



Evapotranspiration from the forest cenose on the territory of Slovakia for the period 1951-2010

Ján Hrvoľ (1), Martin Gera (1), Maroš Turňa (2), and Katarína Mikulová (2)

(1) Faculty of Mathematics, Physics and Informatics, Comenius University, Bratislava, Slovakia, (2) Slovak Hydrometeorological Institute, Bratislava, Slovakia

The evapotranspiration from the forest cenose is an important component of the hydrologic balance of the forest, which is a natural part of the country. The change of the climatic system of the Earth is related to the increase of the global air temperature. The higher air temperature causes the higher evapotranspiration and then more water vapour infiltrates to the atmosphere. The consequence of this process, the water vapour can condensate in bigger amounts and then the higher totals of the precipitation could cause the local floods, which could be regulate by the retention of the forests. The evapotranspiration from the forest cenose is an adequate indicator of the climatic change, because it is coupled with the air temperature and the precipitation too. By the generalization of the evapotranspiration measurement from the forest, we can state that it is by 10-15% higher than that one from the grass cover in comparable conditions.

The paper brings a time and space distribution of the evapotranspiration from the forest cenose at 30 stations lying on the territory of the Slovak Republic. The computation of the evapotranspiration was based on the Budyko-Zubenokova's method from the grass cover. Then the evapotranspiration from the grass cover was used for the computation of the evapotranspiration from the forest cenose defined by the J.L. Rauner's and S.F. Fedorov's method. In the months with the snow, the Kuzmin's method was used. The monthly sums of the evapotranspiration from the forest cenose were computed by the model used on the Department of Astronomy, Physics of the Earth and Meteorology at the Faculty of Mathematics, Physics and Informatics of the Comenius University in Bratislava. The monthly totals of evapotranspiration from the forest cenose were computed for the period 1951 – 2010. We compared two periods 1951 – 1980 and 1981 – 2010 and then determined the differences of the mean monthly, annual and vegetation season's sums between these two periods too. Except for it, we determined the long-term course, tendency, variability and extremes of the annual totals of the evapotranspiration from forest cenose for each of the stations in both periods 1951 – 1980 and 1981 – 2010. By this procedure we could classify the intensity of the change of the evapotranspiration from the forest cenose in a time and space on the territory of Slovakia.