Postdoctoral position

Retrospective simulations of fires and spruce budworm epidemics in the boreal forest of eastern Canada during the Holocene

Keywords: natural disturbances, ecological modelling, landscape ecology, paleoecology

Context:

Boreal forests represent 30% of the world's forest area and provide many ecosystem goods and services to populations. “Natural” disturbances are an integral part of these forests and have shaped them for thousands of years. In Canadian boreal forests, fires and spruce budworm outbreaks are major natural disturbances. However, for several decades now, we have been observing an increase in the regime of these disturbances with major ecological impacts on forest productivity. With ongoing climate change, these forests will likely face unprecedented disturbance regimes. In this context, a better understanding of the relationships between fire regimes and past spruce budworm outbreaks would improve our ability to anticipate future risks and adapt management to maintain the ecosystem services provided by these forests.

Main objectives:

The candidate will be required to use historical disturbance data (budworm and fire) to parameterize the LANDIS-II model and carry out retrospective simulations using the LANDIS-II model to test the causal hypotheses formulated from the palaeoecological data.

Expected qualifications:

The candidate should have the following scientific and technical skills:
- PhD in ecology, forestry sciences, or related field
- Solid knowledge of programming (R or Python)
- Expertise in paleoecology and/or modeling (with a wish to learn modeling if it is not already acquired) and in advanced statistical analyzes
- Ability to publish in international peer-reviewed journals
- Good skills in English (written and oral communication)
- Willingness and capacity for international mobility (visits to the teams of different supervisors depending on the progress of the postdoctoral fellowship and objectives)

Position information:
Duration: 1 year with possibility of extension
Starting period: March 2024
Gross salary: 44 000$CAN
We encourage applications from people from under-represented groups in science (Indigenous people, women, visible and ethnic minorities, LGBTQ+).
The postdoctoral fellow will be supervised by three researchers who cover the expertise targeted in this project:
Main supervisor : Prof. Miguel Montoro-Girona, Université du Québec en Abitibi-Témiscamingue (Amos campus), Canada

Co-supervisors: Dr. Damien Rius, CNRS Laboratoire Chrono-environnement, France & Dr. Cécile Remy, University of Augsburg, Germany

Locations:

The postdoc will be part of the Research Group in Ecology of the MRC-Abitibi (GREMA) and will be based at the Amos campus of the Forest Research Institute (IRF) of the Université du Québec en Abitibi-Témiscamingue (UQAT). UQAT offers a quality environment for students, close to nature, with many cultural activities and an excellent quality of life thanks to its many outdoor activities. Our research team is young, dynamic and multicultural. Although UQAT is a French-speaking university, we offer a bilingual French-English environment for successful research. Stay(s) in the Chrono-environnement laboratory in Besançon in France must be carried out to benefit from the team's expertise in the reconstruction of past fires and insect epidemics. The Chrono-Environnement laboratory is a joint research unit of the CNRS and the University of Franche-Comté. It is an interdisciplinary laboratory specializing in environment/ecology with a strong specialization on the ecological trajectories of ecosystems in response to natural and anthropogenic disturbances (DYNABIO and SOPAST teams) using approaches combining disturbance ecology, paleoecology, ecology molecular and modeling. Since 2021, a partnership linking UQAT, CNRS and UFC has been signed, thus allowing the development of collaborative research on the future of "Cold Forests" in the context of global change. Stay(s) at the Institute of Geography at the University of Augsburg should also potentially be carried out to benefit from the team's expertise in modeling with LANDIS-II. The Chair for Physical Geography and Climate Science in Augsburg carries out a broad spectrum of fundamental and applied research on the human impact on climate. It investigates climate variability and land surface-atmosphere interactions from regional to global scales and emerging ecosystem responses under climate change. Communication with the various supervisors will be maintained throughout the postdoc with regular meetings on Zoom.

Application instructions:

Please send your CV together with a cover letter with the contact information of 2 references to Miguel Montoro-Girona (Miguel.Montoro@uqat.ca), Damien Rius (damien.rius@univ-fcomte.fr) and Cécile Remy (cecile.remy@geo.uni-augsburg.de) before January 13, 2024.