

Response to Anonymous Referee #1

Anonymous Referee #1:

General comments

The paper goal is to examine the importance of soil moisture to influence the hydrological response of a catchment located in the Mediterranean (Southern France). Despite very interesting the topic is not new as many studies (also not cited by the authors) have tried to understand the role of soil moisture in flood modelling. In particular, many of them demonstrated that soil moisture is a good proxy of the catchment initial conditions and it behaves better than many API-based indexes (see the SC1 comment in the Interactive discussion). In this respect, this study has the advantage of relying upon a really dense network of soil moisture monitoring stations that can help better the understanding of the underlying rainfall-runoff generation processes. Said that, I think that the paper is of interest for the journal readership and potentially very interesting. It is also well detailed and written. I have to major comments that the authors should take into consideration:

Response:

Thank you very much for your review of the manuscript. Your comments are highly appreciated and will help us to improve the current version of the manuscript.

Thank you for the positive evaluation of the topic of the study and the appreciation of the data set. Regarding the missing literature references, we want to stress that our study is not a modelling exercise. Thus, in the literature review, we chose to focus on papers that rely on the analysis of soil moisture, discharge and precipitation measurements as does our study. But of course flood modelling studies are undisputedly very insightful to address the topic of the paper. We will reconsider the existing literature on the role of soil moisture on the hydrological response. The short comment posted by Mr. Brocca will be very useful.

1) The paper is really too long and the richness of details and number despite commendable sometimes distracts from the general objectives and make the reading of the paper not really easy. I suggest to shorten the manuscript and reduce the number of figures trying to generalize a little bit the results and reducing the numbers in the text which should already evident from the figures. I think this will make the paper gaining in readability. Please, define clearly in method why certain indexes are introduced and their scope. Consider the use of a table the role of each index in case.

This was also brought up by Referee #2 (H. Gao). We agree that the manuscript can be shortened and we will be more concise for both the text and the Figures in the revised version. We suggest to omit figures no. 2, 12 and 13 at least and possibly figures 5 and/or 7. Figure 4 could be integrated into figure 3. The methods section 2.4 will be revised and we will consider using a table to better justify the indices.

2) The study of the temporal/spatial variability of soil moisture and its connection with land use is surely important but at times seem disconnected with the main research question (RQ) which is the understanding of the impact of soil moisture on runoff generation. The result is that the two RQs higleted in the paper seem two distinct chapter. If the authors want to maintain such a similar structure I am convinced that connections exist and thus they should emphasized. With connections I mean the role of the

land use, spatial variability and temporal variability of certain plot/station soil moisture values in the runoff generation mechanism. If this was done, it is not really immediate to get. The intro section lacks of a significant part of the literature in this topic. The authors could refer to the SC1 comment in the interactive discussion to improve this part.

Thank you very much for this valuable comment. We regret that we could not convey the connections between the two research questions well enough. In a revised version of the paper we will try to emphasize that the first objective to study the variability of soil moisture is necessary to obtain a relevant and representative value for soil moisture at the catchment scale. This is crucial to address the main research question of the role of initial soil moisture on the hydrologic response of a catchment.

Based on my comment above I recommend the paper accepted after major revisions. I would be happy to revise the paper again and to provide a more detailed technical revision once the above comments will have been addressed.

Thank you for this recommendation and for your offer to provide a second revision of a reworked manuscript.