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Comment on nhess-2021-176

Anonymous Referee #2

Referee comment on "Hydrological Drought across Peninsular Malaysia: Implication of drought index" by Hasrul Hazman Hasan et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-176-RC2>, 2021

General comment

The manuscript illustrates the application of a standard hydrological drought index (Streamflow Drought Index, SDI) for the detection at the regional scale of drought events; the case study is the peninsular Malaysia. This work contributes to the state of the art on the topic by improving the knowledge about the hydrology of the case study region. The topic is of interest for the hydrologic community, yet the manuscript needs additional efforts from the Authors to clarify some aspects that are fundamental for the reader understanding; further, a deeper analysis based on the available data is expected. Specific comments follow.

Specific comments

- From the abstract alone it is not clear which is the content and main objective of this work; further, it appears that this work is simply a case study application of methods already known in the literature. If this is true, it should be emphasized the innovative contribution provided by this work.
- Also the Introduction Section needs additional efforts from the Authors to better state the research gaps that justify the proposed work and to avoid repetitions. I'm not sure that the literature review covers properly what has been already proposed in the literature in terms of drought indexes development and application. Further, while the Authors states that there are not many work on SDI (l. 108-109), they report a non negligible number of reference on its application at several time-scales (l. 151-156).
- It is not clear which is the motivation for the choice of the period within the year where SDI is computed, starting in January and covering 3, 6, 9 and 12 months (l. 165-67). In other words, its should be explained why, e.g., the 9-months SDI refers to the period from January to September and not to another one (e.g. from April to December).
- SDI is an index that allows to detect drought events when it is below a given threshold value. To compute drought frequency it should be first defined a drought event; hence, section 2.3 should follow 2.4.
- Why depicting results averaged over 10-years time windows? Which is the difference between depicting the number of droughts and the frequency of drought events? Which

is the statistical significance of frequency computed over a short time period of 10 years? I personally believe that the presentation of results should be improved and more details should be added.

- Drought events can be quantified (as indicated in the Methodology Section) in terms of three different quantities, intensity, duration and severity. How do those quantities are used here to understand drought phenomenon over Malaysia? I personally believe that available data are not exploited enough for drought understanding.
- Results are presented in detail yet not discussed in terms of possible physical explanation of the observed phenomenon. Hydrological droughts result from different processes, as clearly mentioned in the introduction section; yet, there is not reference to such processes.