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Discussions

Interactive comment on "Quantitative reconstruction of precipitation changes on the NE Tibetan Plateau since the Last Glacial Maximum – extending the concept of pollen source-area to pollen-based climate reconstructions from large lakes" *by* Y. Wang et al.

Anonymous Referee #2

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Title: Quantitative reconstruction of precipitation changes on the NE Tibetan Plateau since the Last Glacial Maximum - extending the concept of pollen source-area to pollen-based climate reconstructions from large lakes Author(s): Y. Wang et al.

This is a very interesting study in which the authors address the influence on lake size (and therefore pollen source area) on paleoclimate reconstructions. The paper is generally well designed and written, and there are some very informative results. For

example, the comparison of surface samples from neighboring small and big lakes (to show difference in taxa representation) is very useful. However, there are several parts that could use some clarification. I can't help wondering if the paper might be improved by concentrating on the effect of including lake size, and leaving the discussion of the reconstruction and it's regional significance for another paper.

Given that the goal is to show how using pollen source are improves reconstructions, why is there no comparison with paleoclimate estimates made without taking source area into account? Without this, it is hard to judge how much bias is introduced by not accounting for lake size, and so if the extra work involved in this study really helps in reconstructing climate.

The authors use a battery of statistical methods to examine source area and pollen-climate relationships. Well these are well described, the paper might benefit from a short introduction in the methods section, explaining why these methods have been chosen and what they are being used for. For example, why do the authors use two methods for reconstructing past climate? And how much difference is really observed between these methods?

Some general comments follow:

Page 3565, lines 1-3: It is not clear to me how "species-specific variations in pollen dispersal patterns" are connected to lake-size. I agree that these variations will affect reconstructions, but how are these linked to lake size?

Page 3566, lines 11-12: While the study of past climates helps inform future changes, I'm not sure that it is an "indispensible key for predictions"

Page 3567, lines 15-16: I realize that this will be stated in other papers, but please add a line to explain why estimating deposition in the center of a basin is not suitable for lake sediments

Page 3570: Can the authors include an equation detailing how pollen source areas are

estimated, and what parameters are included?

Page 3570, line 29: Given that different taxa show different source area relationships with a given lake size, how was the final pollen source area derived?

Page 3571, line 14-15: This is where the effect of lake size (and source area) is taken into account, and a little more detail would be useful. Why was IDW used? Climate would normally be interpolated from climate stations to a surface samples, so how does IDW changes the final value assigned? And how would this differ from a direct interpolation from climate stations?

Page 3572, line 27-28: Can the authors provide a citation for the "minor influence" of rare species?

Page 3573, line 17-19: Given that linear methods were indicated here, why did the authors use WA-PLS for reconstructions?

Page 3574, line 19: Why were these variables selected (Pann, Tjul)? Why not seasonal precipitation?

Page 3575, line 1: How where the samples resampled to a regular time step? Interpolation? Averaging?

Page 3575, line 4: By restricted permutations, do the authors mean block resampling?

Page 3579, line 25: The authors note that variations in lake size through time will have an effect on climate reconstructions, but in this article they do not look at size variation over time. I believe the implication is that the lake, which is steep-sided, will not have changes area much over the time period of study, but it would be nice to have the authors explain this, or how they might try to include time-dependent effects of lake are variation

Page 3580, line 1: I don't think that it is true that changes in the pollen composition "have rarely been considered when inferring quantitative climate variations from lake-

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pollen records" – any reconstruction method must do this.

Page 3580: Why is Tann not reconstructed or discussed here?

Page 3580: It would be very informative to compare the reconstructions with the lake area taken into account, with a standard reconstruction (or just compare the climate for the source area with a point estimate of climate)

Page 3581, line 13: I think this figure 8c not 8d

Page 3587, line 15: change "minimize" to "reduce"

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