

Review Brazdil et al 15th century by Christian Pfister

The paper is innovative and convincing in terms of methodology and content. The results are attractively presented and well documented.

RESPONSE: We would like to thank Christian Pfister for generally positive evaluation of our study as well as several comments, which we are trying to respond below.

Major improvements

Sect 3.1. Documentary data

By including seasonal indices for Central Europe (Pfister, Wanner 2021)

<https://boris.unibe.ch/191962/> the number of missing indices might be reduced. This would be particularly crucial for winter., for which just the NAO study by Cook et al. 2019 is available.

RESPONSE: The aim of our article is formulated as follows: “The aim of this contribution is to address research gaps concerning the 15th century in the Czech Lands by presenting the existing knowledge related to weather/climate and HMEs from available documentary evidence. The analysis concentrates on climate variability expressed by temperature and precipitation indices, documented HMEs, and comparison of these results with other climate reconstructions and data sources from Central Europe.” We present Czech temperature and precipitation indices only for cases, in which the corresponding Czech documentary evidence is available and can be used to interpret corresponding indices. Our intention is not to develop any “artificial” Czech indices that also cover years with no Czech documentary sources and being derived from other data sources, for example like those presented on <https://boris.unibe.ch/191962/>. Nonetheless, for years with available Czech indices we did comparison with Pfister and Wanner (2021) indices – see our response to lines 154-155 below.

Line 150: It would be worthwhile to compare the tree-ring reconstruction of the winter (December–March) of the North Atlantic Oscillation (NAO) by Cook et al. (2019) with the results to the 15th century winter indices for Central Europe <https://boris.unibe.ch/191962/>.

RESPONSE: Please see preceding explanation of the aim of our study. We are not working in the scale of Central Europe, but we only compare our “results with other climate reconstructions and data sources from Central Europe.”

Line 154-155 many indices are still missing. Most of the seasonal 15th century indices published in https://boris.unibe.ch/191962 based on Pfister and Wanner 2021 refer to Germany. These results should also be considered.

RESPONSE: As explained above, complementing of missing indices is out of intention of this article. To consider comparison of Czech indices with those from Pfister and Wanner (2021), we added a new paragraph in Sect. 6 Discussion, below the Fig. 10 as follows:

“Quantitative verification of Czech indices for DJF and JJA temperatures and JJA precipitation used in Fig. 10 can be also performed for temperature and precipitation indices from the Low Countries (van Engelen et al., 2001, 2009). Although the temperature indices were defined on different scale (from 1 to 9 degree) and for differently defined seasons (November to March for DJF and May to September for JJA patterns), they show strong and statistically significant ($p < 0.05$) Spearman rank correlation with the Czech indices particularly for DJF temperatures (0.89) and JJA precipitation (0.83) and naturally slightly lower correlation for JJA temperatures (0.54). Comparison of Czech temperature indices with those derived for Western and Central Europe by Pfister and Wanner (2021) gives a lower correlation for DJF temperatures (0.75) and a higher correlation for JJA temperatures (0.62)

than with Low Countries, but statistically significant in both cases ($p < 0.05$). Much smaller number of JJA precipitation indices did not allow to compare both considered datasets. As for above comparison of Czech with van Engelen et al. (2001, 2009) and Pfister and Wanner (2021) indices is necessary to note, that temperature indices from both datasets show clearly higher frequency of very cold and extremely cold DJFs than of very warm and extremely warm DJFs. Similarly, there appeared also significantly higher number of hot and extremely hot JJAs compared to very cold and extremely cold JJAs. However, this feature does not reflect properly climatic patterns of the 15th century, but it rather points out to a specific extreme-oriented feature of documentary indices (Brázdil et al., 2005)."

Line 156-158 the dating of documentary sources according to the Julian style is prone to error, For clarity the term "Julian" or "Jul" should be added to the date or preferably the dates should be presented according to the Gregorian followed by abbreviation "Greg"

RESPONSE: Because of sentence "With respect to comparability with recent climate, the data presented were recalculated from the Julian calendar to the current Gregorian style by adding nine days to the original dates." on lines 156-157 is clear, that dating of events in the following text is made in the Gregorian style, i.e. there is not necessary to use the abbreviation "Greg", which is usually not used in publications. Before this statement an exact dating was used only in Sect. 3.1, point (i), where we corrected it as "[30 November 1434, Julian calendar]" and in point (ii), where we changed it as "*on the Thursday* [14 July, Julian calendar]". All other dates in Sect. 3.1 are already recalculated to the Gregorian calendar.

Small modifications

References

Cook, E., Kushnir, Y., Smerdon, J., Williams, A., Anchukaitis, K., and Wahl, E.: A Euro-Mediterranean tree-ring 680 reconstruction of the winter NAO index since 910 C.E., *Clim. Dyn.*, 53, 1567–1580, <https://doi.org/10.1007/s00382-019-04696-2>, 2019.-----not in alphabetical order

RESPONSE: According to the Czech alphabetical order our ordering is valid (A, B, C, Č, D ...). If there is not distinguished between C and Č in the English alphabet, then the referee's comment is correct, and we will make the change.