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Wind risk in forest growth, value and management models: the FOR-WIND project

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Abstract:

FOR-WIND is a starting project funded by the French National Research Agency (ANR), to develop a modelling toolbox to simulate forest management units submitted to wind hazards at the decade time scale and including uncertainties. A wide range of forest systems will be considered, using pine plantations and deciduous mixed beech forests as case studies. FOR-WIND brings together skills in environmental and soil mechanics, mechanobiology, growth and yield modelling, forest management, insurance and risk economics. The For-Wind toolbox will be used to assess management scenarios build with professional experts, and to conduct a debate on the comparative values of management practises. This toolbox will also improve the initial training of students.

The poster will present the project workflow, and the six major items addressed:

- i) The effects of landscape patchiness, soils and tree species and size on the risk of wind losses.
- ii) The degree of wind hardening of trees, through their capacity of sensing chronic winds and modifying their growth allometries accordingly.
- iii) The integration of the previous effects into growth models.
- iv) The development of computer models of forest management simulating many stands organized into a structured landscape, and including stochastic effects related to climatic hazards and forest vulnerability.
- v) The possibility and advantages of insuring forest taking their vulnerability and value (wood raw production, and external non-market values) into account.
- vi) The relative benefits on the long run of hard adaptation through silviculture versus soft adaptation through insurances, as well as the impact of public policies.

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