Fully funded 3-year PhD position in Gembloux Agro-Bio Tech
Water-Soil-Plante Exchanges Lab

in CROP MODELLING & SOIL PHYSICS

project: Soil Program on Hydro-Physics via International Engagement (SOPHIE)
(https://www.wur.nl/en/article/Soil-Program-on-Hydro-Physics-via-International-Engagement-SOPHIE.htm)

Project description

The objective of SOPHIE is that it supports the realisation of qualified soil hydro-physics (SHP) data, highly needed in EU policy making, coming from EU-wide agreed, preferred, and innovated cost-effective laboratory- and field methods, accomplished through international collaboration. Soil Hydro-Physics (SHP) properties are the properties that determine soil-water-interactions: (i) water flow and water retention, and (ii) with the water flow, the transport of dissolved compounds like nitrogen, phosphates, pesticides, antibiotics, organics, etc. As a result, SHP-properties play an important role in a variety of societal issues that depend on the soil-water condition: e.g. food security & agricultural development (drought and water damage, precision drainage, irrigation). However, based on different field data collection procedures and soil sample analysis techniques, SHP data might differ from one country or research unit to another. Hence probably also impacting research and studies depending on these SHP data. SOPHIE's objective is to identify the impact of these different field and data analysis techniques on SHP data, and propose a more harmonized approach. The candidate's PhD research will focus on the impact of SHP data variations on water-soil-plant modelling results.

Responsibilities

Some research ideas to be further developed by the PhD candidate are:
* Which SHP data will have the greatest impact on which type of crop model? Compare different crop simulation models and study the sensitivity of hydro-physical properties.
* Different crop models are likely to have different sensitivities to SHP data variations. What variation/error is acceptable for which model? And (for policy making) what is the desired yield simulation accuracy? What level of SHP data variation is acceptable?
* Crop models, mainly based on water balances, also make it possible to investigate the impact of SHP data variations on drought and flood impact studies. What is the impact of these SHP data variations on drought or excess water losses in agricultural production? What level of SHP data variation is acceptable to properly study these water related production losses?

Profile

The candidate should hold (or will be holding by September 2020) a master degree in life sciences engineering obtained with distinction and not have been hired as employee for more than 12 months before starting the grant.

The qualities and skills required for this position are:
* Sense of contact, ability to work in a team;
* Excellent analytical, synthesis, oral and written skills;

- Good level of English and computer tools, French is an asset;
- Good knowledge in one or more of the following areas: soil physics, crop modelling, water-soil-plant interactions, statistical data analysis, big data, programming (R, Python, …), geomatics.

We offer

The successful candidate will be based in Gembloux Agro-Biotech (University of Liège), and will have the opportunity to visit partners at e.g. Ghent University, Wageningen University & Research, Joint Research Centre and present research results at international conferences.

- A 36-month contract as full-time PhD;
- Net month salary of 2100 €/month;
- Starting date: as soon as possible (October 1st 2020 latest).

Documents requirements

- Curriculum vitae and motivation letter;
- Research note on how the candidate would fit in this project / how the candidate would elaborate her/his research project.

Contact

- For questions: contact Joost Wellens (joost.wellens@uliege.be)
- Applications should be sent before June 9th 2020 to Aurore Degre (aurore.degre@uliege.be) and Joost Wellens (joost.wellens@uliege.be).