



**Post-doc at CNRM (12 months, renewable 24 months)**

**" Initialization of the land component in global atmospheric seasonal forecasts and hydrological assesement"**

A 12-month (renewable 24 months) postdoctoral fellowship/research position is available for the research topic " Initialization of the land component in global atmospheric seasonal forecasts and hydrological assesement " in the Centre National de Recherches Météorologiques (CNRM, Toulouse, France, <http://www.umr-cnrm.fr/>)

Expected starting date is June. 15th, 2023

Closing date for application is February 28th, 2023

The gross monthly salary, before income tax, will be between 3394 and 4165 €, commensurate with experience. This includes French social security and health insurance.

**General context and objectives :**

The position is funded through the EU Horizon Europe Framework Programme CERISE<sup>1</sup> project . CERISE is a research and innovation project targeting enhancements in the Copernicus Climate Change Services (C3S) reanalyses and seasonal forecasts, with a focus on land-atmosphere coupling.

CERISE aims at developping new and innovative land initialisation techniques to pave the way for the next generations of the C3S reanalysis and seasonal prediction systems, by fostering the exploitation of Earth system observations over land surfaces. The project will also develop diagnostic tools and prediction skill metrics that include integrated hydrological variables to go beyond the traditional skill scores to assess Earth system coupled seasonal prediction, and will deliver proof-of-concept prototypes to demonstrate the feasibility of the integration of the developed approaches in the operational C3S.

The contribution of CNRM to CERISE implies the handling of the following modeling systems : a in-house land data assimilation system (LDAS-Monde, Albergel et al. 2017), the land surface scheme ISBA-CTRIP (Decharme et al. 2019) embedded into the SURFEX modelling platform, and the dynamical seasonal forecast system based on the CNRM-CM6-1 coupled climate model (Voltaire et al. 2019).

In the framework of this postdoctoral position, it is expected that the candidate will :

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<sup>1</sup>CopERNicus climate change Service Evolution

- Implement an upscaled consistent global historical time series of soil moisture, leaf area index and snow water equivalent based on the existing LDAS-Monde, at the resolution of the seasonal forecast system (~0,5°)
- Carry out and evaluate coupled historical simulations with and without constraining the land prognostic variables towards reference dataset derived from the LDAS-Monde. Impacts on both hydrology and atmospheric biases near the surface will be monitored.
- Contribute to the setup and integration of winter and summer seasonal re-forecast prototypes with improved land initial conditions taken from the coupled historical simulations. The impact on atmospheric forecast skill (2m temperature, precipitation) will be discussed.
- Evaluate the simulated river discharges in a selection of large catchments throughout the globe. This hydrological assessment will apply to both the reconstructed historical discharges (from the constrained coupled simulations) and the retrospective seasonal forecast of river discharges

#### Required qualifications :

We are looking for a candidate with strong interests in land-atmosphere interactions and feedbacks, hydrology and climate studies, and with demonstrated statistical and numerical (Linux, Fortran, Python and/or NCL and/or R) skills. The candidate should hold a recent PhD degree in climate science and have experience with complex models on super-computers, and analyses of large climate data sets. Innate curiosity, enthusiasm for reading scientific literature, team spirit, excellent writing and communication skills in English are also essential. Some experience with land-surface modelling and/or evaluating climate prediction ensembles would be a clear asset.

Applicants should send to [constantin.ardilouze@meteo.fr](mailto:constantin.ardilouze@meteo.fr)

- [1] a curriculum vitae (including research experience, publications and conferences, computing and programming skills and fluence in foreign languages...)
- [2] a brief statement of research interests
- [3] names and contact details (email + telephone number) of two academic referees.

Please note that attachments larger than ~5Mo are not accepted by our e-mail server.

Expected starting date is approximately June 15th 2023. Consideration of applications begins immediately. Applications should be sent by email no later than February 28th, 2023.

#### Practical aspects:

The candidate will be based at the CNRM laboratory in Toulouse. Toulouse is a vibrant city that is recognized world-wide for its aerospace industry and research centers. The Centre National de Recherches Météorologiques (CNRM) is the research department of Météo-France (<http://www.cnrm.meteo.fr>) and a CNRS laboratory. It is responsible for conducting the largest part of the Météo-France research activities in weather forecasting, climate modelling, climate prediction, atmospheric chemistry, land-surface processes including snow related processes, and oceanography. CNRM has a long history within the climate research community and contributes to the successive IPCC reports.