

Project acronym: DECAFOR

Project title: The role of deadwood for biodiversity conservation and carbon storage in boreal forests

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Discipline: Earth Sciences & Environment

Station(s): Khibiny Educational and Scientific Station (Russia)

Deadwood in forests is a key element from the ecological point of view, an essential element for the ecological processes, a key factor in the nutrient cycling, a fundamental element in the geomorphological and soil hydrological processes, a potential resource for fuelwood, and a relevant carbon pool. In addition, a large number of organisms are dependent on decaying wood for nutrients or habitat such as vertebrates, saproxylic insects, fungi and bacteria.

DECAFOR project will be conducted at Khibiny station in Russia. The hypothesis of the DECAFOR project is that climate conditions affect carbon storage and biodiversity related to the deadwood in forests. The main objective of the research is to investigate the role of deadwood in boreal forests (Khibiny Mountains) with special regard to three main ecological aspects: (1) Carbon storage, CO<sub>2</sub> fluxes and decomposition rate by species and decay class; (2) Fungal phyla Ascomycota and Basidiomycota richness and diversity, by species and decay class; (3) Bacteria community richness and diversity, by species and decay class.

In order to achieve this aim, the research project will proceed in four main steps: (1) Literature review about deadwood in boreal forests; (2) Experimental design, deadwood sampling and CO<sub>2</sub> emissions measurement: Quantification of deadwood using the Line Intersect Sampling (LIS) method and collection in the field of 60 deadwood samples of Scots pine. CO<sub>2</sub> emissions from deadwood will be measured in the field through a portable infrared gas analyzer (IRGA, PP system); (3) Laboratory analysis: i) analysis of microbial community structure by PCR-DGGE technique; ii) analysis of carbon content, nitrogen content and C/N ratio; iii) calculation of moisture content (%); green/fresh density; and dry/basic density; (4) Data analysis to estimate: average volume of deadwood, average mass, N stock and C-stock in the boreal forest of Khibiny Mountains; fungal, bacterial, and actinobacterial communities of CWD (Shannon-Weiner index); differences in C-stock, fungal, bacterial, communities of CWD by decay class.