



## Soil temperature and its long-term changes in Latvia

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Soil temperature and its variation at various depths are unique parameters useful in understanding both the surface energy processes and regional environmental and climate conditions. Soil temperature has been routinely measured over the past century, but so far received little attention, though its peculiar instrumental and measurement problems.

The long-term monthly data of soil temperature from 14 weather stations in Latvia for the periods 1925-2012 and/or 1945-2012 were analyzed. Soil temperature data includes the following parameters: mean, minimum and maximum monthly and seasonal temperature at the ground surface, mean soil temperatures at the 0.05-0.2 m depth in the period June-September, mean seasonal soil and sub soil temperatures at 0.2-3.2 m depth, the first dates in autumn and the last dates in spring when freezing temperature occurs on the ground surface, the length of the period with positive temperatures on the ground surface. The series of temperatures at 0.2-3.2 m depth for the period 1925-1945 has been corrected for changes in depth. All-time series were checked for the instrumental and location changes.

The data analyses results shows that deep soil temperatures over the past century have positive slopes in all seasons varied from 0.03 to 0.36 °C/decade, depending on the season and depth. The average temperature at the ground surface shows the increasing trends up to 0.48°C/decade in March, April and July and slight decreasing trends in October and November. The number of days with positive ground surface temperature for the period 1945-2012 has increased from 7 days near the Baltic Sea up to 50 days in continental southeast part of Latvia. It was found that soil temperatures variations are closely related to changes in the mean air temperature as well as influenced by changes in snow cover and precipitation.