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High-resolution gridded extreme precipitation indices for the wider Greek Region

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The goal of this study is to create a high-resolution grid of precipitation indices for the wider Greek region using real data from meteorological stations for the 1980-2010 period. Under the risk of increased extreme events caused by climate change, it is important to be able to have a high-resolution gridded extreme precipitation indices in order to overcome the lack of density of observations in both time and space. The development of such a grid can be used to validate model outputs and inform decision makers to better mitigate the damage from extreme precipitation.

The first step of the analysis is to calculate the extreme precipitation indices based on daily observations derived from more than 100 meteorological stations covering a wide range of altitudes and spatial climate patterns existing in Greece. Thereafter, the extreme indices will be multilinearly downscaled to a 12-meter resolution grid. The geophysical parameters used in the downscaling procedure consists of altitude, latitude, longitude, slope, aspect, solar irradiance and Euclidian distance from the water bodies. The altitude information came from the highly accurate 12-meter resolution TanDEM-X Elevation Model, which is a product generated from the TerraSAR-X satellite mission data. The resulting high-resolution patterns will give insight of the spatial and temporal variability of extreme precipitation, over the complex terrain of the wider Greek region.