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Climate change observed in Slovakia and its impact on changes in climate regions

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Many studies focused on the monitoring of climate change have been made across the Europe. In the context of climate change, scientists discuss the relevant reference periods for the assessment of changes in climate. The most of published studies compared recent conditions with the last reference period: 1961 – 1990. In this paper, the changes in annual, seasonal and monthly average air temperature, as well as annual, seasonal and monthly precipitation totals in Slovakia, are presented to imply changes which will probably show up in the next reference period: 1991 - 2020. For this purpose, the monthly data of air temperature and precipitation total in the period 1931 – 2014 were used. Such a long dataset was available only for 13 climatologic stations, but they are quite equally distributed and represent the mountainous part of Slovakia in the north as well as the lowland areas in the south. The average annual air temperature increased in the period 1991 – 2014 from about 0.9 °C to 1.1 °C in comparison to its average value in the period 1961 – 1990. On the other hand, a difference only 0.1 °C was reached comparing average annual air temperature in the periods 1931 – 1960 and 1961 – 1990. The highest increase of monthly average air temperature was observed in the months of January, June, July and August. The precipitation totals show only small changes and they are statistically insignificant. In the second part of paper, changes in the climate regions in Slovakia are analysed, comparing spatial distributions in the period 1961 – 1990 and in the period 1961 - 2010. According to this comparison, we record the changes in sub-regions due to the increase of average monthly temperature and the drying tendencies in lowlands and surrounding lower parts of Slovakia. These drying tendencies are not caused by the decline of precipitation, but by increasing temperature, which enhances evapotranspiration.

Keywords: air temperature, precipitation totals, trend analysis, climate classification, climate regions, Slovakia