ABSTRACT BOOK

medpine 4

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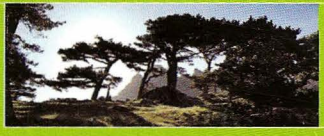

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O1-5 Integration of empirical and process-based models for maritime pine in Portugal

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Forests are very important in Portugal, covering 39% of the land (agriculture occupies 33% and shrubland 21%). From those, the production forest represents 51% (28% maritime pine and 23% eucalyptus) while evergreen oaks represent 36% (23% cork oak and 13% holm oak). Other minor species cover just 12%. Maritime pine is the most important softwood in the country and the only one relevant for wood production (annual wood harvest of softwoods is close to 5 10^6 m^3). Forest resources in Portugal are mainly driven by forest fires and wood harvest, with some impact also of afforestation and deforestation. The prediction of these drivers in the dynamics of forest resources – namely growing stock, volume growth and carbon stock – is crucial at different spatial scales, from the individual landowners, for forest management purposes, to the industry, for the planning of wood supply, as well as for the definition of forest policies. Optimization of management at local levels plays also an important role for the overall dynamics of the forest resources. Growth and yield models implemented in forest simulators appropriate for different spatial scales have been developed in the country for the most important forest species (maritime pine, eucalyptus and cork oak). The global change environment, namely climate change, gave impetus to an increasing use of process-based models that simulate forest ecosystem dynamics for this purpose. Such models, integrating the main physical, biogeochemical and physiological processes involved in forest growth and development, give a mechanistic description of the interactions between the living plants and their environment and are able to assess the energy balance and the cycling of water, carbon and nutrients within a given ecosystem. In Portugal, the 3PG model, a simple process-based stand model requiring few parameter values and only readily available data as input has been selected as appropriate for the simulation of maritime pine stands. Basal area and underbark volume is the only information for managers provided by the original 3PG model and validation of the output against permanent plot data showed some bias, mainly in volume predictions. This presentation describes a series of functions developed on the basis of existing permanent plot data that were added to the 3PG model in order to improve and enrich the type of output that it provides for management.

Keywords: process-based model, empirical models, 3PG, maritime pine