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Preface

The 6th IUFRO Workshop on Connection between Forest Resources and Wood Quality: Modelling Approaches and Simulation Software was held in Koli National Park, Joensuu, Finland on 8–14 June, 2008. It was related to the activities of the IUFRO Working Party 5.01.04 Wood Quality Modelling and followed the five previously hold workshops on the same theme, i.e. in Sweden 1994, South Africa 1996, France 1999, Canada 2002 and New Zealand 2005. The originality and strength of these "Wood Quality Modelling workshops" are their ability to welcome scientists from different fields in the area of forestry and wood sciences. Since the first workshop in 1994, the core idea has been to provide knowledge and develop new tools that can be incorporated into the forestry wood chain by the mean of models, chains of models and simulation softwares in order to answer questions about the current and future growing stocks and wood quality of the forest resources.

The objective of this Workshop held in Finland was to provide an opportunity for participants to share and discuss recent advances in joint modelling of tree growth and wood quality and its applications, to better connect forestry and wood industry for today and tomorrow. In addition to model based analyses, many presentations reported recent findings of experimental work from related topics. Altogether, 60 high quality oral presentations and posters were presented in the following three sessions: i) The impact of forest management and tree growth on stem, wood and fibre properties (Session 1, keynote Prof. Seppo Kellomäki, Finland), ii) Linking the properties of forest resources to end-product quality, performance and value (Session 2, keynote Dr Christine Todoroki, New Zealand), and iii) Supporting forest resource management and utilisation through the use of computer-based simulation (Session 3, keynote Prof. Sophie D'Amours, Canada). The 60 researchers participating the

Workshop represented 15 countries. In addition to oral and poster sessions, we also had a field excursion, during which we visited StoraEnso Timber's Uimaharju sawmill and some forest sites, where we also were introduced to moose damage problem in Finnish forests, which affects timber quality especially in Scots pine.

Research questions were considered at different time and spatial scales, each of them implying a specific approach in terms of models (e.g. spatially explicit or not, stand level or individual tree level, sources of variations) and specific tools (e.g. definition of the end-products, round wood or sawn goods, properties, optimisation, tools for management actions or for strategic decisions etc). For the stand growth and tree development point of view, these questions were dealing with timber availability within a given forest resource, best silvicultural treatments to be applied to forest plantations, best genetic material to be used, understanding of wood formation in order to take into account the impact of climatic change on the growth and yield, and national carbon accounting schemes etc. From the wood quality point of view, emphasis was put on variations of usual intra-stem wood properties (e.g. branches, resin pockets, wood density, shrinkage, strength and stiffness, and colour) as well as on the need to construct regional data bases of wood properties to provide exact information on raw material properties available for various end-products within a given forest resource. Several presentations dealt also with emerging technologies such as the use of terrestrial and airborne laser scanning for assessing in the standing trees their properties, CT scanning for assessing online the internal log wood quality, and NIR spectroscopy etc.

During the workshop, four main lines were identified for future study and development. First, it is necessary to better understand the dynamics of wood formation in order to incorporate soundly the environmental variables in the growth and yield models. Secondly, as the linking between growth and yield and wood properties is based on the use

of models, the modelling approach should be based on the principle of parsimony and a specific effort should be put on the behaviour of theses chains of models out of the range of data used for their calibration, by the analysis of the propagation errors and by the validation of the chain of models that remain scarce to date. The definition of generic models (in terms of formulation and of processes described) and informatics tools for simulation are probably the most challenging and promising perspective in this area. Thirdly, the development of emerging scanning technologies open the perspective to measure at a reasonable cost a lot of geometrical and physical properties. These new tools need to be better incorporated within the forestry wood chain and the huge amount of data generated need to be well managed in standard data bases in order to support the calibration of models. Finally, the use of wood as raw material implies the development of new wooden products that will be able to compete with products build with other material. There is also a need to demonstrate that end-products based on wood are competitive from the ecological point of view. Our modelling chain needs to be implemented with models that permit the assessment of the ecological value of the end-products.

The participants submitted altogether 21 papers to Silva Fennica for a Special Issue. Following the peer review process, 14 of them are now published in this Special Issue, representing quite well the papers and topics presented in different Sessions of the Workshop.

As members of the scientific and local organizing committees for the Workshop, we would like to take this opportunity to thank all the participants of the Workshop for their outstanding contributions, resulting in a fruitful and relaxing atmosphere for the Workshop. In addition, we would like to thank all our hosts during the sessions and excursions. Finally, we would like to acknowledge the support and sponsorship provided for the Workshop by different organisations, including the Federation of Finnish Learned Societies (Tieteellisten seurain valtuuskunta), the Finnish Society of Forest Science (Suomen Metsätieteellinen Seura), the Metsämiesten säätiö Foundation, the Regional Council of North Karelia (Pohjois-Karjalan maakuntaliitto), the University of Joensuu and the Finnish Forest Research Institute (Metla).

This issue is dedicated to our colleague and friend Dr. Lennart Moberg, who passed away unexpectedly on January 31, 2008. He contributed to our group with advanced mathematical/statistical modelling of the determination of the knot structure in Scots pine and Norway spruce. We are among the many of those who will miss him.

On the behalf of the scientific [1] and local organizing committee [2] of the Workshop,

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