

Analysis of the hazardous low-altitude snowfall, 8th March 2010, in Catalonia

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During winter season snow precipitation is quite frequent in the Pyrenees (north-east of the Iberian Peninsula). On average the total amount of fresh snow at 2200 metres is of 250 cm. However, important snow episodes at low latitudes are unlikely. From 1947 to 2009, 16 significant snow episodes took place in the Barcelona and 18 in Girona areas. On 8th March 2010, a severe wet snow event had a high social impact on these regions. One of the most remarkable features of this episode was the type of precipitation (wet snow) and the large amount of precipitation combined with strong wind gust that caused the collapse of electricity pylons and tree forests. The damage was very important in the north-eastern part and the regional government approved funds of 21.4 million € to reduce the impact caused by this event.

Although diagnosis of other low altitude snowfall events in Catalonia has been done previously, the analysis of this event can contribute to characterise a little bit better these snow episodes. In this study, we will present the synoptic framework characterised by the presence of a deep low in the north-east of Catalonia and moving through Ebro valley to the Catalan coast. To do this we will use ECMWF reanalyses and Meteosat images. The main features to predict this snow event and the critical point were the total amount of precipitation and snow level forecasted by mesoscale models (MM5, WRF). The model outputs for precipitation, temperature and wind will be compared with automatic weather, radar and radiosounding data. The snow level and the type of precipitation are compared with the information received from spotters. The main storm was characterised by moderate vertical development with tops of 8 km (4 km were the average height during the initial and final phase of the event). Also, lightning activity was observed, 310 intra-cloud and 128 cloud-to-ground. The type of precipitation at a specific location in the eastern zone temporally changed because of the advection of a warmer and wetter mass coming from the Mediterranean Sea and the total amount of precipitation (up to 100 mm in 24 hours in some places). As a result, its forecast was difficult and had an important impact on one of the most populated areas with higher vulnerability and exposure in Catalonia.