

## Review

**Manuscript #:** ESD-2020-46

**Title:** “Rankings of extreme and widespread dry and wet events in the Iberian Peninsula between 1901-2016”

**Authors:** Margarida L. R. Liberato, Irene Montero, Célia Gouveia, Ana Russo, Alexandre M. Ramos, Ricardo M. Trigo

### **Main comments:**

The manuscript presents a new method for ranking regional extremes of persistent, widespread drought and wet events that considers different time scales. While there are some good points in the manuscript, it lacks in discussion where the authors could put things in context. Specific questions that need to be addressed are:

- Can you show that this method using SPEI performs better for the Iberian Peninsula? How does it compare with other indices (say SPI) for the same purpose? Can you validate its applicability for the outcomes (hydrological/ ecological/ agricultural) on different time-scales? It should be fairly easy to show like Vicente-Serrano et al., 2012 did (for global and continental scales) that SPEI is better than SPI (and PDSI) for various applications. I wonder if it is true for the Iberian Peninsula also?
- The question of ranking also needs more exploration. Does a top ranking translate into maximum impacts on the indicators (agriculture/ streamflow etc.) for the relevant time-scale? Can this be shown in an analysis?
- The temporal variation in the indices (especially in Figures 3 & 4) described as “There is a clear temporal clustering of most extreme drought episodes, particularly with a large concentration between 1943 and 1957 and a second group after 1975”.
- Some analysis should be done (or connections to existing studies made) to analyze the role of modes of variability on decadal or multi-decadal or inter-annual (such as the NAO by Vicente-Serrano et al. (2011) time-scales. Are there any studies carried out over a larger region - like say the Mediterranean – that one can make a connection to?
- Is the clustering of drought events towards the end of the data period in any way connected to climate change? There are numerous studies that have already documented drying of the Mediterranean under climate change.

### **Other suggestions:**

- Numerous grammatical mistakes that can be easily fixed in a modern word processor.