NEWS RELEASE - Greater climate benefit in the parts of the northern coniferous forest belt where forests are managed

The carbon stock in the managed boreal forest landscapes is increasing, while it is relatively unchanged in less intensively utilized forests, where the carbon losses due to forest fires have been significant. This conclusion was drawn in an international research report that analyzes data reported to the UNFCCC by the countries in the "northern coniferous forest belt" during the years 1990–2017.

The boreal forests make up as much as 30 percent of the world's forests and cover about 10 percent of the global land area. Large-scale studies of how the atmospheric content of carbon dioxide varies in time and space indicate that the northern forests are carbon sinks, i.e. that they absorb more carbon dioxide than they emit into the atmosphere.

For the first time ever, a comparison is now reported of the development of the forest's carbon stock over time in different parts of the boreal forest belt, which extends through Canada, the American Alaska, Russia, Sweden, Finland, and Norway. The study is published in a report written by 25 researchers from the six countries, as well as from the research institute IIASA in Vienna, Austria. The analysis is based on the data that the countries involved have reported to the UN climate convention, UNFCCC.

The study compared countries with relatively intensive forestry (Norway, Sweden, and Finland) with countries where forests are used less intensively (Canada and Russia) or not at all (boreal Alaska). The measure used for the intensity of forestry was how many percent of the forests' total carbon stock are harvested each year. In Sweden and Finland, this is 1.5 per cent, compared with 0.9 per cent in Norway, 0.3 per cent in Canada's managed forests and 0.1 per cent in Russia's forests. In countries with forestry, rotation forestry with clear felling is commonly applied.

The study shows that the forests' carbon stocks increased in the countries with intensive forestry. During the period of 1990–2017, the carbon stock in the trees increased by 35 percent, seen as an average over the entire forest landscape in the Nordic countries. In the countries with less intensive forestry, the changes were significantly smaller (a few percent plus or minus).

The report does not support claims that unused forests contribute the greatest climate benefit, says Peter Högberg, who is a professor of forestry at SLU and has led the work on the report.

The countries' reports to the UNFCCC also include estimates of changes in the carbon stock in the soil. The study shows that the carbon stock on mineral soils in the intensively managed Nordic forests increases twice as fast in comparison with the countries with less intensive forestry. On the other hand, significant carbon losses and

N_2O emissions occur from peatlands, where they are drained. Despite this, the Swedish forest soils are on average a carbon sink. In Finland, where the proportion of peatlands is higher and where over 50% of the peatlands are drained, the emissions from peatland soils are of the same magnitude as the carbon sink of upland forest soils.

Differences in the forest carbon sinks between Nordic managed forests and unused vast forest areas in Russia, Canada and Alaska are discussed in the report. One of the driving factors is age class distribution; Nordic managed forests are on average younger. Another reason is the large losses of carbon in the forest fires that occur much more often in the less intensively managed and unused forests. In Alaska, Canada and Russia, an average of 0.5–0.6 per cent of forest area burns each year, compared with 0.01 per cent in Sweden and even less in Norway and Finland. The area burned is thus at least 50 times higher in the less intensively managed forests.

Today's low fire frequency in the Nordic countries is due to effective fire fighting, motivated by the economic value of the trees, says Peter Högberg.

The study covers the period 1990 to 2017. Further back, comparable data from some of the six countries are missing. A challenge for the researchers has been to compare data that have been collected in different ways and are of different quality.

The report is the result of an assignment given at a ministerial meeting in Haparanda, Sweden in 2018, which included six countries: the United States, Canada, Norway, Sweden, Finland and Russia. The assignment was given to the International Boreal Forest Research Institute (IBFRA), an organization that unites forest research institutions in the boreal zone and in which SLU participates. The work was led by professor Peter Högberg, SLU.

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Report

Högberg, P. et al. Sustainable boreal forest management – challenges and opportunities for climate change mitigation. Report from an Insight Process conducted by a team appointed by the International Boreal Forest Research Association (IBFRA). Skogsstyrelsen, Rapport 2021/11.

https://www.skogsstyrelsen.se/globalassets/om-oss/rapporter/rapporter-2021202020192018/rapport-2021-11-sustainable-boreal-forest-management-challenges-and-opportunities-for-climate-change-mitigation-002.pdf