Geoscientific
Model Development
Discussions

Interactive comment on "Impact of climate, vegetation, soil and crop management variables on multi-year ISBA-A-gs simulations of evapotranspiration over a Mediterranean crop site" *by* S. Garrigues et al.

Anonymous Referee #2

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The paper "Impact of climate, vegetation, soil and crop management variables on the multi-year ISBA-A-gs simulations of evapotranspiration over a Mediterranean crop site" uses various forcing and parameters to produce an ensemble of land surface model simulations in order to quantify the relative uncertainty associated with simulated evapotranspiration. Overall this paper is interesting and is useful to the scientific community, however the paper is difficult to read due to the presentation of the results, its organization and confusing sentences. Specifically the organization of the different simulations and the associated comparisons are confusing. Furthermore, the authors rely

too much on presenting tables of metrics instead of performing critical analysis of the results. As such the analysis section is weak and confusing. This paper would greatly benefit from better organization and consistency in the methodology, as well as a more thorough analysis with more figures and less tables. There is also the need to revise the text for grammar and clarity. I therefore recommend the authors make major revisions based on the comments above. I have provided a list of specific comments and a sample of some of the technical corrections that would greatly improve the paper.

Specific Comments: Pg-2057, line 26-28: I think it would be clearer to define the original model first then build off of that to describe the latest version.

Pg-2059, line 15: Table 1 is very helpful, but I get very little out of Figure 1. What are you trying to show in figure 1 that is not given in Table 1?

Pg-2061, lines 6-8: Define all depths, not just the first one.

Pg-2061, lines 9-10: This is very vague and provides little technical info on how the model calculates the carbon and water fluxes. Isn't stomatal conductance needed for net assimilation? So does the model solve the equations through iterations? What are the equations? Is this coupled to the latent heat flux? Since this paper focuses on ET I think there needs to be more details about how ET is calculated in the model.

Pg-2064, lines 20-23: Does this mean the land cover in the model was changed according to the crop schedule shown in Table 1? Is the change in land cover consistent with the LAI forcing? I think this section should be revised to be more explicit as to how this is done.

Pg-2065, line 1: This section should start by describing the control run and then progressively discuss how the individual runs vary from the control run and should be consistent with Table 3.

Pg-2065, line 7: The caption in Table 3 is too long and needs to be revised. I also find it difficult to read the second column, as I cannot tell where the rows end and start. Also

I think it would be best to have the control run first followed by the other simulations starting with the ones most similar to the control. It might also be helpful to bold the aspects that are different from the control.

Pg-2065, line 22: I find "clim" reference confusing as it makes me think of a "Climatology". I would suggest using in-situ or local instead.

Pg-2067, line 7: So the control run is considered as truth? I would be more direct about saying that.

Pg-2067, lines 13-16: I think it would be more consistent and clearer to use the same metrics for both validations and essentially the only difference would be what is considered truth. What is the difference between the Mean Difference and the BIAS, it is unclear.

Pg-2068, line 2: I find Figure 2 too complicated as each line is referenced to something else. It makes it difficult to easily see differences and associated them with differences in the simulations. I think it would be a lot simpler to show all simulations relative to the control run. This would also make it easier to relate back to Table 3 to understand the differences.

Pg-2068, line 9: I don't think these tables are effective at communicating the results and this information would be much better as a Figure illustrating the key results.

Pg-2068, line 23: Again tables are not an effective way of communicating results. I know you can't show all the results in figure, but showcase the most important results.

Pg-2069, line 5: I think it would be better to discuss the differences in the forcing before looking at the evaporation since the differences in the forcing are likely directly related to the difference in evaporation. Also, what is "water flux", flux from what to what, if you mean precipitation as is mentioned in the caption then use that and be consistent throughout.

Pg-2069, line19: Same with this table 7, too much information, just show what is im-

portant with a figure.

Pg-2069, line 26: Figure 6 caption is too long and needs to be condensed. Also add a zero line for reference.

Pg-2073, line 10: Figure 8, how do you have negative irrigation? That doesn't make much sense am I missing something? Please clarify.

Pg-2077, line 28: What is the under study? Please clarify.

Pg-2078, line 17: I think a little discussion as to the limitations and the big picture implications of these results is needed.

Technical Corrections: Pg-2055, lines 18-20: This sentence needs to be revised for clarity

Pg-2055, line 21: Should be "a" before Land surface model

Pg-2055, line 22: Should be "scales"

Pg-2055, line 23: What do you mean couple an LSM to a hydrology model? Do you mean a routing model that produces streamflow from gridded runoff?

Pg-2055, lines 26-27: Needs to be revised for clarity

Pg-2056, line 6: Most reanalysis use a coupled atmosphere-ocean-land model, not just and atmospheric model.

Pg-2056, lines 13-16: Sentence needs to revised for clarity

Pg-2056, line 17: Not sure "Besides" is the right transition word here.

Pg-2058, line 1: Define "A-gs"

Pg-2058, line 7: It is usually called "Hydrologic monitoring" not hydrology monitoring.

Pg-2058, line 11: What is meant by a long period of time? This is very subjective.

Pg-2058, lines 22-24: Revise for clarity

Pg-2059, line 11: Need to define "INRA"

Pg-2062, lines 17-20: Revise for clarity

Pg-2065, line 8: Not sure "achieved" is the best word to use. Is it really an achievement?