



1 Analysis of the 1-day Probable Maximum Precipitation over Catalunya (Spain)

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The main objective of this study is to estimate the 1-day probable maximum precipitation (PMP) over Catalunya (Spain) with a high spatial resolution. For this purpose, annual maximum daily rainfall series from 145 pluviometric stations of the Instituto Nacional de Meteorología (Spanish Weather Service) in Catalunya have been analyzed. In order to obtain values of PMP, an enveloping frequency factor (k_m) curve based on actual rainfall data of stations in the region has been developed. This enveloping curve has been used to estimate 1-day PMP values of all 145 stations. Applying the Cressman method, the spatial analysis of these values has been achieved. Monthly precipitation climatological data, obtained from the application of Geographic Information Systems (GIS) techniques, have been used as the initial field for the analysis. The 1-day probable maximum precipitation at 1 km² spatial resolution over Catalunya has been objectively determined by the employed method, varying from 200 to 550 mm. Structures with wavelength longer than approximately 35 km can be identified and, despite their general concordance, the obtained 1-day PMP spatial distribution shows remarkable differences with respect to the annual mean precipitation arrangement over Catalunya.