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NORTHERN HEMISPHERE SNOW DEPTH DISTRIBUTION USING OPTIMAL INTERPOLATION

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ABSTRACT

The distribution of snow depth over Northern Hemisphere is investigated by 2-Dimensional Optimal Interpolation applied to synoptic station snow depth measurements. The technique computes at each snow-covered grid point a daily snow depth increment as the weighted average of data increments at surrounding stations and applies it to a first guess snow depth derived from a numerical weather prediction model. Calculation of optimal weights is based on spatial correlation functions of horizontal distance and elevation with fixed e-folding scales of 120 km and 800 m, respectively. The results obtained indicates that the technique makes substantial improvements in accuracy compared to forecast snow depth especially over high-elevation terrain. The technique also improves estimations over remote poorly monitored areas due to the successful application of a large radius (600 km) and number of in-situ stations for interpolation (50).

Keywords: Station Snow Depth, Optimal Interpolation, Snow Depth Analysis

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