

## FEATURE SECTION

# **IMPACTS OF HARVESTING AND SITE PREPARATION ON CARBON CYCLING PROCESSES IN FORESTS**

Papers presented at the IEA/BA Task IX Activity 4 workshop  
held in Inverness, Scotland, 24–30 May 1992.

IEA/BA Task IX Activity 4 REPORT 2

## Guest Editorial

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Harvesting and subsequent site preparation operations affect both the level of carbon remaining on a site and the processes that regulate carbon cycling rates. At the plant level, responses to site conditions are manifested through patterns of carbon accumulation and partitioning to above- and below-ground components. In the forest floor and mineral soil, the cycling of carbon can be altered as input levels of materials derived from shoot and root origin change; and by changes in the physical, chemical, and biological status of the site as a result of forest management. Changes in carbon cycling can, in turn, affect physical, chemical, and biological properties of forest soils, and cause changes in forest productivity. In recognition of the need for clarifying the degree to which forest management practices and utilisation of forest biomass for energy production affect global carbon budgets and forest site productivity, two workshops were held in Scotland in May 1992. These workshops were hosted by the Macaulay Land Use Research Institute, Aberdeen. Dr Mike Proe (MLURI) was our Scottish host, and Dr Greg Ruark (USDA-Forest Service) the programme chair.

The "Fine Root Turnover" workshop was held in Edinburgh, 21–22 May 1992, to discuss methodology for measuring fine root turnover, to explore the status of knowledge on fine root turnover, and to recommend a direction for future fine root turnover research. A summary report of this workshop has been published by Ruark & Proe (1992).

The second workshop "Impacts of Harvesting and Site Preparation on Carbon Cycling Processes in Forests" was held in Inverness, Scotland. Papers presented at the workshop were related to three themes: the effects of forest management on plant-level carbon allocation in forest ecosystems; the effects of forest management on processes that regulate carbon cycling in the forest floor and mineral soil; and the potential for, and constraint on, sequestering carbon in forest ecosystems. The papers in this issue of the *NEW ZEALAND JOURNAL OF FORESTRY SCIENCE* were related to the workshop themes from theoretical and empirical studies involving: modelling carbon allocation within plants (Ågren & Wikström); an evaluation of research needs to understand how forest soil carbon is affected by forest management (Johnson); the potential for estimating carbon fluxes using carbon isotopes (Harrison & Harkness); modelling changes in soil carbon and productivity under different harvesting regimes (Bengtsson & Wikström); and the effects of forest management and harvesting on soil carbon cycling in Australia (Carlyle) and Canada (Morrison *et al.*). Additional papers presented at this workshop, and published elsewhere, include those by Canell & Dewar (1994), Hollinger *et al.* (1993), and Keenan *et al.* (1993).

We acknowledge the contributions of Christine Bow and Alison Lowe in compiling this proceedings. The success of the workshop field tours and indoor sessions was due in large part to the technical expertise and excellent organisational skills of our Scottish hosts, and we are grateful to them for their efforts and generous nature. In addition, we thank the workshop participants for their enthusiasm and thoughtful contributions to the workshop discussions, which naturally ranged from highly theoretical to applied levels.

The programme session moderators were excellent facilitators for paper and poster discussions, and contributed to an increased understanding of the concepts presented by authors and workshop participants. We are grateful to: J.R.Boyle (Oregon State University); N.B.Comerford (University of Florida); J.P.Kimmins (University of British Columbia); H.Lundkvist (Swedish University of Agricultural Sciences); and T.Mahendrappa (Canadian Forest Service).

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