

# Changes in climate extremes over the European Forest Types (1991-2050)

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A forest type (FT) generally describes a category of forest defined by its composition, and/or site-specific factors, and used in a system suitable to the situation at country level. The FTs are recognised to be a flexible approach to support the collection of data and organise forest indicators in a given area at different spatial scales, from country up to continental level.

The ongoing climate change is associated with increased intensity, duration and spatial extent of climate extremes, which may exacerbate the impacts on many ecological systems and socio-economic sectors, including forest ecosystems and forest management.

This study explores the observed variability (1991-2020) and estimated changes (2021-2050) in the climate extremes that may occur over the European Forest Types (EFT), to provide a continental-scale perspective of the potential impact on forest ecosystems and provide decision support for forest management. Both temperature and precipitation CLIMPACT extremes indices relevant for forestry described and proposed by the Expert Team on Sector-Specific Climate Indices were computed using CERRA sub-daily regional reanalysis data for Europe. We use model outputs of climate change projections based on two Representative Concentration Pathways (i.e., RCP4.5, and RCP8.5). The climate information

was analysed in combination with the 100 m resolution gridded EFT dataset produced within the Horizon Europe project OptFor-EU, ensuring consistency with similar studies at the European level. The results are detailed for case study areas situated in eight European countries (Norway, Lithuania, United Kingdom, Germany, Austria, Romania, Spain, and Italy).

While all EFTs are subject to increasing temperatures extremes and precipitation intensities, we found clear regional differences. The continental coverage and the level of details provided by these results support both the development of EU adaptation and mitigation strategies and plans, as well as the local forest management practices within the climate change context.

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