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Spatial variability of precipitation extremes over Italy using a fine-resolution gridded product

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Analysis of extreme precipitation events has been the cornerstone of statistical hydrology and plays a crucial role in planning and designing hydraulic structures. Extreme value theory offers a solid theoretical basis for using the Generalized Extreme Value (GEV) distribution as a probabilistic model to describe precipitation annual maxima. Several large-scale studies investigate the properties of the GEV distribution in point measurements offering insights on its spatial variability. Yet the sparse station network in most regions, as anticipated, leads to sparse point estimates that may distort the actual spatial patterns of the GEV's parameters. Here, we use fine-resolution satellite-based gridded product, that is, the CHIRPS v2.0, to investigate the spatial variation of the GEV distribution over Italy. Our results show that the GEV shape parameter forms clear spatial patterns. We use these results to offer robust estimates and create maps for different return periods all over Italy.