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MODERN TRENDS
IN A CHANGING WORLD**



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GEOGRAPHICAL SCIENCES

ANALYSIS OF THE MOISTURE REGIME IN THE TERRITORY OF THE ZHYTOMYR REGION FOR THE PERIOD FROM 2004 TO 2018

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Atmospheric moisture, its phase state and moisture circulation play a significant role in the formation of weather and climate. Air humidity depends not only on the comfort of weather conditions for humans, but also on the intensity of evaporation from the surface of the earth and water bodies, the transpiration of moisture by plants, the occurrence of frosts, and the formation of fogs.

The presence of water vapor in the atmosphere significantly affects the thermal resources of the atmosphere and the underlying surface. The content of water vapor varies greatly depending on circulation processes, physical and geographical conditions of the area, season, soil condition and other factors.

Nowadays, the fact of global warming is considered experimentally proven by long-term instrumental measurements. This is evidenced by the increase in the global air and ocean temperature, the decrease in the area of glaciers, and the rise in the level of the World Ocean. The local climate is largely formed under the influence of the global climate, as a result of which climate changes carry certain environmental and socio-economic risks. That is why the study of local climate change trends in order to implement measures aimed at adapting to new weather and climate conditions is extremely relevant. Zhytomyr Region was formed on September 22, 1937. It is located on the Right Bank of Ukraine, its central part is Polissia. It borders

the Republic of Belarus to the north, Kyiv to the east, Vinnytsia to the south, and Khmelnytsky and Rivne regions of Ukraine to the west. Almost all rivers belong to the Dnipro basin. Swamps occupy a large area in Polissia. The landscape of the Zhytomyr region is plains, densely covered with ravines and river valleys in the south. The area of Zhytomyr Oblast is 4.9% of the territory of Ukraine. The Zhytomyr region has the appearance of an undulating plain with a general decline to the north and northeast. Most of the region (southern and southwestern) lies within the boundaries of the Dnipro and Volyn-Podilsky uplands. The north-eastern part is occupied by the Polish lowland. In the north of the region there is the Slovechan-Ovrutsky ridge with the highest point 316 m above sea level, in addition, there are Bilokorovytskyi-Topylniansky and Ozeryansky ridges on the territory of the region. The climate of the region is moderately continental with warm, humid summers and mild, cloudy winters. The continentality of the climate increases from west to east. The climate of the region is greatly influenced by air masses from the northern part of the Atlantic Ocean, to a lesser extent from the side of the Arctic Ocean. In the formation of the microclimate of the region, solar radiation, forest cover, wetlands, river system, soil and plant cover play a major role.

There are 5 weather stations in Zhytomyr Oblast (Zhytomyr, Ovruch, Olevsk, Korosten, Novograd-Volynskyi). At the weather station of the city of Novohrad-Volynskyi, observations were resumed by Ukrmet in 1922 and continue to this day. Currently, the meteorological station conducts observations according to the program of the II-class station. Observations in the city of Olevsk began in 1923. And on December 21, 1949, a second-class weather station was opened, where regular observations are still being conducted.

The Korosten meteorological station, which was founded in 1924, is a mode station of the II category, and carries out round-the-clock observations of all weather parameters. The only station in the region that observes sunlight. Meteorological observations in the city of Ovruch were started in April 1894 and are still functioning.

Average monthly and average annual air humidity in the Zhytomyr region from 2004 to 2018 were calculated based on weather station data, as well as

calculated deviations of the obtained data from the standard climatic norm.

According to the indicators, it can be seen that at the Zhytomyr station, the average monthly indicators of air humidity during the research period range from 63 to 86%. Minimum values are noted in April. The maximum average monthly air humidity is observed in December and is 86%. Long-term relative humidity trends are characterized by a minimum value of 70% in 2015 and a maximum value of 79% in 2004. The average long-term relative humidity at the Zhytomyr station is 75%.

At the Ovruch station, the average monthly indicators of air humidity during the study period range from 69 to 89%. The minimum average monthly air humidity is indicated in April. The maximum average monthly temperature is observed in December and is 89%. Long-term trends of relative humidity are characterized by a minimum value of 74% in 2015 and a maximum value of 81% in 2013. The average long-term relative humidity at the Ovruch station is 79%.

At the Olevsk station, the minimum monthly average air humidity was also recorded in April and is 67%. The maximum indicators of average monthly humidity are observed in December - 87%. Long-term relative humidity trends are characterized by a minimum value of 74% in 2014 and 2015 and a maximum value of 78% in different years. The average long-term relative humidity at the Olevsk station is 77%.

The annual distribution of relative humidity at the Korosten station is almost no different from other stations; the minimum average monthly air humidity is observed in April and is 66%. The maximum average monthly air humidity is observed in December and is 88%. Long-term relative humidity trends are characterized by a minimum value of 72% in 2015 and a maximum value of 78% in different years. The average long-term relative humidity at the Korosten station is 76%.

At the station Novohrad-Volynskyi, the minimum average monthly air humidity was noted again in April and is 64%. The maximum average monthly humidity is observed in December and is 85%. Long-term relative humidity trends are characterized by a minimum value of 70% in 2015 and a maximum value of 77% in 2006 and 2013. The average long-term relative humidity at the

Novohrad-Volynskyi station is 75%.

The maximum indicators of average monthly humidity are observed in December and vary from 85% to 89%. The highest value of 94% was recorded in December in the northern part of the region at the Ovruch weather station. Average annual humidity ranges from 75% in the south to 79% in the north of the region. The lowest variability of relative humidity is noted in winter. Its values are constantly high, due to the significant recurrence of cyclonic invasions, as well as radiation cooling of air in anticyclones, and approach the maximum of about 90%. In April, features of the summer distribution of relative humidity appear. In June and July, the relative humidity is higher than in May by 3-5% due to an increase in precipitation and downpours. In autumn, the average monthly relative humidity in the studied area varies from 74 to 88%.

The analysis of the obtained results of the air humidity values at five stations of the Zhytomyr region showed that at all stations during the studied period, the relative air humidity changed in almost the same limits. Relative humidity in the surface layer always has a diurnal and annual trend opposite to that of air temperature. That is, as the air temperature decreases, the relative humidity increases, and as it increases, it decreases. Currently, the temperature is increasing every year, and the relative humidity is decreasing. As can be seen from the presented data, in the Zhytomyr region during the studied period, in all seasons of the year, there is a decrease in humidity indicators compared to the norm. The annual distribution shows that the highest values of relative humidity are observed in the cold period from November to February. The lowest indicators take place in the period April-June. Long-term trends of relative humidity are characterized by minimum values in 2015, maximum values are recorded in different years. The average long-term relative humidity ranges from 75 to 79%.