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## **A novel method to identify subseasonal clustering episodes of extreme precipitation events and their contribution to large accumulations**

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Temporal clustering of extreme precipitation events on subseasonal time scales is a type of compound event, which can cause large precipitation accumulations and lead to floods. We present a novel count-based procedure to identify subseasonal clustering of extreme precipitation events. Furthermore, we introduce two metrics to characterise the frequency of subseasonal clustering episodes and their relevance for large precipitation accumulations. The advantage of this approach is that it does not require the investigated variable (here precipitation) to satisfy any specific statistical properties. Applying this methodology to the ERA5 reanalysis data set, we identify regions where subseasonal clustering of annual high precipitation percentiles occurs frequently and contributes substantially to large precipitation accumulations. Those regions are the east and northeast of the Asian continent (north of Yellow Sea, in the Chinese provinces of Hebei, Jilin and Liaoning; North and South Korea; Siberia and east of Mongolia), central Canada and south of California, Afghanistan, Pakistan, the southeast of the Iberian Peninsula, and the north of Argentina and south of Bolivia. Our method is robust with respect to the parameters used to define the extreme events (the percentile threshold and the run length) and the length of the subseasonal time window (here 2 – 4 weeks). The procedure could also be used to identify temporal clustering of other variables (e.g. heat waves) and can be applied on different time scales (e.g. for drought years). For a complementary study on the subseasonal clustering of European extreme precipitation events and its relationship to large-scale atmospheric drivers, please refer to Barton et al.