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The shifting of climate types: manifestation to phenology and ecosystems structure

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According to the Köppen climate classification, almost the entire area of Latvia belongs to the same climate type, Dfb, which is characterized by humid continental climates with warm (sometimes hot) summers and cold winters. In the last decades whether conditions on the western coast of Latvia more characterized by temperate maritime climates. In this area there has been a transition (and still ongoing) to the climate type Cfb.

Temporal and spatial changes of temperature and precipitation regime have been examined in whole territory to identify the breaking point of climate type shifts. We used two type of climatological data sets: gridded daily temperature from the E-OBS data set version 21.0e (Cornes et al., 2018) and direct observations from meteorological stations (data source: Latvian Environment, Geology and Meteorology Centre). The temperature and precipitation regime have changed significantly in the last century - seasonal and regional differences can be observed in the territory of Latvia.

We have digitized and analysed more than 47 thousand phenological records, fixed by volunteers in period 1970-2018. Study has shown that significant seasonal changes have taken place across the Latvian landscape due to climate change (Kalvāne and Kalvāns, 2021). The largest changes have been recorded for the unfolding (BBCH11) and flowering (BBCH61) phase of plants – almost 90% of the data included in the database demonstrate a negative trend. The winter of 1988/1989 may be considered as breaking point, it has been common that many phases have begun sooner (particularly spring phases), while abiotic autumn phases have been characterized by late years.

Study gives an overview about climate change (also climate type shift) impacts on ecosystems in Latvia, particularly to forest and semi-natural grasslands and temporal and spatial changes of vegetation structure and distribution areas.

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