

Response to comments of Anonymous Reviewer #3

I like to thank the Referee for her/his constructive comments that help me to improve the manuscript. Below, detailed responses to all comments are given.

1. How relevant is the choice of the 99th (or the 1st) local percentile to the final results? Would the main results be consistent if the author would choose another threshold? Which threshold would (eventually) be the frontier?

When lowering the threshold, anomalies typically occur at similar locations, but with reduced amplitudes. Also for very moderate events, weak but significant anomalies are still found. There is thus no limit below which the relationship breaks down, just a gradual decrease in the amplitude. A new figure and paragraph will be added describing the anomaly pattern for moderate precipitation events at one sample location (see also the reply to comment 1 of Reviewer 1). On the other hand, if the threshold is shifted to more extreme percentiles, still consistent anomalies are found, but the statistics become worth (due to the reduced number of events).

2. How is the spatial homogeneity of these extreme events analysed? Over each of the wide regions defined in Figure 3 there are grid points where 100 mm would be considered an extreme event and others where it would not. How is this issue relevant for the final results? Would the results be spatially skewed due to this fact?

When investigating extreme events on a grid point basis, a choice has to be made between absolute and relative (percentile-based) thresholds. Both choices are associated with specific limitations: while for the relative thresholds, the absolute amount of e.g. precipitation varies in space (as noted by the Reviewer), an absolute thresholds implies that the number of extreme events changes from grid point to grid point. When averaging the anomaly patterns over subregions, in my opinion the approach of percentile-based thresholds is clearly favourable, as with varying numbers of extremes specific grid points would contribute more to the area mean than others (e.g., wet compared to dry regions); this is what I would call spatial skewness. Moreover, the percentile-based approach is more impact-oriented, as the impacts of an extreme event depend on the local climatology.

