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Providing tools to improve forest management in the northeastern region of Portugal

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The sustainable use of natural resources, such as forest resources, require sound management practices, from both environmental and socioeconomic perspectives, supported by reliable and accurate models and tools developed at proper scales. In forestry, however, tools that use regionally adjusted growth and yield models may not always be available, in particular in mountain areas where local environmental conditions affect tree growth in particular ways. In order to solve existing technical constraints that limit sustainable forestry at the stand and at the landscape level and to encourage and support sustainable wood mobilization in the northeastern region of Portugal, we developed a set of tools targeted to both forest managers and forest owners: FlorNExT® and FlorNExTPRO®. FlorNExT® is a friendly-user cloud computing tool for the simulation of forest growth and thinning operations, directed to forest managers and owners. This application was designed to allow estimates of current stand volume, biomass and carbon content of maritime pine and Pyrenean oak stands to be made easily by any stakeholder, as well as to estimate future forest growth and yield based on four stand variables: age, density, dominant height and basal area. FlorNExTPRO® is a desktop tool that provides a spatial framework to forest optimization using a linear programming approach. The tool tests all the possible combinations of silvicultural plans defined by the user for a set of management units. In addition, the user can apply constraints to the simulations, such as maximum harvested or thinned area, or minimum volume to be removed per period, among other options. Both tools implement a dynamic growth and yield model framework which integrates different transition functions for dominant height (site index curves) and basal area, along with equations of tree and stand volume and structural models to plan thinning operations of variable intensity.

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