

スギ人工林の炭素動態に与える林齢の影響

Carbon dynamics along a chronosequence of Japanese Cedar plantations in central Japan

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Managed, even-aged Japanese cedar plantations are now the most extensive managed forest ecosystem in Japan, comprising ~20% of the Japanese forested landscape. The age-dependent variability of ecosystem carbon dynamics was assessed by measuring biometric based net ecosystem production (NEP) of nine cedar plantations in Takayama, central Japan. The study sites ranged in age from 3-year-old after plantation to mature stands (105 years). Total net primary production (NPP) was low immediately after plantation, highest 36 years stand, and then gradually decreased with age. In contrast, soil respiration had no clear trend with age, although root biomass related to soil respiration. After harvesting, cedar plantations are typically a net source of carbon around 5 years, followed by peak in NEP in mid-aged forest (ca. 40 years). In maturing stands, NEP declines as a result of the age-related reduction of growth.

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