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Assessment of the Precision of Precipitation and Temperature Reanalysis Data (EMO) in the Aosta Valley Basin: A Grid-Based and Sub-Basin Analysis at Daily Time Scale.

Integrated and high-resolution Earth Observation (EO) data are indispensable for studies concerning water resource management and flood prediction, especially in high-altitude regions and mountains where data are scarce. European Meteorological Observations (EMO) represents a European high-resolution, (sub-)daily, multi-variable gridded meteorological dataset constructed from reanalysys of historical and real-time observations. The aim of this research is to assess the precision of daily precipitation records and average daily temperature estimates within the EMO dataset by using ground data. We experiment with two ways of using EMO data: grid and sub-basin; The testing area is the Aosta Valley basin (AVB), a mountainous region located in the north west of Italy. findings indicated no significant difference in precipitation data accuracy across two spatial scales. The average Kling Gupta Efficiency (KGE) and Root Mean Square Error (RMSE) values for both scales were reported as 0.6 and 5.8 millimeters, respectively when data are analyzed all together. Furthermore, our assessments reveal an absence of a clear correlation between elevation and precipitation data accuracy, although such a correlation was evident for temperature data. However, a finer analysis, distinguishing the elevations, show that the average KGE values decreased from 0.7 to -2 and 0.7 to -1.6 from low elevation to high elevation points for the grid-scale and sub-basin, while the average RMSE values increased from 3.8 to 8.4 and 3.7 to 8.1 (mm), respectively. This evident disagreement with elevations is investigated and some explanation of the fact is given.

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