EGU2020-21910
https://doi.org/10.5194/egusphere-egu2020-21910
EGU General Assembly 2020

Spatialization of meteorological variables over south mediterranean catchments. Case of the Tensift (Morocco).

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The spatialization of meteorological variables when the ground network is scattered and the relief is disturbed is a major issue for watershed hydrology or for the characterization of agricultural water consumption. The aim of this study is to set up the SAFRAN re-analysis system on the Tensift catchment area in Morocco. To this end, all the meteorological measurements acquired on the site between 2004 and 2014 by several organisations were gathered in a single database and quality control was carried out. SAFRAN was then assessed according to a leave-one-out approach, which consists of removing a station from the database and comparing the re-analysis with the data from this station. It was also compared to another technic for meteorological variables spatialization named MICROMET (Liston et al., 2006). Particular attention was paid on the mountainous areas. In order to reproduce the high climate variability in this area, SAFRAN is also set up with an irregular grid up to 1 km resolution and compared to the regular version (8 km grid point). The results show that the re-analysis on the irregular grid is much better than on the regular grid, especially in the mountains. For example, the validation at the Aremd mountain station (2058 m) shows that the bias and RMSE on the surface temperature decreased from -4.8°C and 6.2°C for the regular grid to 0.6°C and 3.6°C for the irregular grid. Likewise, for precipitation, the correlation coefficient is improved by more than 23% for the regular grid. Concerning the visible radiation, MICROMET is strongly biased compared to the measurements carried out at the Aremd station (86 W/m²) whereas for SAFRAN, the bias is only 48W/m². Our current work concerns the mapping of vertical soil-vegetation-atmosphere exchanges over the catchment area using SAFRAN forcing on the irregular grid. The challenge is notably to represent irrigation, which strongly modifies the surface water states.