

## THE REGIME OF THE ATMOSPHERE HUMIDITY IN THE GURAHONȚ HOLLOW AREA

Pereș Ana Cornelia\*, Kőteles Nandor\*

\*University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048 Oradea, Romania, e-mail: peresana35@yahoo.com

### **Abstract**

*The current work has followed the regime of the atmosphere humidity from the Gurahonț hollow area. In order to reach this aim the atmosphere humidity data have been processed, data taken from the Gurahonț weather station for a period of 30 years, for the interval 1982 – 2011. The main sizes that characterize the atmosphere humidity and which are the object of our study are: relative moisture, water vapor tension, and the saturation deficit. The water vapors from the air come mainly from the Atlantic Ocean and from the Mediterranean Sea. A lower quantity of water vapors in the studied area comes from the evaporation of water from the soil, from the rivers' surfaces and from the plants' slip out.*

*The multi annual average of the relative humidity in Gurahonț area is of 78%. The monthly average of the relative humidity register their maximum values during the cold period of the year due to the low temperatures as well as due to the high frequency of the wet Mediterranean air. These average values occur especially in December and in January when on average 85% are registered.*

**Key words:** relative humidity, water vapor tension, saturation deficit.

### **INTRODUCTION**

The *Gurahonț* hollow is geographically situated on one side and on the other side of the White River between The Codru Moma Mountains and The Zărandului Mountains. The Gurahonț weather station is situated in the hollow bearing the same name, on the White River Valley and it is surrounded by hills and mountains with heights between 200 – 600 meters in what the hills are concerned and heights of 600 – 900 meters in what the mountains are concerned (Gaceu O., 2005).

### **MATERIAL AND METHOD**

In order to emphasize the characteristics of the atmosphere humidity from the Gurahonț hollow area we have processed data from the period 1982 – 2011, data obtained from the instrumental observations performed at Gurahonț weather station.

The analysis has been done on the basis of the data enlisted on the meteorological observation tables from the above mentioned weather station.

The obtained data have been processed with the help of the statistical and mathematical methods, and the obtained results were then graphically presented.

## RESULTS AND DISCUSSIONS

### 1. Relative humidity

Due to the influence of the wet climate from the west part of the continent the relative humidity from the Gurahonç hollow area registers a multi annual average of 78%.

During the year the relative humidity of the air is influenced by the air temperature. Thus, during summer when the air temperature registers the highest values the relative humidity is low while during the winter the course is exactly vice versa.

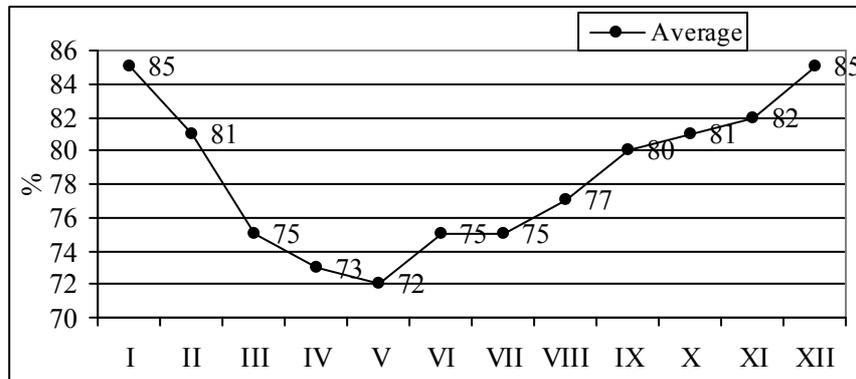


Figure 1. The distribution of the multi annual monthly average values of the relative humidity(%) in Gurahonç

Following the annual regime of the relative humidity it is to be noticed that it is characterized by higher values during winter especially in December and in January when they are of 85%. The high values of the relative humidity are due to the low temperatures from this period of the year but also due to the high frequency of the hot and wet December air coming from the Mediterranean Sea.

The minimum values of the relative humidity are produced in the hot period of the year, thus in May 72 % are registered, in April 73%, in March, June and July 75% and in August 77% (see figure 1).

In spring the multi annual average values are lower than during the cold season of the year due to the increase of the air temperature and as a consequence of the predominant anticyclone regime. Thus, in March the maximum average is registered, of 75%, decreasing in April to 73% and in May to 72%.

Once in September the air temperature decreases, the multi annual average of the air's relative humidity starts to increase registering an average of 80%. Because the anticyclone regime is persistent in this month and also because in this month the temperature is higher in comparison with the other autumn months, relative humidity registers lower values. In October the monthly average is 81% and in November it is of 82%.

**The average frequency of the days with relative humidity  $\leq 30\%$ ;  $\leq 50\%$ ;  $\geq 80\%$**

The average days with very low air relative humidity, with values  $\leq 30\%$  at any of the observation hours is of 6.8 days. During the year they register higher values in spring, for example month April registers a value of 1.7 days. The fewest days with relative humidity  $\leq 30\%$  are registered in winter in the months December and January (0.0 and 0.1 days).

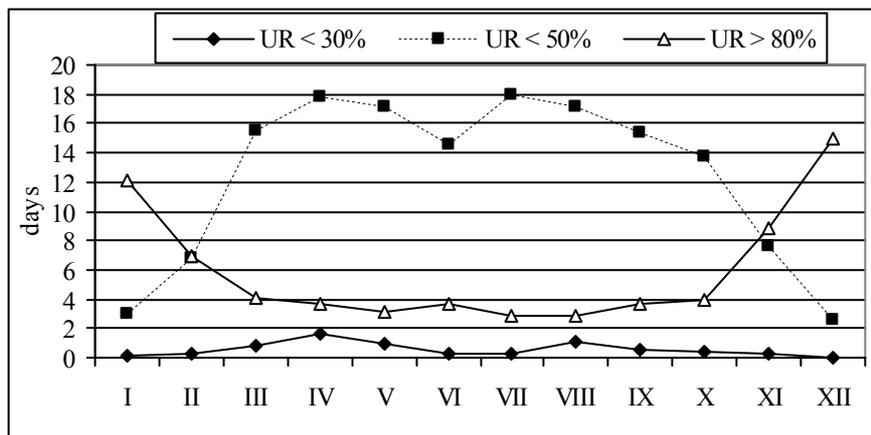


Figure 2. The monthly course of the days with relative humidity  $\leq 30\%$ ;  $\leq 50\%$ ;  $\geq 80\%$ , in Gurahonç

The average days with relative humidity  $\leq 50\%$  at least one of the observation hours is of 149.4 days. During the year the days with relative humidity  $\leq 50\%$  register maximum values during the hot period of the year in the months of July and April with an average of 17.9 days and one of 17.8 days respectively. The lowest values are produced in the cold period of the year in the months of December and of January with 2.6 days and with 3.0 days respectively (see figure 2).

The multi annual average of the relative humidity days  $\geq 80\%$  at noon (when the maximum temperature occurs) is of 71.0 days. Their frequency is higher during the winter due to the low temperature and due to the higher frequency of the wet Mediterranean air. The maximum number is produced

in December with 14.9 days followed by January with 12.1 days. The minimum number of days with relative humidity  $\geq 80\%$  at noon is produced during the hot period of the year due to the high temperature existent in this period of the year. Thus the months July and August register 2.9 days.

## 2. The water vapor tension

In Gurahont hollow area the water vapor tension registers an annual average of 10.4 mb.

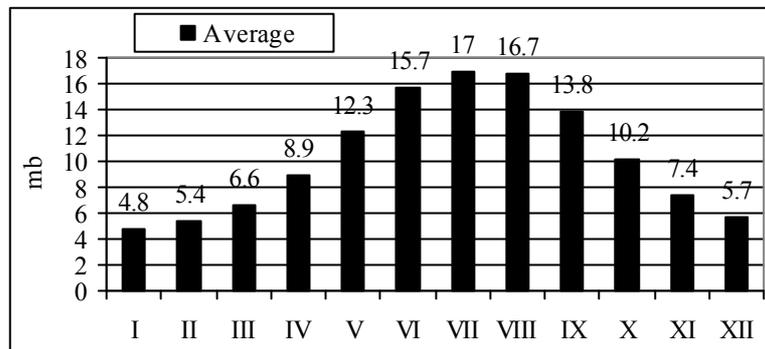


Figure 3. The monthly evolution of the water vapor tension (mb) in Gurahont

During the year the monthly average of the water vapor tension has got an ascending course once the temperature increases and once the wind intensifies and speeds up the evaporation. Thus the highest values are produced in summer, in July 17.0 mb are registered, in August 16.7 mb are registered and in June 15.7 mb are registered.

The lowest values of the water vapor tension are produced in the cold season of the year, with values between 4.8 mb in January and 5.7 mb in December. Intermediary values are registered during the transition seasons, these values being between 7 mb – 14 mb (see figure 3).

## 3. The saturation deficit

In Gurahont hollow area the multi annual average value of the saturation deficit registers 4.1 mb.

The saturation deficit registers an ascending course until July after which it has a descending course until the end of the year. The maximum value is produced in July with a multi annual monthly average of 7.8 mb followed by August with an average of 7.3 mb (see figure 4).

The minimum values are produced during the cold season, these being between 1 mb in January and 1.6 mb in February.

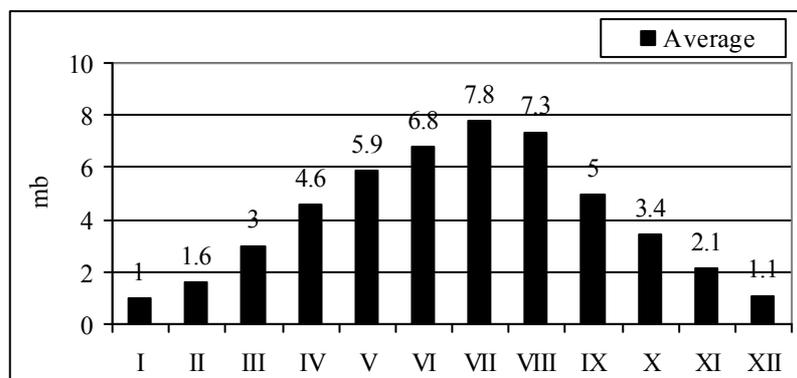


Figure 4. The monthly evolution of the saturation deficit (mb) in Gurahonț

The intermediary values are registered in spring and in fall, being between 2 – 6 mb.

#### CONCLUSIONS

In Gurahonț hollow area the multi annual average of the relative humidity is of 78%. During the year the maximum values of the relative humidity are registered during the cold period of the year because of the low temperatures, especially in December and in January when 85% are registered.

The monthly average values of the water vapors increase once the temperature increases and once the wind intensifies, wind that speeds up the evaporation. Thus, the highest values are produced in summer and the lowest in winter. The multi annual average is of 10.4 mb.

The saturation deficit registers a multi annual average of 4.1 mb. During the year the course is ascending starting with January until July when it registers the maximum value of 7.8 mb. The lowest values are registered during winter, in January and in December when on average 1.0 mb are registered.

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