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CLIMATE CHANGES AND THEIR IMPACT ON BOREAL AND TEMPERATE FORESTS

International Conference

(June 5-7, 2006, Ekaterinburg, Russia)

ABSTRACTS

**Ekaterinburg
2006**

Climate Changes and their Impact on Boreal and Temperate Forests

Abstracts of International Conference

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Ural State Forest Engineering University. 127 p.

Contains abstracts of oral and poster presentations on indication of global, regional and local climate changes including tree rings, climate-dependent dynamics of forest ecosystems including extreme events (windfalls, forest fires and others), productivity and organic matter cycles in forest ecosystems and their feedbacks with a changing climate, developing model-based scenarios of forest ecosystems under climate change, presented at the International Conference "Climate Changes and their Impact on Boreal and Temperate Forests", June 5-7, 2006, Ekaterinburg, Russia.

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**МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РОССИЙСКОЙ ФЕДЕРАЦИИ
РОССИЙСКАЯ АКАДЕМИЯ НАУК
УРАЛЬСКОЕ ОТДЕЛЕНИЕ, СИБИРСКОЕ ОТДЕЛЕНИЕ
НАУЧНЫЙ СОВЕТ ПО ПРОБЛЕМАМ ЛЕСА РАН
МЕЖДУНАРОДНЫЙ СОЮЗ ЛЕСНЫХ ИССЛЕДОВАТЕЛЬСКИХ ОРГАНИЗАЦИЙ
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И ЛАНДШАФТА (WSL)**

ВЛИЯНИЕ ИЗМЕНЕНИЙ КЛИМАТА НА БОРЕАЛЬНЫЕ И УМЕРЕННЫЕ ЛЕСА

(5-7 июня, 2006, Екатеринбург, Россия)

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Влияние изменений климата на бореальные и умеренные леса: Тез. докл. междунар. конф. – Екатеринбург: Урал. гос. лесотехн. ун-т, 2006. – 127 с.

Сборник содержит тезисы пленарных, секционных и стендовых докладов по индикации глобальных, региональных и локальных изменений климата, включая древесные кольца, климатогенной динамике лесных экосистем, в том числе под влиянием экстремальных событий (ветровалы, лесные пожары и др.), продуктивности и круговороту органических веществ в лесных экосистемах и их обратной связи с изменяющимся климатом, моделированию и сценариям будущих изменений лесных экосистем под влиянием изменений климата, представленных на международной конференции “Влияние изменений климата на бореальные и умеренные леса”, 5-7 июня 2006 г., Екатеринбург, Россия.

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CLIMATE DRIVEN DYNAMICS OF FOREST-TUNDRA COMMUNITIES IN THE POLAR URALS

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The spatio-temporal dynamics of forest–tundra communities under climate warming in the 20th century has been studied in the upper timberline ecotone of the Polar Urals. Siberian larch (*Larix sibirica* Ledeb.) is dominated tree species in the study area. Large-scale maps reflecting the distribution of different types of forest–tundra communities, morphological and age structures of stands for three time sections (the mid-1910s, 1960s, and 2000s) have been made using GIS. Land description of 1043 mapping sites on the area more than 5800 hectares was implemented. Data from forest plots and altitude profiles as well as old landscape photographs taken in the sixties were used for reconstruction of morphological and age structures of stands.

Analysis of the maps has shown that during the last 90 years open and closed forests have markedly expanded due to natural afforestation of the tundra and existing stands have increased in the density and productivity. The upward and plane shift of light, open and closed forests on some of slopes lie in the range 60-80 and 200-800 meters accordingly. Degree of afforestation increased twice for study period. More sufficient modification of communities was in the lowest part of treeline ecotone. This area is characterized by more favourable soil and microclimatic conditions as

well as good enough of seeds availability. Low level of last factor is one of the main restrictions for expansion of trees into tundra in the highest part of ecotone.

The unidirectional pattern of plant community transition (from the tundra to closed forests) in study area with different types of habitats provide evidence that this transition has been conditioned by one factor. The study area is practically not disturbed by antropogenic impact or forest fires. Climate records of meteorological station Salekhard show increasing mean summer and winter temperatures up to 0.7°C and 1.1°C accordingly from the period of 1920-2004 in comparison with time interval of 1883 – 1920. Thus, analysis of these facts allows us to conclude that expansion of tree vegetation into tundra communities has been conditioned by climate warming.

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