Climate
of the Past
Discussions

Interactive comment on "Application and evaluation of the dendroclimatic process-based model MAIDEN during the last century in Canada and Europe" by Jeanne Rezsöhazy et al.

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General comment

The paper "Application and evaluation of the dendroclimatic process-based model MAIDEN during the last century in Canada and Europe" by Rezsöhazy et al. is a good example to explain specifics of MAIDEN model application taking into account a complexity of such multidimensional tool to simulate tree growth under climatic influence in different environments.

The overall impression of the paper is very good. The logical structure of the

manuscript, a detailed description of the parameterization procedure of the model itself and skills comparison of two models: VS-Lite and MAIDEN are noteworthy. I want to underline that the parametrization of such models, their calibration and verification is a key point to apply correctly a tree-growth simulation in different habitats.

The authors mentioned that their "results provide a protocol for the application of MAIDEN to potentially any site with tree-ring width data in the extratropical region". I am wondering did the authors make the MAIDEN code available in some open-access depository to use it for wider group of researchers. I am sure the tables of optimal parameter values for some sites as well as corresponded climate data and tree-ring chronologies putting on-line will allow to make the model itself more applicable in the research community.

I suggest that the paper can be published after minor revision.

Specific comments

Section 100 "...the ongoing phenological phase (five phases per year: winter 1, winter 2, budburst, summer and fall)" Could the authors explain what is the difference between winter1 and winter 2 phenological phases?

Section 125 "Those chronologies have been standardized using the Age-Band Regional Curve Standardization (or RCS) method". Did the authors use pith estimations for individual tree-ring series? Did the authors split fast and slow growing trees to avoid end-effect bias?

Section 135 "...we get five aggregated sites (Table 1)" What are intersite correlations (Rbar) between tree-ring chronologies at the same one-degree grid? Could the authors clarity this point in the paper?

Section 135 "This observational network represents an archetypal example of a singular species that covers an important hydroclimatic gradient" Why is the gradient important? Could the authors explain it?

Section 140 "…standardized with a cubic-smoothing spline with a 50% frequency cut-off at 35 years;" and "… standardized using a spline with a 50% frequency cut-off response at 32 years". The authors mentioned that the European sites has a good replication of wooden samples which is a necessary condition to apply the same standardization strategy as for Canada. What was a reason to use another standardization technique for Europe which could be a reason of the end-effect bias (Melvin, 2004)?

Section 170 "The comparison relies on the computation of the model likelihood defined as the sum of the logarithms of the normal probability densities of the residuals between the model simulation and the observations". Why the authors use the logarithms of the normal probability densities of the residuals? Are the residuals non-normal distributed? It seems to me by such transformation the authors tried to adopt the Markov chains procedure to their parametrization taking into account strong requirement of data normality in Markov processes.

Section 190 "Pearson correlation coefficients between observed TRW and simulated Dstem were computed, as well as the corresponding confidence level" Pearson correlation is not enough to guarantee a convergence of simulated curve with initial chronology. Why did not the authors use an additional criterion such as RMSE minimising or others?

Section 200 "The VS-Lite parameters are calibrated at each location…" How many parameters were optimized keeping in mind that overall 11 of them were used in the VS-lite? Could the authors describe them more precisely in the ms.

Supplementary materials. Could the authors include the table with the optimal MAIDEN and VS-lite parameter values for all sites in Canada and Europe?

Supplementary materials. Among with Fig. S2, S3 could the authors include the obtained distributions of the MAIDEN parameters?

Supplementary materials. Could the authors include the obtained distribution of the

VS-lite parameters?

Please also note the supplement to this comment:
https://www.clim-past-discuss.net/cp-2019-140/cp-2019-140-RC1-supplement.pdf