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The growing season in Ukrainian Carpathian region under modern climate conditions

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Temperature regime of some particular region can be characterized by dates of stable air temperature transition above/below certain thresholds and the duration of respective seasons. In climatology, the seasons with threshold values of 0, 5 and 10^0C are standard. They are also very important for different sectors of national economies. For example, season with temperature below 0^0C is important for tourist business (ski resort) especially in mountainous countries. In climatology, the season with temperature less than 0^0C is called as the cold period. Periods with temperature above 5 and 10^0C are very important for agriculture, where they are called as the growing season (vegetation period) and the active vegetation periods respectively. The terms “cold (warm) period”, “vegetation period” and “active vegetation period” are commonly used among climatologists of former USSR countries.

The objective of our work is to study peculiarities of the growing season (the start, the ending and the length) in Ukrainian Carpathian region under modern climate conditions.

In our study we used data-set of daily mean air temperature collected on 39 Ukrainian climatological stations located within the area of Ukrainian Carpathian. Data of climatological stations from neighboring countries (Poland, Slovakia, Hungary and Romania) were also used to harmonize our calculations. Data-set represented the time period of 1961-2010. Time series of daily mean air temperature were controlled and homogenized by means of MASH software. Revealed errors and inhomogeneties were removed.

The most problematic stage of such studies is calculation of dates of stable air temperature transitions above/below threshold. There are a lot of different algorithms for calculation giving, however, quite different results.

In order to calculate dates of stable air temperature transition above/below threshold of 5^0C (the start and the ending of the growing season) we used 4 different methods which are used the most often. Using these methods we obtained dates of the start, ending and length of the growing season for each year of the period 1961-2010 and each station. These new time series served as a base for our further study (geostatistical analysis).

To define how significant changes of the growing season were during the period of 1961-2010 we calculated linear trend coefficients of time series of the start, ending and length for each of considered stations.

Comparison of the results showed that peculiarities of the growing season depend very strongly on the method used for calculation of dates of stable air temperature transitions. But in general we can conclude that there is some tendency of increasing of growing season length in Ukrainian Carpathians.

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