

Postdoctoral Position (m/f/d)

Integration of sensor network data streams into process-based forest modeling

Project C4.1 within the CRC SFB-1537 **ECOSENSE**

Who we are:

The Karlsruhe Institute of Technology (KIT) – The Research University in the Helmholtz Association creates and imparts knowledge for the society and the environment. At our Campus Alpine in Garmisch-Partenkirchen, scientists at IMK-IFU investigate changes in the atmosphere, the water balance and the living conditions for vegetation and society in global climate change. In the division ‘Terrestrial Biogeochemistry’ we develop and apply the process-based model LandscapeDNDC for simulation of carbon, nitrogen and water balances of forest and agricultural ecosystems under changing environmental conditions.

Your task:

The work on forest process modelling (SP C4.1) is part of the joint project ‘Multi-scale quantification and modelling of spatio-temporal dynamics of ecosystem processes by smart autonomous sensor networks’ (SFB 1537 ECOSENSE) , Research Area C). It is jointly financed by KIT and the University of Freiburg.

For details on ECOSENSE see <https://www.cep.uni-freiburg.de/forschungsprojekte/ecosense>).

The successful candidate will work at the Institute of Meteorology and Climate Research (IMK-IFU) in Garmisch-Partenkirchen and will use data streams from various soil- and plant sensors for a comprehensive and comprehensible understanding of forest carbon and water cycling. Based on these data as well as an extensive literature review, stress responses related to changing environmental conditions shall be analysed, explained, and implemented into the process-based ecosystem model LandscapeDNDC. Hind- and forecast simulations of forest ecosystem development in the Black Forest (Baden-Württemberg/ Germany) will be obtained with the improved modelling approach. Model development and applications will be closely linked with development of statistical, machine- and deep-learning workflows applied in C4.2.

Your responsibilities:

- Characterization of various forest types at the SFB study region
- Improvement of stress-related process description and implementation into the LandscapeDNDC model
- Simulation and evaluation of biogeochemical fluxes and physiological processes at test sites of the joint project
- Investigating the relation between simulation results and measurements in dependence on spatial and temporal resolution
- Publication of scientific articles and presentation of results on conferences.
- Interaction with other sub-projects related to field measurements and data analysis

Your qualifications:

- A doctoral degree (PhD) in in forest/ natural sciences, or any related field
- Independent work ethics, scientific rigor, systematic and analytic thinking, commitment, creativity, and ability to work in a team
- Good English communication skills.

- Experience in programming with C++, Python, R, or a similar programming language
- Preferably experience in ecosystem of forest modelling

What we offer

- An exciting interdisciplinary topic with a relevant application focus for our society
- International, interdisciplinary and friendly working environment
- Attractive research campus at the foot of Germany's highest mountain
- Collaboration with a diverse, open-minded, and international team
- Salary and benefits will be based on the Collective Agreement for the German Public Service Sector (E13, 100%). The position is available at earliest convenience until 30.06.2026 (provided final financial agreement).

Details on the documents required for your application and on the required form of the application are to be found on <https://www.cep.uni-freiburg.de/forschungsprojekte/ecosense>. Please **follow these rules strictly** and send your job application in digital form until **September 15th, 2022**, to the following persons:

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