

# Large scale 3D LiDAR data for wall-to-wall assessment of forest structures and resources

In recent years, national scale laser scanning inventories have been conducted in Sweden, Finland, Denmark and Norway. Data from such inventories represent a unique source of information about the forests and forest resources. The aim of the network was to strengthen research on the utilization of large scale laser scanning data for assessment of forest structures, functions and resources. Several subjects for future research were identified



Photo: Thomas Nord-Larsen

## Introduction

Wall-to-wall 3D LiDAR surveys have been undertaken in Sweden, Finland and Denmark and are currently being done in Norway. The surveys provide a hitherto unseen amount of detail on the forest resources. In most cases the potential of these data are far from fully exploited.

The aim of the network was to strengthen research on the utilization of large scale laser scanning data for assessment of forest structures, functions and resources. Leading scientists were brought together to facilitate collaboration on future research projects and applications for funding.

## Activities

Two meetings were held in Nødebo, Denmark and Ås, Norway. The meetings were attended by leading specialists within the research field.

The objectives of the meeting in Nødebo was to identify large scale LiDAR mapping projects currently or recently being undertaken among the participating countries, to inform participants on technical details of these surveys and to identify common research needs and possibilities arising from the large scale LiDAR datasets.

The subsequent meeting in Ås, was held back-to-back with the CARISMA network. The objectives of the meeting were to pin-point common research needs and discuss future possibilities for Nordic/Baltic funding of projects related to the utilisation of large-scale LiDAR data.

## Conclusions

At the meetings, several subjects for future research on large scale laser surveys were identified, including:

- Analysis of change with repeated laser scanning surveys
- Temporal combination of various surveys with sensors using data assimilation for better and continuously updated forest data
- Distinguishing between managed and unmanaged forests
- There is a lack of information on vertical distribution of biomass
- Identifying non-native or invasive tree species

Future work on remote sensing in general and LiDAR in particular may be focused on these subjects. Although activities within the EFINORD-SNS network "Large scale 3D LiDAR data for wall-to-wall assessment of forest structures and resources" have ended, activities are carried on in the Center of Advanced Research for the innovative use of 3D remote sensing in mapping of forest and landscape attributes based on national forest inventories (CARISMA).



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