Modeling Pan Evaporation Using Intelligent Methods of ANN, LSSVM and Tree Model M5 (Case Study: Shahroud and Mayamey Stations)

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Abstract : The importance of evaporation estimation in water resources and agricultural studies is undeniable. Pan evaporation are used as an indicator to determine the evaporation of lakes and reservoirs around the world due to the ease of interpreting its data. In this research, intelligent models were investigated in estimating pan evaporation on a daily basis. Shahroud and Mayamey were considered as the studied cities. These two cities are located in Semnan province in Iran. The mentioned cities have dry weather conditions that are susceptible to high evaporation potential. Meteorological data of 11 years of synoptic stations of Shahrood and Mayamey cities were used. The intelligent models used in this study are Artificial Neural Network (ANN), Least Squares Support Vector Machine (LSSVM), and M5 tree models. Meteorological parameters of minimum and maximum air temperature (Tmax, Tmin), wind speed (WS), sunshine hours (SH), air pressure (PA), relative humidity (RH) as selected input data and evaporation data from pan (EP) to The output data was considered. 70% of data is used at the education level, and 30 % of the data is used at the test level. Models used with explanation coefficient evaluation (R2) Root of Mean Squares Error (RMSE) and Mean Absolute Error (MAE). The results for the two Shahroud and Mayamey stations showed that the above three models' operations are rather appropriate.

Keywords : pan evaporation, intelligent methods, shahroud, mayamey

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