

Hydrol. Earth Syst. Sci. Discuss., author comment AC1  
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## Reply on RC1

Amar Halifa-Marín et al.

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Author comment on "A multivariate-driven approach for disentangling the reduction in near-natural Iberian water resources post-1980" by Amar Halifa-Marín et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-565-AC1>, 2022

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**GC: The work by Halifa-Marín and co-workers addresses the causes of changes in water resources availability over the Iberian Peninsula. This is highly relevant issue given the current stress on water resources in the region, and the fact that not all studies are in agreement on what drives these changes. Overall the study is well motivated, has clear research goals and hypotheses, and the results seem to be robust. However there are some issues that I believe need to be addressed before the manuscript can be considered for publication in HESS. These are discussed in more detail below.**

We will complete the work as suggested. Thank you for your consideration.

**C1: Title. The current title seems to suggest that the focus is on understanding the scarcity of water resources, rather than its changes. This might be slightly misleading, because scarcity itself does not seem to be the focus of the study, but rather water resources availability. If the authors choose to keep scarcity in the title and manuscript, this term should be accompanied by a clear definition.**

Right, thank you for the support. The title has been modified.

**C2: Data quality. The study is based on a dataset of water inflows into reservoirs as determined by the Spanish Ministry of Environment. This raises the question how these data were observed. From the text, the impression is given that these flows have been measured before they flow into the reservoir. However it seems much more likely that these are determined from the reservoir outflow while accounting for reservoir storage changes, and perhaps even using inverse modeling (have the flows been "naturalised"?). Of course this can have impacts on the inferred trends. More information should be given on the nature of the data, techniques used etc.**

Thank you for the recommendations. Further information about data (techniques used to estimate the water inflows) has been added in the manuscript and Appendix A.

**C3: Natural flow.** On line 94, the authors state that “we identify/focus on reservoirs where its water inflows nearly keep the natural flow regime.” Please define clearly what is meant by natural flow regime, and how this was checked. Clearly, these basins are still influenced by non-natural land use changes such as abandonment of agricultural land. I don’t necessarily disagree with the approach taken, but it is important to realize that basins without big water infrastructure and not necessarily near-natural.

Right, thanks. It has been modified/clarified in the manuscript. Line 328, Section 2.1.

**C4: Presentation.** While generally the illustrations are of high quality, much of the results are presented in the form of maps. This risk here is that the manuscript reads more like a report than a scientific study, and at the same time it is much harder to draw quantitative (and objective) conclusions based on visual interpretation of spatial patterns. I suggest the authors reconsider the style of some of the figures, so that present key metrics that can be used to base the conclusions on.

Thanks for the recommendation. The style of some of the figures has been modified in order to improve the interpretation of results/conclusions.

#### **Detailed comments.**

- **Line 73:** “All these works highlighted the role of afforestation processes into the rise of potential evapotranspiration (ETP)” -> I don’t think this statement can be backed up by previous studies. ETP does increase in response to global warming, and afforestation increased actual ET – but how exactly would one lead to the other?

Thanks for your recommendation. The sentence has been modified in the manuscript. Line 199.

- **Figure 13: please show the regression lines, and explain the vertical lines.**

Thanks for the recommendation. All these suggestions have been added to that figure (currently, Fig. 12).