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Interesting work, but some more clarification and quantification needed

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Referee 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-RC1>, 2022

Review of "Disentangling the scarcity of near-natural Iberian hydrological resources since 1980s: a multivariate-driven approach" by Amar Halifa-Marín et al.

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.

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.

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.

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.

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.

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?

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