

COFORD's PLANSFM Research Programme

Planning and Implementation of Sustainable Forest Management

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Presentation to COFORD's Council
July 24th 2009

Hillsborough, Northern Ireland



Overview of presentation

- Introduction and benefits of programme structure
- Overview of projects: objectives, research partners, staff
- Project durations
- Programme and project staff – capacity building
- Dissemination
- Future developments
- Questions



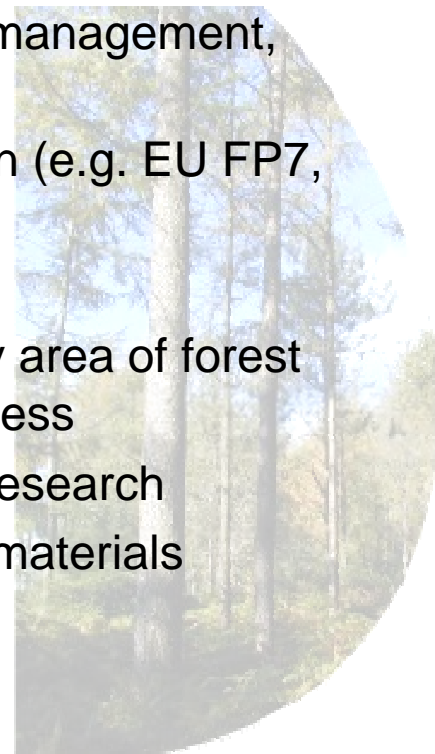
Introduction

- Until 2007 COFORD funding for individual projects
- Each project relatively small (on an international scale)
- No possibility to take on expertise across projects
- In 2007 COFORD invited Programme applications
- My project submissions all fitted together under the SFM umbrella
- Successful submission of PLANSFM proposal



Advantages of grouping projects into programme

- All projects involve the collection of data, the transformation of it into information, and the use of the information in decision making for SFM
- Linkages in data sources, collection processes and analysis procedures
- Possibility to fund and attract programme staff to assist in management, coordination and execution of all projects
- Critical mass for national/international research cooperation (e.g. EU FP7, Marie Curie, COST Actions, UCD Earth Systems Institute)
- Providing thematic 4th level forestry education
- Building a research competence at national level in the key area of forest management and planning - vital to long term competitiveness
- Providing some level of permanence to field-based forest research
- Economies of scale in relation to research equipment and materials



PLANSFM programme consist of 8 projects

- FORESTSCAN
- NATFOREX
- PractiSFM II
- STANDMODEL
- TREEMODEL
- WESTFOREST

- CLUSTER

- FORECAST



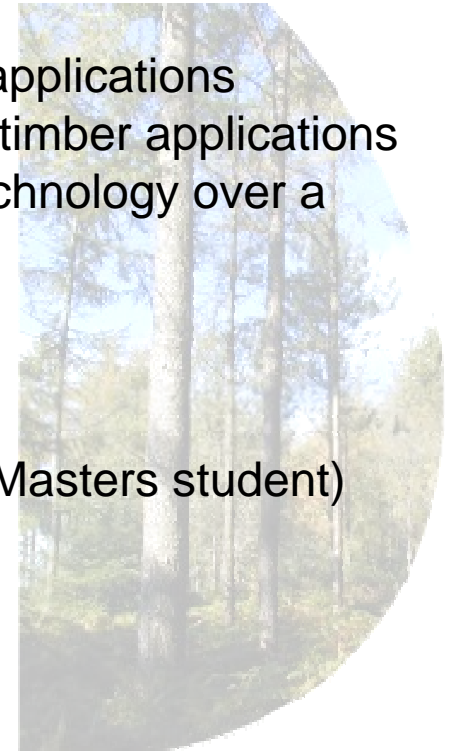
FORESTSCAN - Terrestrial Laser Scanning Technology for Multi-Resource Forest Inventories

The project has the following objectives:

- An investigation of the basic principles of terrestrial laser scanning technology and its applicability to (multi-resource) forest inventories
- An evaluation of existing data analysis software for forestry applications
- Development of new software for a range of timber and non-timber applications
- A cost-benefit analysis for the introduction and use of this technology over a range of potential inventory applications

Project partners are Treemetrics Ltd. and PTR Ltd.

UCD staff: Prof. Maarten Nieuwenhuis, Martin van Leeuwen (Masters student) and Taye Mengesha (PhD student)



NATFOREX – The Establishment of a National Resource of Field Trials and a Data Base for Forest Research and Demonstration

The project has the following objectives:

- The evaluation of the relevance of existing trials in Coillte's experimental plot network and in the research sections of other organisations (Teagasc, NPWS)
- Deciding on the feasibility of the analysis of existing data from past and current trials; and on the benefits of further data collection in existing experiments
- Carry out of necessary maintenance work on key field trials; update the thinning and management status of the trials; and implement and continue the experimental treatments
- The collection of new data in trials where the development of the stand and the research objectives of the specific trial require this
- The integration of the data from past and current trials into a publicly accessible data base

The project partner is Coillte Teoranta

UCD staff: Prof. Maarten Nieuwenhuis (Project Leader), Ted Lynch (Project Manager), Clare Cullinan (Data Manager) and Donal O'Hare (Field Manager)



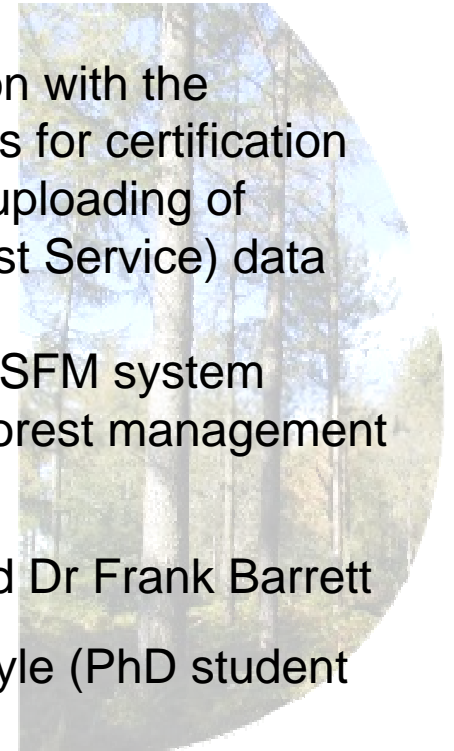
PractiSFM II: Sustainable Forest Management - Implementation, Communication and Optimisation

The project has the following objectives:

- The field testing and validation of the existing PractiSFM system (the multi-resource inventory procedure and the decision-support component) with the help of forest management companies
- The further development of the existing system in cooperation with the management companies, including the reporting requirements for certification
- The development of a communication system, enabling the uploading of PractiSFM management plan information into a central (Forest Service) data base
- The development of an optimisation component to the PractiSFM system
- The implementation of the completed system in the private forest management sector by providing a training and support service

Project partners are PTR Ltd., FEL Ltd., Green Belt Ltd. and Dr Frank Barrett

UCD staff: Prof. Maarten Nieuwenhuis and Marie Doyle (PhD student and UCD staff member)



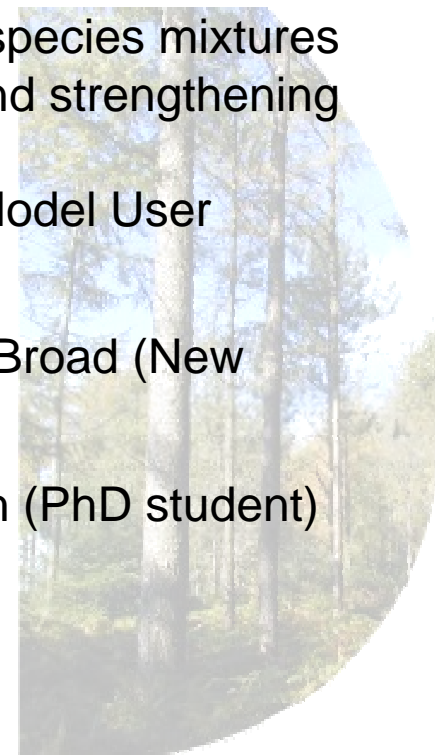
STANDMODEL - Development of Dynamic Yield Models for Conifers, Broadleaves and Mixtures

The project has the following objectives:

- Produce new dynamic yield models for Japanese larch (thinned and unthinned) and ash (thinned)
- Investigate the potential for generating growth forecasts for species mixtures
- Investigate potential for utilising NFI plot data in validating and strengthening existing dynamic yield models
- Develop additional functionality for the Irish Dynamic Yield Model User Interface.

Project partners are PTR Ltd., Coillte Teoranta and Dr Lance Broad (New Zealand).

UCD staff: Prof. Maarten Nieuwenhuis and Andrew McCullagh (PhD student)



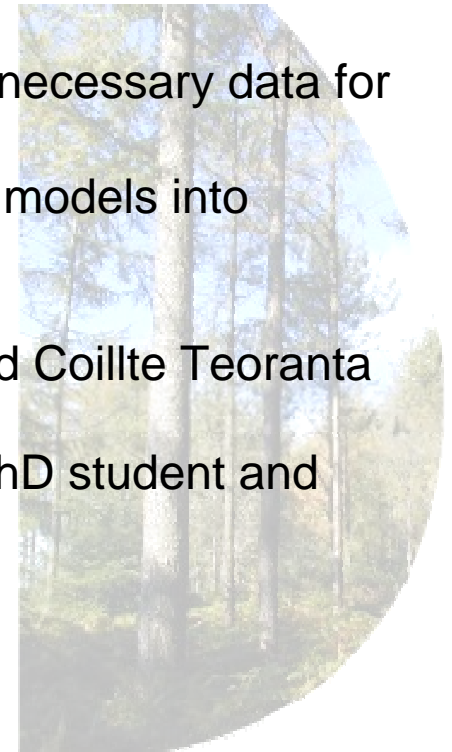
TREEMODEL - Development of Single-Tree Volume Models and Stem Profile Models

The project has the following objectives:

- Produce stem profile models for Sitka spruce, Norway spruce, Douglas fir, lodgepole pine, Japanese larch, Scots pine and ash
- 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

Project Partners are PTR Ltd., IFER Ltd. (Czech Republic) and Coillte Teoranta

UCD staff: Prof. Maarten Nieuwenhuis and John Redmond (PhD student and Forest Service employee)



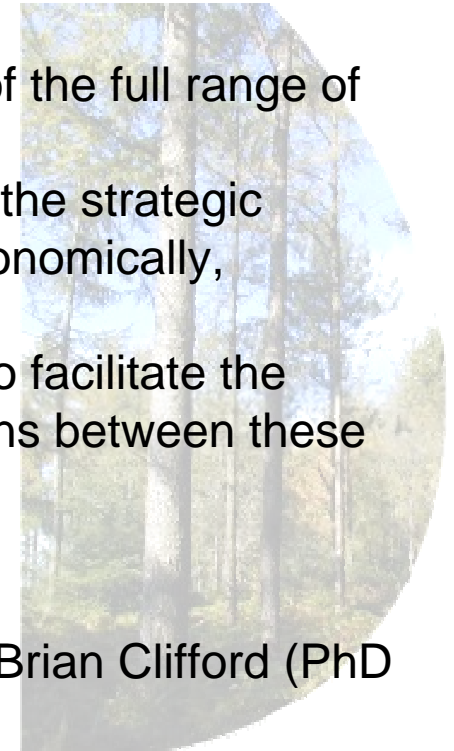
WESTFOREST - a GIS-Based Multi-Objective Decision Support System for the Optimal Management of Forests on Sensitive Sites

The project has the following objectives:

- The development of a GIS system that contains information on environmental, cultural, social and operational restrictions that are applicable to the Western Peatland Forests (WPFs)
- The development of a matrix in which the known impacts of the full range of potential forest management practices are identified
- The development of a Decision Support System (DSS) for the strategic management and redesign of WPFs in a manner that is economically, environmentally and socially acceptable
- The development of an optimisation module for the DSS, to facilitate the production of alternative plans and the scientific comparisons between these plans

The project partner is Coillte Teoranta

UCD staff: Prof. Maarten Nieuwenhuis and Brian Clifford (PhD student, from Sept 2009)



CLUSTER - A cluster based approach for identifying farm forest resources to maximise potential markets

The project has the following objectives:

- Development of methods to quantify the forest resource and produce a timber forecast at a local level
- Development of cluster groups where forestry operations can be performed together to minimise cost
- Development of cluster groups to facilitate combined sale of forest products from many farms
- Scheduling harvesting to coincide with adjacent harvesting in similar locations based on demand for selected products

Teagasc project team: Niall Farrelly, Brian Clifford and Stuart Green



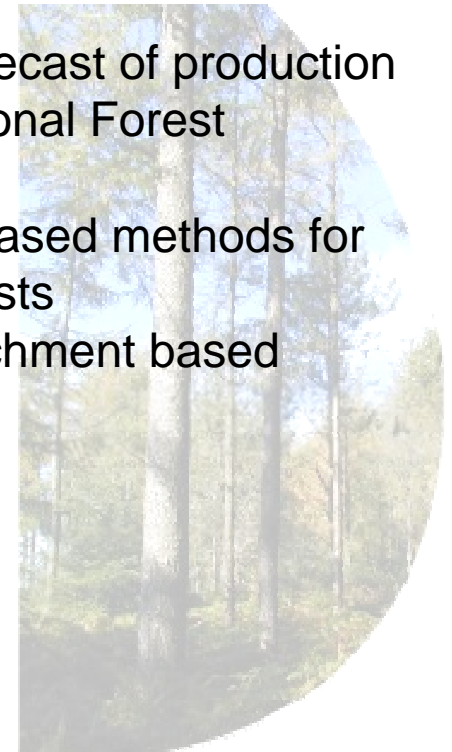
FORECAST - Geospatial forecasts of private sector timber supply

The project has the following objectives:

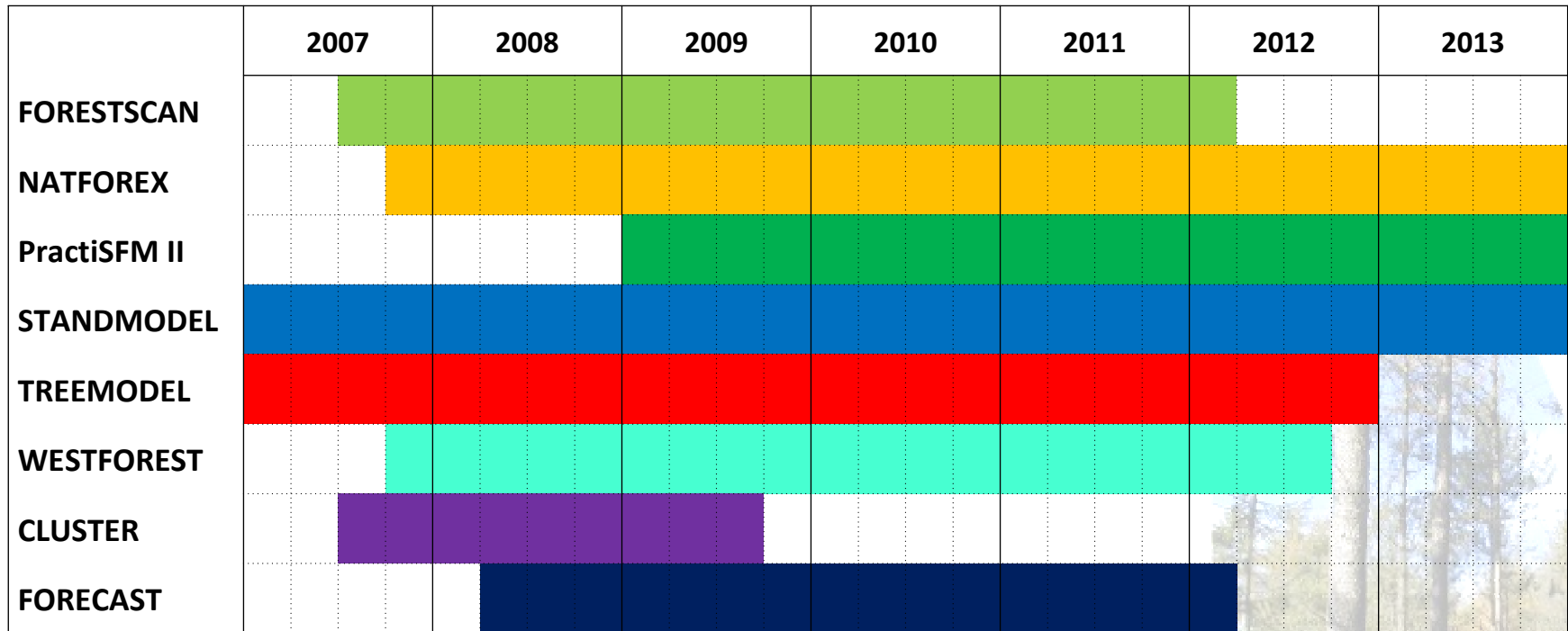
- To develop an interim geospatial forecast (2009–2028), within 12 months, on a national and catchment basis for privately owned forests using available spatial data and yield models
- To determine whether it is possible to generate a reliable forecast of production from privately owned forests using existing data from the National Forest Inventory (NFI)
- To compare the relevant merits of plot based versus stand based methods for forecasting future timber production from privately owned forests
- To develop an interface for the provision of national and catchment based forecasts over the internet

Project partners are the Forest Service, Henry Phillips

UCD staff: Dr Máirtín MacSiúrtáin and researchers



PLANSFM - individual project duration



Staffing of PLANSFM programme

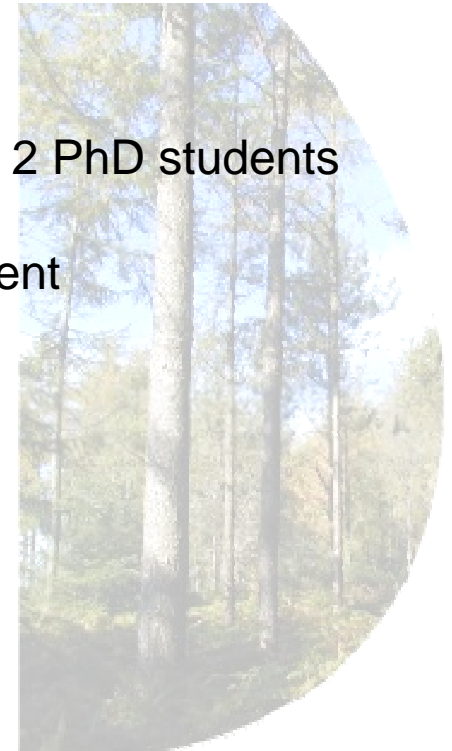
Professor Maarten Nieuwenhuis – Programme Leader

Mr Charles Harper – Programme Manager

Dr Michael Hawkins – Programme Post-Doc Research Fellow (from Sept 2009)

Programme staff also involved in other COFORD projects:

- CARBiFOR II - Work Package1 – Biomass group
Prof. Maarten Nieuwenhuis, Dr Brian Tobin, 2 PhD students
- CLIMADAPT - co-funded by Forest Research UK
Prof. Maarten Nieuwenhuis and 1 PhD student



Building research capacity and competence

Project	Staff	Post-Doc	PhD	MSc
FORESTSCAN			●	●
NATFOREX	● ● ●			
PractiSFM II			●	
STANDMODEL			●	
TREEMODEL			●	
WESTFOREST			●	
CLUSTER	● ● ●			
FORECAST		○	○	●
Programme	●	●		



Dissemination

- Nieuwenhuis, M. 2007. NATFOREX – a National Data Base of Forest Experiments and Research. *Irish Timber and Forestry* 16(4): 20 - 24.
- Nieuwenhuis, M. and Purser, P. 2007. STANDMODEL: Dynamic Yield Models for Larch, Ash and Mixtures. *Irish Timber and Forestry* 16(5): 22 - 23.
- Nieuwenhuis, M. and Tiernan, D. 2007. WESTFOREST – a GIS-Based Multi-Objective Decision Support System for the Sustainable Management of Forests on Sensitive Sites. *Irish Timber and Forestry* 16(6): 20 - 22.
- UCD today. 2007. UCD Researcher awarded €5.8 million in research funding. December 2007.
- Farrelly, N. and Clifford, B. 2007. *Using Cluster analysis to Identify Forest Resources*. Poster presented at Bioenergy 2007. Oak Park Co. Carlow.
- Farrelly, N., Clifford, B. and Green, S. 2007. Identifying Forest Resources Using GIS Cluster Analysis. *Irish Scientist Yearbook*.
- Nieuwenhuis, M. 2008. €5.0 Million Invested in the PLANSFM Research Programme. *Irish Timber and Forestry* 17(1): 22 - 24.
- Nieuwenhuis, M. 2008. FORESTSCAN – Terrestrial Laser Scanning Technology for Multi-Resource Inventories. *Irish Timber and Forestry* 17(3): 32 - 35.
- Nieuwenhuis, M. 2008. NATFOREX – Establishing a National Resource of Field Trials and a Database for Forest Research and Demonstration. *COFORD Forestry and Wood Update* 8(12): 2-3.



Dissemination (cont.)

- Cullinan, C. and Nieuwenhuis, M. 2008. NATFOREX - Establishing a National Resource of Field Trials and a Database for Forest Research and Demonstration in Ireland. In (Karlsson, K. Ed.) *Proceedings of NoLTFoX meeting*. Edinburgh, Scotland (June 5 – 6, 2008).
- Nieuwenhuis, M. 2008. *PractiSFM II – a link between the inventory and management needs of the private forestry sector and the need for production forecasts*. COFORD technical workshop: Forest growth modelling and wood production forecasting. Portlaoise, Ireland (May 12, 2008).
- van Leeuwen, M. 2009. *On the Use of Laser Rangefinding Techniques for Forest Inventory Studies*. MScAgr Thesis, University College Dublin.
- van Leeuwen, M. and Nieuwenhuis, M. Retrieval of Forest Structural Parameters Using LiDAR Remote Sensing. *European Journal of Forest Research* (submitted).
- Mengesha, T. and Nieuwenhuis, M. 2009. *Retrieving Forest Parameters Using Terrestrial Laser Scanning Technology*. Poster to be presented at Silvilaser 2009, the 9th international conference on LiDAR applications for assessing forest ecosystems. Texas A&M, USA (October 14-16, 2009).
- Barrett, F. and Nieuwenhuis, M. The PractiSFM multi-resource inventory protocol and Decision Support System: a model to address the private forest resource information gap in Ireland. *Irish Forestry* 65: (in press).
- Purser, P. 2009. Recent Developments in Irish Stand and Stem Modelling under COFORD STANDMODEL and TREEMODEL Projects. Presentation to ITC Technical Group, Portlaoise (July 14, 2009).



Future developments

Almost all projects and programme now fully staffed and up-and-running

Opportunities to attract funding from other sources:

- FP7 AdaFOR application (unsuccessful)
- Marie Curie application (in progress)
- European Research Council (planned)
- PRTL: UCD Earth Systems Institute (in progress)

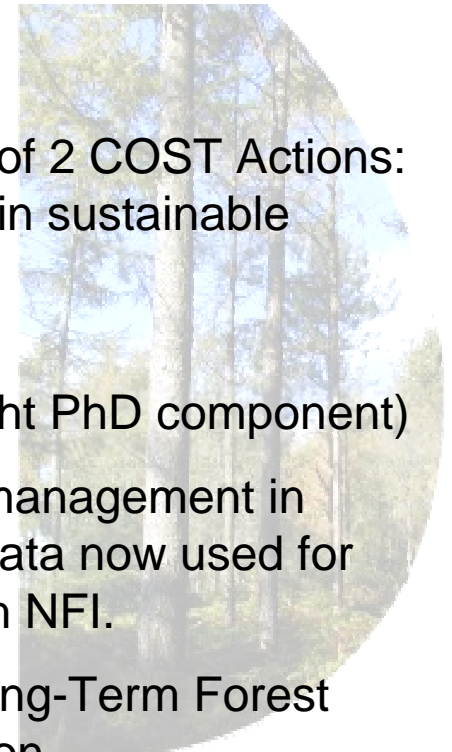
Prof. Nieuwenhuis is a member of Management Committees of 2 COST Actions:

- FP0603 - Forest models for research and decision support in sustainable forest management
- FP0804 - Forest management decision support systems

Development of thematic 4th level education in Forestry (Taught PhD component)

Development of a permanent structure for (field-based) data management in forest research. Critical in relation to long-term experiments; data now used for climate change research, dynamic yield models. Linkages with NFI.

Membership of NoLTFoX (Northern European Database of Long-Term Forest Experiments). Potential for future research cooperation.



Thank you.
Questions?



UCD Earth Systems Institute

