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Water and precipitation patterns in the North-East of Romania

A.-M. Luchian (1), O.-M. Machidon (), D. Luchian (), N. Luchian (), and D. Machidon ()

(4) Lehrkrankenhaus der Friedrich-Alexander-Universität Erlangen-Nürnberg–Landkreises Neumarkt i.d.OPf Hospital; 92318 Neumarkt, Germany (luchian_alinutza@yahoo.co.uk), (1) National Meteorological Agency of Romania, Moldova Center Iasi, (agro_is@meteoromania.ro), , (2) "Al. I. Cuza" University, Faculty of Geography and Geology Iasi (ovidiumachidon@yahoo.com), (3) "Costache Negruzzi" National College Iasi, Romania, (dorina10luchian@yahoo.com)

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Alina Mihaela Luchian (4), Ovidiu-Miron Machidon (1,2), Dorina Luchian (3),
Neculai Luchian (1), Dana Machidon (2)
(1) National Meteorological Agency of Romania, Moldova Center Iasi, (agro_is@meteoromania.ro), (2) "Al. I. Cuza" University, Faculty of Geography and Geology Iasi (ovidiumachidon@yahoo.com), "Costache Negruzzi" National College Iasi, Romania, (dorina10luchian@yahoo.com), (4) Lehrkrankenhaus der Friedrich-Alexander-Universität Erlangen-Nürnberg–Landkreises Neumarkt i.d.OPf Hospital; 92318 Neumarkt, Germany (luchian_alinutza@yahoo.co.uk).

Abstract: We have studied the changing precipitation patterns, intensity and extremes in the climate variability in the last 55 years, focusing on the temporal and spatial distribution of the precipitation and the temperature in the period of 1956 to 2010, in the North-East of Romania, especially at 8 meteorological stations in Moldavia: Iasi, Podu-Iloaie, Cotnari, Rauseni, Botosani, Dorohoi, Avrameni and Darabani (from south to the north). The obtained results following this study proves that it is a randomized line of the annual values of the observational data which represent an important and useful element supporting the understanding of a certain dynamic aspects related to the regime of precipitation in the N-E of Romania. Different precipitation producing mechanisms are associated with the northern precipitation regime and the atmospheric air circulation mainly from North-West. Space-time distributions that give the statistical number of cases of quantities of rainfall on medium, maximum and minimum threshold of values are needed to detect the climate changes given by the natural variability. The graphics of the annual rainfall thresholds represent 33% of all analysis cases. We did case studies of regional hydrological behavior in climate sensitive and drought or flood regions in the north-east of Romania. We have considered the average, maximum and minimal precipitation quantities recorded at the meteorological stations on scales higher than 0.1 and the higher than 1.0, 10.0, 20.0 and higher than 30.0. We have identified four dangerous levels of precipitation especially for flood and drought regions in the north-east Romania. Through this study we have the documented information about the structure of the annual precipitation regime over the North-East of Romania. The goal is to detect climate change impact on the evolution of the meteorological phenomena of risk (extreme temperatures and precipitation, droughts, hail, storms), very important in agriculture, economy and vineyards in Moldavia.

Key words: precipitation patterns, hydrological behavior, extreme level, risk phenomena.