

## ***Interactive comment on “Droughts in the area of Poland in recent centuries” by Rajmund Przybylak et al.***

### **Anonymous Referee #2**

Received and published: 11 July 2019

This article contains a useful review, and assessment, of the occurrence and severity of drought in Poland during the past five centuries using both instrumental data (from the 18th century), historical documentary data and tree-ring width data. As past drought, or hydroclimate in general, in Poland is an under-researched topic, the manuscript is clearly worth publication after revision. The manuscript is in need of some polishing and English language editing but can otherwise, in my opinion, be published. That said, I would still recommend the authors to consider a few things:

1) Streamline part of the text, including the Abstract and the Introduction, as especially the Abstract is too long and too detailed. Moreover, part of the Introduction does not really well capture the state-of-the-art knowledge of hydroclimatic changes with global warming and the selection of references in the introduction is a bit biased.

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2) The translation of narrow tree-rings to dry years/growing seasons are a bit problematic as the response between tree-growth and hydroclimate is non-linear, and not stable over time, and low temperatures may also produce narrow rings. My concern here is mainly that some of the narrow rings during the climax of the Little Ice Age c. 1570–1710, as well as during some other shorter time intervals, may in some cases be a result of very cold springs and summers. The authors could probably systematically compare the narrow rings with climate information in the documentary sources to rule this possibility out. It is a bit unclear in the present version of the manuscript if this has been done or not. Regarding the non-linear relationship between tree growth and climate, see the discussion and references given in: <https://iopscience.iop.org/article/10.1088/1748-9326/ab2c7e>

3) I would recommend the authors to better include, and cite, the recent scholarship in historical climatology. A good starting point, with ample references, could be the articles in *The Palgrave Handbook of Climate History*, ed. S White et al (London: Palgrave Macmillan).

Minor comments:

Page 2 (in general): The evidence for increasing droughts in recent decades is weaker, and more controversial, than evident from what the authors write. To a large extent, the results are dependent on which drought metrics is used. It is also questionable, except in some particular regions, if there is any empirical evidence for longer breaks between episodes of precipitation. The present reviewer has in the past six years worked considerably with hydroclimate and not found support for this in the literature.

Page 2, line 5: “The increase in degree of” is a strange formulation here.

Page 2, line 16: Cite also: Greve P et al 2014 Global assessment of trends in wetting and drying over land *Nat. Geosci.* 7 716–21

Page 3, lines 30–33: I guess the authors provide these examples to show that hydrocli-

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mate reconstructions also can be obtained for rather cold regions of Europe? It should be made clearer here.

Page 12, lines 12–14: It should be better pointed out that some statements about rivers that had dried out certain summers likely are not reliable or that they, at least, are overstatements.

Section 2.2 and section 3.2: This must be placed in a better dendro research context. In particular, the non-linear relationships between temperature and hydroclimate and tree-growth need to be discussed. I also note that the correlation between the tree-ring records and precipitation is very weak. It is far weaker than in tree-ring chronologies explicitly developed for reconstructing hydroclimate. I think it is important, and fair to the reader, to point out that many of the included tree-ring chronologies have not been developed with that purpose explicitly in mind.

Page 23, lines 7–10: This part can be shortened as it is not very clear what is meant with that drought has not been “very frequent”.

Page 25, lines 15–16: This is an interesting and potentially important part. Could it also be that there were fewer droughts in the first half of the 17th century in Poland because it also was the coldest part of the Little Ice Age with less evapotranspiration due to lower temperatures?

Page 26, line 31: Very strange formulation. Please, consider revision.

Section 3.2 and Fig. 7: The low number of dry pointer years in the medieval times is certainly a result of fewer records. This should be pointed out as dry years in the region actually seem to have been more frequent back in medieval times. See, most recently: Scharnweber, T., Heußner, K.-U., Smiljanic, M., Heinrich, I., van der Maaten-Theunissen, M., van der Maaten, E., Struwe, T., Buras, A., Wilmking, M., 2019. Removing the no-analogue bias in modern accelerated tree growth leads to stronger medieval drought. *Sci. Rep.* 9, 2509. <https://doi.org/10.1038/s41598-019-39040-5>.

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Page 33: Try to make changes in drought trends over time clearer to the reader. As it is written now, it is a bit hard to follow this.

Page 44, lines 18–21: The formulation is unclear and a bit hard to follow.

Page 45, line 7: “T” is missing in “This”.

Page 45, line 22: Insects rather than vermin.

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Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2019-64>, 2019.

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