The carbon cycle of permafrost-dominated ecosystems

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This issue of carbon uptake of main Siberian permafrost forests and tundras has direct economic implications under the Kyoto Protocol. Not only can the uptake by permafrost ecosystems be used to counter industrial emission, but any surplus uptake capacity may be sold by emission trading. Large reservoirs of carbon have been accumulated in the ecosystems of this region over many centuries. We estimate that carbon stock in the soils of forest and tundra ecosystems of Yakutia is 17 *Gt C.*

The results of statistically reliable data on eddy-covariance (1996-2007), obtained at 12 stations, allowed us to quantitatively assess annual carbon fluxes in four representative biomes of the Russian Federation. It has been established that carbon sink significantly dominates in the permafrost forests of Yakutia compared to other investigated biomes of Russia. The sink here is greater than in the meadows and tundras of Russia by 1.5 and 4.5 times respectively. In total, all the territory of the Russian Federation is an area of considerable carbon sink equaling 1.9 *Gt C* yr^{-1}. Largest carbon sink belongs to forests, followed by meadows, and then come bogged territories.