Earth Syst. Sci. Data Discuss., referee comment RC1
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Comment on essd-2021-105

Anonymous Referee #1

Referee comment on "Daily standardized precipitation index with multiple time scale for monitoring water deficit across the mainland China from 1961 to 2018" by Qianfeng Wang et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2021-105-RC1, 2021

The authors present a common methodology and analysis for the drought index SPI with 1-month scale, 3-month scale, 6-month scale, 9-month scale and 12-month scale over China. It is meaningful for the drought research in different fields. However, the daily SPI is wider used, since many studies have carried out the drought research in China using daily SPI (e.g. Xie et al., 2019 (in Chinese)). The method of gamma distribution used for calculating SPI is common with no special changes. Additionally, there are still some detailed analyses needed for improving the quality of this manuscript.

Specific comments:

- Introduction: The necessity of this study is not clearly described and lack of logic, e.g. in this section the authors do not explain shortcomings of existing SPI (on daily scale), and why they need to do this research.
- Daily SPI calculation: The method used in this manuscript refers to McKee et al., 1993 and 1995 without special changes, which has been used in many studies, such as Guttman, 1998 and 1999, Mcgree et al., 2016 and 2019, Turco et al., 2020, and so on.
- Table 1: It should be added some references, such as McKee et al., 1993 or Guttman, 1999.
- Analysis of drought characteristics of typical stations: Why the authors selected these three stations not the others, some reasons are needed for this. And there should be some comparisons with similar data products or using other means for validating the reliability and superiority of the daily SPI in this manuscript, not just a few examples from Chinese Disaster Dictionary and Disaster Yearbook.
- L310-311: Is the expression correct? Please check it.
- Figure 6b-8b: The symbols for P-value are blurring.

The references mentioned above are as follows:

- Guttman, N., B.: Comparing the palmer drought index and the standardized precipitation index, Journal of the American Water Resources Association, 34(1): 113-121, 1998.
- Guttman, N., B.: Accepting the standardized precipitation index: A calculation algorithm, Journal of the American Water Resources Association, 35(2): 311-322, 1999.
- Mcgree, S., Schreider, S., and Kuleshov, Y.: Trends and variability in droughts in the Pacific Islands and Northeast Australia, Journal of Climate, 29: 8377-8397, http://doi.org/ 10.1175/JCLI-D-16-0332.1, 2016.
- Mcgree, S., Herold, N., Alexander, L., Schreider, S., Kuleshov, Y., Ene, E., Finaulahi, S., Inape, K., Mackenzie, B., Malala, H., Ngari, A., Prakash, B., and Tahani, L.: Recent changes in mean and extreme temperature and precipitation in the Western Pacific Islands, Journal of Climate, 32: 4919-4941, http://doi.org/ 10.1175/JCLI-D-18-0748.1, 2019.
- Turco, M., Jerez, S., Donat M., G., Toreti, A., Vicente-Serrano, S., M., and Doblas-Reyes F., J.: A global probabilistic dataset for monitoring meteorological droughts, BAMS, E1628-E1644, https://doi.org/10.1175/BAMS-D-19-0192.2, 2020.
- Xie, W. S., Tang W. A., and Song, A., W.: Applicability study of SPI in multiple time scales in meteorological drought monitoring in Anhui Province, Meteorological Monthly (in Chinese), 45(11): 1560-1568, https://doi.org/10.7519/j.issn.1000-0526.2019.11.006, 2019.

Minor comments:

- L93: “Theses”-> “These”
- L95: “except of”-> “except for”