

## ***Interactive comment on “Two millennia of Main region (southern Germany) hydroclimate variability” by Alexander Land et al.***

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Comments to Referee #3 by Alexander Land

Dear Referee #3, Thank you for these critical comments.

RC#3: Sensitivity tests using other seasonal windows than the well-defined (Feb. 26-Jul. 06) These sensitivity tests were conducted at the beginning of the project. The temporal changes as well as the changes in the length of the sensitive interval were studied including the well-defined interval Feb. 26-Jul. 06 as well as “classical” seasonal window lengths (e.g. April-June, March-July). This can be provided as a Figure in the Appendices. However, the “classical” seasonal windows are always well-defined, too: e.g. April-June = April 01-June 30. So to me our well-defined interval is nothing

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else than a prolonged “classical” window.

RC#3: Longer discussion about the implication of differences in MSL This issue will be addressed and critically discussed in the associated sections. Here I would like to mention, that the minimum MSL is 110 and the maximum is 230 years. In the Figure 2b the fluctuation in MSL seems to be huge, because of the scale (y-axis) ranging from 90-240. The range of this axis was explicitly used to give the reader a more detailed information about the fluctuation of MSL. The fluctuation of MSL is not as “huge” as the line graph implies. Compared to other oak tree-ring studies, in my opinion, it is not really dramatic (even normal when dealing with subfossil and historical tree-ring series). Are there reasons for this assumption? Would it be possible to provide a reference to that topic?

RC#3: Climate mean 1961-1990 instead of 1901-2000 Mean precipitation sum (Feb. 26-Jul. 06) in the investigated Main region is 219.7 mm during the past century (1901-2000), whereas the mean precipitation sum from 1961 to1990 is 241.0 mm (+10%). The reason for choosing the one-century reference period has the following reason: “outside” 1961-1990 some more droughts appeared (e.g. 1921, 1934, 1991, 1993) characterising the climate of the region. When the previous millennia are compared to the reference period 1901-2000, in my opinion, it becomes much clearer that in some periods the droughts/wets are more “outstanding”. In many other studies the reference period 1901-2000 is also used and sometimes the reference period 1971-2000 can be found (e.g. Karl et al. 2009: Global Climate Change Impacts in the United States or Meehl et al. 2003: Solar and greenhouse gas forcing and climate response in the twentieth century. Journal of Climate, 16, 426-444, DOI:10.1175/1520-0442(2003)0162.0.co). But perhaps I am wrong and we should change it to make it more comparable with other results.

RC#3: Critical discussion about applying RCS detrending – possibilities, limitations The 100-year MSL (~ minimum) restricts the potential to get low frequency information from such data, and one can use a 100-year smoothing spline. But indeed, our

discussion about that topic is not seriously addressed. In the revised version of the manuscript this will be critically discussed.

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