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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "A joint probabilistic index for objective drought identification: the case study of Haiti" *by* Beatrice Monteleone et al.

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Drought is a naturally occurring event, which takes place in virtually all of the world's climatic regimes that results in significant economic, social, and environmental impacts in both developing and developed countries. Moreover, drought is widely recognized as a creeping natural hazard (Gillette, 1950) that occurs as temporary phenomena due to the natural climate variability. The increasing demand for food and water resources caused by a growing population and the potential to increase in severity, frequency and/or duration of droughts because of climate change have raised questions as to how humanity will withstand and confront future droughts. Consequently, drought is a serious problem throughout the world. Due to the multi-discipline character of the drought, a single, unique definition of a drought does not exist, but is subject to the

domain of interest of the observer (Niemeyer, 2008). The lack of general acceptance of a precise and objective definition of drought has been one of the principle obstacles to the investigation of drought (Yevjevich, 1967). Drought studies have been suffering from the lack of consistent methods for drought analysis. "Creeping" phenomena make detection of the onset and the end-point of a drought difficult to detect. Often these factors are determined long after the drought event has finished. For the identification, quantification and monitoring of drought phenomena, various methodologies have been proposed. The most popular of them seem to be single factors known as drought indices. Over the years, many drought indices were developed and used by meteorologists and climatologists around the world, which ranged from simple indices such as a percentage of normal precipitation and precipitation percentiles to more complicated indices such as the Palmer Drought Severity Index the Percent of Normal (PDSI), the Standardized Precipitation Index (SPI), and the Deciles and the Crop Moisture Index (CMI). However, no one of them has inherent priority over others, some of them have better performance in specific conditions. As Eslamian et al. (2017) pointed out, the drought monitoring using modern indices to predict the onset and termination of drought period, severity and other features is deemed necessary in order to develop the required measures to overcome the drought before its occurrence. The recent widespread and severe droughts that have resulted in serious economic, social, and environmental impacts in many countries have highlighted the need for improved drought monitoring. Hence, the manuscript investigates an important and timely environmental topic with global interest. Specifically, it suggests a new composite drought index, the Probabilistic Precipitation Vegetation Index (PPVI) based on the combination in a probabilistic framework two well-known drought indices, as the SPI (Standardized Precipitation Index) and the VHI (Vegetation Health Index) are. The PPVI presents some advantages such as: (a) Few data are required for its computation (precipitation and Vegetation Health Index); (b) It is a remote-sensing product; (c) It is easily transferable and scalable over the entire globe; (d) It can be a very useful tool in areas with scarce gauge coverage; (e) It is a powerful tool since it can identify events of vegetation

stress, and at the same time, select among those the ones actually due to drought; etc. This manuscript is well written, clear and well structured, follows a logical argumentation and restrictions of the results. My evaluation is positive. I suggest publishing the paper, but before the authors have to take into accounting my specific comments and remarks.

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Please also note the supplement to this comment:
https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2019-296/nhess-2019-296-SC1-supplement.pdf

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