Reviewer 2

I am very excited to see a manuscript that (finally) shows changing rainfall intermittency is important for soil moisture and hence flooding. This is very important and timely work. I can only expect (and look forward to) seeing the follow up work to this study involving the impact on flooding. Please see my minor (and bordering on pedantic) suggestions below.

We would like to thank you for your positive appraisal of our manuscript. Please find below the answer to your comments.

I am not sure on the format of HESS – but the "Annexe" references didn't quite match the SI for me.

We modified the format of supplementary materials.

I am not sure I saw a reference to the full calibration parameters?

We added page 10, line 14: "(see supplementary material S2 for the calibrated NSRP parameters)".

Page 1, Line 6: "on a 10 year time period" -> "for a 10 year time period"

Changed

Page 2, Line 4: I would appreciate Wasko and Nathan (2019) to be cited along side these as, though similar to Bennett et al (2018), it goes beyond to quantify the impact of soil moisture changes with flood recurrence.

We added this reference page 2 line 4

Page 1, Line 9: Just wonder if the following also supports the drying trend you are referring to. Rodell, M., Famiglietti, J. S., Wiese, D. N., Reager, J. T., Beaudoing, H. K., Landerer,F. W., & Lo, M. H. (2018). Emerging trends in global freshwater availability. Nature,557(7707), 651–659. https://doi.org/10.1038/s41586-018-0123-1

Indeed, but this paper refers to groundwater dynamics, where in this section we are mentioning trends in atmospheric water supply.

Page 1, Line 20: Obviously I am more familiar with Australian references, but the following evaluates in-situ soil moisture. I would

make the point that one issue with evaluation is the different depths that are measured and modelled by all products.
Holgate, C. ., De Jeu, R. A. M., van Dijk, A. I. J. ., Liu, Y. ., Renzullo, L. J., Vin-odkumar, et al. (2016). Comparison of remotely sensed and modelled soil moisture data sets across Australia. Remote Sensing of Environment, 186, 479–500.https://doi.org/10.1016/j.rse.2016.09.015

We added this reference page 2, line 22. The issue of evaluation at different depths is mostly valid for remote sensing data, able to measure soil moisture for the surface only, when in climate models the land surface scheme is capable of reproducing also the root zone soil moisture.

Page 3, Line 2: Please have a look at the following as I think it is also looking at soil moisture using a scenario-neutral approach: Stephens, C. M., Johnson, F. M., & Marshall, L. A. (2018). Implications of future climate change for event-based hydrologic models. Advances in Water Resources, 119, 95–110.

We added this reference page 2, line 31.

Figure 1: If it isn't too much of a hassle it would be nice to see Figure 1 include an inset of the study site in the context of the greater region (as I am not familiar with the study region). But this is only a suggestion and I don't mind if this isn't performed.

We added a small map of France in the top left corner to locate the region of interest (see our response to reviewer 1, Figure 6)

Page 7, Line 2: "series"

Changed

Page 8, Line 5: I recognize studies often change all the parameters in the NSRP model for downscaling (e.g. Bordoy and Burlando, 2014). If you are looking for examples of where a parameter is fixed in stochastic generation based on, for example, physical intuition you can see Wasko et al (2015) and Onof and Wheater (1994).
Bordoy, R., & Burlando, P. (2014). Stochastic downscaling of climate model precipita-tion outputs in orographically complex regions: 2. Downscaling methodology. WaterResources Research, 50(1), 562–579. https://doi.org/10.1002/wrcr.20443
Wasko, C., Pui, A., Sharma, A., Mehrotra, R., & Jeremiah, E. (2015). Representing low-frequency variability in continuous rainfall simulations: A hierarchical ran-dom Bartlett Lewis continuous rainfall

generation model. Water Resources Research,51(12), 9995–10007. https://doi.org/10.1002/2015WR017469
Onof, C., & Wheater, H. S. (1994).Improvements to the modelling of Britishrainfall using a modified random parameter Bartlett-Lewis rectangular pulse model.Journal of Hydrology, 157, 177–195. https://doi.org/http://dx.doi.org/10.1016/0022-1694(94)90104-X

Following the recommendations of Reviewer 1, Guillaume Evin, we also tested a different approach by recalibrating all the parameters of the rainfall generator after modifying the rainfall statistics (similar to Bordoy and Burlando 2014), see our response. Since this approach did not work well, we kept our original approach, similar to the two references you mentioned. We added the two references proposed.

Page 8, Line 14: “resumes” -> “presents”

Changed

Page 8, Line 21: where you say the modelling chain is processed 20 times, I think you mean to say “stochastic replicates” or “simulated ensembles” – this terminology I think is clearer.

Changed to “a simulated ensemble of 20 stochastic replicates is generated”

Page 9, Line 8: A typo has occurred. Remove “the)”?

Changed

Section 4.1: These increases of say 432mm, is this for one site in particular? Or across all the sites on average? I am a bit confused here.

We added: across all sites on average

Page 10, Line 9, 12: “The” NSRP model?

Added

Page 10, Line 18: “Opposite” -> “Alternatively”

Changed

Page 15, Line 1: “The Figure” -> “Figure”

Changed

Page 15, Lin 9: “became” -> “be”

Changed

Figure 9, 11, 12 captions: I think these say “extreme” drought while in other parts of the manuscript you just say “drought”. I would stick to the terminology “drought”.

We removed “extreme” in the figure captions

Page 17, Line 7: Can you mention in the text what the blue and red symbols in Figure10 are and maybe specifically mention how the RCP changes predicted are at the “extreme” ends of your scenario space. If I have interpreted the results correctly his point was lost on me but is very important to highlight I think?

We added this information about the symbols in the text page 17, line 7 and 8.

Page 21, Line 2: The following manuscript is one of the few manuscripts demonstrating how drier soils interact with higher precipitation intensities. Wasko, C., & Nathan, R. (2019).Influence of changes in rainfall andsoil moisture on trends in flooding.Journal of Hydrology, 575, 432–441.https://doi.org/10.1016/j.jhydrol.2019.05.054

We added this reference in the introduction.