

Two postdoc positions in modelling plant-environment and
soil-plant interactions
Swedish University of Agricultural Sciences (SLU)

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Posted Apr. 6, 2020, set to expire Aug. 5, 2020

Job Title	Two postdoc positions in modelling plant-environment and soil-plant interactions
Department	Crop Production Ecology
Institution	Swedish University of Agricultural Sciences (SLU) Uppsala, , Sweden
Date Posted	Apr. 6, 2020
Application Deadline	May 12, 2020
Position Start Date	By agreement
Job Categories	Post-Doc
Academic Field(s)	Environmental Sciences/Ecology/Forestry Earth Sciences Sciences - General
Job Website	https://bit.ly/3aNT4PX

Apply By Email

Job Description

Societies need to achieve food security and obtain biomass from managed ecosystems while minimizing the negative environmental and climate impacts. Identifying management solutions that are sustainable in the long term and are robust to changes in climate requires considering environmental and technological limits, and the tradeoffs implicit in contrasting needs. Mathematical models based on ecological and physiological mechanisms allow exploring future climatic conditions and how they can affect crops and forests. In combination with extensive available data, these models can thus offer insights on climate change adaptation strategies.

Position 1 will be part of the project “Innovative modelling approaches for the identification of boreal forest management strategies under a changing climate” - involving the Swedish University of Agricultural Sciences (SLU) and the Natural Resources Institute (LUKE) in Finland. Boreal forests are

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warming twice as fast as the rest of the planet and increasingly prone to drought and heat stress. Exploiting mathematical models jointly with multi-scale data, the project aims at identifying the key mechanisms behind boreal forest response to climate change; and to evaluate management solutions to prepare boreal forests and forestry for future climates.

Position 2 will be associated with the project “Examining the prospects of perennial grain crops for sustainable food production” - a collaboration between the Swedish University of Agricultural Sciences (SLU) and The Land Institute and the University of Kansas in the USA. There is an emerging interest in the use of perennial grain crops, which are under development, for their ability to provide food as well as many ecosystem services. Yet, a shift from annual to perennial crops presents several potential tradeoffs, mediated by crop traits as well as climatic and soil conditions. The aim of the project is to explore such tradeoffs using mathematical models.

Duties:

The postdoctoral researchers will develop, evaluate, and apply mechanistic models and stochastic methods for the assessment of the interactions between plants, soils and the environment in managed ecosystems. While there is some flexibility in the research tasks and approaches, the work will include development of novel process-based mathematical models, use of existing ones, and collation and analyses of ecophysiological, environmental and climatic data. The postdoctoral fellows are expected to take active part to develop the projects and to write and publish science in collaboration with the research team. The successful candidates will enter world leading, international research teams working with both crops and forest systems, with an outstanding publication record and extensive empirical and theoretical expertise (<https://giuliavico.wordpress.com>, <https://www.luke.fi/en/personnel/samuli-launiainen/>, <https://landinstitute.org/about-us/staff/tim-crews/>, <https://geog.ku.edu/nathaniel-brunsell>). This is a great opportunity to further your modelling skills, develop your research network, and gain experience in proposal writing.

Qualifications:

We are looking for highly motivated candidates who are actively pursuing an academic career, with an interest in the development and use of process-based models to describe plant-environment interactions and/or soil-plant interactions. Applicants should have a PhD in quantitative disciplines, such as plant biology, ecology, hydrology, earth and environmental sciences, soil sciences, agronomy, applied mathematics or physics, or related fields. Previous experience in model development (i.e., beyond the use of existing models) is required. The applicants shall also have a demonstrated ability to independently initiate, conduct, and complete research projects; and to generate and publish the findings in international peer-reviewed journals. Excellent communication skills in English (both written and oral) are required. The applicants are expected to have documented research experience with models coupling plants, biogeochemical cycles, ecosystems, and environmental conditions. Strong

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quantitative and programming skills (in MatLab, R, Python, C, Mathematica, Fortran, or other programming languages for data analysis and model implementation) are required. For position 1, experience in analyzing spatial data and modelling spatial patterns of vegetation response to pedoclimatic conditions at the hillslope to landscape scale is a merit.

Place of work:

Uppsala, Sweden, Department of Crop Production Ecology, part of the Ecology Centre at the Swedish University of Agricultural Sciences (SLU).

The research conducted within the department generally aims at improving crop and forest productivity and sustainability, considering the interactions with the surrounding environment. The Ecology Center offers a stimulating research environment, involving scientists with very diverse and complementary expertise, aiming at sustainable agriculture, forest production and biological conservation.

Furthermore, the location in Uppsala allows opportunities for collaborations with researchers at Uppsala University, Stockholm University, and KTH.

Form of employment:

Two year

Extent:

100%

Starting date:

By agreement

Application:

We welcome your application no later than May 12th, 2020. Please use the application button at the end of the call for applications: <https://bit.ly/3aNT4PX>. Applications received via email will not be considered.

The application should be written in English and contain: i) a statement of scientific interests and motivation for applying to this position (max 8000 characters including spaces); ii) Curriculum Vitae including a complete publication list, separating peer-reviewed papers from other publications; iii) contact information of at least two reference persons; iv) copies of previous university degrees and transcripts of academic records. The statement should clearly highlight current research interests and other activities of relevance for at least one of the advertised positions.

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Contact Information

Please reference Academickeys in your cover letter when
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