



Precipitation changes in the Baltic countries in 1966-2013

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Air temperature has significantly increased in northern Europe during the last fifty years while changes in precipitation are much more unclear. Precipitation is characterised by a very high temporal and spatial variability making trend analyses complicated. Studies on precipitation trends in northern Europe have revealed increase in winter and various results for the warm half-year. GCM outputs for the future project similar changes. The objective of this study was to analyse trends in monthly, seasonal and annual precipitation in the three Baltic countries.

The study region is located in the eastern coast of the Baltic Sea roughly between the latitudes 53.5°N and 59.5°N. Monthly precipitation data from 54 stations during 1966–2013 were used: 16 from Lithuania, 19 from Latvia and 19 from Estonia. The wetting corrections to every precipitation measurement were added since 1966. After that the precipitation time series could be considered as homogeneous. Although the meteorological measurements have been made using the automatic weather stations during last years, precipitation measurements have been made manually using Tretyakov gauges. Trend analysis is realised using Mann-Kendall test and Sen's method. Statistically significant changes have not been detected in all stations. The trends are significant in some stations and insignificant in the others. Annual precipitation has significantly increased at 22 stations from 54. The mean trend value was 9 mm per decade that was the highest in Latvia and the lowest in Lithuania. The majority of the precipitation increase is concentrated to the cold season when the trends are statistically significant in the majority of stations. They are weaker only in Lithuania. Monthly precipitation trends during the cold season are significant in January and February. Increasing trends revealed also in summer and especially in June. The precipitation changes in spring and autumn are negative but mostly insignificant.