

Abstract template for the conference “A century of national forest inventories – informing past, present and future decisions”

Dear author. This is a two-page template that in the first page will ask for information on presenter name, topic, and preferred presentation form.

On page two, you are asked to fill in your abstract in the format and font size indicated. Please remember to include authors affiliation information in the footer section of page two. The length of the abstract may not be more than one page including references.

Abstract title:		A large-scale forest dynamic model to estimate wood resources in the French forests based on NFI information
Take-home message:		Modeling growing stock dynamics of the French forest represents a real challenge, as these are the most heterogeneous in Europe and their growing stock is increasing. Margot model is presented that intends to account for these features.
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General topic, see website: <small>(please double click on the check box and activate the relevant one)</small>	<input type="checkbox"/>	Improving future NFIs by learning from the past
	<input checked="" type="checkbox"/>	NFIs today and in the future
	<input type="checkbox"/>	Cutting edge and futuristic inventory techniques and technologies
Preferred presentation form:	<input checked="" type="checkbox"/>	Oral presentation
	<input type="checkbox"/>	Poster
<i>Abstracts will be reviewed by members of our scientific committee and you will be given information on decisions in due time after the submission deadline has passed.</i>		

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A large-scale forest dynamic model to estimate wood resources in the French forests based on NFI information

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Introduction: Non-stationary forest dynamics of secular arising from the forest transition, and current agenda on climate change mitigation and valuation of wood resources (Bioeconomy), make the development of large-scale models crucial to support forest management strategies on these issues. French forests further exhibit significant contrasts in climatic context and diversity in tree species, challenging these developments. Based on the MARGOT model (Pignard, 1993; Wernsdörfer et al., 2012), we intend to model all the diversity of the French forest in a non-stationary context.

Materials and methods: Using NFI data to both build reference historical chronologies of growing stock and estimate model parameters, we compared past retrospective projections of model MARGOT, constructed at different hierarchical scales representative of diversity of the French forests, with historical and modern database from the French NFI over a period of 40 years (1971-2011), to conduct model evaluation. We also performed a sensitivity analysis on the felling rates. Second step is to represent density-dependent processes in the model in order to better simulate forest management.

Results: MARGOT was found to overestimate the growing stock trajectories, both on a regional and national scale. A sensitivity analysis on felling rates suggested their underestimation from the NFI protocol by a factor of 2, as a consequence of the temporary nature of sampling plots. Modelling of density-dependence was introduced and tested against former simulations.

Conclusion: In spite of overestimations in the growing stock, MARGOT was found able to describe the French forest expansion, indicating that forest maturation is a key current process in these increases. Density-dependence was found to lower overestimations in the growing stock. A next step will consist in hybridizing Margot with a process-based model in order to account for climatic forcings.

References:

Pignard, 1993, *Revue Forestière Française*

Wernsdörfer et al., 2012, *Annals of forest science*, 69(7), 829 - 844

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