Post-doctoral Position

Title	**Quantify the net global climate impacts of past and future land-use and land-cover changes. Identify and quantify the temporal and spatial impacts (on climate) of both biogeophysical and biogeochemical processes triggered by Land-Use changes**
Dead-line for Submission	Septembre 15, 2014
Start of Contract	~December 2014 (or earlier; 3 months delay are necessary between acceptance and start of the job = time requested for administrative procedures)
Duration	36 months
Salary	~1928 to 3191€ depending on the number of years of past experience
Employer	CNRS
Location	Laboratoire des Sciences du Climat et de l'Environnement Orme des Merisiers 91191 Gif-sur-Yvette. France (http://www.lsce.ipsl.fr/)
Contact Person	nathalie.de-noblet@lsce.ipsl.fr

Description of the job

Scientific Context

In a world that faces continued population growth, changing consumption patterns and affluence, whilst striving to achieve an equitable and acceptable level of well-being for all people, **climate change and land-use change are the two foremost environmental challenges to society**. These two challenges are also **inseparably linked**: **land-use and land-cover changes (LULCC) contribute to global and regional climate change** through emissions of greenhouse gases (GHG), by affecting the amount of solar radiation absorbed by the surface and by changing the amount of this radiation that is used to evaporate water as opposed to raising the surface air temperature. Concurrently, climate change affects the functioning of terrestrial ecosystems, and hence the services that people derive from ecosystems, such as the supply of food and freshwater, or carbon storage and climate regulation.

The European LUC4C project has been recently funded to help advance our fundamental knowledge of the interactions between climate change and land-use change, and in doing so develop a framework for the synthesis of complex earth system science into guidelines that are of practical use for policy and societal stakeholders.

Among the various objectives of the project, the tasks proposed here intend to a) **advance our ability to represent LULCC in climate models** and b) **quantify how the LULCC-climate change interplay affects global vs. regional, and biophysical vs. biogeochemical ecosystem-atmosphere exchange.**

Assignments

The post-doc recruited will have three main tasks:

- Provide an in-depth analysis of historic and future land-use induced climate effects. He/she will analyse the spatio-temporal differences between the biogeophysical (bph) and biogeochemical (bgc) aspects of LULCC for climates change. This task will essentially rely on already existing, recent simulation studies from international model-inter-comparison exercises (http://www.mpimet.mpg.de/en/science/the-land-in-the-earth-system/climate-biogeosphere-interaction/lucid-cmip5.html). In the LUC4C project, these large data sets will be analysed to design

	and generate appropriate metrics that can be used to evaluate the relative importance of both bph and bgc climate impacts (and of their eventual synergism) in the past and in the future. ➢ Design an idealized protocol that allows one to quantify the sensitivity of any global climate model to land-use changes at various time and spatial scales. The need to quantify model sensitivity to land-use changes is a necessary step to understanding the response of climate models to LULCC scenarios. The protocol will be applied to the IPSL climate model but will be designed in collaboration with the broader LUCID/CMIP5 community. The final objective is to make this protocol widely available so that other earth system modeling groups outside of LUC4C can conduct similar experiments. ➢ Contribute to design a common way to properly implement land uses and land use changes in global earth system models, and test the impact of various implementation strategies in the IPSL climate model.
Requested Skills	
Competences	- Climate Modelling and analysis - Knowledge of biosphere-atmosphere interactions - Statistical analysis - Fortran Programming
Education	PhD