



Mapping the potential development of snow pack for large areas using precipitation and temperature data

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Many efforts have been done to map the snow pack at regional scale. This is an important target due to its relevance for different fields related to territory management, such as, water resources, flood risk control, planning of traffic and touristic activities, following up the climate variability, etc. The main drawback associated to analyse the spatial distribution of snow is the relatively high meteorological and/or nivological data demand. This problem increases when the study area enlarges.

The aim of this work is obtaining an approach about the significance of the snow accumulation in the mountainous areas of Aragón (47.452 Km², NE Spain) that is one of the largest regions of Spain. A complex relief and different exposure to Atlantic and Mediterranean influences explain contrasted climatic conditions. By hence, the frequency and amount of precipitation in solid form and the duration of snow pack exhibits a great variability over this territory. Here, historical databases on climate usually consist of temperature and rainfall. Only, regular measurements of snow depth and density have been carried out regularly since 1985 in Pyrenees, which is the most important mountainous range of Aragón.

Monthly climate data were interpolated (100x100 m of grid size) by means of regressions with topography and geographical variables. Maps of the potential development of snow pack were obtained combining thermic and pluviometric information. Snow accumulation data of Pyrenees were used to validate the resultant cartographies.

Results indicate that the proposed method provides a satisfactory approach to the spatial distribution of snow in the study area. The simplicity of the used method suggest

that it could be appropriate for preliminary studies on snow accumulation in sectors, as the presented here, with a large surface and limited availability of meteorological data.