



Indirect assessment of a high-resolution precipitation reanalysis system in mountainous areas during winter.

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During the EURO4M project, the MESCOAN surface reanalysis system has been developed. The aim of this work is to assess the performance of MESCOAN in mountainous areas during winter.

In this study, the background of 24-h accumulated precipitation, two meters temperature and humidity come from a 11 km atmospheric reanalysis system (UERRA project) downscaled at 5 km. The surface reanalysis, based on Optimal Interpolation algorithm (OI) is produced every 6 hours over France for the period 2006-2010. The OI algorithm for precipitation at each grid point requires 16 nearby observations within a radius of 200 km from the point of analysis. A sensitivity study to the density of observations on the quality of the precipitation reanalysis was performed. The quality of snow measurements was also discussed. Furthermore, the influence of the characteristic horizontal scale length was analysed.

In order to evaluate those sensitivities, MESCOAN reanalysis was used as forcing to drive off-line simulations with the French land surface model SURFEX over France.

The evaluation of MESCOAN-SURFEX was made by comparing SURFEX outputs with in situ measurements in mountainous areas, such as snow depth. The optimum MESCOAN setup in those regions is then discussed in terms of precipitation reanalysis quality.