

STUDY REGARDING THE AIR TEMPERATURE IN THE BARCĂU HIDROGRAPHICAL BASIN

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Abstract

In the present paper, the temperature regime was studied during 1992-2010, based on data submitted by the National Administration of Meteorology (Oradea stations, Nușfalău and Săcuieni) and Tikovizig Debrecen (Debrecen station).

The result was that the highest average annual temperature value recorded in Debrecen, on Hungarian territory and the lowest value on Romanian territory, at Nușfalău station. The air temperature presents a minimum value in January and a maximum in July. The hottest year was 2000 (12.3°C at Săcuieni) and the coldest was 1996 (8.3°C at Nușfalău). The number of summer days (max. 25°C) was between 82 and 97. The number of winter days (max. 0°C) was between 26 and 38. The number of frost days ranges between 93 and 118.

The average annual temperature of the soil recorded a maximum in the year 2000 (13.7°C at Debrecen) and a minimum in the year 1996 (9.8°C at Nușfalău).

Key words: air temperature, hydrographical basin, soil temperature, climate, weather station.

INTRODUCTION

Air temperature in the catchment area of Barcău varies, in time and space, as a result of a complex interaction between solar radiation, atmospheric circulation and surface active peculiarities. It varies space-time depending on the latitude, altitude, local and general circulation of the atmosphere, but also the type of soil, landform, vegetation, hydrography etc. So, the air temperature is an essential climatic element in the climatological analysis of a region.

MATERIAL AND METHODS

Temperature regime was studied during the period 1992-2010, based on data submitted by the National Administration of Meteorology (Oradea, Nușfalău and Săcuieni stations) and Tikovizig Debrecen (Debrecen station).

RESULTS AND DISCUSSION

Multiannual monthly average temperature and average monthly temperature variation multiannual Basin boat, are shown in the figures no.1 and 2.

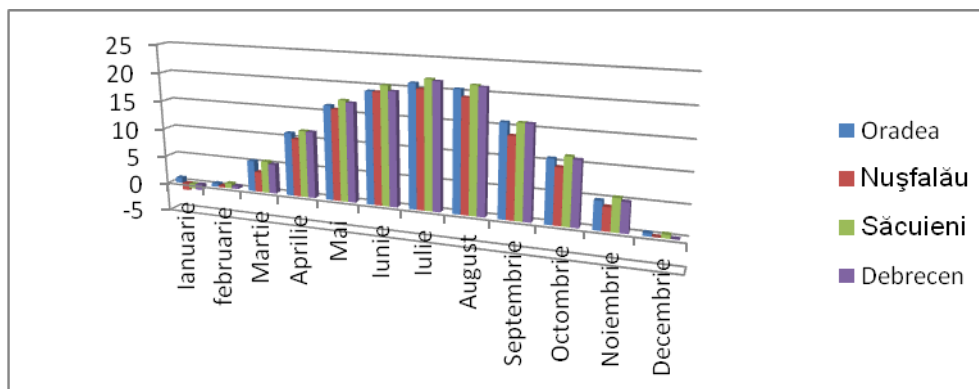


Fig. 1. Monthly average air temperature during the 1992-2010 multiannual (°C)
(Source: National Administration of Meteorology and Tikovizig Debrecen)

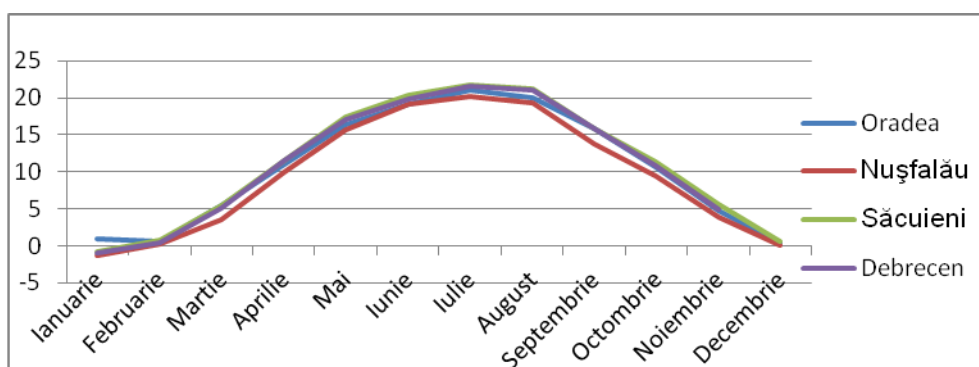


Fig. 2. Multiannual monthly average temperature variation during 1992-2010 (°C)
(Source: National Administration of Meteorology and Tikovizig Debrecen)

For the studied, there is a minimum in January (-0.9°C at Oradea; -1.24°C at Nușfalău; -0.82°C at Săcuieni; -0.96°C at Debrecen) and a maximum in July (21.0°C at Oradea; 20.01°C at Nușfalău; 21.79°C at Săcuieni; 21.52°C at Debrecen).

The average annual temperatures and average annual temperatures variation are shown in figures no. 3 and 4. The highest average annual temperature value recorded in Debrecen, on Hungarian territory and the lowest value on Romanian territory, at Nușfalău station.

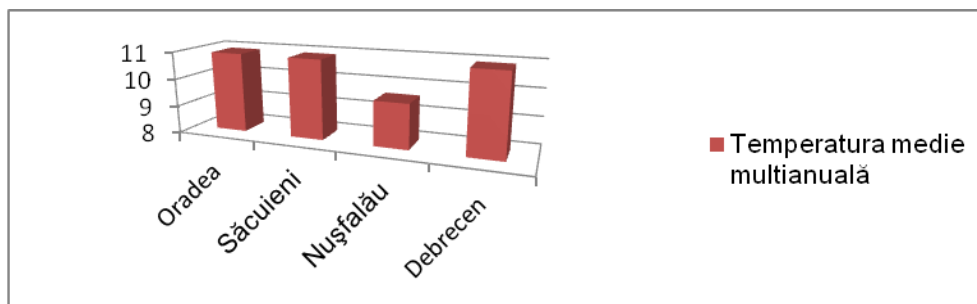


Fig. 3. Annual average air temperature in the range 1992-2010 (°C)
 (Source: National Administration of Meteorology and Tikovizig Debrecen)

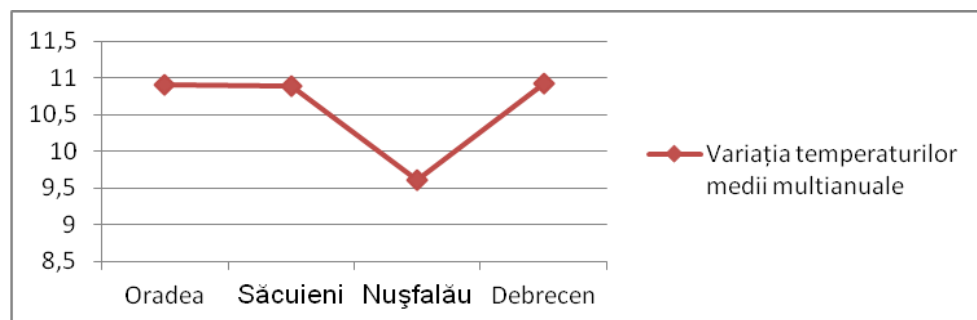


Fig. 4. Changes in average annual air temperature in the range 1992-201 (°C)
 (Source: National Administration of Meteorology and Tikovizig Debrecen)

Annual average temperatures range from 8.3°C at Nușfalău (1996) to 12.3°C at Săcuieni (2000). There is a relatively uniform distribution for the values of the stations Oradea, Debrecen and Săcuieni. Annual average temperatures throughout the study are shown in the figure no.5 and the evolution in the figure no.6.

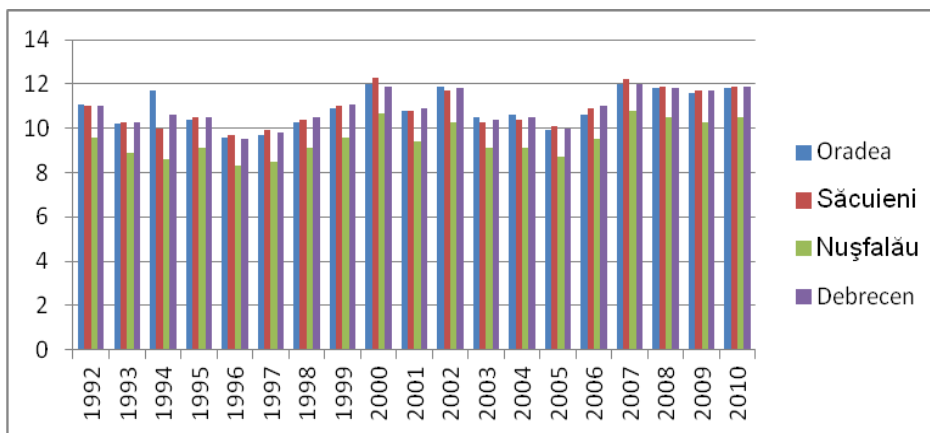


Fig. 5. Annual mean air temperatures during 1992-2010 (°C)
 (Source: National Administration of Meteorology and Tikovizig Debrecen)

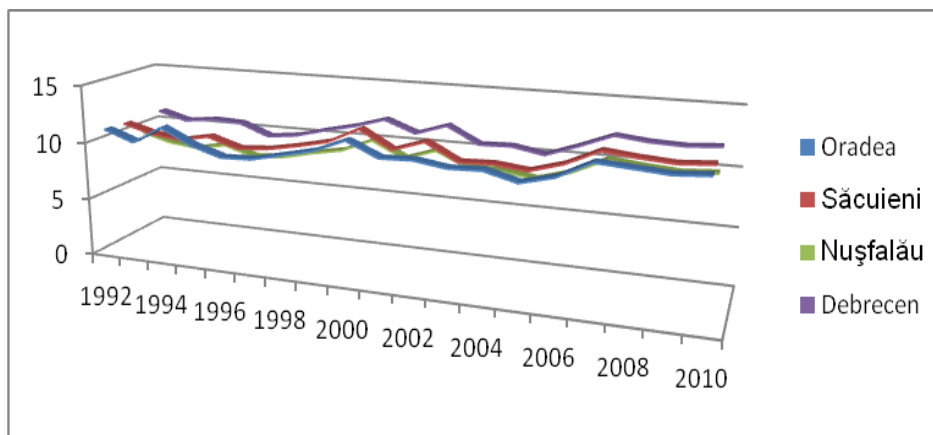


Fig. 6. Evolution of annual mean temperatures during 1992-2010
 (Source: National Administration of Meteorology and Tikovizig Debrecen)

The number of summer days (max. 25°C) was between 93 and 97 in Oradea and Debrecen, and 82 at Săcuieni and Nușfalău. The number of winter days (max. 0°C) to Oradea, Debrecen and Săcuieni was between 26 and 29 days and 38 for Nușfalău. The number of frost days ranges between 93 and 101 in Oradea and Debrecen, and maximum 118 in Nușfalău.

Soil temperature is an important factor which makes the performance and intensity of physical processes, chemical and biological soil occurring. It is closely correlated with a number of factors, such as: the amount of solar energy received, altitude, exposition, slope, degree of revegetation of land, albedo, soil water content, soil solution chemistry etc.

The average annual temperature of the soil recorded a maximum in the year 2000, with an average of 13.07°C (13.4°C at Oradea; 11.6°C at Nuşfalău; 13.6°C at Săcuieni; 13.7°C at Debrecen) and a minimum in the year 1996, with an average of four stations of 10.62°C (10.6°C at Oradea; 9.8°C at Nuşfalău; 11.0°C at Săcuieni; 11.0°C at Debrecen). Overall, the highest values recorded at station Debrecen and the lowest at Nuşfalău station (Fig. no.7 and 8).

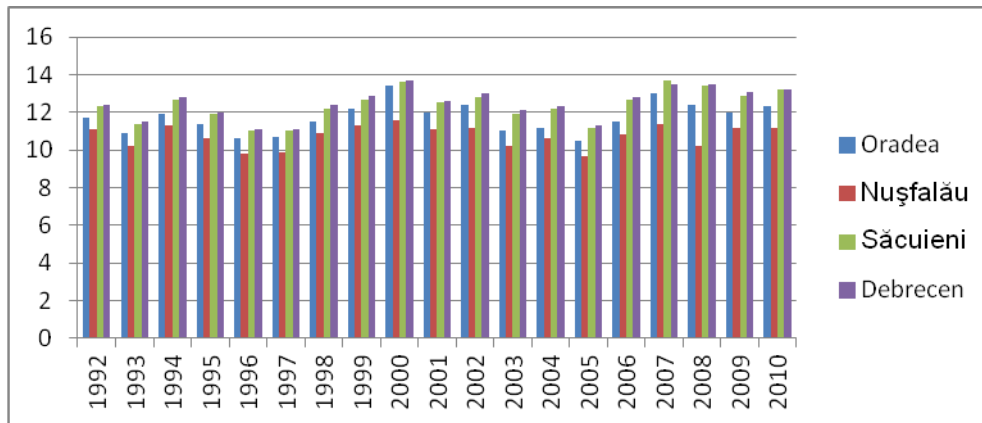


Fig. 7. The average annual temperature of the soil for the period 1992-2010 (°C)
(Source: National Administration of Meteorology and Tikovizig Debrecen)

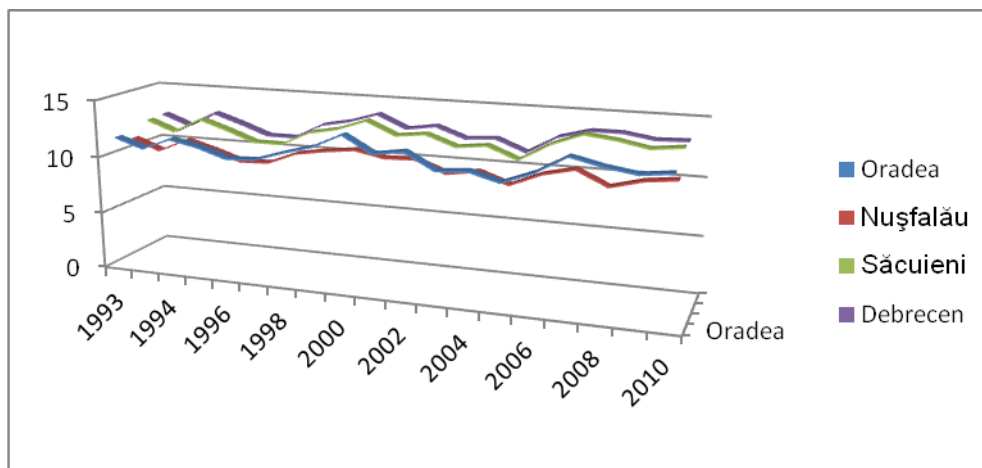


Fig. 8. Mean annual soil temperature variation during 1992-2010 (°C)
(Source: National Administration of Meteorology and Tikovizig Debrecen)

Average yearly temperature at the soil surface (Fig. no.9 and 10) recorded values between 10.76°C and 12.48°C (11.64°C at Oradea; 10.76°C at Nuşfalău; 12.30°C at Săcuieni; 12.48°C at Debrecen).

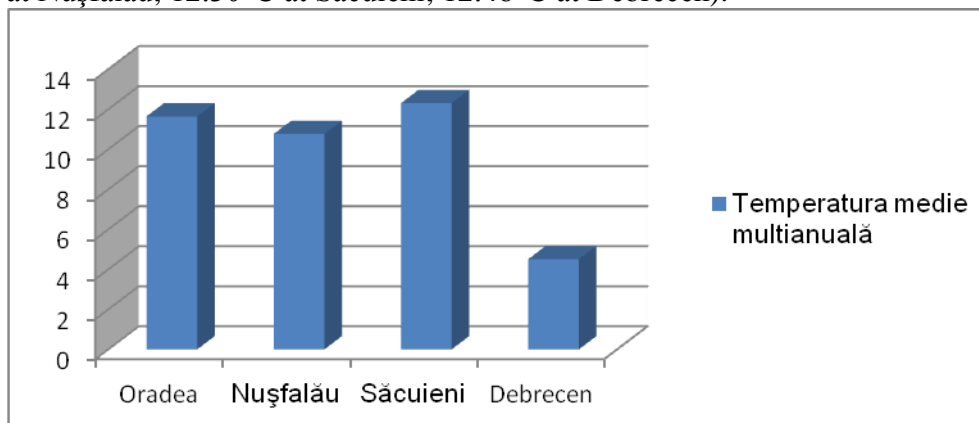


Fig. 9. Average yearly temperature at the soil surface for the period 1992-2010 (°C)
(Source: National Administration of Meteorology and Tikovizig Debrecen)

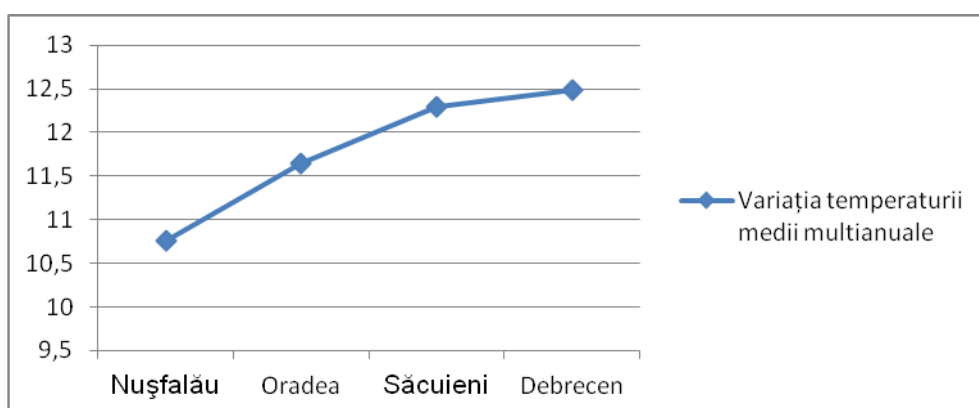


Fig. 10. Changes in average annual soil surface temperature during 1992-2010 (°C)
(Source: National Administration of Meteorology and Tikovizig Debrecen)

The average monthly temperature at the soil surface during the 1992-2010 study (Fig. no.11 and 12), presents minimum values at Nuşfalău station (-1.9°C) and maximum at Oradea station (-1.1°C).

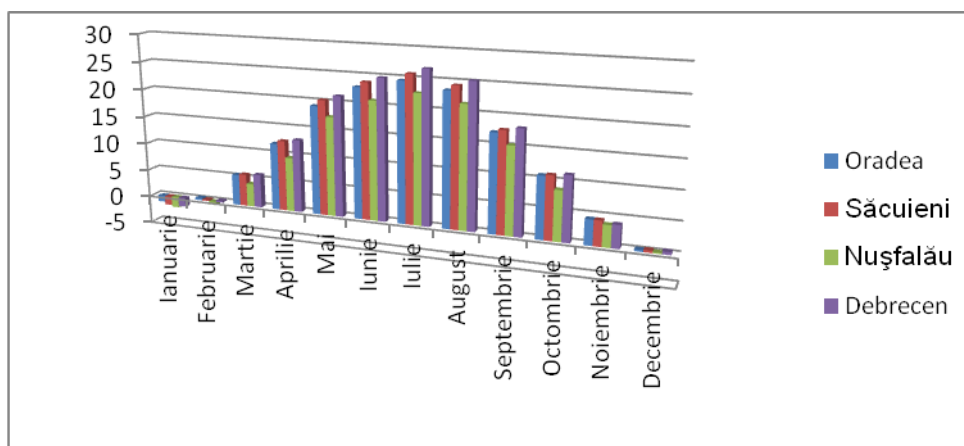


Fig. 11. The average monthly temperature at the soil surface during 1992-2010 (°C)
(Source: National Administration of Meteorology and Tikovizig Debrecen)

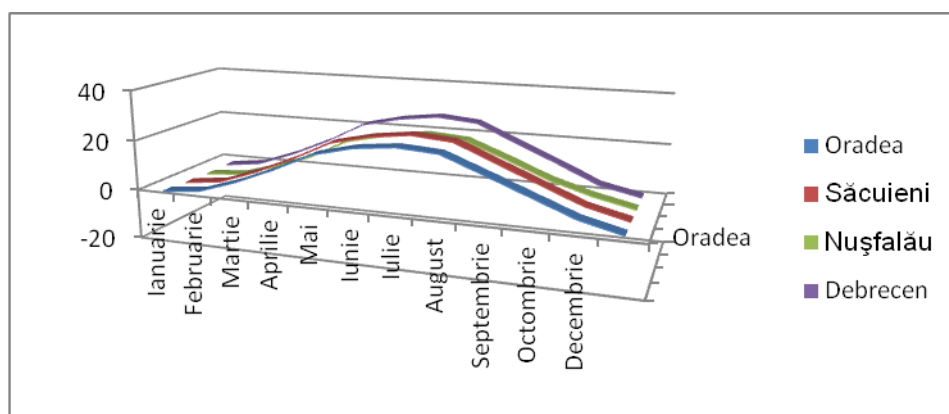


Fig. 12. Variation of monthly average temperature at the soil surface during 1992-2010(°C)
(Source: National Administration of Meteorology and Tikovizig Debrecen)

CONCLUSIONS

The highest average annual temperature value recorded in Debrecen, on Hungarian territory and the lowest value on Romanian territory, at Nușfalău station. The air temperature presents a minimum value in January and a maximum in July. The hottest year was 2000 (12.3°C at Săcuieni) and the coldest was 1996 (8.3°C at Nușfalău).

The number of summer days (max. 25°C) was between 82 and 97. The number of winter days (max. 0°C) was between 26 and 38. The number of frost days ranges between 93 and 118.

The average annual temperature of the soil recorded a maximum in the year 2000 (13.7°C at Debrecen) and a minimum in the year 1996 (9.8°C at Nuşfalău).

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