

Earth Syst. Dynam. Discuss., referee comment RC1
<https://doi.org/10.5194/esd-2022-10-RC1>, 2022
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Comment on esd-2022-10

Anonymous Referee #1

Referee comment on "A 20-year satellite-reanalysis-based climatology of extreme precipitation characteristics over the Sinai Peninsula" by Mohsen Soltani et al., Earth Syst. Dynam. Discuss., <https://doi.org/10.5194/esd-2022-10-RC1>, 2022

Review of the manuscript entitled "A 20-year satellite-reanalysis-based climatology of extreme precipitation characteristics over the Sinai Peninsula" by Soltani et al.

General comments:

In this paper, the authors try to characterize the synoptic conditions of extreme precipitation events over the Sinai region. They use the satellite-derived GPM daily precipitation and meteorological fields from the NCEP-NCAR reanalysis data during the 2001 - 2021 period. I have several concerns over the methods used by the authors in this study. Therefore, I suggest the manuscript should undergo a major revision.

Specific comments:

1. The authors claim that threshold precipitation of ≥ 10 mm/day is required to define the wet and dry periods over the Sinai region. I fail to understand the logic behind choosing this arbitrary threshold. Why don't you choose a percentile-based threshold rather than an arbitrary one? The 10 mm/day threshold also suggests that 9 mm/day is considered as dry. Is it correct? I think that you need to have separate thresholds for wet and dry events.

2. Cyclone Tracking: From the description, the cyclone tracking method is not clear. How did they identify the genesis and lysis of cyclones? If multiple cyclones are present, how did they identify each of them at the subsequent time steps? Did the authors use an automated algorithm? In that case, it should be mentioned explicitly. There are several cyclone tracking algorithms available. The authors can compare their technique with some of the other tracking techniques.

3. Statistical significance of the trends: The authors should do a significance test (ideally, a non-parametric test) for the trends presented in Fig. 2 and report it in the caption.

4. Fig. 4: I don't understand the logic behind this analysis. Why do you need to compare the annual mean precipitation with the wettest month and wettest day precipitation? The colour scales of all the plots should be the same for comparison. There are better ways for understanding spatio-temporal variability. E. g. an EOF analysis.