

# ***Interactive comment on* “The influence of global climate and local hydrological variations over streamflow extremes: The tropical-mountain case” by Juan Contreras et al.**

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1.- This manuscript assesses the contribution of several factors, including precipitation factor, land use change and large scale climate indices on hydrological extreme change, using the statistical approach. My major worry is that work about statistically investigating the influences from different drivers on hydrological extremes is not new, and the data/tools used by the authors are also conventional. In this condition the authors should explicitly illustrate their differences in findings and interpretation by comparing to different former studies. Nevertheless, this part is still weak.

Thanks for the comments. It is well-known that the Andean-region plays a fundamental

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natural role, and yet, full monitoring systems are still scarce, which limits the applicability of more sophisticated techniques for more in-depth research. However, the more conventional GAMLSS technique can tackle essential research questions, making use of conventional – but key – data for obtaining reliable results. These more straightforward but still powerful methods, capable of unveiling relations between local hydrological variables and global climate conditions, constitutes a milestone for future research in the Andean region. The authors highlight this statement and the novelty of our study in Introduction in Lines: 46-56, 69-76, 90-92, 97-104, and 107-108. Also, we clarify the differences in findings and interpretation of results, comparing our study with former research for enhancing its importance. The latter mentioned was included in the Discussion section (Lines: 553-564).

2.- The authors might try to make their findings are representable to different areas as they stated that their study area is natural laboratory for hydrological and climate research. However, I found their statements in introduction too focus on the Andean area. This might restrict the global significance of their work and tend to make it like a regional study.

The reviewer is right in the sense that the results represent expressly to the Andean region. When we pointed out to the location as a “natural laboratory”, we refer to the combination of specific very complex climate and hydrological conditions, which makes of it crucial for research under such circumstances. However, we understand that the way we have stated this idea could lead to confusion. Therefore, let us clarify the “natural laboratory” statement. On the one hand, small monitored areas with 30 years of temporal data-sets constitute in a luxury hydrological information for the Andean-systems. Particularly, the monitored nested hydrological catchments – one undisturbed and the other altered – provide the opportunity for contrasting the hydrological reactions that similar climate effects exert over such different systems. On the other hand, since the local information encompass long-term dynamical land cover evolution, it was possible to discern the impact that these cover trends have over low and high extremes, and dif-

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ferencing them from the climate effects. In virtue of the latter mentioned, the authors' statement of "natural laboratory" is used, and we believe that this is where the importance of the study mainly relies on. We clarify all the mentioned in the Introduction in Lines 108-109 and 114-118. Also, we changed the title of the manuscript to the aim of restricting our study to Andean regions.

The revised manuscript is in the following link  
[https://drive.google.com/drive/folders/1YrUG7fMXBhkqCHs-8dpemt72aMf\\_HCj\\_?usp=sharing](https://drive.google.com/drive/folders/1YrUG7fMXBhkqCHs-8dpemt72aMf_HCj_?usp=sharing)

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