P. 9). Why is this the case?

The implications of this study for our understanding of past climate are also rather unclear. The discussion on past climate changes seems to be quite general, and too marginal compared to the aspects of peat development. Most importantly, the authors get to the conclusion that “the mire development reflects climate conditions on the one hand, but on the other hand represents a local signal” (P12), but no discussion about land-use changes in the area is provided. Therefore, the extent to which tree mortality truly reflect changes in moisture remain unclear, considering that data cover a period of time (the Neolithic) where deforestation in the catchment may have resulted in a raise of the water table, thus biasing the climate signal.

In sum, I value the big effort from the authors to provide such a nice dataset, by I suggest a major revision and improvement in most chapters, to better fit the Journal's scope.

Sorry not to be more helpful at this stage.

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