

Interactive comment on “Central Europe, 1531–1540 CE: The driest summer decade of the past five centuries?” by Rudolf Brázdil et al.

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Received and published: 21 September 2020

Anonymous Referee #2

This is an exemplary paper that uses a very large amount of documentary and other proxy evidence for a 'deep dive' into one particular decade in the sixteenth century. There is clearly a huge amount of work that has gone into compiling these records, not to mention the work that went into putting them together in the first place. RESPONSE: We would like to thank the anonymous referee #2 for generally positive evaluation of our paper and two suggestions, which we are trying to explain below.

I therefore only have two very minor suggestions:

I would like to know a bit more about the discrepancy with the Luterbacher et al. (2002)

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NAO reconstruction. This study uses loads of data, so does this suggest a limitation in the Luterbacher et al. paper? RESPONSE: We do not think that this finding has anything common with the limitation of the NAO reconstruction. The discrepancy may be related to the fact that NAO represents large-scale circulation pattern and its manifestation on of the Czech Lands territory may be complicated by other local/regional factors (air temperature, soil moisture, etc.). Moreover, both the Luterbacher et al. NAO and drought indices used in our paper as a primary data source are proxy reconstructions with some degree of uncertainty. This may be another reason for the explanation of the found differences not only with NAO but also with other proxy-based reconstructions used for comparison.

Can you say which decades are drier in the OWDA record, and give some suggestion of why there is a discrepancy? This is particularly important given the conclusion that the decade was the driest, (rather than saying that it may have been the driest). If you're going to be that confident you need to say why you're effectively discounting the OWDA record. RESPONSE: The following decades in OWDA were drier than 1531-1540: JJA PDSI: 1861–1870, 1831–1840, 1741–1750, 1941–1950, 1781–1790, 1511–1520, 1901–1910, 1631–1640 JJA DAI: 1861–1870, 1831–1840, 1941–1950, 1781–1790, 1741–1750, 1801–1810, 1511–1520 We hope that some response to your comment could be the new version of the corresponding paragraph which we complemented based on the comments of the referee #1: “The uniqueness of the 1531–1540 decade is weakened when decadal characteristics in the 1501–2012 period for the same window are calculated from OWDA (Cook et al., 2015). The 1531–1540 decade in terms of scPDSI for JJA emerges as the ninth driest, while JJA DAI is the eighth at a threshold of -1 (Fig. 15c,d). This is probably related to the fact that summer hydroclimatic patterns are only one factor among others influencing a tree growth. Moreover, the OWDA, as a spatial reconstruction, is calculated from numerous tree-ring width series and is more spatially heterogeneous (see Fig. 13b). Thus, if we compare series of the Czech drought indices with the mean OWDA series over a relatively large window (5–25°E and 45–55°N), OWDA seems to be rather smoothed (compare dry Bohemia

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and eastern Germany with wetter south-east Poland and Austria in Fig. 13b).” Moreover, inspection of data sources used for OWDA spatial reconstruction reveals that for the territory of the Czech Lands only a single TRW chronology (fir - *Abies alba*), was included. This chronology explains only a part of the drought variability (so do drought indices used in our study) and is further combined with other data in spatial OWDA reconstruction.

Otherwise great, thanks for compiling these records! RESPONSE: Many thanks!

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2020-92>, 2020.

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