Comment on nhess-2021-328

Anonymous Referee #1

Referee comment on "Different drought types and the spatial variability in their hazard, impact, and propagation characteristics" by Erik Tijdeman et al., Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2021-328-RC1, 2022

Tijdeman et al. (2021); NHESSD

Tijdeman et al. (2021) compared hydrometeorological drought hazard and associated propagation characteristics with impacts of major droughts between 1990-2019 in Southwestern Germany. This manuscript is written clearly, and it is an interesting study, particularly by linking different drought types and impact characteristics. Although only a regional (sub-national domain) is explored, this limited spatial extent is balanced by a larger number of variables explored. Among other results, the strongest agreement between impact start and drought hazard was found for soil moisture and river flows, while precipitation and groundwater showed a weaker relationship. I provide a number of minor recommendations, which I would like the authors to address before recommending for publication.

(1) It is not clearly defined in the manuscript, whether the P & T & SM variables are averaged over individual catchments or average over the entire BW region is performed (e.g., in Figure 2). There is a large spatial variation in meteorological variables due to the Alps, so this needs clear clarification.

(2) What is the soil moisture representation from the TRAIN model? Please, provide some more details about the representativeness of this model with respect to soil moisture observations.

(3) The title of section 2.4 requires a more intuitive name.

(4) Line 224: how do you distinguish between quick and slow developing drought? I have missed this definition.

(5) Line 232-235: More clarification for these conditions is required, the current explanation is too brief.

(6) Section 2.6, provide a formulation of A in mathematic form. Additionally, in analogy to line 248, explain the meaning of A=1.

(7) Figure 2: Why P12 and T12 do not have not the same scale. P12 is monthly, T12 is annual. Would not it make more sense to have it the same?

(8) Ticks on the x-axis of fig.2: ticks should be displayed for 1.1.YYYY, rather than the current version.

(9) Please, explain, what happened during the year 2005? There were also several months

of exceptional drought conditions identified but never discussed.

(10) Regarding the impacts, considering just the number of reported impacts is a big simplification. Can you quantify them as well using more quantitatively (e.g., financial losses, crop-yield losses?)

(11) Where is the statement on lines 423-424 supported by earlier presented results?

(12) Two sentences on lines 426-427 require reformulation.

(13) Discussion can be possibly extended with the following suitable references: https://doi.org/10.1088/1748-9326/aba4ca on impact assessment with text mining; https://doi.org/10.1088/1748-9326/abe828 on assessing multi-year droughts by different aggregation periods.

(14) The current data availability statement is not sufficient. Please, provide your processed data presented in this manuscript on the online repository.

Further textual suggestions:

Line 10: "the environment …"

line 11: in => into

line 340: word missing in the sentence.