

Job description

Typical job or profession* : Postdoctoral research fellow

* REME, REFERENS, BIBLIOPHILE

Function : Research Scientist

Category : A

Professional body : Post-Doc

Functional attachment : Fédération IPSL – Institut Pierre Simon Laplace

Hierarchical attachment : Direction de la Recherche et de la Valorisation de Sorbonne Université – Faculté de Sciences et Ingénierie

To submit your application (CV + motivation letter) : Nathalie de Noblet, nathalie.de-noblet@lsce.ipsl.fr, Mathieu Vrac, mathieu.vrac@lsce.ipsl.fr ; Francesca DAU, Direction de la Recherche et de la Valorisation (francesca.dau@sorbonne-universite.fr).

Dead-line for submission of your application : 31 may 2024

The activities listed in the job description are subject to change according to the knowledge of the profession, service needs, and constantly evolving collaborations.

Presentation of Sorbonne University

To transmit knowledge, understand the world, and meet the challenges of the 21st century, a new university was born on January 1, 2018, resulting from the merger of Paris-Sorbonne University and Pierre and Marie Curie University. Sorbonne University is a multidisciplinary, research-intensive university of global standing. Anchored in the heart of Paris, with a presence in the region, it is committed to the success of its students and strives to address the scientific challenges of the 21st. www.sorbonne-universite.fr

Presentation of the structure (laboratory, department of teaching, central service ...)

Description (missions, team,...) :

The Pierre-Simon Laplace Institute (IPSL) is recruiting a research scientist for the development of statistical learning methods that allow for climate projections at the scale of specific landscapes within contrasting territories (agricultural zone in peri-urban areas, wooded park within or near a large city). These methods will translate, into much more local climate information, the climate projections made in international exercises (e.g. CMIP6), downscaled using dynamic methods as in the CORDEX exercises, by combining them with a set of local data (e.g. land use, atmospheric observation network, satellite measurements). The targeted region for application is the Ile-de-France. This work will be carried out within the framework of the GREC francilien (Regional group of expertise on climate change and ecological transition in Ile-de-France). The position is initially for a duration of 12 months, renewable. Led by IPSL and the Institute of Environmental Transition (ITE) at Sorbonne University, the GREC's main objective is to facilitate and promote the integration of science, and its latest advances, into public decision-making. The project will also contribute to the IPSL-Climate-Graduate-School within the framework of climate services. The researcher will work under the scientific responsibility of Nathalie de Noblet and Mathieu Vrac, and will be part of a larger project team, including specialists with different expertise.

Localization : Laboratoire des Sciences du Climat et de l'Environnement LSCE/IPSL, UMR CEA-CNRS-UVSQ 8212 (équipe ESTIMR)
CEA Saclay, Bat 714
Site de l'Orme des Merisiers
Chemin de Saint Aubin - RD 128
F-91191 Gif sur Yvette Cedex - France

Job vacancy : as soon as possible

Workload : full time (100%) **Application deadline :** 31 may 2024

Missions and main activities

Mission (purpose of the position) :

The researcher will be tasked with:

- i) conducting a state-of-the-art review on the topic of statistical downscaling for climate determination at a relatively fine scale, in highly urbanized environments;
- ii) developing one or more statistical downscaling or machine learning methods to generate climate projections at the scale of specific environments found in the Ile-de-France region (built-up areas, parks, forests, agricultural lands, suburban regions, etc.). These methods will be based on statistical techniques developed at IPSL (e.g., analog methods, bias correction), and available observations (weather stations, remote sensing, campaigns, SIRTAs observatory, etc.), and may include machine learning techniques;
- iii) applying one or more statistical methods to the Île-de-France region to create a database of reference climate projections for the Île-de-France regional expertise group on climate change (GREC) and its funders (Region, City of Paris), and analyzing the results; this application may involve one or more urbanization scenarios, in addition to scenarios of climate change; the initial variables to study will include temperature, humidity, wind, rainfall, and some indicators;
- iv) publishing the results in scientific journals and communicating them to territorial decision-makers and at scientific conferences.

The project will start with a state-of-the-art review (point i). In parallel, it will be necessary to identify available climate observations and projections at different spatial resolutions, and categorize the target environments in the Paris region for which downscaling will be conducted. It will continue with series of tests of statistical methods such as CDFt, analogs, or machine learning methods by modeling local variables based on synoptic meteorological variables. Temperature will be the first variable studied, but others will also be analyzed. Once the methods will be tested and validated, a database of projections for each environment will be created. The work will continue with the exploitation of the results (analysis of climate change) and the exploration of future avenues (other environmental issues in particular).

Main activities (maximum 10) :

- Development and application of advanced statistical learning methods
- Collection and analysis of available observations, and incorporation of these observations into statistical method learning
- Analysis of results, changes in multiple variables under climate change
- Establishment of an initial database of territorial projections
- Contribution to writing up the results
- Participation in, and organization of, GREC meetings
- Communication of results to various audiences, including scientists and decision-makers.

Supervision : NO

Nb of agents supervised by catégorie : /A - / B - / C



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MINISTÈRE
DE L'ENSEIGNEMENT SUPÉRIEUR
ET DE LA RECHERCHE

Knowledge and Skills*

Skills and knowledge required :

Skills :

- General knowledge of climate and ecology domains
- Knowledge of statistical methods for processing geophysical data
- Programming in python, R or FORTRAN, knowledge of the LINUX environment
- Understanding of meteorological observations, climate models, and their limitations
- Strong writing skills
- Strong oral communication skills
- Proficiency in French and English, written and spoken
- Analytical and synthesis skills
- Ability to understand the issues raised by stakeholders (public decision-makers)

Cross-functional skills :

- Communication and mediation of knowledge
- A practice of multidisciplinary and interdisciplinary work

Soft skills (maximum 3) :

- Ability to work in a team
- Interpersonal and communication skills

Special conditions of practice :

- Travel is to be expected in the Paris region
- Type of contract offered: 12-month fixed-term contract, renewable
- Salary based on experience

* Conformément à l'annexe de l'arrêté du 18 mars 2013 (NOR : MENH1305559A)