



Statistical Downscaling of Rare Events. Application to Storm Forecast

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Different statistical downscaling methods have been developed to adapt the predictions provided by NWP models to local scales, considering the climatology given by the historical records observed in the location of interest. This adaptation is done by a statistical model establishing an empirical relationship between NWP model outputs and the local observed climate using a historical common period (usually a re-analysis period). These methods have not been designed to work with rare events, which yield to unbalanced occurrence/non-occurrence training subsets, usually leading to low skills. In this work we introduce a modification of the traditional analog methodology to overcome this limitation. To this aim, we consider a balanced training set including all the event occurrences and sampling with stratification the different weather types of the non-occurrence events.

As an example we illustrate the application of this methodology to storm forecast in Spain, working with a high-resolution observation network. We show how the new method outperforms the traditional analog scheme.