Geoscientific
Model Development
Discussions

Interactive comment on "Suitability of modelled and remotely sensed essential climate variables for monitoring Euro-Mediterranean droughts" *by* C. Szczypta et al.

Anonymous Referee #1

Received and published: 23 December 2013

With interest I have read this manuscript presenting an evaluation of two long term satellite derived products (Leaf Areas Index and Surface Soil Moisture) with their modelled equivalent from 2 Land Surface Model; ISBA-A-gs and ORCHIDEE. The scientific content of the manuscript is quite good, clear, well supported by figures and appropriate references. However its structure should be carefully revised for a better comprehension (and some paragraphs should be rephrased). It seems to me that some paragraphs where added 'on top' of the manuscript making difficult its readability. Also the title ([...] Euro-Mediterranean droughts) doesn't really reflect the text as very few is said about drought (only section 3.4 is investigating drought). I believe that the manuscript should be accepted subject to minor revisions with respect to its structure

and the rephrasing of some part of the text.

Abstract You define some acronyms (LAI, SSM, LGP) but not others (ORCHIDEE, ISBA-A-gs) Please double check GMD(D) policy for acronyms.

L1 "Two new remotely sensed Leaf Area Index (LAI) and Surface Soil Moisture (SSM) satellite products [...]" It might be fair to use 'satellite-derived' products

L7 "The leaf onset and the Length of the vegetation Growing Period (LGP) are derived from the satellite-derived LAI and from the modelled LAI." could be rephrased by "The leaf onset and the Length of the vegetation Growing Period (LGP) are derived from both the satellite-derived and modelled LAI."

1 Introduction P.5554, L.25, Please define what is an Essential Climate Variable. P.5555, L.3-11, I am missing a transition here, while most of the introduction is fairly well written, the paragraph on LAI reads more as a technical point. Please rephrase the beginning of the Introduction section.

2 Data and Methods P.5557, L.5-12, This paragraph should introduce section 2 (?) No transition at all between the different sentences, it seems that just 'bullets' are expressed.

P.5557, L11-12, "From 1991 onward, SSM observations from active (ERS-1/2, ASCAT) and passive (SSM/I, TMI, AMSR-E) microwave sensors are available." OK, I understand that you will use them latter on in the manuscript but as it is, this sentence is useless. Do you mean that additionally to the ESA-CCI SSM data set this study makes use of SSM observations from active (ERS-1/2, ASCAT) and passive (SSM/I, TMI, AMSR-E) microwave sensors over yyyy-yyyy and available from...If you prefer you could also dedicate a sub-section to all the soil moisture data set used in this study.

P.5557-5558, while you provide acronyms for SECHIBA, STOMATE, LPJ, you do not provide that of ORCHIDEE (or ISBA-A-gs).

2.1.3 Design of the simulation P.5559, L19-20, after a quick look to Szczypta et al.,

2011, it seems that the underestimation of precipitation in ERA-Interim was observed over France. How realistic is to correct the rain over your much bigger domain?

2.3 GEOV1 LAI P.5561, L.7-8, "The GEOV1 scores are better than those obtained by other products." such as?

2.4.1 should be Surface Soil Moisture instead of 'SSM' only 2.4.2 should be Leaf Area Index instead of 'LAI' only. "Three metrics are calculated to characterize LAI seasonal and interannual variability [...]"

3 Results P.5564, L.2 'squared correlation coefficients', coefficient of determination (?) [as P.5569]

3.2 Simulated and observed phenology Could Authors provide an indication of the ability of GEOV1 product to capture observed LAI amplitude (if any evaluations are available)?

3.3 Representation [...] P.5565, sometimes r2 is used and sometimes it is r, please be consistent.

4.1. Representation of soil moisture L.1, first sentence does not reflect the title of the subsection. Also this sentence is not clear (to me), do you mean that the difficulty of the model to represent LAI inter-annual variability can be partly explained by [...] (?)

4.2 Representation of LAI P.5568, the algorithm used to produce GEOV1 LAI should be indicated in section 2.3

Section 4.3 could be presented in section 3 'Results'

5. Conclusions P.5572, L.13, "[...] and highlighted the regions where the ESA-CCI product can be improved." But did not mention how to improve this product

Figure 3 (also 4), it is not clear to me if the white areas have a r value close to 0 or if no data are available for the evaluation.

Figure 8, considered period should be indicated in the caption.