

French National Research
Institute for Sustainable
Development



Institut de Recherche
pour le Développement
FRANCE

Postdoc in Paris, France

Institute for Ecology and Environmental
Science (IEES)

Impact of earthworms on carbon storage in tropical soils

The activity of soil fauna and in particular earthworms plays a pivotal role in the fate of carbon of highly weathered tropical soils, which is poorly understood up to now. In particular it is unknown how biostructures formed by earthworms affect carbon storage and release from soil. Earthworms impact the degradation and stabilization of soil organic matter through their impact on soil physical and chemical parameters dependent on soil properties, vegetation and climatic parameters.



The objectives of the postdoc are (1) to use the earthworm model SWORM (Blanchart et al. 2009¹) to model the fate of carbon in earthworm casts in relation to physical soil properties, (2) to introduce climatic parameters into the SWORM model, (3) to model the fate of C in biostructures under different climate scenarios established with the terrestrial biosphere model ORCHIDEE (Kinner et al., 2005²) and (4) to develop simplified equations for the reproduction of the complex processes modeled by SWORM in earth system models (e.g. ORCHIDEE).

The postdoc will be based in Paris at the IEES laboratory (<https://ieesparis.ufr918.upmc.fr/>). He will spend 2 months on a long-term mission in Vietnam. His work will be carried out in close interaction with researchers from IRD and CNRS at the same unit and at UMMISCO (http://www.ummisco.fr/?page_id=521) and the LSCE (<https://www.lsce.ipsl.fr/en/index.php>). He will also collaborate with Vietnamese partners.

We look for a dynamic candidate with modeling skills. He/She should be trained in soil and/or environmental sciences and should be interested in combining experiments with modeling. Knowledge of programming software are a plus. The postdoc also needs good communication skills and should be comfortable to work in a team and in an Asian context.

We offer a stimulating work environment, a large dataset and expertise about tropical soils earthworms and the models to be used in this postdoc project.

¹ Blanchart E., Marilleau N., Chotte J.L., Drogoul A., Perrier E. & Cambier C. (2009) SWORM: an agent-based model to simulate the effect of earthworms on soil structure. *European Journal of Soil Science*, 60: 13-21.

² Krinner, G.; Viovy, N.; de Noblet-Ducoudré, N.; Ogée, J.; Polcher, J.; Friedlingstein, P.; Ciais, P.; Sitch, S.; Prentice, I. C. A dynamic global vegetation model for studies of the coupled atmosphere-biosphere system. *Glob. Biogeochem. Cycles* 2005, 19 (1).

Duration: 2 years (1+1 year contract)

Duties: The post-doctorate position will focus on modeling exercises, running models improving their performance and analyzing modeling results. Some data collection is also necessary. He/she will also be expected to prepare manuscripts to submit to peer-reviewed journals.

Qualifications:

- A PhD in agricultural, ecosystem, bio-geoscience, or environmental science, or in related fields of science;
- A proven track-record in field-based research and modeling;
- A demonstrated ability to conduct and complete research projects, generating and publishing their findings in international peer-reviewed journals;
- Strong written and oral communication skills in English.

Skills:

- A keen understanding of the complex biological problems,
- Expertise in scientific computing, including proficient modelling skills,
- Expertise in model evaluation, calibration, parameter optimization, sensitivity and uncertainty analyses, model improvement and scenario analyses,
- Strong statistical analysis skills

Salary: The net salary will be based on professional experience and skillsets.

Application: Please email your application to cornelia.rumpel@inra.fr and nicolas.bottinelli@ird.fr with **Post-docVietnam** in your title, as soon as possible but no later than **30 september 2019**.

Applications should include a cover letter highlighting current research, activities and skills relevant to the position; an updated resume; an extensive publication list as well as 2 or 3 of your choice publications; the names and contact information of at least two professional references familiar with your qualifications and skills; the copy of your degrees and transcripts of your academic record. All documents are to be submitted in English – or French, if applicable.