Daily pan evaporation estimations are achieved by a suitable Artificial Neural Network (ANN) model for the meteorological data recorded from Automated GroWheather meteorological station near Lake Egirdir which lies in the Lake District of western Turkey. In this station six meteorological variables are measured simultaneously, namely, air temperature, water temperature, solar radiation, air pressure, wind speed and relative humidity. Since the purpose is the estimation of evaporation the ANN architecture has only one output neuron with up to 4 input neurons representing air and water temperatures, air pressure and solar irradiation. Prior to ANN model construction the classical correlation study indicated the insignificance of the wind speed and the relative humidity in the Egirdir Lake area. Hence, the final ANN model has 4 input neurons in the input layer with one at the output layer. The hidden layer neuron number is found as 3 after various trial and error model running. The ANN model provides good estimations with the least Mean Square Error (MSE).