

FORECAST

Geospatial forecasts of private sector timber supply

PROJECT TEAM

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BACKGROUND

Ireland's private forest estate is fast becoming a considerable wood and energy resource. Most of the 320,000 ha private forest estate has been established over the past two decades, with many areas now entering the first thinning stage. Recognising the need for updated and improved information on wood supply, COFORD funded the FORECAST project.

OBJECTIVES

The overall objective is to develop a reliable national GIS-based private sector wood supply forecast model. The short-term objectives relate to the provision of an interim GIS forecast to provide guidance to the forest sector as to the likely timber supply from privately-owned forests. The long-term objectives are research orientated, focusing on reliable GIS forecasting methods and internet interface development.

- To develop an interim GIS forecast on a national and catchment basis for privately owned forests (2009-2028) to replace the current private sector forecast; and
- To publish an interim private sector timber supply forecast within 12 months after consultation with interested parties.
- To analyse the possibility of generating a reliable forecast of production from privately owned forests using existing National Forest Inventory (NFI) plot data.
- To compare plot versus stand based methods for forecasting future timber production from privately-owned forests.
- To develop an internet interface for the provision of national and catchment forecasts through an easy-to-use client browser, which is fully compatible with

iFORIS and ESRI products, using industry standard licence-free GIS software.

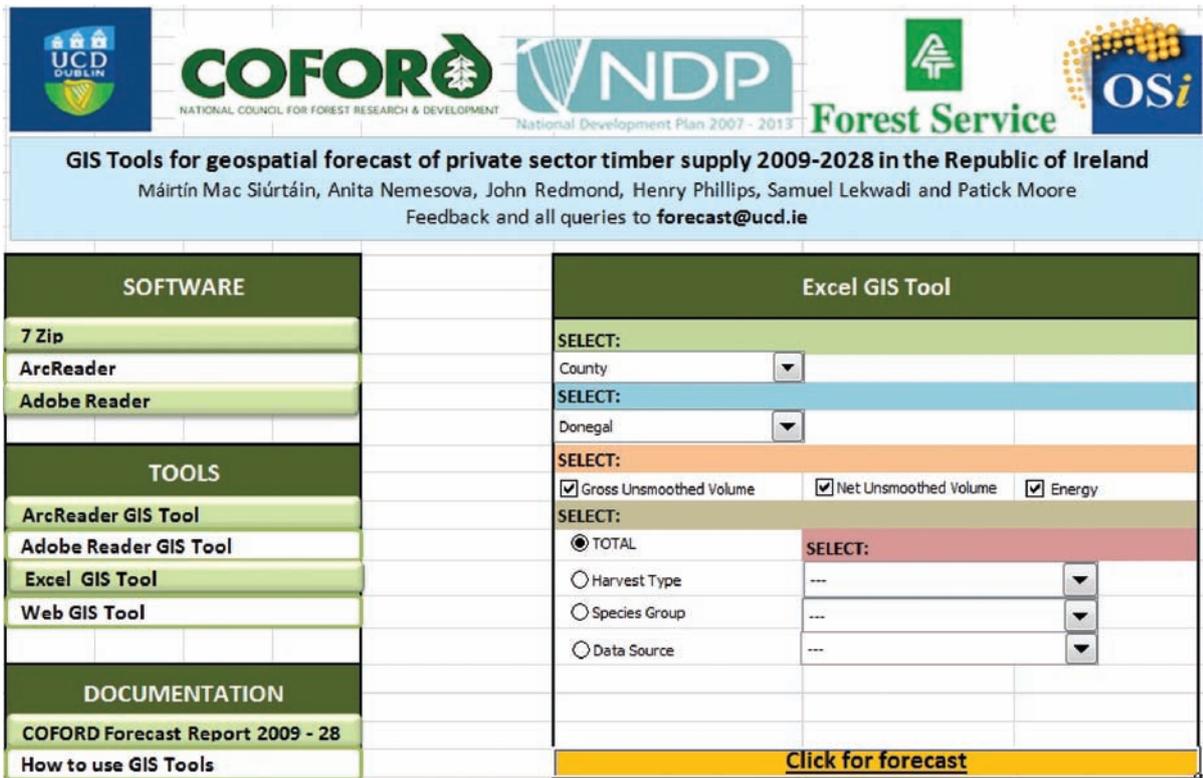
PROGRESS

The FORECAST report *Roundwood production from private sector forests 2009-2028 - A geospatial forecast* (Phillips et al. 2009) sets out the annual potential level of gross and net roundwood supply from privately owned forests, which is predicted to increase 8-fold over present levels, to reach almost 3 million m³ by 2028. The overall net smoothed roundwood production from privately owned forests will increase from an estimated 0.38 million m³ in 2009 to 2.95 million m³ by 2028.

The NFI data contain no information on top height or yield class. Robust models predicting top height from mean height have been developed for all coniferous species and broadleaves, based on data contained within the Coillte permanent sample plot database. Models were also developed to predict the 95% upper and lower prediction intervals for all species. These top height-mean height models allow the NFI plot data to be populated with top height, yield class and with the precision of the estimates quantified. Source R code has been developed to facilitate realtime analysis and revision of top height-mean height models as new data are acquired.

The FORECAST team published a suite of four free web-enabled GIS Tools through an Excel interface Excel_GIS_Tool.xls. The GIS Tools enable private sector forecasts to be downloaded at national, regional, county levels as well as at 60 and 80 km radii from 42 locations; 40 of which are in the Republic of Ireland, with two locations in Northern Ireland.

All Excel formatted private sector forecasts are available directly through the Excel GIS Tool and or through an ESRI ArcReader GIS Tool in published map format (*.pmf), through Adobe Reader GIS Tool in published map format (*.pdf) and through an interactive Microsoft Access database query interface. All Excel formatted forecasts provide gross and net unsmoothed volumes (000 m³ or m³) by assortment plus net energy assortment (000 m³ or m³) and harvest areas (ha) by production year. The forecasts are further broken down by Harvest Type, Species Group and Data Source. The GIS Tools were developed in co-operation with the Forest Service and Ordnance Survey Ireland (OSi), who provided geospatial vector and raster data for the GIS Tools. Source code, developed by Spectral Signatures Ltd, facilitates interactive queries of the



FORECAST Excel GIS Tool interface.

Microsoft Access forecast database from within the GIS Tools. The GIS Tools have highlighted the importance of physical accessibility in relation to private sector forecasts.

ACTIVITIES PLANNED

Through the FORECAST project, COFORD is compiling an all-island forecast of roundwood production, which will combine private sector forecast with those from Coillte and the Northern Ireland Forest Service. This work will provide an updated roundwood production forecast for the full island and the first ever complete county forecast for the Republic of Ireland.

The research activities of the FORECAST will focus on:

- Updating geospatial private sector forecasts using National Forest Inventory (NFI) data.
- Further development of geospatial FORECAST GIS Tools and web services.
- Population of parameter estimates databases for reliable forecast estimation using the Coillte permanent sample plot and OSi lidar geospatial databases.
- Geospatial modelling of accessibility constraints on private sector forecasts.

OUTPUTS

Phillips, H., Redmond, J., Mac Siúrtáin, M. and Nemesova, A. 2009. *Roundwood production from private sector forests 2009-2028. A geospatial forecast.* COFORD, Dublin.

Mac Siúrtáin, M., Nemesova, A., Redmond, J., Phillips, H., Lekwadi, S. and Moore, P. 2009. *GIS Tools for geospatial forecast of private sector timber supply 2009-2028 in the Republic of Ireland.* University College Dublin.

Nemesova, A., Mac Siúrtáin, M., Redmond, J., Phillips, H. and Lekwadi, S. 2009. *GIS Tools for accessing timber and energy forecasts for the Republic of Ireland.* Prize-winning poster. School of Agriculture, Food Science and Veterinary Medicine, University College Dublin.

COFORD-FORCAST GIS Tool Workshops. 22, 29 September and 30 October 2009.

Presentations at the workshops and conferences:

- Forest Service, Johnstown Castle 20 May 2009.
- Bioenergy 2009, Banking on Biomass, 17 June 2009.
- FORECAST – Forestry Commission Meeting, UCD 28 August 2009.
- GIS 2009, The Guinness Storehouse, Dublin. 14 October 2009.
- Economic and Social Research Institute (ESRI). 10 December 2009.
- COFORD Wood Supply Group meeting 11 December 2009.

Input into the Forestry Degree Curriculum development at UCD: Mac Siúrtáin, M. 2009. *FORECAST GIS Tools incorporation in Forestry Degree Modules: FOR 30310 GIS and Remote Sensing, FOR 40080 GIS and Forest Inventory.* University College Dublin.