

# **The Influence of Changing Forestry Practices on the Effects of Wildfire and on Interactions between Fire and Changing Climate in central Siberia**

## **Abstract**

The Russian boreal zone is a region of global significance in terms of climate change impacts and carbon storage, but it is also a tremendous, largely untapped, reservoir of wood products. Currently, wildfires in the Russian boreal forests burn about 10 to 15 (20) million ha per year, and both the area burned and the severity of fires are expected to increase as climate changes. Both legal and illegal logging are also increasing rapidly in many forest areas of Siberia. These logged areas often have extremely high fuel loads due to logging debris and typically experience higher severity fires than unlogged forests. Such fires may often occur close to communities, increasing the threat that homes and businesses will be burned. Changing patterns of land use, primarily harvest of wood products, can be expected to increase the emissions and ecosystem damage from wildfires, inhibit recovery of natural ecosystems, and exacerbate impacts of wildland fire on changing climate and on air quality. Most research to date on the effects of fire on carbon cycle, fire emissions, and ecosystem recovery has focused on relatively undisturbed forests. However, as the areas impacted by logging increase, it is becoming rapidly apparent that any accurate regional assessment of these interactions must include effects related to logged areas. We propose to estimate the relative effects of wildfire, under variable seasonal climate regimes, on logged and unlogged sites in central Siberia, including potential feedbacks to the atmosphere and climate. The project will integrate data and models derived from field sampling with analysis of Landsat and MODIS imagery to extrapolate fire effects and processes to a landscape level. The results will provide a basis for improved projections of impacts of climate change and land use patterns on burned area, fire severity and carbon cycle, with an emphasis on central Siberia.