PLANSFM

TREEMODEL

Development of single tree volume models and stem profile models

PROJECT TEAM

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BACKGROUND

The National Forest Inventory has collected detailed tree and stand measurement data at over 1,800 permanent sample plots across the country. Investigations to determine the suitability of these data for updating dynamic yield models are required. Work associated with the National Forest Inventory has derived very accurate Sitka spruce tree volume equations that have an application not only in deriving stand volume estimates, but as a cost-effective mensuration tool. Further work is required in this area, extending to other species, as is research on deriving wood supply indications from the national inventory and other data sources.

OBJECTIVES

- Produce stem profile models for ash, Douglas fir, Japanese larch, lodgepole pine, Norway spruce, Scots pine and Sitka spruce.
- Validate these models with newly collected stem data.
- Describe the different inventory tools available for collecting necessary data for stem profile models.
- Develop recommendations for the integration of stem profile models into everyday private sector inventory and management practice.

PROGRESS

Stem data provided from the Coillte measurement database are available in several databases for all species relevant to this project with the exception of ash. At first, these data were checked for inconsistency and missing or incorrect values were recalculated. Then all the databases were put together, restructured and converted into the FieldMap database to be available for the StemProfiler software. As FieldMap enables visualization of stem profiles, data were also checked visually. This database is now complete and is part of the Field Map program. FieldMap is used as an interface between the large dataset and the user, allowing summarisation of data both numerically and graphically per tree, plot, year, treatment and species. A querying facility has been developed. The database has also been transformed to the commonly accessible MS Access format.

The parameterisation of the Douglas fir, lodgepole pine, Norway spruce, Scots pine and Sitka spruce models has been completed by IFER. A model for ash has yet to be completed. The data of the 19 sample plots collected in 2007 have been verified and are available in a MS Access database for processing. The Sitka spruce model has been tested and validated.

A paper detailing the methods used in model parameterisation will be completed in 2009. Ash data from 100 sample plots from the STANDMODEL project are currently being reviewed in advance of the development of a similar single tree volume model for this species.

ACTIVITIES PLANNED

- A paper detailing the methods used in model parameterisation and stem profile modelling will be completed and submitted for publication.
- The integration of the new single models into practical inventory systems will be advanced. This will involve consultative workshops with the industry.
- There will be further work on the development of a measurement equipment database (Figure 1).

Figure 1: The Masser RC3H in use, a basal area calculator for productive inventory and planning work. This forms part of the measurement equipment database developed during the TREEMODEL project.

OUTPUTS

- The validated Sitka spruce stem profile model has been produced (Figure 2).
- Stem profile models for Douglas fir, lodgepole pine, Norway spruce and Scots pine have also been produced.
- A fully cleaned MS Access database of all stem data has been produced.
- A rudimentary querying system for the above models has been produced.

Current Internet Presence

http://www.ucd.ie/forestry website describing TREEMODEL in the context of the PLANSFM research programme (due for launch in March 2009).

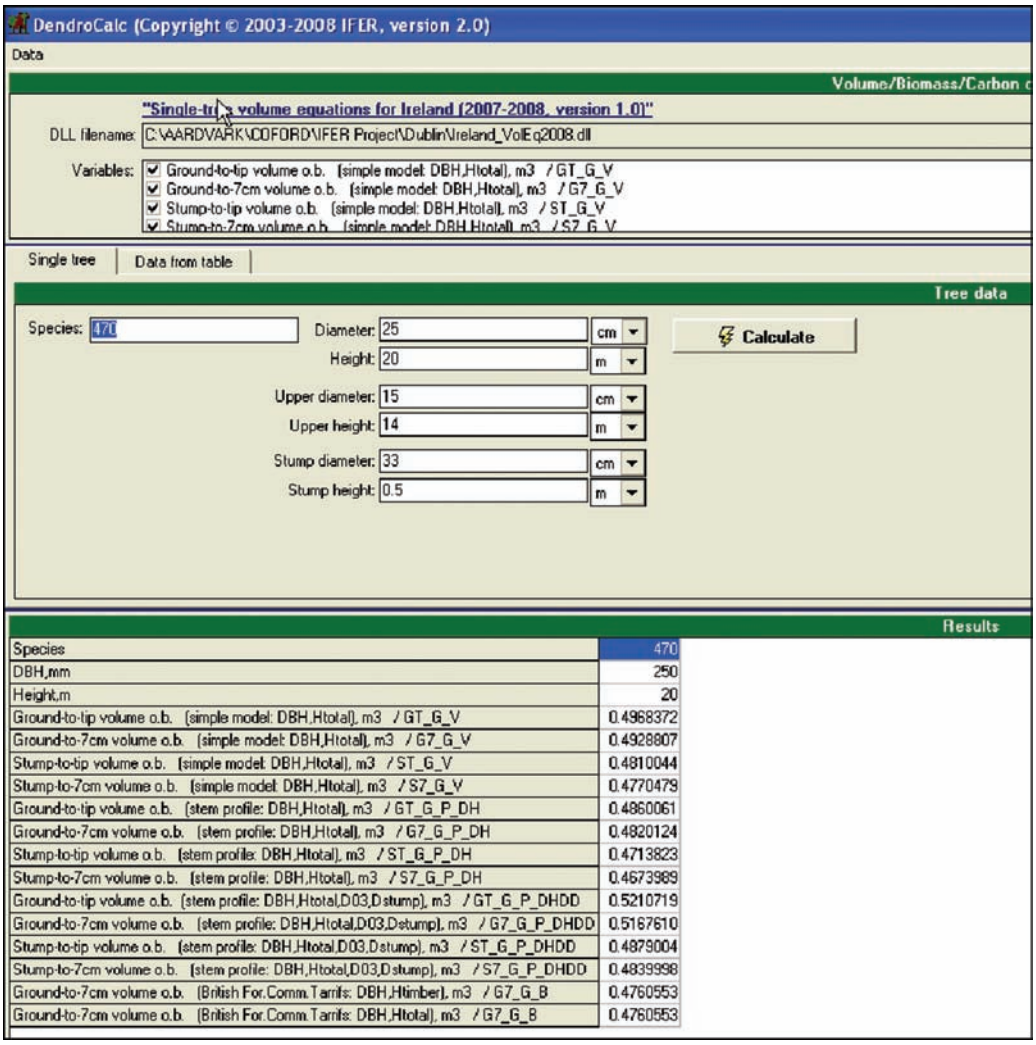

Figure 2: Validated Sitka spruce stem profile data are now included in the DendroCalc software.