

Earth Syst. Sci. Data Discuss., referee comment RC2
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Comment on **essd-2022-148**

Anonymous Referee #2

Referee comment on "Gridded pollen-based Holocene regional plant cover in temperate and northern subtropical China suitable for climate modelling" by Furong Li et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2022-148-RC2>, 2022

General comments

This paper describes the use of Holocene pollen records to estimate pollen-based plant-cover reconstruction (27 plant taxa, 6 plant functional types (PFT) and 3 land-cover types (LCT)) for temperate and northern sub-tropical China.

The paper provides information on the Landscape Reconstruction Algorithm approach and its sub-model REVEALS, its current state, data sources and sites, and choice of methods. The results are part of a wider project, the European and northern hemisphere results have already been published. This paper clearly states the limitation of the REVEALS reconstruction, especially the lack of two major taxa (*Abies* and *Picea*). The main sources of uncertainty are discussed and future improvements to methods and data are described. Maps provide examples of the LCT reconstructions for major key time windows over the Holocene. The paper is carefully constructed, comprehensive and well explained.

While the paper states that the present the first pollen-based quantitative reconstruction of Holocene plant-cover change, the authors also mention that they use REVEALS estimates previously published in Li et al (2020). Could you further explain the differences between Li et al. (2020) and this paper?

The main limitation in the datasets is the grouping of sites from adjacent grid cells for the application of the REVEALS model. Although the authors explained and justified their choices, my main concern is not that they grouped sites but rather that they gave results and interpret them at the 1x1° grid cell, see below

L231 you have previously said that 57 grids were grouped into 19, and only 18 grids cells

remained. It is confusing that results and maps are still expressed into grid cells, while they were not calculated as such.

L 268 Yes no surprise that those grid cells are all reaching low value as sites from all grid cells are used for calculation. This is confusing to give number when in fact the value reflect the group. Is there any other way of showing the results without numbering cells that are indeed carrying the same regional vegetation cover estimates?

I do understand why you have presented maps of LCT, I'm wondering if you could have presented a graph that synthesize changes in proportion for each LCT focusing on the groups of sites (instead of grid cells)

Abies and *Picea* exclusion

L 296 the exclusion of *Abies* and *Picea* needs further explanation. Their exclusion can already be mentioned and justified in the methods.

Other comments

L 234. Is the results from the ten PFTs used in Li et al. 2020 necessary, as you're saying this classification is not the best one for the purpose of your article

L78 LC and LU instead of LU and LC

L132 rephrase to the basin type (lake or bog) and its size (area and calculated radius)

L196. You mention three computer programs, only one is specified.

L189 Use either SD or SE and harmonize through the text. I'm not sure that there are differences between the two terms in your results. ERV results are expressed in SE, the delta-method as well.

L203 space between lake(s)) and are

L204 space between obtained and using

L236 10.7-11.2 ka BP instead of 9.7 – 10.2 ka BP

L261 Harmonize names of time windows between text and figures

L412. I guess there are ways of testing the impact of RPP's SE on the REVEALS reconstruction, by testing the sensitivity of the REVEALS model using simulation. But this was out of scope of this paper.

L 433 To be provocative I would say "This is a serious caveat if the taxa for which no RPP values are available represent a significant part of the **vegetation** and are present in the pollen assemblage" We want to be able to reconstruct key dominant species in the **vegetation**...Apart *Abies* and *Picea*, are they other dominant taxa in the pollen assemblages with no RPP values?

L 443 remove "estimate the **the** past"

L457 remove "be cautious and **The** is a limitation of the"
L. 469 correct "REVEALS estimates **rby** increasing"

L468, your strategy of having two pollen counts per time window prevent the problem to only have one pollen count documenting the whole period. This pollen count could be linked with a unique event

L500 insert a space between "cover_(e.g."

L516 the information on "x years (x years is the number of years between 1950 CE and the year of coring)" should be already mentioned in the methods

Figures

- Fig 1: is the graph in the right lower panel useful?
- Fig 2-4 could you improve the maps by adding key information that you're referring in the text (i.e. Yangtze River region, vegetation zone...)
- Fig 4, ensure error circle of grid cell 30°N-90°E is in the reconstructed cell for time window 5.7 – 6.2 ka BP