Classification of rainfall events for weather forecasting purposes in andean region of Colombia

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This work presents a comparative analysis of the results of applying different methodologies for the identification and classification of rainfall events of different duration in meteorological records of the Colombian Andean region.

In this study the work area is the urban and rural area of Manizales that counts with a monitoring hydro-meteorological network. This network is composed of forty-five (45) strategically located stations, this network is composed of forty-five (45) strategically located stations where automatic weather stations record seven climate variables: air temperature, relative humidity, wind speed and direction, rainfall, solar radiation and barometric pressure. All this information is sent wirelessly every five (5) minutes to a data warehouse located at the Institute of Environmental Studies-IDEA. With obtaining the series of rainfall recorded by the hydrometeorological station Palogrande operated by the National University of Colombia in Manizales (http://froac.manizales.unal.edu.co/bodegaIdea/); it is with this information that we proceed to perform behavior analysis of other meteorological variables, monitored at surface level and that influence the occurrence of such rainfall events.

To classify rainfall events different methodologies were used: The first according to Monjo (2009) where the index n of the heavy rainfall was calculated through which various types of precipitation are defined according to the intensity variability.

A second methodology that permitted to produce a classification in terms of a parameter β introduced by Rice and Holmberg (1973) and adapted by Llasat and Puigcerver, (1985, 1997) and the last one where a rainfall classification is performed according to the value of its intensity following the issues raised by Linsley (1977) where the rains can be considered light, moderate and strong fall rates to 2.5 mm / h; from 2.5 to 7.6 mm / h and above this value respectively for the previous classifications.

The main contribution which is done with this research is the obtainment elements to optimize and to improve the spatial resolution of the results obtained with mesoscale models such as the Weather Research & Forecasting Model- WRF, used in Colombia for the purposes of weather forecasting and that in addition produces other tools used in current issues such as risk management.