



## The growing season in Carpathian region during 1961-2010

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The objective of our work is to study features of the growing season (GS) in Carpathians regions during period of 1961-2010 and reveal their possible changes. The area of interest included longitudes from 17°E till 27°E, latitudes from 44°N till 50°N.

In our study we have used gridded data of mean and minimum daily air temperature obtained during realization of the CARPATCLIM project. According to available data the beginning, end and length of the GS were calculated in every point of 0.1°x0.1° grid and for every year. To obtain reliable results and with purpose of comparison the beginning and end of the GS were calculated by means of three different methods which are most often used in similar studies.

Produced time series were averaged over two periods 1961-1990 and 1981-2010 and anomalies of growing season characteristics (1981-2010 against 1961-1990) were calculated to answer a question regarding changes observed. We have built maps of anomalies obtained with different methods and studied their statistical significance.

Besides, we averaged air temperature for every grid point and for every day of year over mentioned time periods. Then, we built dynamical maps of averaged daily air temperature to study relative contribution of circulation factors in the formation of the beginning and end of the GS separately in 1961-1990 and 1981-2010.

Analyzing our results, we can conclude:

- 1) GS characteristics depend strongly on method used to calculate the beginning and end of the season. Differences remain even after time averaging over 30-year period.
- 2) All methods basically give increasing of the growing season length over bigger part of studied area excepting mainly Carpathian Mountains.
- 3) Increasing of the season length is mainly due to a shift of its beginning toward earlier dates. The end of the GS remains mainly unchanged.
- 4) Circulation factors play more important role (comparing with radiation factors) during formation of the beginning of the season. In the autumn it seems to be vice versa.
- 5) The most important factor what defines the growing season in the studied area are Carpathian Mountains. They are a natural barrier, which stops warm air moving from south and west in spring and cold air moving from north and east in autumn.