

Boreal forest: a system mostly producing soil organic matter

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We have been estimating carbon dynamics of boreal forests, where it may be affected strongly with strong biological feedback due to the warming climate. We measured increment of aboveground biomass, aboveground litter, heterotrophic respiration, and growth and mortality of fine roots in three stands of *Pinus banksiana* that differed in stand age in Wood Buffalo National Park in the Northwest Territories, Canada. Then, net primary production (NPP) and net ecosystem production (NEP) of these forests were estimated. The amounts of fine root growth and mortality were evaluated with the fine root litter traps - a device modified from the fine root ingrowth core. Amount of fine root ingrowth was calculated as the sum of fine root growth and fine root mortality. NPP of these stands was 477, 525, and 272 gC m⁻² year⁻¹, respectively. Amount of fine root ingrowth was 409, 454, and 203 gC m⁻² year⁻¹, respectively. Therefore, the proportion of fine root ingrowth in NPP was 85%, 86%, and 74%, respectively. We note that these stands are allocating most of the organic matter produced annually into belowground organs. Boreal forests appear to have small amount of organic matter stored in the aboveground parts. These forests at high latitudes can be considered the systems that are producing mostly the soil organic matter.