

Interactive comment on “Climate and topographic controls on pasture production in a semiarid Mediterranean watershed with scattered tree cover” by J. Lozano-Parra et al.

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Received and published: 2 January 2014

hess-2013-544 - Referee Comment

I found this to be a thorough and complete study, that is well-written & carefully referenced. The paper is easy to read and follow. The modelling exercise appears to be described in sufficient detail to give readers a clear idea of the model structure and function, while it strikes a good compromise between adequate and excessive information.

There are some small errors relating to correct use of English, but these can be read-

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ily corrected and do not involve major work. I'm attaching a scanned copy of the manuscript that I annotated to point out these errors and suggested corrections.

I believe that the title is misleading as it does not indicate that the study is a modelling exercise. This point needs to be made clear in the title so readers know that the results are the product of simulation. I'd suggest that the title include the word 'modelling' and perhaps the '300 year series'.

I have a number of queries regarding the study. (i) In the simulation of the weather data, was the necessary co-variance between variables, that were being simulated separately, considered? (p. 15178, In 26 & onwards). For example, one may expect that dry conditions would also coincide with larger hours of radiation and higher temperatures. Were the simulations of weather such that these weather variables varied in association with each other. (ii) Where did the tree density come from and did it change at all over time (through the 300-year period of simulation)? If tree cover was static, and unable to respond to variations in climate, then I think this should be made explicit, as it seems rather unnatural (although not unacceptable in a modelling exercise). (iii) The modelling results depend in part on the re-distribution of water both overland (steeper slopes) and subsurface, allowing higher some units to accumulate more water, and thus have greater productivity. However, it was not clear to me how such re-distribution occurred in the modelling. Therefore, it was not clear whether such modelling results should be given much credence. In general, my previous point relates to the need in a modelling exercise to be clear about which results are considered realistic (likely) as opposed to those that might be an artefact of the model design and structure. Running the model over a longer sequence of years will not remove defects or artefacts of the model, but it is the modellers who are most likely to be aware of the limitations of the model. An objective assessment of the model would be a good and useful supplement to the paper.

Specific minor points. Abstract, In 9: physical not "physic-based" p. 15169, In 5: derives (or some synonym) and not "incentis" p. 15170, In 14: I believe it is wrong to call

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a modelling exercise an experiment. Shorten the sentence to read “few studies of simulations over the entire range . . .” p. 15172. There is awkward language in several places in the descriptions (see attached annotated manuscript). p. 15173, ln 10: “crops out” is not correct English p. 15174, ln 25: weighed not “weighted” (weighting is to assign a weight or importance to a factor)

I did not check the detail of the model description on pages 15175 – 15177.

p. 15180, ln 1: mean annual precipitation, not “annual mean ppt” ln 15: represents (?) rather than “present”

p. 15182, ln 10: change “along the whole year” to throughout the year

p.15187, ln 19: change “competence” to competition

In many places the word “production” is used where productivity might be more correct. However, on p. 15189, ln 7, the correct word can only be productivity or the sentence is incorrect.

p. 15190, ln 24: I suggest substituting topographic controls for the longer and awkward, “topographic structure of the landscape”

p. 15191, ln 8,9: I suggest you end the sentence with the word “. . . nutrients.” The remainder of your sentence introduces speculation that is not a valid conclusion from your paper.

p. 15192, ln 18: insert the Chow reference (from next page where it is out of sequence)

Consider omitting Figures 10 c & d as I don’t think they add any value.

The figure captions, generally, could use some work to clarify what exactly is being illustrated.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 15167, 2013.