

Interactive comment on “Detecting vegetation-precipitation feedbacks in mid-Holocene North Africa from two climate models” by Y. Wang et al.

Y. Wang et al.

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Interactive comment on "Detecting vegetation-precipitation feedbacks in mid-Holocene North Africa from two climate models" by Y. Wang et al. H. Renssen (Editor) hans.rensen@geo.falw.vu.nl Received and published: 20 September 2007

Dear authors, Thank you for submitting your manuscript to Climate of the Past. Both referees find your paper an interesting contribution, presenting an original analysis of vegetation-climate feedbacks in mid-Holocene North Africa. However, Referee #1 mentions a recently submitted paper by Notaro et al. that has very similar methodology and conclusions. Since I do not have access to the Notaro et al. paper, I cannot form an opinion on the novelty of your contribution. I therefore encourage you to submit

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a revised version of the manuscript that clearly discusses the novel aspects of your results compared to the Notaro et al. paper.

Response:

The paper by Notaro et al, in which I am the second author, is a separate research paper as compared with this paper. In my paper, I focused on the three major findings as listed in my conclusion section. In particular, the timescale dependence of vegetation-precipitation feedback is a distinguished finding that has not been reported in modeling and paleoclimate studies. Furthermore, the effect of background climate state on vegetation-precipitation feedback has not been reported in previous vegetation-climate interaction studies. On the other hand, Notaro et al. focused on the annual timescale interaction between vegetation and precipitation. They employed methods that include statistic approach and initial value ensemble simulations. In this short paper, we really want to initialize the whole vegetation-climate study community with the three major findings that we reported here. We expect further investigations such as Notaro et al. to follow up in the near future. Please notice that Notaro et al. (2007) has a different title now as listed in my reference. The paper is available online now.

All other issues raised by the reviewers should also be addressed in the revised manuscript. One particularly important issue raised by both referees is the potential impact of runoff and soil characteristics on your results. Please discuss in detail the treatment of soils and runoff in your models, including the involved assumptions and the effect they might have on the presented results. Another important point, raised by Referee #2, is that some results discussed in the text require support from additional figures. Referee #2 recommends discussing figures showing seasonal results for precipitation, evapotranspiration and soil evaporation, as well as figures showing soil humidity and surface albedo for 6k and 0k.

Response: We have carefully responded to reviewer's comments (see attached responses to reviewers). In particular, we have significantly revised our paper to explore

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the potential impact of runoff and soil characteristics on our results. The treatment of soil and runoff has been extensively explored in our revised paper. In addition, we have added two figures on the different top layer soil moisture (associated with surface albedo calculation) and annual rainfall between 6K and 0K model simulations to support a wet surface condition in mid-Holocene. The total effect of monthly and seasonal features is already included in our Figure 5. The actual surface albedo is missing in the model history files so that we cannot plot this variable. However, the wetter mid-Holocene conditions correspond well with the detected negative feedback regions in both climate models.

Thanks again. Hans Renssen Interactive comment on Clim. Past Discuss., 3, 961, 2007.

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