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Impact of windstorm from November 2004 on mezo- and microclimatic conditions in the High Tatras region

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On Friday, November 19th 2004, violent windstorm of wasting force hit the Hight Tatras forest scrubs. Landscape pattern of the 50 km long and 2,5 km wide area have been completely changed by the rare meteorological phenomena (total area of devastated forest scrub is about 12 000 hectares). Forest scrub pattern has been dramatically changed whereby the connected and coherent spruce scrubs at the age between 40 and 110 years have been replaced by the low, mainly meadow vegetation. It is highly probable the radical surface change might result in modification of mezzo- and microclimatic conditions of the affected region. Apart from this fact an impact of expected mezzo- and microclimatic condition changes on regional climate could modify the atmospheric component of the High Tatras environment.

Investigation and quantification of feasible forest scrub changes impact on mezo- and microclimatic conditions in the stricken region of the High Tatras has constituted one of the most crucial task point of recently finished APVV project called “Microclimatic effect of forest scrub in the High Tatras”. On the ground of statistical analysis of meteorological measurements and observations obtained from meteorological stations network of SHMI the statistical trends and long-term variability as well as significant changes of selected meteorological components, such as air temperature, air humidity and precipitation, have been evaluated during the first phase of the project. The results of the statistical investigation have represented an essential input data for verification of mathematical model designed to simulate the effect of forest scrubs on mezzo- and microclimatic conditions of the areas stricken by the windstorm.

For the purpose of identification and quantification of significant scrub-change induced mezoclimatic signal we are dealing with statistical analysis of selected meteorological component time series (air temperature, air humidity, precipitation, wind speed, cloudiness as well as sunshine duration and snow cover characteristics) at representative climatological stations (Poprad, Štrbské Pleso, Tatranská Lomnica, Stará Lesná, Oravská Lesná, Liptovský Hrádok, etc.) within the 1951-2008 and 1961-2008 period. Almost all selected climatological stations are situated in the immediate vicinity of the windstorm stricken areas (except Liptovský Hrádok, Oravská Lesná and Poprad that have been used to compare the results from farther intact regions). In addition to the trend and variability analysis we are also dealing with evaluation of mezoclimatic conditions particularity of the stricken areas (long-term regime of precipitation, air temperature, air humidity, snow cover, etc.) in the presented paper.