

Continuous measurement of forest floor CO₂ fluxes in a larch forest on the base of Mount Fuji

TERAMOTO, Munemasa^{1*}; LIANG, Naishen¹; ZENG, Jiye¹; IDE, Reiko¹; SAIGUSA, Nobuko¹; TAKAHASHI, Yoshiyuki¹

¹Center for Global Environmental Research, National Institute for Environmental Studies

Carbon fluxes of forest floor are thought to be important part of forest carbon dynamics. Multi-channel automated chamber system was installed to a larch forest site on the base of Mount Fuji in 2006 for continuous measurement of forest floor CO₂ fluxes. We prepared soil chambers for measuring soil respiration (Rs) and heterotrophic respiration (Rh). Root trenching was applied to separate Rs and Rh. Net ecosystem exchange (NEE) on the forest floor was measured with plant chambers. In 2013, the average efflux of CO₂ was 2.24, 1.81 and 2.11 $\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$ in Rs, Rh and NEE, respectively. Root respiration was estimated to occupy 80.7% of Rs. Plants of forest floor was suggested to absorb about 5.9% of CO₂ in Rs, and it meant that the amount of carbon fixed by those plants was relatively low. There was little rain in summer time (July-August), and forest floor CO₂ fluxes were decreased due to decreased soil moisture. Q₁₀ was 2.49 and 2.87 in Rs and Rh, respectively. Soil respiration was estimated to be 8.48 tC ha⁻¹ yr⁻¹, and the forest floor was seen as 7.98 tC ha⁻¹ yr⁻¹ carbon source.

Keywords: soil respiration, chamber, forest floor plants, photosynthesis

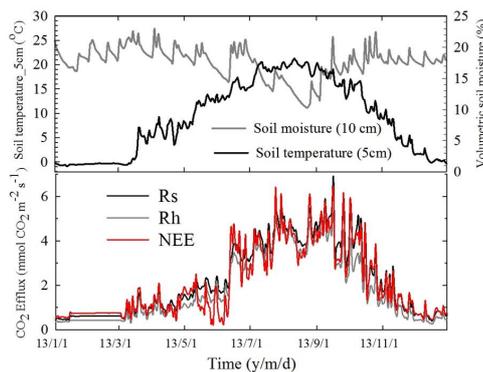


Fig 1. Seasonal variation of soil temperature, soil moisture and CO₂ efflux of each fluxes in 2013.