

عنوان مقاله:

Potential Assessment of ANNs and Adaptative Neuro Fuzzy Inference systems (ANFIS) for Simulating Soil Temperature at different Soil Profile Depths

محل انتشار:

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خلاصه مقاله:

Objective: Soil temperature serves as a key variable in hydrological investigations to determine soil moisture content as well as hydrological balance in watersheds. The ongoing research aims to shed lights on potential of artificial neural networks (ANNs) and Neuro-Fuzzy inference system (ANFIS) to simulate soil temperature at 5-100 cm depths. To satisfy this end, climatic and soil temperature data logged in Isfahan province synoptic station were collected. **Methods:** The ANNs structure was designed by one input layer, one hidden layer and finally one output layer. The network was trained using Levenberg-Marquardt training algorithm, then the trial and error was considered to determine optimal number of hidden neurons. The number of 1 to 13 neurons were evaluated and subsequently considering a trial and error test and model error, the most suitable number of neuron of hidden layer for soil depths 5, 10, 20, 30, 50 and 100 cm was found to be 3, 4, 5, 4, 5 and 3 neurons respectively. Clustering radius was set as 1.5 for subtractive clustering algorithm. **Results:** Results showed that estimation error tends to increase with the depth for both ANNs and ANFIS models which may be attributed to weak correlation between the input climatic variables and the soil temperature at increasing depth. Result suggested that ANFIS approach outperforms ANN in simulating soil horizons temperature.

کلمات کلیدی:

Artificial neural networks, ANFIS model, Soil temperature, Levenberg, Marquardt

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