RISK ASPECTS DURING THE PERIOD 2003-2005 IN WESTERN ROMANIA

ASPECTE DE RISC DIN PERIOADA 2003-2005 ÎN PARTEA DE VEST A ROMÂNIEI

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***Abstract**: Characterising climate supposes analysing the evolution in space and time of the different climate parameters during the period 2003-2005 at meteorological stations in the Banat area. The varied relief, whose auditorium-like distribution opens to the south and west, allows the penetration of moister air masses from north-west or from south turning Banat's climate into a moderate-continental climate with ocean and sub-Mediterranean influences.*

***Rezumat:** Caracterizarea climatică a presupus o analiză a evoluției spațiale şi temporale a diferiților parametrii climatici în cursul perioadei 2003 - 2005 la stațiile meteorologice din Banat. Relieful variat, a cărui distribuție în amfiteatru deschis spre sud şi vest, permite pătrunderea maselor de aer mai umede din nord-vest şi vest, sau a celor din sud, imprimând climatului bănățean un caracter continental moderat cu influențe oceanice şi submediteraneene.*

***Key words:** thermal regime, rainfall regime, hail, storm, snowstorm, ice deposit.*
***Cuvinte cheie:** regim termic, regim de precipitații, ceață, furtună, furtună de zăpadă, gheață*

INTRODUCTION

Within this particular geographical area bordered north by the Mures River Valley and south by the Danube Valley are located the 20 meteorological stations covering all forms of relief. In the plain area are located the stations in Arad, Sannicolau Mare, Jimbolia, Timisoara, Novi Sad, Zrenjanin, Banloc, Vrset and Lugoj; in the gorge or depression areas are located the stations in Deva, Varadia de Mures, Caransebes, Bozovici, Baile Herculane, and Moldova Veche; in the hill areas, the stations in Oravita and Resita; and in the mountain area, the stations in Semenic, Cuntu, and the Varfu Tarcu.

MATERIAL AND METHOD

The varied relief, whose distribution under the shape of an auditorium open to the south and the west allows the penetration of both moister air masses from north-west and west and of warmer air masses from the south and confer the Banat's climate a moderate continental character with sub-Mediterranean influences. Below we analyse the main meteorological parameters that have evolved during the year 2003 in the Banat area. The southwestern part of Romania is affected, depending on season, by the influence of the action centres, constituted of the Azores anti-cyclone, the Mediterranean cyclones, and the Icelander minimum, while, during the cold season there is the influence of the East-European anti-cyclone.

RESULTS AND DISCUSSIONS

The annual absolute maximum occurred at all meteorological stations between December 5 and 23, 2003, except for the Varfu Tarcu meteorological station, where maximum values was on October 27, 2003, table 1 and 2.

The annual absolute minimum was signalled on April 21, 2003, by most

meteorological stations, while at the Varfu Tarcu meteorological station it occurred on February 27, 2003.

Abatements from the normal values had positive values on the average, i.e. 0.3^0C more, with higher values in Lugoj, Zrenjanin, Caransebes (0.9^0C) and with the lowest value at Varfu Tarcu ($+0.2^0$C), in Novi Sad ($+0.8^0$C), and Zrenjanin ($+0.7^0$C).

Table 1

Monthly rainfall (mm) registered at Timisoara Meteorological station in 2003 – 2005

Month	2003	2004	2005
I	69.0	60.0	33.0
II	26.7	40.3	68.0
III	10.2	18.0	45.0
IV	46.3	59.1	154.0
V	51.4	66.2	50.0
VI	80.5	34.8	36.0
VII	55.4	45.2	45.0
VIII	4.2	76.9	142.0
IX	66.3	55.6	84.0
X	113.2	62.8	25.0
XI	31.3	127.0	21.0
XII	22.1	60.8	89.0

Table 2

Monthly mean temperatures (^{0}C) registered at Timisoara Meteorological station in 2003 – 2005

Month	2003	2004	2005
I	-2.5	-2.2	0.0
II	-4.7	1.5	-3.3
III	4.7	6.0	3.3
IV	10.4	12.2	11.3
V	20.2	15.2	16.7
VI	22.8	20.0	19.7
VII	22.4	22.5	22.3
VIII	24.2	21.2	20.7
IX	16.2	15.8	17.3
X	9.0	12.7	11.0
XI	7.5	6.0	5.0
XII	1.3	2.4	1.3

The month of August proved to be the hottest month of the year 2003 at all meteorological stations in the Banat area. The highest average was at Moldova Veche (24.9^0C). Higher relative values that month were in Kikinda (23.1^0C), Banloc (22.5^0C), Baile Herculane

(23.1^0C), and Novi Sad (23.1^0C).

The month of February was the coldest month in all the meteorological stations, monthly averages having negative values in most meteorological stations in the Banat area. In Timisoara and Novi Sad, in this month of the year they recorded -4.7^0C, while in the mountain area the values, as expected, dropped below -10.0^0C.

Hail was recorded mainly during the warm season; it fell from Cumulonimbus clouds and can produce considerable damage in the plain areas. The maximum number of 11 days was recorded at the Semenic meteorological station, followed by Kikinda with 5 days, and by Varfu Tarcu and Zrenjanin with 3 days each. In lower lands, it was present at Sannicolau Mare (2 days) and Jimbolia (1 day).

Storm is a phenomenon that accompanies the cold front of the second order; it sometimes produces considerable damage. At the meteorological station in Oravita they recorded the highest number of storms (8 days), followed by the meteorological station at Banloc (5 days).

Blizzard is the transport of snow at high altitudes and it was signalled in 2003 mainly in the mountain areas; fog is a phenomenon frequent in the mountain area, where it was recorder for over 100 days.

In general, in 2003, there was 577.5 mm rainfall (Timisoara), 610 mm in Caransebes, 542 mm in Novi Sad, and 599 mm in Zrenjanin. Abatements from normal values show how variable atmospheric rainfall is. The year 2003 was characterised by deficient annual amounts compared to multi-annual averages, at all the important meteorological stations in the area. The analysis of annual averages of the wind speed point out higher values in the mountain area and in southern Banat area. Thus, annual averages oscillated between 7.9 m/s (Varfu Tarcu) and 1.4 m/s (Resita). In the plain area, average wind speeds are over 2.0 m/s, and at the meteorological stations where there is the influence of the Cosava, there are average wind speeds of 3.1 m/s in Oravita, 2.4 m/s in Moldova Veche, and 3.0 m/s around Vrset.

Defining climate features supposed an analysis of the spatial and temporal climate parameters in 2004 at the meteorological stations in the Banat area.

Air temperature is a variable size, because of the factors determining warming and freezing of the earth's cover, because of its lack of homogeneity, and because of the uneven distribution of solar energy. Air temperature over the year is pointed out by the succession of annual and monthly average values.

July is considered the hottest month of the year in 2005, with average values that went above 25.0^0C at many meteorological stations; in Timisoara, it was 20.3^0C.

January was the coldest month of the year with negative averages at all the meteorological stations: at most observation points, the values were below -3.0^0C. In Timisoara, it was -5.0^0C, and the average was -2.2^0C.

The analysis of monthly averages and of the abatements in 2005 point out colder months than usually – January, February, March and November – and warmer ones – May, July, September, and December.

Ice depositions specific to the cold season is a dangerous meteorological phenomenon when expanding, as it can cause damages to the communication systems.

White frost (soft and hard) occurs mainly in the mountain area, where the number of days with such depositions can reach 159 days at Varfu Tarcu. Silver thaw is another form of ice deposition that can affect transportation when lasting too much.

The annual amount of rainfall recorded in 2004 was 716.7 mm. The year 2004 was very moist, which was confirmed by the numerous months with excess moisture.

The months with the highest amounts of rainfall were April, August, and November, and the lowest values were recorded in March.

CONCLUSIONS

Annual amounts of rainfall recorded in 2003 oscillated around 1200 mm at certain mountain meteorological stations and 550 mm at most meteorological stations in the plain.

The year 2004 was colder than usually and had a rainfall excess. After a winter and a spring colder than usually, there was a relatively warmer summer with an exceeding rainfall regime, while the autumn was colder.

Annual averages for 2005 were lower compared to multi-annual values, i.e. 10.5^0C at the meteorological stations in the low plains and in southern Banat, or did not go above 5.5^0 at mountain meteorological stations.

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