

Development of soil carbon stocks following clear-cutting and regeneration in Finland: a chronosequence study.

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Clear-cutting and regeneration can be expected to have a major impact on carbon sequestration. However, little is known about the development of soil carbon stocks following clear-cutting and regeneration in Finland. Since the 1970s some 250,000 ha are harvested annually for forest regeneration, half of which is through clear cutting. Rotation times vary from 80 years in southern Finland to >100 years in Lapland. Nearly all the clear-cutting is stem-only and large amounts of logging residue are left on site. It is generally believed that soil carbon is lost following clear cutting, but this may not be the case if the carbon associated with the logging residues and changes in the ground vegetation are taken into account besides that in the original organic layer and mineral soil. We determined soil carbon stocks from the surface to a depth of 30 cm in the mineral soil in 18 clear cuts ranging in age from 12 to 27 years old and located throughout Finland (60-68 °N). Carbon stocks calculated from samples taken in 2001 were compared with those calculated from samples taken in the year of clear-cutting. The change in carbon stocks were evaluated in relation to a number of factors, including age of clear-cut, estimated logging residue input and latitude.

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