

# Air temperature forecasting using artificial neural network for Ararat valley

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*Earth Science Informatics* (2021) | [Cite this article](#)

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## Abstract

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The air temperature is a critical factor in many societal challenges to protect human health and the environment. Moreover, a vital climatic parameter, the temperature has a direct impact on evaporation, frost, and snow melting. Temperature predictions are based mainly on numerical and statistical models. Sometimes it is a challenge to improve the weather forecast accuracy. The article aims to implement a weather prediction technique based on machine learning methods and approaches to improve the hourly air temperature prediction for up to 24 hours in the Ararat valley (Armenia). Due to intense heat and low relative humidity, the high temperatures and hot winds occur between 120 and 160 days per year in Ararat valley, as one of the aridest regions of Armenia. The approach utilizes the earth observation data received from several meteorological stations and the large satellite analysis-ready datasets at different frequencies and resolutions. The experiments have been conducted with multiple neural networks to forecast air temperatures for 24 hours that happened over the Ararat valley. The suggested model has 87.31% and 75.57% accuracies to predict the temperature for the next 3 and 24 hours, which is sufficient to be used alongside the current state-of-the-art techniques.