

## ***Interactive comment on “The 4.2 cal ka BP Event in Northeastern China: A Geospatial Perspective” by Louis A. Scuderi et al.***

### **Anonymous Referee #2**

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The paper by Scuderi et al. presents an example of geospatial analysis on the 4.2 events database by using the new conceptual spaces for defining the informational architecture of the reconstruction of this event in northeastern China. It's a new approach to integrate the climate event in a large region and even on the continental scale. However, there are still some issues need to be considered in the integration with this geospatial analysis. I recommend the acceptance of this manuscript for publication in the journal of Climate of the past after moderate revisions.

The description for the eastern, southern and northern units of Hunshandake Sandy Lands is rather unclear. Is it the yellow shaded region in figure 1, labelled with Hunshandake, was subdivided three units or the box region, namely the study area reported in this study, was subdivided three units? I suggest the authors to rewrite this

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part and describe this clearly. The authors may use simple plots to indicate these three units.

How the CMIP5 data was generated from the coupled model intercomparison project 5 data? Is it the average of the multiple model outputs or just a single model output (which model) for 6 ka? Although the wide range of a single climate variable (e.g. June precipitation in the text) at the study site is somewhat useful to illustrate the difficulty using a single site in assessing the impacts of the 4.2 event, the changing direction and rates are more important to assessing the influence of the event. So, the varied climate changes observed in the study area in different years might be more robust to illustrate this difficulty. In addition, the paleoclimatic proxy usually reflect the mean climate condition and the relative changes, so using the absolute value of June precipitation to illustrate the complex of using single site in studying the climate change is some unsuitable. Maybe using the seasonal or annual climate condition changes is more appropriate.

In the 77 sites reported in 60 published papers, some sites might be reported several times, which may bias the evaluation inevitably. How to deal with these repeats in different publications should be considered in the geospatial analysis.

The 4.2 ka event is hardly to be extended to 3.0 ka and even later. A return to grass land condition between 2.8 and 1.5 ka BP at eastern Hunshandake can't be regarded as a different signal for 4.2 ka event. So, I suggest the authors should also double check the response of 4.2 ka event at other sites and place this event within a certain period, although the chronology uncertainty could be a factor broadening this period slightly.

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