

## ***Interactive comment on “A chironomid-based mean July temperature inference model from the south-east margin of the Tibetan Plateau, China” by Enlou Zhang et al.***

### **Anonymous Referee #2**

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This manuscript presents two nested chironomid-temperature calibration set from China and a reconstruction of July temperature over the last ~150 years from a mountain lake. The manuscript is well written.

The rationale for using both the 47 and 100 lake calibration sets is unclear. The paper would be greatly simplified if only the larger calibration set was used.

The correlation between the instrumental data and the reconstruction appears to be good ( $r = 0.45$ ) given the small magnitude of the variability in the instrumental record and the large uncertainty on the reconstruction. However, the statistical significance may be overstated because of the lack of independence between samples due to autocorrelation, both inherent in the data and induced by the three-point moving average

C1

of the instrumental data.

###Minor points

Line 183 Böhner 2004 is not in the reference list. It is probably worth clarifying that Böhner uses reanalysis data.

A histogram showing the distribution of lakes along the temperature gradient should be given, or at least discussed, as WAPLS is sensitive to an uneven distribution of lakes.

Line 217 If  $N$  (number of lakes) is less than two, Hill's  $N_2$  is guaranteed to be less than two.

Line 223. Variance inflation factors are useful for diagnosing multi-collinearity amongst the predictors, but is less useful for identifying which variable should be deleted. Simply deleting the variable with the highest VIF is a poor strategy. Stepwise selection based on pseudo- $F$  is probably better.

Line 250. A 2-component WAPLS model is selected although the improvement in model performance is only about 1%, less than the 5% threshold reported. A randomisation t-test is probably a better test than a simple threshold.

Line 296. I think it would be better to show that temperature is an important predictor with the ordination before discussing species temperature preferences.

Line 309. Move the section on Lake Tiancai chironomids to after transfer function development.

Line 398. It is expected that weighted-averaging with inverse deshinking and weighted averaging partial least squares component-one will give similar models. Under certain circumstances, they will be identical.

Line 401. Please don't use novel abbreviations. The space they save is not worth the cognitive load on the reader. No need to report all the performance statistics that are in table 4.

C2

Line 438. Please provide a statistical comparison of the reconstruction and the instrumental data. Reporting that they have a "comparable trend" is not sufficient - don't leave it to the discussion to give the correlation.

Line 621. The text suggests that the instrumental data are lapse-rate corrected, whereas the figure suggests that anomalies are compared. Obviously, the former test is much more powerful.

Figure 2 is impossible to interpret as the reader does not know the lake numbers. Sorting the lakes by temperature (and including this information), would make this figure much better.

Table 3 is rather large and needs to be condensed by extracting just the most important parts (eg L1/L2 for temperature).

Table 4 needs proper headers, not simply the output from C2.

The authors should state where the data will be archived.

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