

Post-Doctoral Fellowship in Spatially Explicit Modelling of Forest Dynamics Following Silvicultural Treatments in Hardwood Forests

Background

Within the framework of a research project entitled "Assessing the impact of different silvicultural scenarios on stand growth, composition and structure of sugar maple forests under ecosystem management", we are looking for a post-doctoral fellow with interest and experience in modelling, particularly with individual-based spatially explicit simulation models (e.g., SORTIE-ND; <http://www.sortie-nd.org/>).

The candidate will be required to complete the calibration of the SORTIE-ND simulator for hardwood forests in the Eastern Townships (southern Quebec), to test and use the model for the evaluation of the impact of different silvicultural scenarios on stand-level growth, and forest structural characteristics and composition. The project objectives include the identification of silvicultural scenarios that could reduce differences between managed and pre-industrial forests.

Detailed Description of the Project's objectives

- Complete calibration of the SORTIE-ND simulator for hardwood forests in the Eastern Townships (southern Quebec) from field data, inventory databases and literature
- Test the model by using different approaches (sensitivity analysis, comparison of predicted values to observed values, etc.)
- Contribute to the development of silvicultural scenarios that can be used in stands dominated by sugar maple, in the context of ecosystem management
- Establish baseline conditions (stand tables) representative of the forests under study
- Perform simulations of silvicultural scenarios
- Compile and analyze the simulations results. This stage will include the calculation of various indicators (e.g., composition diversity and structural complexity), and multivariate analyses could be used.
- Publish at least one scientific paper dealing with the issues described above

The candidate will also be invited to explore topics of their choosing, using modelling, in conjunction with the general themes of the project.

Profile, Knowledge and Experience Sought

- Ph.D. in forest science, biology or environmental science (with a thesis project related to forestry and/or forest ecology)
- Ph.D. degree obtained recently (i.e., less than 3 years ago)
- Strong interest in modelling, particularly with regard to individual-based spatially explicit simulation models
- Familiar with the process of model calibration, evaluation (sensitivity analysis, validation) and simulation
- Basic knowledge and interest in silviculture and forest management
- Knowledge of SAS and/or R
- Strong foundation in statistics (including linear and nonlinear mixed models, multivariate analysis)
- Ability to program in C++ would be an advantage, but is not essential
- Record of publication with a minimum of two articles published as first author in recognized scientific journals
- Basic knowledge of French for communication in the workplace and sufficient knowledge of English to write in that language.

Personal Qualities Required

- Autonomy, motivation, discipline, strong organizational and interpersonal skills

Research Team and Training Environment

- Christian Messier, Ing. f., *Ph.D.*, Dep. Biology, University of Quebec at Montreal (UQAM), Regular Member of the Centre for Forest Research (CEF). (Project Principal Investigator)
- Marilou Beaudet, biol., *Ph.D.*, Direction de la recherche forestière (DRF), Ministère des Ressources naturelles et de la Faune (MRNF), Québec, Associate Member of the CEF.
- Daniel Mailly, Ing. f., *Ph.D.*, Direction de la recherche forestière (DRF), Ministère des Ressources naturelles et de la Faune (MRNF), Québec, Associate Member of the CEF.
- Dominique Gravel, Ing. f., *Ph.D.*, University of Quebec at Rimouski (UQAR), Rimouski, Regular Member of the CEF.
- Guy Lessard, Ing. f., M.Sc., CERFO, Quebec.

The post-doc will be based in Quebec, preferably, with occasional trips to Montreal and Rimouski. He/she will be part of CEF (<http://www.cef-cfr.ca/>) and may take courses, if necessary, at one of the affiliated universities.

Position Details

- Core funding available from the FQRNT research grant, already obtained for **1.5 years (40 000\$CAN/year)**
- Possibility of additional funding by applying for a post-doctoral fellowship within the context of the Forest Complexity Modelling program (FCM), CREATE (NSERC) (<http://www.mcf.uqam.ca/>). These fellowships are available for projects performed in collaboration with industry and government partners. In the case of this project, the MRNF and CERFO are directly involved.
- The candidate should be able to start registration procedures as a post-doctoral fellow and CREATE fellowship application as soon as possible (and no later than the end of December 2011) in order to **begin as early as possible in 2012.**

Application Process

Please submit your curriculum vitae along with a cover letter describing how, in your estimation, your past experiences and expertise qualify you for this position, to:

Dr. Christian Messier (messier.christian@uqam.ca)
CC: Dr. Marilou Beaudet (marilou.beaudet@mrnf.gouv.qc.ca),
Dr. Daniel Mailly (daniel.mailly@mrnf.gouv.qc.ca),
Dr. Dominique Gravel (dominique_gravel@UQAR.qc.ca).