

Review of the manuscript cp-2011-67

“Tropical climate and vegetation changes during Heinrich Event1:
comparing climate model output to pollen-based vegetation reconstructions with emphasis
on the region around the tropical Atlantic Ocean”
by D.Handiani, A.Paul1, and L.Dupont

Recommendation: minor revision

General Comments:

The authors used the University of Victoria (UVic) Earth System-Climate Model (ESCM) with dynamical vegetation and land surface components to simulate four scenarios of climate-vegetation interaction to investigate the effect of abrupt climate change on tropical vegetation during Heinrich event 1. A model-data comparison was performed by the authors to validate the simulation and to discuss the mechanism of the impact of HE1 on vegetation patterns in the Atlantic tropical region. The manuscript makes valuable contribution towards understanding how vegetation pattern changes in tropical areas in different climate backgrounds (glacial and interglacial).

I recommend that the manuscript be accepted with minor revision.

Specific comments:

1. The authors mentioned that the precipitation response in the HE1_GL simulation (Page 1988, lines 16-24) was similar to several other studies that is related to a southward shift of the ITCZ. Usually, the ITCZ appears as a band of clouds (thunderstorms) that circle the globe near the equator. But from Figure 9, it can be seen that the increased precipitation (due to a southward shift of the ITCZ) is approximately in the Southern Atlantic Ocean (0° - 30° S) and Eastern South America, which is not a band structure. Please give some illustration about the precipitation structure and the relationship with shift of the ITCZ for the HE1_GL simulation.
2. Following comment 1, simulated tropical mega biomes by UVic ESCM corresponding to the increased precipitation in Eastern South America in the EH1 simulations do not match the reconstructed biomes (Figure 11). At the same time, simulated SST in the HE1 experiments shows a bipolar seesaw pattern due to a collapse of the AMOC. It would be better if the authors could give a discussion in the summary part on how the collapsed AMOC influence North Atlantic climate, and further influence the vegetation pattern distribution in the tropical area.
3. Page 1995, line 6, the authors mentioned “PI_CNTRL biomes were in general agreement with modern and Holocene biome reconstructions.....”. As is introduced in the experiment setup, the PI_CNTRL experiment was forced by the pre-industrial boundary conditions, if the simulated biome results were in general agreement with Holocene biome reconstructions, what does it means, please give more indications to clarify this point.
4. The Abstract and Summary and conclusions are suggested to be rewritten to highlight the most important contributions of this paper.

Minor comments:

1. Please show or give indications of color scales in PFT covers in Figure 3.
2. The red crosses in Table 4 (sites 14, 15) are shown in blue crosses in Figure 11, they should have the same colors.