**FOREST MODELS - objectives:**

Forest models, allowing to simulate the growth of the trees and the dynamics of the structure and composition of the forest when subjected to different silvicultural treatments and / or environmental conditions, are essential tools to support forest management decisions. To be used in practice, the models have to be implemented into computer programs, designated by forest simulators, which can represent different spatial levels, from a stand to a management area, a landscape or even an entire country or continent. Annually, the simulators provide information on the characteristics of each of the stands included in the case study, including information on the structure of the stands, and for the whole area as well as indicators of sustainable forest management for each stand and the whole area (*e.g.* biodiversity, carbon stocks).

The general objective of this course is that students acquire the basic knowledge about forest growth and yield models and the respective simulators. The specific objectives are that students:

1. know the data that can be used for the construction and validation of forest models
2. understand the different types of forest management-oriented models, from traditional growth and production models - including stand models, diameter distribution models and individual tree models - to forest succession models (gap models) and physiological based models (based on processes);
3. learn growth functions or mathematical expressions that can be used in modeling growth
4. understand what are the main factors that determine site productivity
5. know in detail examples of the main types of forest models and become familiar with several forest simulators for different spatial scales;
6. learn the most used statistical techniques in the development of traditional growth and production models;
7. understand how to calibrate physiological models
8. realize the importance of evaluating/validating forest models and learn how this can be done