372_25_ES_CVC_R2

Job Reference

372_25_ES_CVC_R2

Position

Postdoctoral researcher on Land-Use/Land-Cover change and remote sensing of vegetation (R2)

Data de tancament

Divendres, 13 Juny, 2025
Reference: 372_25_ES_CVC_R2
Job title: Postdoctoral researcher on Land-Use/Land-Cover change and remote sensing of vegetation (R2)

About BSC

The Barcelona Supercomputing Center - Centro Nacional de Supercomputación (BSC-CNS) is the leading supercomputing center in Spain. It houses MareNostrum, one of the most powerful supercomputers in Europe, was a founding and hosting member of the former European HPC infrastructure PRACE (Partnership for Advanced Computing in Europe), and is now hosting entity for EuroHPC JU, the Joint Undertaking that leads large-scale investments and HPC provision in Europe. The mission of BSC is to research, develop and manage information technologies in order to facilitate scientific progress. BSC combines HPC service provision and R&D into both computer and computational science (life, earth and engineering sciences) under one roof, and currently has over 1000 staff from 60 countries.

Look at the BSC experience:
BSC-CNS YouTube Channel
Let's stay connected with BSC Folks!

We are particularly interested for this role in the strengths and lived experiences of women and underrepresented groups to help us avoid perpetuating biases and oversights in science and IT research. In instances of equal merit, the incorporation of the under-represented sex will be favoured.

We promote Equity, Diversity and Inclusion, fostering an environment where each and every one of us is appreciated for who we are, regardless of our differences.

If you consider that you do not meet all the requirements, we encourage you to continue applying for the job offer. We value diversity of experiences and skills, and you could bring unique perspectives to our team.

Context And Mission

We are looking for an enthusiastic and talented researcher to analyze historical variability in vegetation and land use change, and produce novel high-resolution datasets of land-use/land-cover and vegetation characteristics in the historical period and future projections. The successful candidate will be responsible for the creation and assessment of time-varying land surface boundary conditions to be used in several climate model applications, with the aim of providing more accurate surface boundary conditions for climate projections and seasonal-to-decadal forecasting.

The offered position will primarily contribute to the Horizon Europe projects TerraDT (https://terradt.eu/) and CONCERTO (https://projectconcerto.eu/). The TerraDT project aims to include novel processes into the cutting-edge Digital Twins of the Earth System, such as time-varying land cover and LAI (Leaf Area Index) and interactive aerosols with interactive dust emissions. The CONCERTO project aims to advance the understanding and modeling of carbon cycle processes within Earth System Models such as EC-Earth4.

The candidate will be responsible for the development and assessment of time-varying, high resolution (1 km) Land Use (LU) and Land Cover (LC) and Leaf Area Index (LAI) datasets. The analysis will leverage satellite-based data products and historical land-use data to reconstruct and extend land dynamics back to 1850 using land-use change modelling, spatial analysis and/or machine learning methodologies, as well as in the future using the newly developed Land-Use change scenarios for CMIP7. An independent verification of the Land Use and Land Cover (LULC) products will be done using regional products based on high-resolution satellite imagery before 1993.

This position will be hosted in the Climate Variability and Change (CVC) Group within BSC's Earth Science Department. The CVC Group undertakes fundamental research to (1) understand climate variability and change, including for climate extremes, (2) investigate global biogeochemical dynamics, and the effectiveness and impacts of carbon removal technologies to mitigate climate change, (3) develop new Earth System modeling capabilities, and (4) improve our ability to forecast the climate variations from one month to multiple decades into the future, both at global and regional scales.

The candidate will also have the opportunity to participate in other research activities within the CVC group. In particular, contributions are anticipated to the evaluation of the climate modelling experiments (including centennial-scale projections and seasonal-to-decadal scale climate forecasts) conducted by the CVC group using the EC-Earth Earth System Model which simulates the Global Carbon Cycle at timescales ranging from multi-annual to centennial. This will entail analyzing the contributions of vegetation and land-use change to the global carbon cycle in the projections and near-time predictions made by the CVC group.

Key Duties

- Create and assess the time-varying Land Use, Land Cover and LAI datasets
- Collaborate with colleagues and external partners in the integration of these datasets in the Digital Twin models in the TerraDT project and Earth System Models in the CONCERTO project
- Lead the preparation of scientific publications, and present the research at scientific workshops and conferences
- Analyze the contributions of vegetation and land-use change to the global carbon cycle in the climate projections and near-time climate predictions
- The candidate will work closely with scientists within the Climate Variability and Change Group and other groups of the Earth Sciences Department, and with international project partners

Requirements

- Education
  - PhD in spatial modelling, land-use change, geography, or a related discipline

- Essential Knowledge and Professional Experience
  - Demonstrated experience in the analysis of geo-spatial and remote sensing data and/or Land-use change models
  - Proven ability to prepare and submit manuscripts to peer-reviewed scientific journals
  - Programming skills: scripting (e.g. bash, Python, R), open-source spatial data analysis and visualization software (e.g. GeoPandas, r-spatial, QGis)

- Additional Knowledge and Professional Experience
  - Interest and capacity in participating in the writing of research and computing proposals
  - Experience with vegetation model and/or climate model data
  - Knowledge of version control systems (git, svn, …)

- Competences
  - Fluency in spoken and written English
  - Highly collaborative spirit and ability to work independently as part of a large, strongly-coordinated team and to continuously share both knowledge and tools

Conditions

- The position will be located at BSC within the Earth Sciences Department
- We offer a full-time contract (37.5h/week), a good working environment, a highly stimulating environment with state-of-the-art infrastructure, flexible working hours, extensive training plan, restaurant tickets, private health insurance, support to the relocation procedures
- Duration: Open-ended contract due to technical and scientific activities linked to the project and budget duration
- Holidays: 23 paid vacation days plus 24th and 31st of December per our collective agreement
- Salary: we offer a competitive salary commensurate with the qualifications and experience of the candidate and according to the cost of living in Barcelona
- Starting date: Sept 1 or earlier

Applications procedure and process

All applications must be submitted via the BSC website and contain:

- A full CV in English including contact details
- A cover/motivation letter with a statement of interest in English, clearly specifying for which specific area and topics the applicant wishes to be considered. Additionally, two references for further contacts must be included. Applications without this document will not be considered.

Development of the recruitment process

The selection will be carried out through a competitive examination system ("Concurso-Oposición"). The recruitment process consists of two phases:

- **Curriculum Analysis:** Evaluation of previous experience and/or scientific history, degree, training, and other professional information relevant to the position. - ***40 points***
- **Interview phase:** The highest-rated candidates at the curriculum level will be invited to the interview phase, conducted by the corresponding department and Human Resources. In this phase, technical competencies, knowledge, skills, and professional experience related to the position, as well as the required personal competencies, will be evaluated. - ***60 points.*** *A minimum of 30 points out of 60 must be obtained to be eligible for the position.*

The recruitment panel will be composed of at least three people, ensuring at least 25% representation of women.

In accordance with OTM-R principles, a gender-balanced recruitment panel is formed for each vacancy at the beginning of the process. After reviewing the content of the applications, the panel will begin the interviews, with at least one technical and one administrative interview. At a minimum, a personality questionnaire as well as a technical exercise will be conducted during the process.

The panel will make a final decision, and all individuals who participated in the interview phase will receive feedback with details on the acceptance or rejection of their profile.

At BSC, we seek continuous improvement in our recruitment processes. For any suggestions or comments/complaints about our recruitment processes, please contact