



Comparison of meteorological forcing (WFDEI, AGRI4CAST) to in-situ observations in a semi arid catchment. The case of Merguellil in Tunisia.

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Meteorological forcing is essential to hydrological and hydro-geological modeling. In the case of the semi-arid catchment of Merguellil in Tunisia, long term time series are only available in the plain for a SYNOP station. Other meteorological stations have been installed since 2010. Therefore, this study aims at qualifying the reliability of the meteorological forcing necessary for an integrated model conception. We compare the meteorological data from 7 stations (sources: WMO and our own station), inside and around the Merguellil catchment, with daily gridded data at 25*25 km from AGRI4CAST and 50*50km from WFDEI. AGRI4CAST (Biavetti et al, 2008) is an interpolated dataset based on actual weather stations produced by the Joint Research Centre (JRC) for the Monitoring Agricultural Resources Unit (MARS). The WFDEI second version dataset (Weedon et al, 2014) has been generated using the same methodology as the widely used WATCH Forcing Data (WFD) by making use of the ERA-Interim reanalysis data. The studied meteorological variables are Rs, Tmoy, U2, P, RH and ET0, with the scores RMSE, bias and R pearson.

Regarding the AGRI4CAST dataset, the scores are established over different periods according to variables based on stepping between the observed and interpolated data. The scores show good correlations between the observed temperatures, but with a spatial variability bound to the stations elevations. The moderate and interpolated radiations also show a good concordance indicating a good reliability. The R pearson score obtained for the values of relative humidity show a good correlation between the observations and the interpolations, however, the short periods of comparisons do not allow obtaining significant information and the RMSE and bias are important. Wind speed has an important negative bias for a majority of stations (positively for only one). Only one station shows concordances between the data. The study of the data indicates that we shall have to adjust the wind speeds and the relative humidity of the air for the implementation of a model. Finally the reference evapotranspiration seems relatively coherent, in spite of the dispersal observed during the meteorological measures, but with biases rather high and RMSE also rather high (> 1.3 mm). After revised the parameter U2 and RH, AGRI4CAST can possibly be corrected by ancillary ground stations. The analysis of the WFDEI dataset is currently under evaluation.

(1) Biavetti, I., Karetos, S., Ceglar, A., Toreti, A., Panagos P. (2014), European meteorological data: contribution to research, development and policy support, Proc. of SPIE Vol. 9229 922907-1

(2) Weedon, G. P., G. Balsamo, N. Bellouin, S. Gomes, M. J. Best, and P. Viterbo (2014), The WFDEI meteorological forcing data set: WATCH Forcing Data methodology applied to ERA-Interim reanalysis data, Water Resour. Res., 50, 7505–7514, doi:10.1002/2014WR015638.