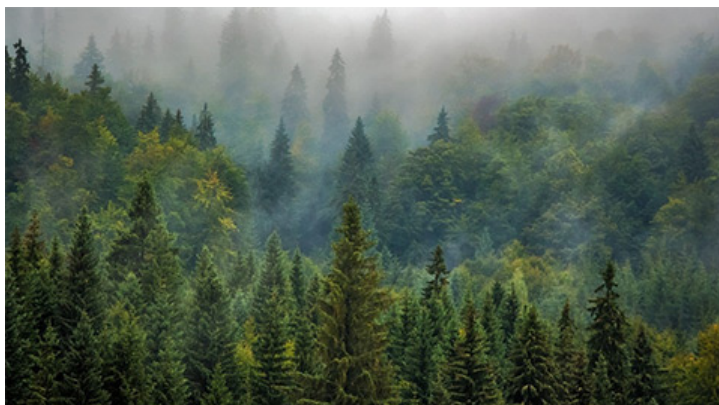


Scientists warn: Siberian pine forests may replace larch

The team of researchers of Siberian Federal University and the Sukachev Institute of Forest of the Siberian Branch of the Russian Academy of Sciences studied the internal mechanisms for controlling the evaporation of water by Siberian larch and Scots pine. The study results are published in the Journal of Agricultural and Forest Meteorology.



*"The most common forest-forming genus in Russian forests is larch; and there is Siberian Larch (*Larix sibirica*) in the south of the Krasnoyarsk Krai. Larch perfectly adapted to the cold climate and grows even in the permafrost zone. However, due to the global warming, pine (*Pinus sylvestris*) spreads further and further north and can press the larch from its usual range. This is*

important because Russian boreal forests, formed mainly by larch and pine, account for 20% of the area of all forests, and seriously affect the global climate of the planet. We figured out how pine and deciduous forests regulate the evaporation of water from them, and what is the difference between them in the course of this process," — said **Alexei Rubtsov**, senior researcher at the laboratory of biogeochemistry of ecosystems of the Institute of Ecology and Geography, Associate Professor of the Department of GIS of the School of Space and Information Technologies of SibFU.

The scientists compared two areas of the forest of the same age (49 years) - one with larch and another with pine. According to the measurements, the larches tend to evaporate more water from the soil into the crown (scientists call this process transpiration), while pine has shown itself to be more economical, better controlling evaporation from the needles. For larch, the total annual level of transpiration was 284 millimeters per year, for pine - by 20% less (about 227 mm).

"Today, pine and larch occupy 80% of the Siberian forests. If pine in the north replaces larch, the evaporation rate in forests will drastically decrease. It is difficult to say for sure what this will lead to. A global increase in temperature usually leads to an increase in the volume of evaporated water. Therefore, replacing larch with pine in existing taiga forests compensates for the increase in evaporation due to climate warming. Forest evaporation plays a

huge role in the formation of precipitation: a change in the evaporation process directly affects the climate," said **Josef Urban**, senior researcher at the Laboratory of

Biogeochemistry of Ecosystems, Associate Professor at the Department of Ecology and Nature Management at the School of Ecology and Geography of SibFU.



In the future, scientists plan to study the potential effects of global warming, in particular, the expansion of forests to the tundra and the change in the amount of available water in the ecosystem, which affects the survival rate of larch forests in permafrost.

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