

## ***Interactive comment on* “The quantitative reconstruction of the paleoclimate between 5200 and 4300 cal yr BP in the Tianshui Basin, NW China” by N. Sun and X. Q. Li**

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General comments A quantification of two sets of charcoal assemblages from middle Holocene terraces in China was done in order to reconstruct past climate. Although the chosen tool for this study the CA method is not novel, it applied to 2 sets of charcoal in an important part of the world. This is overall an interesting manuscript with useful conclusions.

Specific comments I do not understand how you come to an age of 4800-4300 cal yr BP for the samples in the Xishanping section. There is a date at 350 cm of 4970±100, therefore your first sample (at 450 cm) is older than this and more likely to be close to

5620 yr, the date at 490 cm depth. This has serious implications because your 2 sites have then a clear chronological overlap. If the date at 5620 yr BP is to be rejected you have to explain this clearly. I suggest that you add a section on chronology, as other radiocarbon dates are reversed too.

Page 2746, lines 8-9: you suggest that 100 charcoals is sufficient for a temperate region. You work however in a subtropical region, which has normally more biodiversity. Should this mean that you should count more charcoals?

Page 2746, Lines 18-23: discuss what is the difference with the mutual range method? It is used widely in the Holocene for various proxies such as pollen and beetles.

Page 2747, line 3: we need many more details here on where you got the plant distribution, species by species, and also explain better how you have linked the plant distribution and the meteorological data in the stations. Add at least a paragraph.

Page 2747, line 23: add an 's' to forest because you are dealing here with at least two different forests types. Some charcoals may have been transported as trees by the river.

Pages 2749-50: What is the role of the difference in altitude between the 2 sites? is it enough to have different vegetations and different climates at the same time? What is the altitude of the Lueyang site you use for comparison?

Section 5 Discussion; it would be useful to illustrate the changes over time in each site using the CA method. Could you add two diagrams?

Technical comments Page 2742 Lines 11-14, page 2749 lines 28-29, and page 2750 lines 1-2 and 13-15: replace the word 'increase' by 'were higher than present'. Everywhere replace 'from 5200-4900' by 'from 5200 to 4900'. Page 2742, line 15: between 5200 and 4300 Page 2743 line 20: are relatively direct proxies Page 2744, line 2: the fossil charcoal reflects local vegetation Line 4: reconstructing the local vegetation history and the local climatic Line 15: delete ", which is sensitive to climate change" as

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much too general Line 16: where does the information come from, from which met station and from which sources? This is an average on how many years? Line 21: replace by the modern botanical nomenclature Page 2746, line 16: in which institution is located the wood collection? Page 2748, lines 6 to 26: move this to the introduction. Table 1: In the caption indicate that the AMS was for 14C. The same for fig. 3 and 4. Add a column with the ages used in fig. 2 Table 2: Ulmus is misspelled Fig. 1: add North. In the caption, add the meaning of the triangles. Fig. 2: add a vertical line along each lithological column for the depth range where the samples come from. Disturbed is misspelled. Fig. 3 and 4: add a column with the numbers of charcoal counted. Fig. 4: it seems that the charcoal samples and the radiocarbon samples have the same sample numbers. Is this correct? Should it be different? Fig. 6 and 7: add horizontal lines for the modern values in each graph.

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