Geophysical Research Abstracts,
Vol. 11, EGU2009-3330-1, 2009
EGU General Assembly 2009

The Application of Factor Analysis and Artificial Neural Networks in Predicting Spring Precipitation by Means of Climatic Parameters of the Upper Levels of Atmosphere

M Habibi Nokhandan (1), G.-A. Fallah-Ghalhary (2), and M Mousavi Baygi (3)

(1) Climatological Research Inistitue, National Center for Climatology, Mashhad, Islamic Republic Of Iran (habiby_2001@yahoo.com), (2) Dept of Geography, Isfahan University and Climatological Research Inistitue, Mashhad, Islamic Republic Of Iran (ab_fa789@yahoo.com), (3) Water Engineering Dept, Faculty of Agriculture, Ferdowsi University of Mashhad, I.R of Iran (mousavi500@yahoo.com)

This paper aims to study the relationship between climatic large-scale synoptic patterns of the Upper Levels of Atmosphere and rainfall in Khorasan-e Razavi Province. Artificial neural networks and factor analysis were used in this study to predict rainfall in the period between April and June in the province. At the first the relationship between average regional rainfall and the changes in synoptic patterns including the temperature of 700-mb level, the thickness between 500 and 1000-mb levels and the relative humidity of 300-mb level was analyzed. In the selection of these regions, we have considered the effect of synoptic patterns in these regions on the rainfall in the northeast region of Iran. Then, artificial neural networks model for the period 1970-1997 were taught. Finally, the rainfall in the period 1998-2007 has been predicted. The results show that artificial neural networks can predict rainfall with reasonable accuracy in all years. The root mean-square error of the model was 5 millimeter.
Keywords: rainfall prediction, synoptic patterns, artificial neural networks, factor analysis.