



EGUsphere, community comment CC1
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Comment on egusphere-2022-1234

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Community comment on "El Niño Southern Oscillation (ENSO)-induced hydrological anomalies in central Chile" by Renee van Dongen et al., EGU sphere,
<https://doi.org/10.5194/egusphere-2022-1234-CC1>, 2023

Title: El Niño Southern Oscillation (ENSO)-induced hydrological anomalies in central Chile

Summary:

This paper presents a well written comprehensive work, related to the El Niño Southern Oscillation (ENSO) anomalies. In particular, there is a presentation of how the different phases of the ENSO affect the hydrological conditions in Central Chile (29-42°S). The analysis performed in the paper are quite good, nevertheless I would suggest the authors to revise the temperature results.

I just have a couple of Major revisions, that can most likely be easily solved by the authors.

General Comments:

1) In the results section, the authors estimate the changes in temperature, as relative changes. To me, this makes no sense, because it is highly influenced by the baseline temperature. For example, if the baseline temperature is 10°C and one has a temperature increase of 1°C (between two different phases of ENSO), the percentage of change is a 10%, but if the baseline temperature was 0.5°C a 1°C increase would lead to a 200% change. In an even more extreme case if the baseline temperature of was -0.5°C a 1°C increase, would lead to a -200% change. To avoid, these types of problems I would recommend one of two options: Option 1) to use absolute temperature changes, or Option 2) to use relative changes, but with Kelvin degrees, which avoid all the issues beforementioned. Some of the results presented, I think might be influenced by using relative changes in temperature, and might mislead the reader of your article.

2) I would add an analysis of a trends, especially for temperature. If there is a temperature trend in the study zone and period, and given that most of the La Niña years have happened before 1980, that might bias your temperature analysis for "La Niña", in case you detect temperatures increasing in time.

Minor Comments:

1) When describing CAMELS-CL in lines 178-181 you mention a list of attributes, but some of the attributes are not mentioned (for example, CAMELS-CL has information regarding

water rights, Barría et al., 2021). If you do not want to mention all the attributes that is fine, but then sentence 181 should close with "among others" or equivalent. In case you want to list all the attributes mention the water rights and add "Barría et al., 2021" reference.

2) Given that you are mentioning the human intervention level in line 181 and then using it in Figure S1C, I would recommend you to revise and Cite Barría et al., (2021), as recommended in CAMELS-CL explorer page.

3) The specific discharges (Q_{sp}) of Figure 3 are in "mm"? Please add the units in the axis, when using Q_{sp} .

4) In Figure 3, when the gamma distribution process is described in the caption, you mention the "k" parameter. Although you mention it is the shape parameter in line 325, the caption of Figure 3 does not mention it, I would recommend to add it in the caption of Figure 3. Also, I assume you are referring to the Two Parameter Gamma distribution (and not the Three Parameter Gamma), it would be good to clarify this.

5) I would recommend to explicitly mention that the "k" parameter is the "shape parameter" in captions of Figures 5 and 7

Reference:

Barría, P., Sandoval, I. B., Guzman, C., Chadwick, C., Alvarez-Garreton, C., Díaz-Vasconcellos, R., Ocampo-Melgar, A., Fuster, R.: Water allocation under climate change: A diagnosis of the Chilean system. *Elem Sci Anth*, 9(1), 00131, <https://doi.org/10.1525/elementa.2020.00131> , 2021.