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Daily weather data from 1960 to 2008 for a 1km grid over Austria

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Daily weather data are an important constraint for diverse applications in ecosystem research. In particular, temperature and precipitation are the main drivers for forest ecosystem productivity. Mechanistic modelling theory heavily relies on daily values of minimum and maximum temperatures, precipitation, incident solar radiation and vapour pressure deficit. These data are usually provided by interpolation techniques using measured values from surrounding stations or weather generators based on monthly mean values. One well-known and frequently used software package is DAYMET which was adapted and validated for Austrian purposes. The calculation includes the interpolation of maximum and minimum temperature and precipitation based on near-by measurements, and the subsequent extrapolation of incident solar radiation and vapour pressure deficit based on the temperature and precipitation values. The Austrian version of DAYMET uses daily weather data from more than 400 measuring stations all over Austria from 1960 to 2008.
We describe a dataset of daily values for minimum and maximum temperature, precipitation, solar radiation and vapour pressure deficit for a 1km grid over Austria. With this dataset it is possible to perform analyses not restricted to the location of measurement stations. To demonstrate such an application, we use the change in the length of the growing season from 1960 to 2008 as an example. A statistical analysis exhibited a significant increase of 0.033 °C/year in mean temperature (t=5.77; =0.05%) but no significant change in annual precipitation (t=0.64; =0.05%). For the growing season length a significant increase of 0.34 days/year (t=3.0; =0.05%) on average was estimated. Such a positive trend was significant for 90.1% of the grid points (t>2.01; =0.05%). Additionally, we present the spatial distribution of the change from 1960 to 2008 in mean temperature and growing season length in Austria.