

## IRIS

### NEW TECHNOLOGIES TO OPTIMIZE THE WOOD INFORMATION BASIS FOR FOREST INDUSTRIES- DEVELOPING AN INTEGRATED RESOURCE INFORMATION SYSTEM

Project Start Month: January 2008

Project Duration: 36 months

## Project Consortium

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## Project Objectives

The major objectives of the research are:

1. To develop and optimize laser scanner methods for assessment of wood qualities and quantities at high spatial resolution and validate these methods across countries.
2. To further improve the flow of information regarding wood resources along the forest/wood-products chain by adapting forest information and planning systems to utilize improved information from laser scanner aided inventories.

The research in each country will be conducted in forest environments that are considered important to national wood-based industries like conifer forest typical for the Nordic countries, deciduous and other forests typical for Central Europe, and plantation forest in South America of significant importance to forest industries in Europe by serving as a major resource base.

## Project Approach

The major focus of the project is on development of new or improved algorithms and procedures for extraction of wood-quality related information with single-trees, plots, and stands as at the target units. Although area-based methods focused on stand estimates have been used operationally in a few countries for some years, there is a potential of method improvement and modification, and for testing of their applicability under different conditions, like deciduous forests in Central Europe and eucalyptus plantations in South America. The project will also focus on extracting wood-quality related information, like tree size distribution or canopy length, by using the area-based methods.

Seven major scientific issues will be addressed in the project and different parts of the work will be focused in each of the five countries collaborating on the consortium. The work is organized by sub-projects (work-packages) where each country is responsible for specific issues. The research will be conducted by collaboration between countries and partners within each and every work-package. The seven major scientific issues are: (1) identifying industry demands for detailed information on quality and quantity of forest resources, (2) developing and testing methods (a) for single-tree detection and wood parameter extraction, (b) for stand-based assessment using airborne laser scanning, (c) for combining single-tree information and area-based estimation to provide unbiased and detailed information for larger regions, (d) for product recovery by combining single-tree airborne laser scanner data with terrestrial laser or harvester data, (3) design of forest resource information data bases, and (4) development of inventory and planning systems.

## Expected Project Impact

The major results of this research have a direct relevance to commercial actors. Improved methods for assessment of wood resources and wood quality in particular, is a part of the business idea of consultancy firms dealing with forest inventory and consultancy services in forest management. Four such firms are represented on this consortium. We expect the developed methods for resource assessment to be implemented by firms in this sector in order to offer improved information products to their customers, i.e., actors in the forest and forest industry sectors. We also expect the novel logistics and decision support systems to become a basis for commercial software development.

Forestry and wood-based processing industries in Europe differ in focus between regions due to different natural conditions, ownership, industrial structure, markets, social demands etc. Improved wood supply information systems and management models are essential for strengthening the competitiveness of the European forest-based sector. The emerging use of wood for energy and biofuels also increases the demand for flexible planning systems. The project is focused on how rapid technological developments in the areas of remote sensing can help improving wood resource assessments to better fit with the wood-based processing industries' need for precise information on wood quality. We believe this research will provide the knowledge and methods required to fulfil the visions of "tailor made" raw materials by bridging the information gap between the industries' wood quality requirements and the location and properties of the timber resources. This will help increasing profitability of European forest industries and also help reaching the goals of increased use of renewable energy sources. Specifically, we foresee the following utilities of the research: (1) detailed allocation of wood resources, (2) better assessment of wood quality to meet specific market demands (added value), (3) improved strategic and tactical planning in forestry (improved decisions), (4) improved operational planning in forestry (better support for harvest operations and reduced costs), (5) our industrial partners will get hands-on experience with the benefits of detailed wood-quality related timber resource information. They will plan for receiving such information for future use on an operational scale.

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