

P3. Ecosystem carbon loss in 5 years old clear-cut site of a mature larch forest in Eastern Siberia

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Abstract

Evaluation of land use change on the basis of global carbon cycle is increasingly needed under global warming scenario. Here, we examined the effect of clear-cutting on carbon pool function of the taiga in eastern Siberia. In winter 2000-01, 70 m by 140 m clear-cutting was conducted. In two summers 2003 and 2005, understoried vegetation, litter, humus, and mineral soil were collected in contrasting between the clear-cut and the next intact forest sites. The results in the intact site were assumed to be those before the clear-cutting. The dry matter and carbon pool were investigated. The above ground biomass of understoried vegetation decreased from $2.7 \pm 1.1 \text{ ton ha}^{-1}$ to $1.3 \pm 0.7 \text{ ton ha}^{-1}$ in 2003, and thereafter increased to $5.6 \pm 3.3 \text{ ton ha}^{-1}$ in 2005. The fine root biomass decreased from $8.6 \pm 4.3 \text{ ton ha}^{-1}$ to $3.8 \pm 2.7 \text{ ton ha}^{-1}$ in 2003, and thereafter increased to $11.3 \pm 5.0 \text{ ton ha}^{-1}$ in 2005. The fluctuation of aboveground and fine root biomass was due to death of *Vaccinium* sp., which dominantly covered the forest floor, and due to recruit of weeds after the clear-cutting. Thus the clear-cutting reduced the understoried vegetation biomass, but thereafter the vegetation biomass immediately recovered at 5 years after the clear-cutting. The dry matter of leaf litter was significantly lower in the clear-cut site than in the control site in 2003 (16.0 ± 4.4 vs. $12.6 \pm 2.0 \text{ ton ha}^{-1}$) and in 2005 (16.0 ± 4.4 vs. $4.6 \pm 2.2 \text{ ton ha}^{-1}$), indicating that the clear-cutting accelerated the decomposition of leaf litter. No significant difference in dry matter of humus was found in 2003 and 2005. In general, the amount of humus was determined by the supply of organic matter from the litter layer and the decomposition of humus. Probably the small change in the amount of the humus was caused by a relatively greater supply from the litter layer and decomposition of humus accelerated by clear-cutting. Thus the clear-cutting could accelerate the decomposition of litter and humus. In that day of symposium, we will present the result of carbon pool in each compartment, and quantitatively discuss the change in ecosystem carbon pool.