

## ***Interactive comment on “Ensemble projections of future streamflow droughts in Europe” by G. Forzieri et al.***

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The manuscript describes a valuable analysis of future drought conditions in Europe, assessed from LISFLOOD projections driven by 12 GCM/RCM simulations and a water use scenario. The methodological approach, including the assessment of the impact of choosing different variables, return levels and sources of variability are all well applied and described. The comments to the reviewers questions have well been incorporated in the revised manuscript. Therefore it can be accepted subject to minor revisions.

Apart from a number of textual details 2 issues would deserve a bit more discussion, both putting the study results in the context of the real world. First, although some discussion about observed drought trends is included in the manuscript, the detection of

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trends in droughts is far from trivial. A recent paper by Orlowsky and Seneviratne (doi:10.5194/hess-17-1765-2013) does discuss the (in)consistency between CMIP5 projections and observations of Standardized Precipitation Index and Soil Moisture Anomalies, pointing at a clear signal for the Mediterranean but not for other areas in Europe. It is worth referring to this paper in this manuscript.

Second, the motivation to use the ENSEMBLES-A1B scenario (the only one that has a sufficiently large ensemble) may be valid, but could (should) be accompanied by a more thoughtful discussion of the implication of this choice. You can either present results for this scenario for the sake of a methodological demonstration of your approach, or make clear that one should not derive any probabilistic implication from your choice: a scenario is not a forecast. This scenario may be considered relevant and/or plausible, but not at all the most likely scenario that the world is facing. I would encourage to include a qualitative speculation on the effects of choosing other (climate and water use) scenarios in the conclusion section, just by discussing the major differences between the selected scenario and the ones that are analysed frequently currently (for instance, the 4 RCPs from AR5, and the other 3 scenarios from the SCENES project). Obviously, detailed analyses of these other scenarios should be encouraged. When framed properly, this speculative discussion will put your analysis in a proper context.

Some specific topics:

- P1L25 and P24L15: avoid the use of “positive” as it is quite a subjective qualification. Just phrase it in terms of “reduced droughts”
- P2L3-4: I would state that increase evaporation results from changes in temperature, wind, relative humidity; evaporation is not another variable that fits in this list of drivers of evaporation
- P2L20: start sentence with “Compared to other natural hazards. . .”

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- P4L4: make clear that only extreme events at submonthly scales are not well reproduced by these coarse resolutions
- P6L17: higher performances: does this mean that these bias corrections are better transferrable to future (unprecedented) situations than others?
- P8L16-19: complex sentence with a chain of denials (“unless”, “less affected”, “not accounting”): consider to rephrase
- P12L9: a better word than “reliable” is “indicative”
- P15L13: you discuss catchment size but discharge volume is what is shown in the figure. Do you make an implicit assumption about the relationship between the two?
- P15L24: is the bias correction discussed here limited to precipitation and temperature?
- P16L2: is this “ranking” a (subjective) choice? Why should it depend on model efficiency?
- P19L10: it is not obvious why thermal electricity should use water; it merely changes its quality (temperature), isn't it?
- P19L16: the reduction in water withdrawal in Southern Iberia needs some discussion. Is this due to reduced water availability?
- P23L7: “develop longer in time” or “become more persistent”: does this reflect intra-annual conditions, or also multi-year time scales? Is important to discern
- P24L22: replace “consistent” by “similar”
- P25L14-16: does this small importance of decadal variability also apply to projections for the near future?

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- P25L17: delete “longer (i.e.” as it confusingly tends to refer to the decadal timescales discussed just before
- P25L21-25: is this interannual spread defined before or after averaging the ensemble members? Not clear, but important.
- P25L28: “at all stations”: this is not valid for the Seros station, I would tend to conclude from the figure
- Acknowledgements: please acknowledge Anne v Loon and the anonymous reviewer
- P46L35: delete “length of the”
- P54L73: typo in “gouging”

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