

**Manuscript:** Sensitivity of water scarcity events to ENSO driven climate variability at the global scale

### **Major remarks**

Many studies have already investigated of the climate impacts of ENSO, but the present study is the first that combines the occurrence of water scarcity with the influence of ENSO events. In this way the study provides some new insight in the relation of water scarcity and climate variability. While the study is generally interesting, parts of the manuscript are somewhat lengthy and may be shortened. In this respect, the whole paper should be checked for redundant text.

The whole manuscript comprises too many figures, with an appendix that has even more figures than the main text. As all figures are referred and discussed in the text, it is quite difficult to judge which figures are the important ones. Some of the appendix figures are likely dispensable, e.g. A2 or A3. I suggest determining which figures are essential for the study, and then remove those figures that are not important. Please avoid showing all figures that you made during the study!

Sect. 3.1 discusses results of the study mixed with results from literature so that it remains unclear what is the new contribution to science by the authors in this section.

Sect. 3.3 comprises a lot of number crunching. I suggest putting all number in a summarizing table and discuss only those numbers explicitly in the text that are important. For all other numbers the new table should be sufficient. Further it seems sufficient to concentrate on discussing one of the indices, e.g., CTA. If you then write about numbers and it may be sufficient to write the WCI number only in brackets if you think the information is necessary in the text. In addition, some of the percentages given refer to the total land area, some of them only to a specific land area (e.g. p. 5481 – line 2), which is sometimes confusing. Providing both percentages in the table would be helpful.

In summary, I suggest some revisions to be conducted before the paper may be accepted for publication.

### **Minor Comments**

In the following suggestions for editorial corrections are marked in *Italic*.

p. 5466 – line 6

... climate *change*. *However*, ...

p. 5467 – line 16

I assume that the term “blue water” is not familiar to everyone so that it needs to be properly defined.

p. 5475 – line 6-14

Very long sentence that makes it difficult to follow. I suggest separating into several sentences to improve readability.

p. 5478 – line 5-7

It is written: “ ...whereas it might be more appropriate for consumptive water use to assess its correlation either using monthly time-scales or yearly maxima.”

Can't this be checked?

p. 5478 – line 20-24

Sentence is difficult to read. Please rewrite!

p. 5479 – line 13

It is written:

“ ... we did not find any FPU's with (in)significant correlations for water availability, ...

I don't understand. Does this mean that you don't find any correlation at all? If so then write it directly.

p. 5480 – line 25-26

It is written:

“... we found correlations ... ...for one-third (33.1%) of the land area susceptible to water stress events (blue dots).”

Does mean 33% of the total land area, or 33% of the susceptible land area? Please clarify in the text!

p. 5481 – line 10-11

What is a factor difference? A factor is multiplicative, a difference is additive. I don't understand.

p. 5481 – line 13-18

This sentence is difficult to read and seems to only duplicate the caption of figure 6. Please avoid duplicating figure captions in the main text!

p. 5483 – line 22

... that *all individual* GHMs ...

p. 5484 – line 1

... areas *sensitive* to ...

p. 5484 – line 14

Due to *clustering* effects ....

p. 5485 – line 27

It is written:

“ .... of ENSO lacks (...).

Here, some words seem to be missing after ‘... lacks’.

p. 5486 – line 4

... value *remain* stationary ....

p. 5486 – line 16

... modulate *the* ENSO ...

p. 5487 – line 5

... presented *here*, are ...

p. 5488 – line 3-5

Sentences "...water resources availability and consumptive water use to ENSO driven climate variability." And "We found that both water resources availability and water scarcity conditions can be significantly correlated with ENSO driven climate variability..." are redundant. Please merge appropriately.

p. 5499 – Figure 1

Panel titles are too small.

Also, it would make more sense to show FPU's in Fig. 1 as FPU's are used in Fig.2.

p. 5507 – Figure 9

The black colour is difficult to separate from the grey one (Water Gap/Ensemble mean ENSO).

It seems that the middle panels are the only panels that include the red and the orange line, but actually I cannot distinguish both lines. If they are the same one of those lines may be obsolete