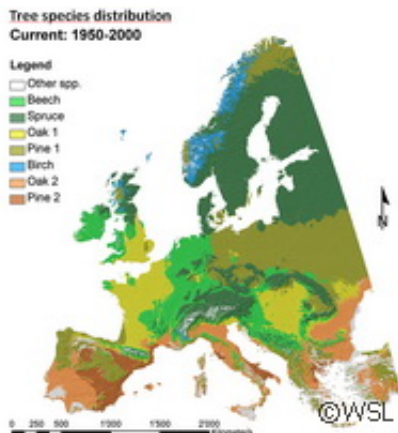


# Forests to feel climate change effect—damage could cost billions

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Credit: WSL

A new pan-European study suggests that the economic value of forests will decline between 14 % and 50 % due to climate change. If measures are not taken to change this, the damage could reach several hundred billion euros, say researchers led by the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL) in Switzerland. The study was presented in the journal *Nature Climate Change*.

Researchers from Finland, Germany, the Netherlands and Switzerland believe that changes in both temperature and precipitation will affect the range of most [tree species](#). Their estimates were calculated on a wide range of temperature increases, between 1.4 °C and 5.8 °C. They anticipate this will occur even if the [climate change](#) scenario is not

extreme. Cold-adapted and mesic species, including the Norway spruce, which is the biggest contributor to the economic value of European forests, will feel the biggest crunch.

Using three [climate change scenarios](#) outlined in the [Intergovernmental Panel on Climate Change](#) (IPCC), the researchers believe the Norway spruce will change direction and go north, shifting away from its current locations in western central and eastern Europe.

With respect to [higher elevations](#), the team estimates the Alps spruce, for example, could potentially survive. Meanwhile, climate change could benefit trees that have adapted to drought, but are slow to grow in areas like the Mediterranean, including Cork oak and Holm oak. Based on their findings, these trees could expand their ranges much further north than where they are today.

The data show that these species will increase to, on average, more than 32 % of the forest land in Europe, with the exception of Russia, under the moderate scenario. The change would be from 11% to over 28% under the mild scenario, and to more than 40% of the forest land under the extreme scenario.

The researchers say climate change will largely impact tree [species distribution](#) within European forests. Their findings demonstrate that by 2100, when Norway spruce might have disappeared in many regions, between 21 % and 60 %, and an average of 34 %, of European forest land will be suitable only for a Mediterranean oak forest type with low economic returns for the timber industry. Further, these slow-growing forests will absorb less carbon than today's forests. The calculated loss, based on interest rate and climate scenario, will range from 14 % to 50 %, with an average of 28%, of the current value of forest land in Europe.

Under a moderate IPCC climate scenario, the researchers say the loss

could be around EUR 190 billion. The loss could range between EUR 60 billion and EUR 680 billion in all three climate scenarios. According to the researchers, Europe will deal with forests with lesser [economic value](#) if countermeasures are not introduced. One alternative would be to introduce other species into Europe, such as the Atlas Cedar or Douglas Fir.

**More information:** Hanewinkel, M. et al., 'Climate change may cause severe loss in the economic value of European forest land', *Nature Climate Change*, 2012. [doi:10.1038/nclimate1687](https://doi.org/10.1038/nclimate1687)

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