

An overview of ModisPinaster model

Teresa F. Fonseca¹, François de Coligny², Carlos P. Marques¹,
Bernard R. Parresol³, Margarida Tomé⁴

¹Universidade de Trás-os-Montes e Alto Douro, Vila Real (Portugal)

²INRA-AMAP, Montpellier (France)

³US Forest Service, Southern Research Station, Asheville, NC (USA)

⁴ Instituto Superior de Agronomia/Universidade Técnica de Lisboa (Portugal)

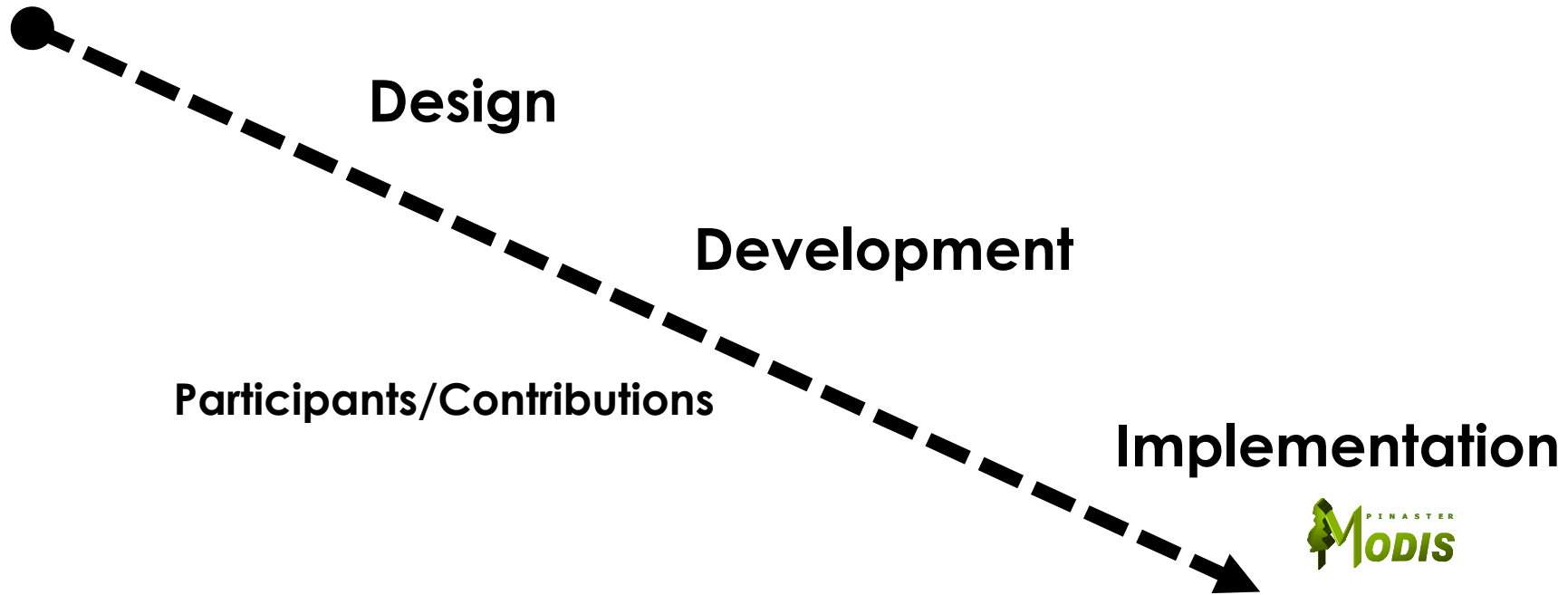
2-4 April 2012

Réunion CAQ15 - Capsis14, Nogent sur Vernisson, , France



ModisPinaster

Starting point



Starting point

The Portuguese forest occupies 3.4 millions ha – 38% of the territory

Maritime pine (*Pinus pinaster* Ait.) is the leading softwood species in Portugal, covering 23% of its mainland forested area.

The major continuous pine forest cover occurs in the North part, in the **Tâmega valley**.

Most of these forest areas are **common land**, which are co-managed by the National Forest Services and the local communities.



One decade ago, the existing models were not flexible enough to attend for the management of the species in the North of Portugal.

Main desirable features of the new model:

Easy of use for Inventory update & Thinning simulation

Simulation of yield by diameter classes

Inclusion of a Mortality module

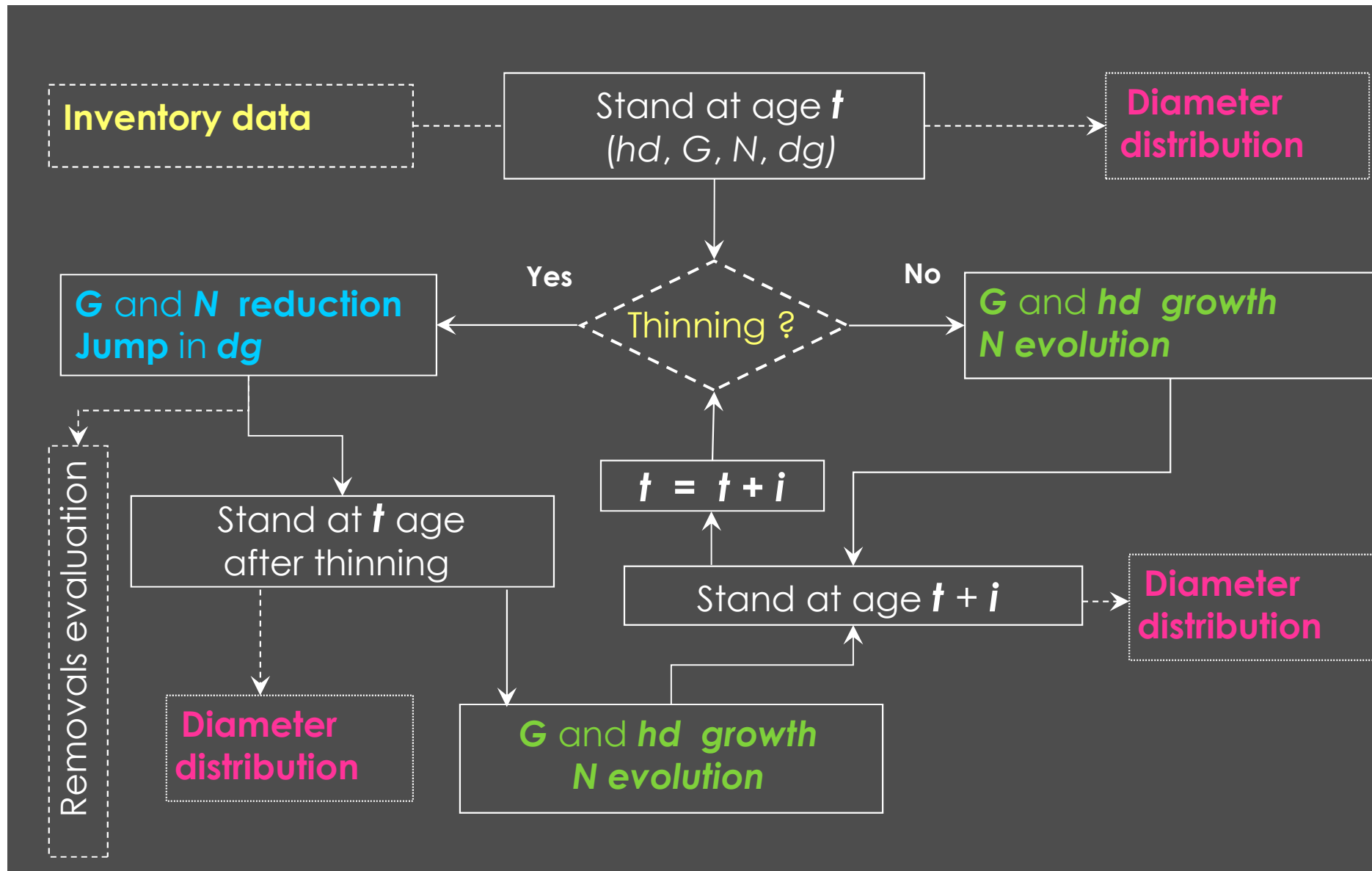
– wind and competition related



The name:

Model with diameter distribution for Pinus pinaster

Design (it started with a sketch like this...)

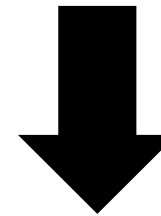


Development



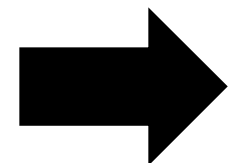
**Good data
& Lots of work
Maths
Modelling
Forest dynamics**

& some years after



**the model in a paper
format
(hence, restricted to an
academic use only)**

Plus a great suggestion presented by Céline Meredieu



Implementation

Integration of ModisPinaster in Capsis platform



Training / Discussions (fc, ff, cm)

François de Coligny →

Integration of the stand level modules

Integration of the distribution part

**Integration/adaptation of the
thinning algorithm**

Why Capsis 4?



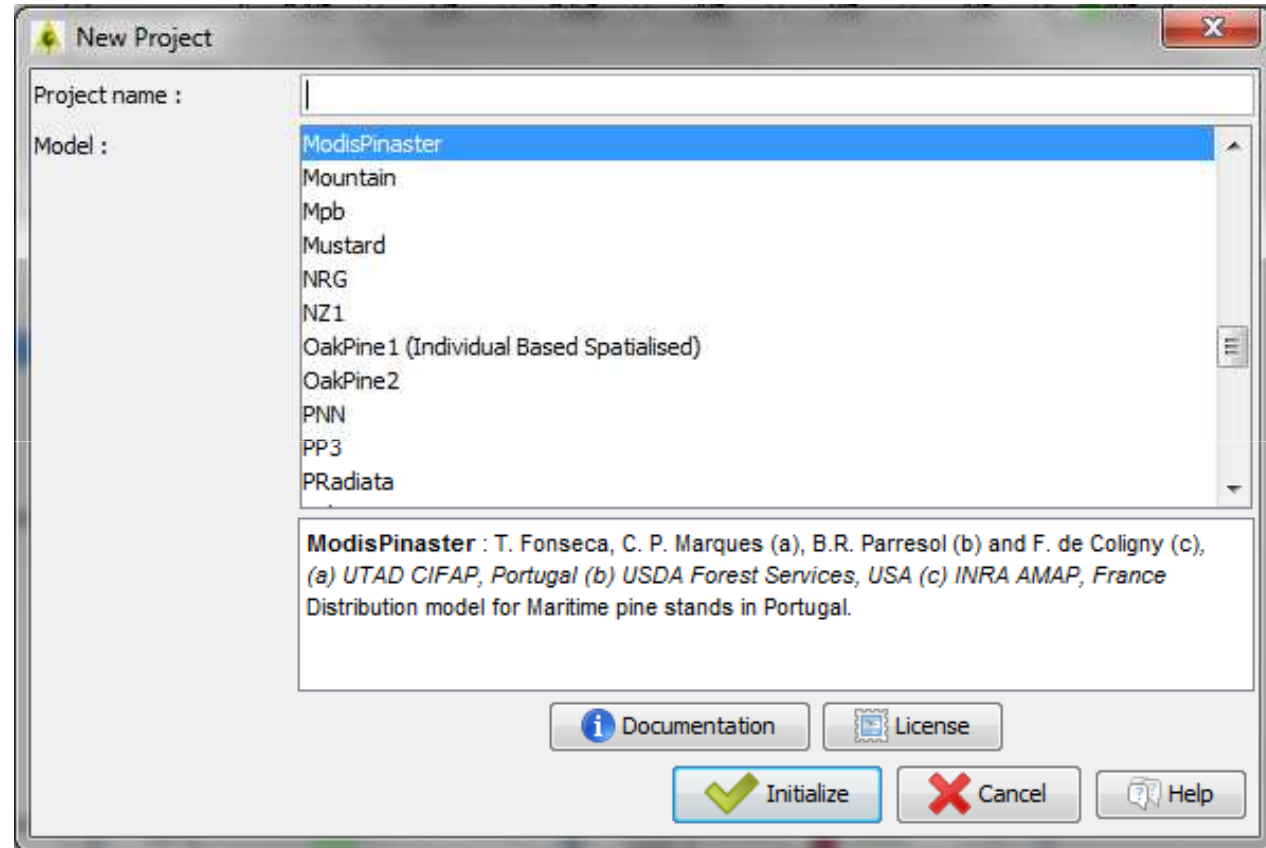
- Good reputation of the supporting institutions (e.g. INRA)
- Secure platform (confidence on perennity)
- Professional and technical support by the Developers
- Easy to run in different operative systems (Windows, MacOSX, Linux)
- Free software
- + all the properties of using Java language
(easier than others, free, easier for distribution, stable)
- Use of existing extensions → model improvement
- Easy to share the model with the forest managers
- Easy to do simulations within the Capsis platform

Implementation

GNU LESSER GENERAL PUBLIC LICENSE



Everyone is permitted to copy and distribute verbatim copies of this license document.



Starting Point

Design

Development

Implementation

Results – Input dialog

Minimal Input

Homogeneous stands, by default

Initialize scenario

Stand characteristics

Stand name : No name

Stand age (t, years) : 20

Dominant height (hd, m) : 10.3

Number of trees (N, n.ha⁻¹) : 2200

Basal area (G, m²ha⁻¹) : 23

Dominant diameter (dd, cm) : 17.7

Terrain direction (°, °) : 180

Terrain slope (°, °) : 15

Volume merchantable (vmer, sq.m)

Use top diameter for merchantable volume (cm) 0

Use top height for merchantable volume (m)

Stand nature

Stand nature selected

Homogeneous

Heterogeneous

Stand nature estimated

Number of diameter classes :

Diameter standard deviation (sd, cm) :

Optional data

Average diameter (davg, cm) :

Median diameter (dmed, cm) :

Minimum diameter (dmin, cm) :

Recent cut :

Recent mortality

MODIS

Demo Save As Load

Ok Cancel Help

Merchantability limit, set by the user

To improve the initialization of stand variables

Examples of the evolution dialog windows



Revision and Improvement

Presentation to the potential users and users' feedback

Collecting new data



Extended data set



Submodels revision

Analysis, revision and improvement

Analysis, revision and improvement



Capsis

Computer-aided projection of strategies in silviculture



Submodels revision

Integration of the thinning descriptors

Wilson Factor and Stand Density Index

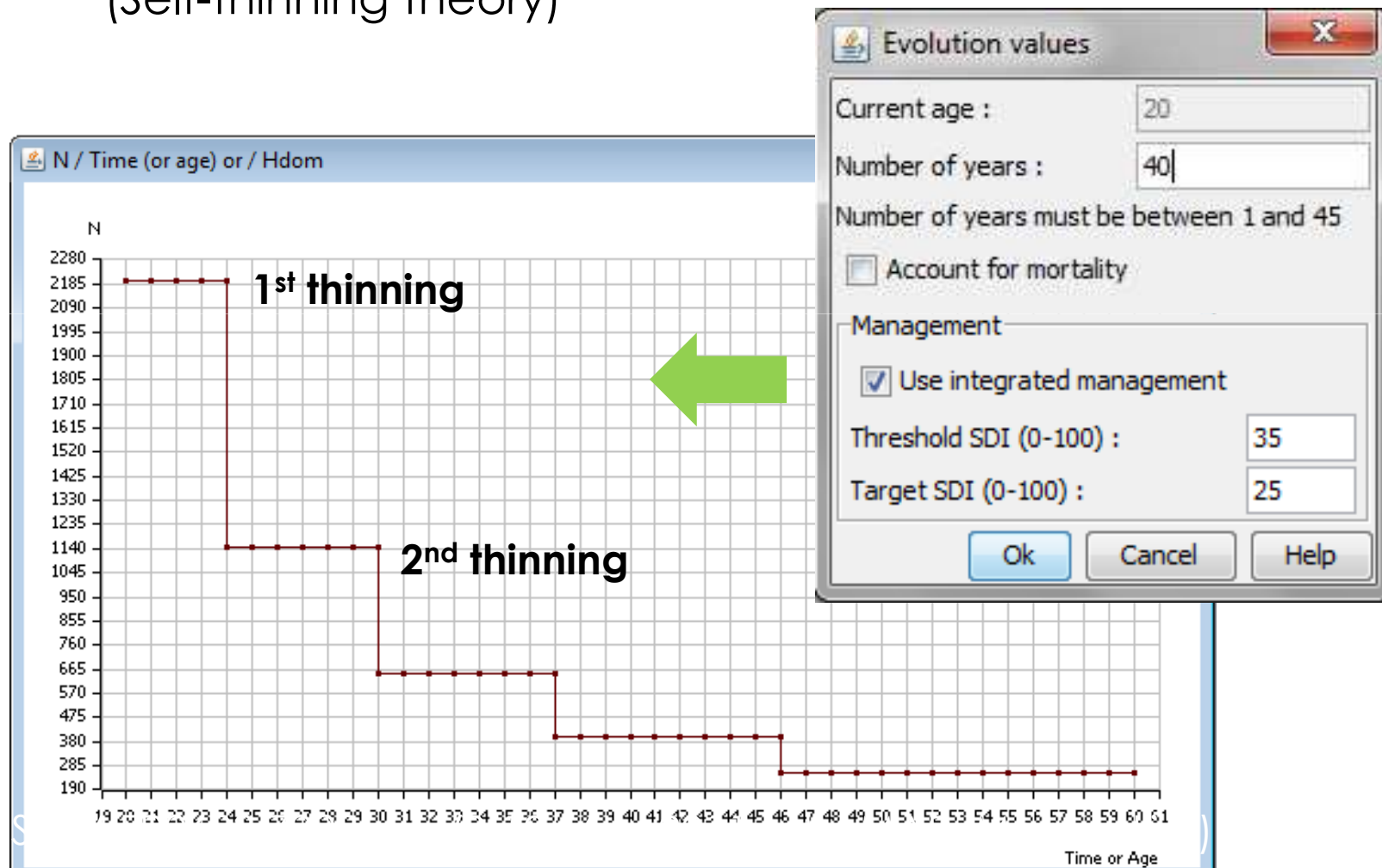
Integration of automatic management (Self-thinning theory)

Expanded output

Biomass and carbon

Analysis, revision and improvement

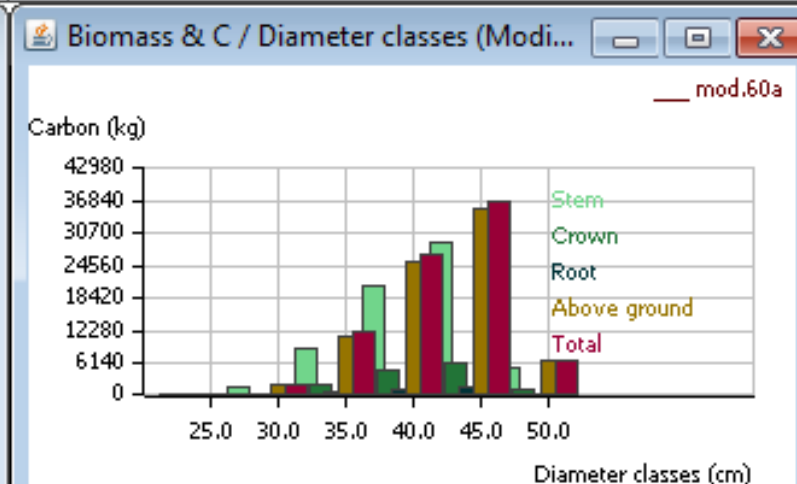
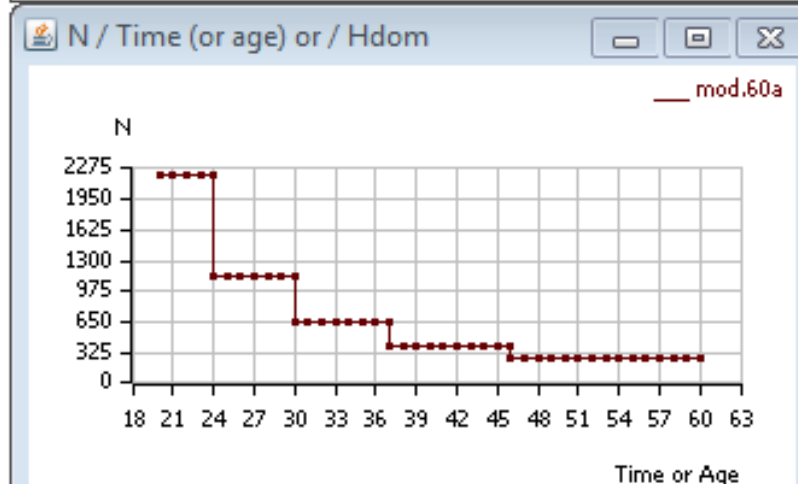
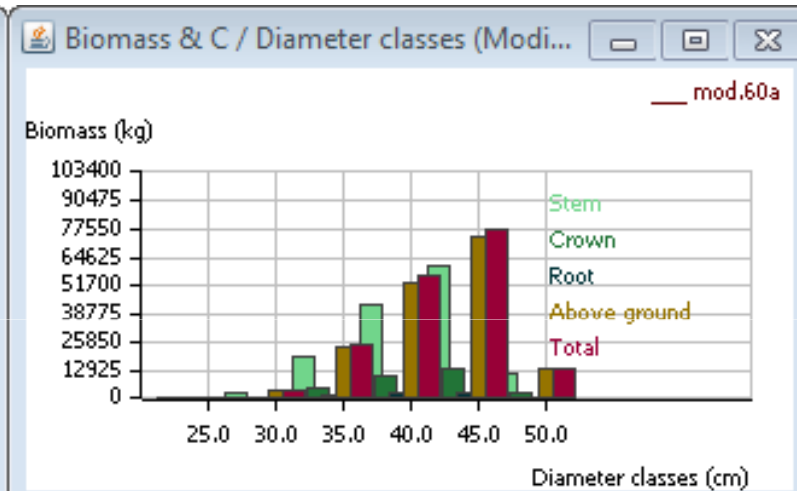
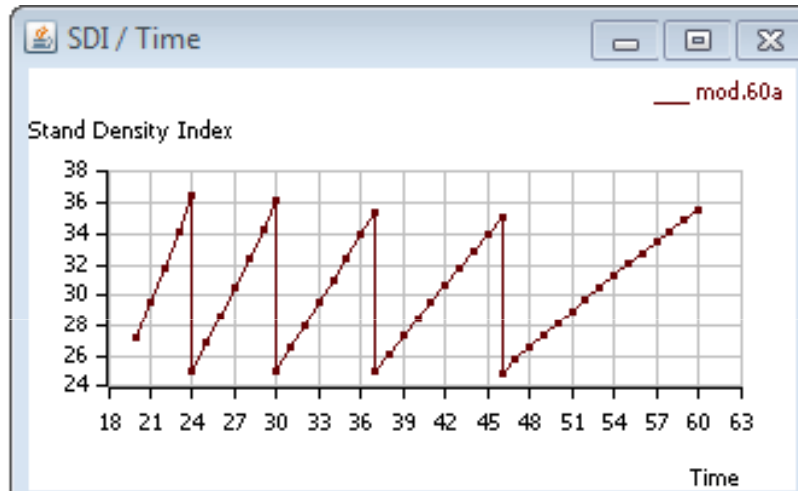
Integration of automatic management (Self-thinning theory)



Analysis, revision and improvement

Automatic management
(Self-thinning theory)

Expanded output
e.g. Biomass and carbon



Analysis, revision and improvement

- The potentialities of Capsis enhance the use of forest models for SFM through the easy of sharing the model with the forest managers without charges and of permitting the analysis of different scenarios.
- Simulations are easy to run and users can utilize and test different silvicultural scenarios for a sustainable and adaptive forest management.

What was the contribution of ModisPinaster to Capsis?



Jonhson S_B distribution model

LM code now available in a Capsis library

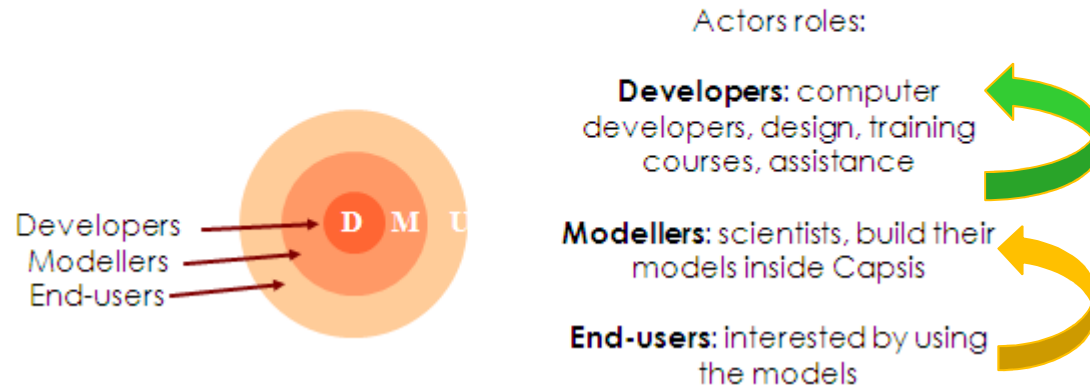
New thinning algorithm options

Mortality module

mortality related to wind

mortality related to density

The Capsis project organisation



Technical meeting about the ModisPinaster model

Vila Real (Portugal) by Teresa F. Fonseca and François de Coligny on 19th October 2011 for 25 engineers, technicians and members of associations of the forestry field

for a feed-back from the users

