Climate change will hit Mediterranean forests hardest

A new study has highlighted the regional variation in the impacts that climate change may have on European forests. In northern and western Europe there may be positive effects on forest growth, whilst increasing drought and fires in the Mediterranean could damage forests.

Climate change can have an impact on forests in a number of ways. Higher temperatures can extend the growing season, whilst changes in water availability can restrict productivity. It can also change the frequencies of pest outbreaks, droughts and forest fires. This EU-funded study¹ analysed previous research on the impacts of climate change on five different types of European forests: boreal, temperate continental, temperate oceanic, Mediterranean and mountainous.

Warmer temperatures and higher levels of CO₂ caused by climate change will increase the growing period for trees in the Boreal region, which includes Norway, Finland and Sweden, and is characterised mainly by coniferous forests. This will produce bigger amounts of timber in the mid- to long-term and the distribution of tree species may change, with broad-leaved deciduous trees expanding northwards.

In the Temperate Oceanic region, which includes France, Germany, the Netherlands and the UK, extreme events, such as storms, droughts, flooding and heat waves are the greatest risks for forests. Summers are likely to be dryer and hotter with temperature increases of up to 4°C which may cause outbreaks of pests, such as bark beetles and fungal diseases.

The Temperate Continental (Eastern Europe) and Mediterranean forests are the most water-limited and will suffer most from droughts. In Temperate Continental forests, increases in annual temperature of 3-4°C may trigger outbreaks of pests. The Mediterranean is most at risk from forest fires and there may be an increased chance of desertification with rainfall dropping by up to 50 per cent in the summer in some places. Tree growth is likely to decrease in Mediterranean mountain ranges where water is scarce and in the Alps and Carpathians there could be an increasing number of broadleaved species.

The study also analysed the capacity of European forests to adapt to climate change. Forests have some natural mechanisms for adaption, such as genetic changes and natural selection, but these are slow processes and natural adaptation may not be quick enough for forests to survive. Socio-economic adaptation is thus also needed, for example, through development of adaptive forest management strategies to secure sustainable wood production and provisioning of ecosystem services.

Currently there are considerable differences in socio-economic adaptive capacity across regions in Europe. The Mediterranean region has the least capacity, as large forest areas here are unmanaged and this is where the largest impacts from climate change are expected.

¹. This research is based on a study commissioned by the European Directorate General for Agriculture and Rural Development: “Impacts of Climate Change on European Forests and Options for Adaptation”. See: http://ec.europa.eu/agriculture/analysis/external/euro_forests/full_report_en.pdf


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