Ref. No. SU FV-1242-17
Closing date: 19/05/2017

Postdoctoral Fellow in Root-zone Hydrological Processes in Agricultural Systems

at the Department of Physical Geography. Closing date: 19 May 2017.

The Department of Physical Geography is one of the major departments within the Faculty of Science. The department has approximately 135 employees and educates approximately 2 000 students annually. Education is oriented towards geography, geosciences, biology-earth sciences and environmental management. The main research areas are: Biogeography and Geomatics, Climate science and quaternary geology, Environment, resource dynamics and management, Geomorphology and glaciology, and Hydrology, Water resources and permafrost.

Project description

The Department of Physical Geography at Stockholm University seeks to employ a postdoctoral researcher to investigate the mixing and age distribution of water across the root zone in a tropical agricultural setting. Specifically, this project targets quantification of water partitioning from the plot-to-landscape scale over various treatments of irrigation, soil amendments (e.g. biochar) and cropping systems for field sites in Costa Rica and Brazil. The research will involve using hydrological tracers (stable water isotopes) and hydrometric observations to characterize water storages along the continuum from the bottom of the root zone through plants. The core of this research will focus on modeling the soil-plant-atmosphere water dynamics that define how storages mix/connect to determine the partitioning of root zone water either up through evapotranspiration or down through recharge.

Main responsibilities

The postdoctoral researcher will be responsible to help design and coordinate stable water isotopic sampling across the soil-plant-atmosphere continuum for field sites in Costa Rica and Brazil. He/she will develop and implement storage mixing models to assess age distributions and water partitioning at plot-to-landscape scales leveraging available tracer and hydrometric data. Coupled to such modeling, the postdoctoral researcher will be responsible for quantifying water (and carbon) dynamics across the soil-plant-atmosphere continuum as a function of the various treatments (i.e. irrigation, biochar amendments, cropping system) from an optimality perspective and help feed these into landscape-scale assessments.

Qualification requirements

Postdoctoral positions are appointed primarily for purposes of research. Applicants are expected to hold a Swedish doctoral degree or an equivalent degree from another country.

Assessment criteria

The degree should have been completed no more than three years before the deadline for applications. An older degree may be acceptable under special circumstances, which may involve sick leave, parental leave, clinical attachment, elected positions in trade unions, or similar.

In the appointment process, special attention will be given to candidates with degrees in a relevant discipline and a strong computational and mathematical background. Practical experience with a tracer-based eco-hydrological approaches and/or storage mixing modelling is important. Strong experience with computer programming (e.g. Matlab, R) for model code development is vital. In addition, demonstrated knowledge of (1) estimating water travel times or partitioning through various storages; (2) designing and conducting “virtual experiments” within an optimality framework; and/or (3) experimental design for sample stable water isotopes from soil and plant water is advantageous. Experience synthesizing data and modeling analysis across several field sites and publishing in top-level journals in English is beneficial.

Terms of employment

The position involves full-time employment for a maximum of two years, with the possibility of extension under special circumstances. Start date 2017-08-01 or as per agreement.

Stockholm University strives to be a workplace free from discrimination and with equal opportunities for all.

Contact

Further information about the position can be obtained from Professor Steve W. Lyon, telephone: +46 8 16 48 88, steve.lyon@natgeo.su.se, or Senior Lecturer Stefano Manzoni, telephone: +46 8 674 78 02, stefano.manzoni@natgeo.su.se.