



## **Job description: Postdoctoral fellowship in diagnostic and analysis of global and regional land carbon fluxes**

We are looking for a motivated post doc fellow interested in the interpretation of global atmospheric inversion fluxes, and the comparison of their results with data-driven and process-based models to deliver a better understanding of the current variations of the global land carbon cycle. This work is in support of the community efforts of the Global Carbon Project through a project funded by the European Space Agency.

Observations of the CO<sub>2</sub> dry air mole fraction in the atmosphere carry the imprint of the underlying CO<sub>2</sub> surface fluxes over the globe, modulated by atmospheric transport. Atmospheric inversions provide a global picture of large-scale CO<sub>2</sub> fluxes with an uncertainty structure, but the mechanisms causing variations in those fluxes can only be elucidated by comparing inversion results with other indicators of the carbon cycle provided by remote-sensing data, as well as by bottom-up data-driven and process-based models results. The post-doc candidate will compare top-down (inversions) and bottom-up estimates of land CO<sub>2</sub> fluxes and quantify their respective uncertainties across different time scales for all land regions of the globe. This work will contribute to and augment the scientific analysis of the global carbon budget annually updated by the Global Carbon Project by annual updates of regional CO<sub>2</sub> fluxes and interpretation of key anomalies happening in some regions. The methodology will build upon the RECCAP project (<http://www.globalcarbonproject.org/reccap/>) and take stock of newly available land surface and atmospheric remote sensing data.

The work plan aims at better understanding the regional aspects of relevant processes in the global carbon cycle, such as the response to climate variability and extremes, and answering unsettled questions, e.g. the CO<sub>2</sub> sink enhancement post volcanic eruptions. The main tasks involve analyzing regional results from the global in-situ based atmospheric inversions used by the Global Carbon Budget annual updates as well as satellite based inversions developed by LSCE using the ESA CCI GHG data products, in order to identify the magnitude and timing of regional anomalies in net land-atmosphere ecosystem exchange. and relate them to bottom up information from in-situ observations, process-based model outputs and machine-learning methods such as the FLUXCOM (<http://www.fluxcom.org/>). A key goal is to identify climate drivers of regional and global anomalies in CO<sub>2</sub> exchange by crossing information about climate and biophysical parameters, fire occurrence and changes in vegetation cover using ESA-CCI products (e.g. soil moisture, fire, land-cover).

This work plan will be performed in collaboration with project partners University of Exeter for the analysis of process-based models, Max-Planck institute for Biogeochemistry for data driven models, with visits in these two institutes, and the Global Carbon Project.

The fellowship will be hosted at the **Laboratoire des Sciences du Climat et de l'Environnement (LSCE)** in the south-west of Paris for a fixed-term period of up to 36 months. Candidates should hold a PhD in meteorology, mathematics, remote-sensing or earth-system science, strong skills in computer science, strong writing skills, and very good spoken and written English and demonstrated ability to work in a team environment.

**How to apply:** Applications to be emailed to Ana Bastos ([ana.bastos\\_at\\_lsce.ipsl.fr](mailto:ana.bastos_at_lsce.ipsl.fr)), Philippe Ciais ([philippe.ciais\\_at\\_lsce.ipsl.fr](mailto:philippe.ciais_at_lsce.ipsl.fr)) and Frédéric Chevallier ([frederic.chevallier\\_at\\_lsce.ipsl.fr](mailto:frederic.chevallier_at_lsce.ipsl.fr)), should include: (1) a curriculum vitae including most important recent publications, (2) statement of motivation (see above) and (3) names, addresses, phone numbers, and email addresses of at least two references. The position is available from February 1<sup>st</sup> 2018. The call will remain open until filled with review of applications and interviews. Salary follows national directives and is adjusted for work experience.