

Interactive comment on “Pollen-based biome reconstructions for Latin America at 0, 6000 and 18 000 radiocarbon years” by R. Marchant et al.

Anonymous Referee #1

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I have reviewed the paper entitled ;Pollen-based biome reconstructions for Latin America at 0, 6000 and 18 000 radiocarbon years&; by Robert Marchant, S. P. Harrison, H. Hooghiemstra, V. Markgraf, J. H. van Boxel, T. Ager, L. Almeida, R. Anderson, C. Baied, H. Behling, J. C. Berrio, R. Burbridge, S. Björck, R. Byrne, M. B. Bush, A. M. Cleef, J. F. Duivenvoorden, J. R. Flenley, P. De Oliveira, B. van Geel, K. J. Graf, W. D. Gosling, S. Harbele, T. van der Hammen, B. C. S. Hansen, S. P. Horn, G. A. Islebe, P. Kuhry, M.-P. Ledru, F. E. Mayle, B. W. Leyden, S. Lozano-García, A. B. M. Melief, P. Moreno, N. T. Moar, A. Prieto, G. B. van Reenen, M. L. Salgado-Labouriau, F. Schäbitz, E. J. Schreve-Brinkman, and M. Wille.

This paper is the last one of several interesting papers which focus on the reconstruction of the 6 ka and 18 ka biomes for most regions of the world, in the framework of

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the BIOME 6000 project. After biomes reconstruction for Africa, China, Eastern North America, Eurasia, Europe, Japan, Australia, Western North America, and Beringia, R. Marchant et al. propose to fill the gap for South America and to produce a pollen-based biome reconstruction for Latin America.

I think this paper is well written, clear, and can be published in the special issue of Climate of the Past with only minor changes.

To better validate your biomisation procedure, could you add a table with a numerical comparison of each site between pollen-derived and observed biomes at 0 ka (cf table 4 in Jolly et al., 1998)?

-p. 373, line 10: change 1000±18 000 14C yr BP to 18000±1000 14C yr BP

-p. 377, line 21: Could you better explain how you classify the potential vegetation into twelve biomes? A table with the 57 different vegetation types (Huck, 1960, Schmithusen 1976) and the biome assigned could be added.

- p. 378, lines 10 to 18: I think that this part should be moved to the method part.

- p. 381, line 20: I don't see any dating control in table 6, I think you are talking about the table 1. Please check.

- p. 382. Are the 381 modern pollen samples stored in the LAPD? Several studies focused on Scandinavian samples show that the pollen traps record a signal that can be different than the signal based on the moss posters. Could you add a sentence to justify the use of the pollen traps?

- p.382, line 8: I don't agree with this sentence: The taxonomic diversity of the Neotropical phytogeographical realm can be demonstrated by taking the modern biomisation as an example: the number of pollen taxa for the production of our biomes is greater than Africa (364) (Jolly et al., 1998a), Europe (41) (Prentice et al., 1996b), Russia and Mongolia (98) (Tarasov et al., 1998a) and China (68) (Yu et al., 1998). In your study, you take into account in the biomization procedure all the pollen taxa.

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In previous studies, only the main taxa (very few herbaceous taxa) were taken into account for the biomes (Prentice et al., 1996b, Tarasov et al., 1998a). Elenga et al. and Peyron et al., 1998 have increased the number of taxa for Europe (104 taxa). For Africa, 364 pollen taxa were used for the production of the biomes, but here too, the number of taxa available in the modern pollen dataset was strongly higher.

- p. 383, line 17: are you sure it was Biome 3 in Prentice et al., (1992)? I think it was the Biome1 vegetation model.

- p. 384, line 28: could you give more details in the text about the definition of the biome affinity scores?

- p. 388: the other biomes (steppe, desert?) are not discussed.

- p. 397, line 24. This regression of the forest during the mid-Holocene (8000 to 6000 14Cyr BP) in the southern tropical zone of Latin America is opposite to full forest development in Africa (Servant et al., 1993; Jolly et al., 1998a). Please nuance your sentence. I don't see a full forest development in Africa and disagree with this sentence: in Africa at 6 ka, the tropical seasonal forest was present in all the sites from central Africa, except for one site from Cameroon. Tropical rain forest was not present in this region. In eastern and southern Africa (including Madagascar), the biome distribution was generally similar to today (Jolly et al., 1998).

- p. 398, lines 17-28: could you add more precisions about this sentence?

- p. 400, line 19: I prefer to change ;modern analogue-driven transfer function; by modern analogue approach because the modern analogs technique is not a transfer function sensu stricto.

- p. 400, line 27: please add the references Wu et al., 2007 climate dynamics, and Wu et al (2007) PNAS.

Table 1: check your table caption (it's the table 3 legend). Please define MTCO, alpha. Usually alpha is below 100. How do you explain your value above 1500 in the biome

TRFO?

Table 2: how do you define the bioclimatic range? Explain, what is MTCO, alpha and GDD5 in your table caption.

Table 3: check your table caption .What is RC?

Table 5 is better before table 4.

Figure 1: Explain better your biome code. Could you use the same color code as in table 7, 8, 9? For example; desert is pink in figure 2 and yellow in the others figures. WEFO is also different. Please check.

Figure 3 : in your pictures, g is f, and f is g I think. Please check

Figure 4 : the legend must be more clear (give the name of the biome in the text..)

Figure 5 : really not clear. How do you define the clim. Space?

Check the tables in your text (for example: p.383, line 15, it's not table 3 but table 2, and so onæ).

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