

Interactive comment on “Multilevel and multiscale drought reanalysis over France with the Safran-Isba-Modcou hydrometeorological suite” by J.-P. Vidal et al.

Anonymous Referee #3

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This study presents a modeling framework for assessing drought characteristics over France, during the past 50 years (1958-2008). In general, this is a well written paper, and the topic is appropriate for the Hydrology and Earth System Sciences journal. The methodology is generally sound, and it is explained relatively well. The coupling, albeit offline, of the three models is a particular strength having implications in assessing droughts over regions with no in-situ measurements, and representing different types of drought (potentially adding socio-economic models). However, there are a number of points that need clarification and minor revisions which are outlined below.

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Although using a model to evaluate drought can offer some advantages over just using point observations (e.g. space-time continuous fields, indirectly observed variables), I think some discussion of potential uncertainties with respect to the 10 year validation versus 50 year simulation, would be a nice addition.

I think having larger figures would be beneficial for the reader (especially 4 and 5). How are the timing results (section 5.2) affected by the sensitivity to the chosen drought threshold? That is, would a 30% threshold lead to different results? Although the authors have provided some significance testing, I think providing some physical association like climate teleconnections (admittedly not easy to do) would strengthen the argument.

In Section 5.3, would it be more appropriate to use the mean duration of the identified individual drought events instead of the local-scale duration? The same drought event might cover two distinct areas but not concurrently, therefore using the local-scale duration, as valuable as it may be, could underestimate the actual event durations.

In Section 5.4, how is the mean magnitude exactly calculated? If it the monthly severity divided by the time period, I would expect that it would be lower for longer periods. This is not explained very well in the text.

p. 6457 (lines 3-4): I would change “economic impacts” to “impacts” in general, droughts have external costs as well.

p. 6459 (lines 19-20): Since the reference is in press, it would be useful to add a short summary of the validation results.

p. 6467: The introductory part of Section 4 is a little confusing. Was the 3-month period choice arbitrary? Why is the RDI chosen instead of other indices? It seems to be related to hydrological drought, is that right? Are there other studies that look at drought over France that were not included here?

p. 6469 (line 17): change “on the contrary to” to “in contrast with”.

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p. 6474 (line 5): what about hydrological droughts?

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