

Interactive comment on “A Multi-Scale Daily SPEI Dataset for Drought Monitoring at Observation Stations over the Mainland China from 1961 to 2018” by Qianfeng Wang et al.

Anonymous Referee #4

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This dataset presents the computation of the Standardized Precipitation Evapotranspiration Index (SPEI) over Mainland China using an ensemble of 427 meteorological stations from 1961 to 2018. The SPEI values are computed over different time scales (1-, 3-, 6-, 12-, and 24-month). The dataset is available via ftp. It consists in one csv file for each station (427) and each time scale (5). That is a total of 2135 files (in addition to station lookup table and readme files).

The paper is comprehensive and presents examples of metrics that can be derived from the SPEI values computed such as the Annual Total Drought Severity (ATDS), the Annual Total Drought Duration (ATDD), and the Annual Total Drought Frequency

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(ATDF). This could be a useful dataset for further analyzing droughts over Mainland China.

General comments

[1] The different types of droughts: SPEI is by essence a metric for meteorological drought. It represents a deficit in precipitation. This deficit in precipitation, doesn't necessarily translate into agricultural, hydrological, and socio-economical droughts. SPEI (and SPI) values at different time scales can be used as a proxy for other type of droughts but it lacks the complete picture (no soil moisture condition, streamflow, etc.). This point should be emphasized in the manuscript. I suggest to refer to Zargar et al. (2011) for a review and extensive description of the different indices and types of droughts. Ref: Zargar, A., R. Sadiq, B. Naser, and F. I. Khan. A review of drought indices, Environ. Rev. 19: 333–349 (2011)

[2] The different time scales: This is a daily product, but the time scales are defined in months. I would suggest to replace the different time scales 1-, 3-, 6-, 12-, and 24-month by 30-, 90-, 180-, 360-, and 720-day to reflect that this is a daily product.

[3] Drought monitoring: The dataset covers the years 1961 to 2018. Monitoring droughts would imply that the dataset is constantly updated (daily in this case). It is not clear if there is a plan to routinely update the dataset (and how often the product will be updated). If this is intended to be a static product, I believe that "characterizing droughts" would be more appropriate than "monitoring droughts". Could the authors explain the process in maintaining the dataset up to date, and if there is such a plan ?

[4] Possible dataset applications: The SPEI dataset is presented only at the station level (427 stations). The station distribution is very uneven throughout the country. Therefore, its application is limited to the direct vicinity of each station. The dataset doesn't provide the global coverage that could be provided by a satellite for instance. In addition, the scientific community tends to use gridded products for characterization and monitoring. Are there any future plans to propose a gridded product ?

[5] Link to the dataset: The link to the dataset (P24, L376) needs to be corrected. Please change the name of the datafile from “muliti-scale” to “multi-scale”

[6] Handling the dataset: There is a total of 2135 csv files which could become delicate to handle. I believe that one csv file by station that would include all the time scale would be easier to manipulate.

[7] Proofreading: There are a few mistakes throughout the text. Please correct typos and errors (see examples below).

Specific comments

[1] There are typos at several locations in the manuscript (examples: P7, L140: we read “sued” instead of “used”; P13, L244: we read “severer” instead of “more severe”; P32, L150: we read “muliti” instead of “multi”). I suggest the authors to proofread the manuscript thoroughly before publication.

[2] P32, L349 : “In addition, we used the well-received GEV probability distribution for the SPEI”. Not sure what you mean by “well received”. Please explain.

[3] Figures 3, 4, 5, 6, and 7 : Add units on figures, and possibly the definition of the terms ATDS, ATDD, and ATDF in the legends.

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