

Interactive comment on “Mid-Holocene climate change in Europe: a data-model comparison” by S. Brewer et al.

Anonymous Referee #1

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The authors of this manuscript address what I believe are important problems in data-model comparisons, including: 1) how do we assess the degree of uncertainty in both the data-based reconstructions and in model simulations, and 2) how do we give credit to the model simulations when they get the direction and/or amplitude of change correct, but with shifted geographic placement?

The researchers employ an impressive array of approaches, although it is difficult to assess whether all of the underlying assumptions can be supported. For example, is it reasonable to consider (for the basis of data-model comparisons) widely dispersed clusters to represent the same climatic causes? For example, cluster 4 is present in the western British Isles and Netherlands-Denmark-N. Poland, absent across most of the intervening continent, and then present again in the Black Sea and Aegan region. The

pollen-based anomalies must be similar, but are they due to the same causes? If not are not due to the same causes, how do we assess the performance of the models?

In regard to the model simulations, should it have been an option that the model simulated values at a given grid point do not have to fit into the clusters identified in the paleodata? In other words, what criteria must be met to declare that a given gridpoint is sufficiently similar that it warrants membership in a given cluster?

The authors were faced with a mismatch between the amplitude of anomalies in the model simulations and those reconstructed from pollen data. Their solution was to magnify the model anomalies to match the amplitudes of those in the data. This brings up a couple of questions: 1) are the relatively small anomalies in the model simulations within the noise level (and thus amplifying them would not make sense), and 2) if the 6 ka model runs underestimate the degree of observed climate change, is there an implication that simulations of future climatic changes may also produce changes that are too modest?

There are also some minor problems with the manuscript, including:

- 1) The abstract says that more than 400 pollen samples were used in the reconstructions, whilst later in the text it says that either 350 or 245 samples were used.
- 2) I believe that the more-arid anomalies should be categorized as “drier”, not “drier” (every definition I could find states that a “dryer” is an appliance that removes moisture).
- 3) Figure 1 - the scales for MTCO and GDD5 are misplaced (MTCO has the scale for GDD5 and vice-versa)
- 4) the caption for Figure 3 should indicate that these are anomalies (are they not?)

Interactive comment on Clim. Past Discuss., 2, 1155, 2006.

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