

# Carbon sink capacity in northern forests reduced by global warming

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Mont Wright, a northern hardwood forest near Quebec City, Canada. Credit: Marc André Giasson

An international study investigating the carbon sink capacity of northern terrestrial ecosystems discovered that the duration of the net carbon uptake period (CUP) has on average decreased due to warmer autumn

temperatures.

Net carbon uptake of northern ecosystems is decreasing in response to autumnal warming according to findings recently published January 3rd, in the journal Nature. The carbon balance of terrestrial ecosystems is particularly sensitive to climatic changes in autumn and spring. Over the past two decades autumn temperatures in northern latitudes have risen by about 1.1 °C with spring temperatures up by 0.8 °C.

Many northern terrestrial ecosystems currently lose carbon dioxide (CO<sub>2</sub>) in response to autumn warming, offsetting 90% of the increased carbon dioxide uptake during spring. Using computer modeling to integrate forest canopy measurements and remote satellite data, researchers found that while warm spring temperatures accelerate growth more than soil decomposition and enhance carbon uptake, autumn warming greatly increases soil decomposition and significantly reduces carbon uptake.

Lead author of the study, Dr. Shilong Piao from the LSCE, UMR CEA-CNRS, in France says “If warming in autumn occurs at a faster rate than in spring, the ability of northern ecosystems to sequester carbon will diminish in the future”.

Philippe Ciais also, a member of the research team and a scientist from the Global Carbon Project says “The potentially rapid decline in the future ability of northern terrestrial ecosystems to remove atmospheric carbon dioxide would make stabilization of atmospheric CO<sub>2</sub> concentrations much harder than currently predicted”.

Source: Global Carbon Project

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