Post-Doctoral Position

Title	**Designing relevant indicators of climate change impacts (for agro-ecosystems and managed forests), derived from Global Dynamic Vegetation Models' outputs**
Dead-line for Submission	November 30, 2011
Start of Contract	~March 2012 (No later than June 2012)
Duration	24 to 34 months (see 'assignments' in 'description of the job')
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

Global Dynamic Vegetation Models (hereafter referred to as DGVMs) are now frequently used to evaluate the regional or global impacts of climate changes on the functioning of terrestrial ecosystems. Such impacts are regionally distributed on a regular grid and are computed using similar formalisms for e.g. water and carbon cycles, basic processes of ecosystem functioning, which gives confidence on the spatial distribution of the simulated impacts. Scholze et al. (2006), for example, carried out a climate-change risk analysis for world ecosystems.

Although scientifically very challenging, such estimates do not provide sufficient quantitative information for e.g. agronomists, forestry scientists on the real risks their specific area of interest will be facing in the near and far future. They are therefore not an effective basis for communicating the climate change pressures likely to be faced by land-management stakeholders (Matthews et al., 2008) and do not hold a socio-economical dimension.

Such considerations have pushed some of us to propose to develop a methodology to make our DGVM outputs more useful. We intend to elaborate series of indicators in view of linking land use (arable crops, grasslands and forests) to climatic variations (signals of temperature and rainfall changes, dryness/wetness cycles, etc.) for a pertinent set of cropping, grassland and forest systems. We will develop transfer functions that will connect some of the various outputs from our DGVMs to the outputs simulated by specific impact models in e.g. agronomy, forestry.

The work proposed here is part of the ANR-ORACLE project (https://oracle.lsce.ipsl.fr/). The aim of ORACLE is to systematically explore the potential implications of climate change and changes in socio-economic and policy environment for land-use in France (and Europe)—taking explicitly into account the link between uncertainties on climatic drivers and ecosystem responses on one

	hand, and adaptation decisions on the other hand. ORACLE brings together climatologists, agronomists, economists, hydrologists and statisticians with a common goal: better inform the relationships between climate constraints and land uses. We focus on major anthropogenic ecosystems in Europe (crops, pasture and managed forests). Our time scale of interest spans the very recent past (last 30 years), and the future regional climate projections for the 21th century with various horizons of interests (2050 and 2100).
Assignments	The recruited post-doctorate fellow will participate to the development of the transfer functions to translate the DGVM's outputs into the set of indicators mentioned above. This part of the task implies a very close collaboration with all partners, and with engineers or post-docs that individual partners will (or have) hire(d). He/she will be in charge of implementing those transfer functions in the ORCHIDEE DGVM, developed at LSCE/IPSL. He/she will carry out the simulations of future impacts of climate change, forcing ORCHIDEE with a variety of climate change scenarios. He/she will work, for this task, in close collaboration with an engineer to be recruited at LSCE. He/she will work on the interpretation of these simulations, and develop tools to assess the areas of risks/opportunities in France (and eventually Europe). The post-doctorate will be recruited for 24 months. ***Additional 10 months may added to the contract in which case the post-doctorate will be asked to spend those in Bordeaux (INRA laboratory, EPHYSE: http://www.bordeaux-aquitaine.inra.fr/ephyse/) and work in the definition of useful indicators for forested areas.***
Requested Skills	
Competences	– Biosphere Modelling – Statistical analysis – Fortran Programming
Education	PhD