

Interactive comment on “Comparison of simulated and observed vegetation for the mid-Holocene in Europe” by S. Brewer et al.

Anonymous Referee #2

Received and published: 27 June 2009

Thank you for the opportunity to read this article, it was informative and seeks to answer an important question for palaeoclimatic researchers: why GCMs appear to be in disagreement over mid-Holocene (6kya) climate conditions in the Mediterranean.

Using four GCMs, acting as inputs into the CARAIB vegetation model the authors test various mid-Holocene climate scenarios and examine the effects on biome distribution. Using the results from this analysis they then test model sensitivity by modifying climate parameters and CO₂ concentrations for the most suitable model (GISSmodelE).

The paper succeeds in presenting fairly complex data in a straightforward manner but at times this is hampered by a lack of precision in the language (discussed below), and perhaps to a lesser degree, by the overly large number of figures. I believe this

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

paper ought to be accepted by the editor with some minor changes. Particular emphasis should be placed on broadening the abstract to include comment on the fit of the GISSmodelE in the Mediterranean, a particular goal of this paper.

Specific Comments: Abstract, last sentence: I am not comfortable with this sentence. "The matching simulated circulation patterns"; ought to be clarified further. Is it not possible to add that it is the GISSmodelE that provides the best fit to the vegetation models, and also supports the hypothesis of increased westerly flow?

p967 l5: sounds like to are comparing between continents.

P967 l21-23: Can you add a reference to this statement? Would Thuiller et al (2005; doi:10.1073/pnas.0409902102) be appropriate here? It depends on what you mean by "most affected": inundated (Netherlands) or dessicated. . .

p968 l16-17: Is there a reference for this statement?

P968 l17-21: The phrasing of this statement is unsatisfactory. The issue of precipitation is one of both availability in the sense of evaporation/transpiration, but also of timing with relation to the growing season. It seems that this issue, change in the timing of the rainfall, is more important for the Mediterranean, and as such you should be more explicit in this regard when explaining the issue.

p971 l18: Is point (b) simply a 0,1 value indicating whether or not there is a period during which seed cold-stratification period can occur, or is it the actual length of time (Julian days) over which stratification may occur?

P972 l11/Table 1: Jungclaus et al (2005) is not in the references. Given the differences in GCM resolution do you expect the overall sensitivities of the models to be somewhat different, simply given that low resolution models may not accurately represent sharp climate gradients cf. at marine/terrestrial interfaces? I am not as familiar with GCMs as the authors evidently are, but I had trouble interpreting the resolution T63, is it possible to translate this into degrees for Europe?

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)

P973 I12: The first sentence is very long and not particularly clear. There are "different changes"; but the authors only discuss changes in the east. What is happening in the west?

Figure 3: Is it possible to change this figure into four panes with a single caption rather than four separate figures?

P974 I12: While I agree with the authors with regards to the visual interpretation of Figure 7, this analysis would be more compelling with some sort of statistical test comparing changes across the regions and between the models. This would add further support to the contention made on the same page at I15.

Figure 7. Is it true that the bars represent the limits of the data? Or do they represent the 95% CIs for the data? The latter would make more sense if there are outliers beyond the bars. P975 I975: Again, can this contention ("little difference to the modern potential cover") not be tested in some way? I wonder if Syrjala's Psi (Ecology vol 77, 1996) might not be useful here.

P975 I19-20: I find this statement very interesting, but I don't understand how this is the case. Can you make this statement more explicit? Are you saying that the area covered by tundra in all models decreases but that the overall distribution of the tundra varies between models so that there is no one region that has a decline in tundra across all models?

Figure 8: The axis titles for these four figures are not informative, what is the unit of measurement for these values? It is not clear which axis is the temperature anomaly and which is the precipitation anomaly. Also, this figure may be more informative (and smaller!) if split into only two, one four panel figure for precipitation and one for temperature, with four curves in each representing the individual model outputs. This would also allow for easier comparison between model outputs.

P977 I5-6: Is this true? It looks like many of these changes exceed zero. What is the

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)

scale of the anomaly? Again, are these summary statistics the means of all the pixels within each region? If so can you not test whether the differences are significant from zero?

P978 I21: "Changing"; can you change this to "Decreasing"? I am not clear here whether this is the sensitivity test VCO2.

P979 I25-28: "show a poleward shift in . . ."; do you mean "show a poleward shift for temperate forests in . . ."?

P980 I1-2: This needs to be rewritten. You do not define a Central European forest type in the text.

P980 I3-5: I would take "Observed southward spread . . ." to mean observed in your results, but I think you mean Observed through the pollen record. Perhaps this can be made more clear.

Technical Corrections:

In several places (p966 I10, p974 I22): "Try and . . ." is a common mistake and should be changed to: "try to . . ."

p968 I13: add "have" before "had"

P970 I24: add "by" before "the GCM"

P973 I4: Add a space between “using” and “the”.

P973 I23: Add an 's' to "input"

P975 I15-17: Add "pollen" to "the data", presumably this is pollen data?

P976 I5: change "a" to "the"

P977 I2: I think this is referring to Fig 8.

P979 I3: Add "the" to "in east of Europe"

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)

Interactive comment on Clim. Past Discuss., 5, 965, 2009.

CPD

5, S297–S301, 2009

Interactive
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

S301

