

## Post-doctoral Position

### LABEX BASC - Biodiversity, Agroecosystems, Society, Climate

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| <b>Title</b>                    | <b>Regional impacts of various scenarios of land planning on climate and air quality: identification and quantification of both the temporal and spatial resolution of those impacts</b>   |
| <i>Dead-line for Submission</i> | Septembre 30, 2014   |
| <i>Start of Contract</i>        | ~January 2015 (3 months delay are necessary between acceptance and start of the job = time requested for administrative procedures)  |
| <i>Duration</i>                 | 18 to 24 months  |
| <i>Salary</i>                   | ~1928 to 3191€ depending on the number of years of past experience   |
| <i>Employer</i>                 | CEA  |
| <i>Location</i>                 | Laboratoire des Sciences du Climat et de l'Environnement<br>Orme des Merisiers 91191 Gif-sur-Yvette. France<br>( <a href="http://www.lsce.ipsl.fr/">http://www.lsce.ipsl.fr/</a> ; <a href="http://www6.inra.fr/basc">http://www6.inra.fr/basc</a> ) |
| <i>Contact Person</i>           | <a href="mailto:nathalie.de-noblet@lsce.ipsl.fr">nathalie.de-noblet@lsce.ipsl.fr</a><br>please send a complete CV + letter of motivation   |

#### **Description of the job**

##### *Scientific Context*

The growth of human population and the implementation of societal choices significantly affect –through still unresolved combinations of direct and indirect effects- the composition of the atmosphere at all spatial scales, climate, and the functioning of soils and ecosystems, thus affecting their provision of ecosystem services to the society. However, at local to regional scales, such interactions have not yet been clearly identified, nor quantified, while those spatial scales are important for solving societal questions.

Climatologists have already demonstrated that changes in land-cover and/or uses (e.g. deforestation, irrigation, urbanisation) influences the thermal and hydrologic state of the atmosphere, its chemical composition (i.e. pollution), as well as the intensity of extremes (e.g. heatwave amplification). However, a) those impacts have never been thoroughly quantified at a scale relevant for decision making, b) there is a lack of available metrics to be delivered to land planners, to anticipate potential negative impacts of their decisions on local climate/air quality.

We therefore propose here to focus on simulating the impacts of changes in land-cover and uses induced by decisions on land planning on a) regional climate change over France, b) and atmosphere composition. Our objective is to develop a set of diagnostics to quantify those impacts (looking at both mean & extreme climatic conditions). We will look at the evolution of those impacts at temporal scales ranging from days to many decades.

Simulations will be carried out using a coupled land-atmosphere-chemistry climate model. No specific development will be needed during the course of this post-doc.

The post-doc recruited will have to **precisely quantify the impact land planning scenarios have on both the local /regional climate and on the atmospheric composition / pollution** at the same spatial scales.

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| <i>Assignments</i>      | <p>The post-doc will work in close collaboration with scientists from INRA (National Agronomic Institute) and will have three main tasks:</p> <ul style="list-style-type: none"> <li>➤ Choose some specific simplified scenarios of major changes in land-uses that France may experience within the next decade/s (e.g. transition towards agro-ecology, increase in bioenergy production, changes in the partitioning between crop productivity &amp; farming).</li> <li>➤ Run a regional climate-chemistry model at the scale of France, to simulate the sensitivity of climate &amp; atmospheric chemistry to those changes in land cover and uses.</li> <li>➤ Analyze those runs and more specifically develop useful diagnostics of impacts to be used for upcoming discussions with land planners.</li> </ul> |
| <b>Requested Skills</b> |  |
| <i>Competences</i>      | <ul style="list-style-type: none"> <li>- Climate Modelling and analysis</li> <li>- Knowledge of biosphere-atmosphere interactions</li> <li>- Statistical analysis</li> <li>- Fortran Programming</li> </ul>  |
| <i>Education</i>        | PhD  |