UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Machine Learning for Crop-Climate Modelling, Faculty of Environment

Salary: Grade 7 (£37,099 – £44,263 p.a.)

Reference: ENVEE1697

Fixed-term until 30 September 2025 - the post is required to complete time limited work

Location of the post is University of Leeds (with scope for hybrid working)

We will consider job share / flexible working arrangements

Research Fellow in Crop-Climate Modelling with Machine Learning
School of Earth and Environment, Faculty of Environment

Are you a skilled crop-climate modeller with an interest in working in a multi-disciplinary team? Are you ready to help develop fibre-rich white bread for UK consumers? Do you have excellent mathematical and Machine Learning experience?

We seek a motivated and versatile post-doctoral researcher to work on a UKRI-funded project to model crop responses to climate variability and change using crop-climate models. The project, “Increasing UK Dietary Fibre – The Case for the Great White British Loaf”, will work towards transformation of the UK wheat supply chain to sustainably supply fibre-rich white bread to UK consumers. The project provides an excellent opportunity for you to gain experience of a diverse range of agricultural and food economics research challenges and techniques.

White bread accounts for 76% of bread sold in the UK with around 12 million loaves being sold each day. Its high popularity, the need for increased fibre in the diet, and slow acceptance of changes to high dietary fibre offerings (e.g. towards wholegrain), means increasing the fibre content of white bread is highly likely to assist in increasing overall UK dietary fibre intake.

We envisage two crop-climate methodologies being used in the project. The first is the machine learning version of the GLAM crop model, applied to UK wheat by drawing on remotely-sensed data. The second is drawing on existing global simulations of wheat, in order to provide an indication of the comparative advantage of UK wheat production and the way in which that will evolve over time as climate continues to change.

By developing the core crop-climate modelling capability for the project, you will be key to the project’s success. The team comprises seven Research Fellows, plus PIs, including food and behavioural scientists, economists, wheat experts and mathematical food chain modellers based at the Universities of Reading and Leeds, as well as Rothamsted Research, working with industrial partners across the UK wheat supply chain.

You will work within the collegiate and dynamic environment of the Climate Impacts group, which is part of the School of Earth and Environment, and the cross-campus Priestley International Centre for Climate, and the Global Food and Environment Institute. Find out more about these in the Additional Information section below.

What does the role entail?

As a Research Fellow, your main duties will include:

- Developing the latest generation of Leeds crop models, which have embedded Machine Learning to parameterise stresses; and using the relevant model(s) with data from the projects to simulate wheat in the UK under current and future climates;
- Identifying and drawing upon existing wheat yield simulations for the EU, USA, Canada and the Black Sea region (Russia, Ukraine, Kazakhstan) out to the 2070s under conditions of climate change;
- Liaising with project partners from the outset, sharing your knowledge and expertise in order to orient and integrate the crop modelling results with the broader project aims;
- Leading on the upkeep of model infrastructure and documentation, such that the model(s) are available for use by other members of the group;
- Conducting literature reviews and collating data and compiling datasets;
- Contributing to data management within the project and preparing, with guidance, other project deliverables and presentations in a timely manner;
- Presenting work at project meetings and conferences nationally and internationally as required;
- Developing research objectives and proposals and contributing to setting the direction of the research project and team including preparing proposals for funding in collaboration with colleagues;
- Evaluating methods and techniques used and results obtained by other researchers and to relate such evaluations appropriately to your own work;
- Preparing papers for publication in leading international journals and disseminating research results through other recognised forms of output;
- Contributing to the research culture of the School, where appropriate, including assisting with the supervision of projects in relevant areas;
- Working both independently and also as part of a larger team of researchers, engaging in knowledge-transfer activities where appropriate and feasible;



- Maintaining your own continuing professional development and acting as a mentor to less experienced colleagues as appropriate.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

What will you bring to the role?

As a Research Fellow you will have:

- A PhD or near completion (i.e. the initial thesis needs to have been handed in at the point of application) in crop-climate or environmental modelling, or a quantitative science such as mathematics, computer science, or physics or a closely allied discipline;
- A strong background in crop-climate modelling or a closely related topic in environment / ecology, including ability to use and manipulate associated crop and/or climate datasets;
- Experience in the development of crop, environmental, ecological, or climate models;
- Basic understanding of plant science, in terms of crop growth and developmental processes;
- Basic understanding of machine learning;
- Strong programming skills in either R or Python. The role involves designing and further developing software infrastructure;
- Excellent written and verbal communication skills, including presentation skills;
- Demonstrated experience of conducting research and ability to lead and deliver on key research tasks by agreed deadlines;
- Ability to work flexibly, both as part of a team and independently, with proven ability to manage competing demands effectively, responsibly and without close support;
- A strong commitment to your own continuous professional development.

You may also have:

- Experience with machine learning;
- Experience in sourcing and using remotely-sensed data;
- Experience of pursuing external funding to support research;

- A proven track record of peer-reviewed publications in high impact factor journals.

How to apply

You can apply for this role online; more guidance can be found on our How to Apply information page. Applications should be submitted by **23.59** (UK time) on the advertised closing date.

Contact information

To explore the post further or for any queries you may have, please contact:

Andy Challinor, Chair of Climate Impacts
Tel: +44 (0)113 343 3194
Email: a.j.challinor@leeds.ac.uk

Additional information

Please note: If you are not a British or Irish citizen, from 1 January 2021 you will require permission to work in the UK. This will normally be in the form of a visa but, if you are an EEA/Swiss citizen and resident in the UK before 31 December 2020, this may be your passport or status under the EU Settlement Scheme.

Find out more about the Climate Impacts Group

Find out more about our Global Food and Environment Institute

Find out more about the Priestley International Centre for Climate

Find out more about the Faculty of Environment

Find out more about the School of Earth and Environment

Find out more about our Research and associated facilities

Find out more about equality in the Faculty



Our University
As an international research-intensive university, we welcome students and staff from all walks of life and from across the world. We foster an inclusive environment where all can flourish and prosper, and we are proud of our strong commitment to student education. Within the Faculty of Environment we are dedicated to diversifying our community and we welcome the unique contributions that individuals can bring, and particularly encourage applications from, but not limited to Black, Asian and ethnically diverse people; people who identify as LGBT+; and people with disabilities. Candidates will always be selected based on merit and ability.

The Faculty of Environment has received a prestigious Athena SWAN silver award from Advance HE, the national body that promotes equality in the higher education sector. This award represents the combined efforts of all schools in the Faculty and shows the positive actions we have taken to ensure that our policies, processes and ethos all promote an equal and inclusive environment for work and study.

Working at Leeds
We are a campus based community and regular interaction with campus is an expectation of all roles in line with academic and service needs and the requirements of the role. We are also open to discussing flexible working arrangements. To find out more about the benefits of working at the University and what it is like to live and work in the Leeds area visit our Working at Leeds information page.

Candidates with disabilities
Information for candidates with disabilities, impairments or health conditions, including requesting alternative formats, can be found on our Accessibility information page or by getting in touch with us at disclosure@leeds.ac.uk.

Criminal record information

Rehabilitation of Offenders Act 1974
A criminal record check is not required for this position, however, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be, in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our Criminal Records information.