

Job Description

Summary

Job title	Senior Researcher in Machine Learning and Climate
Division	Social Sciences
Department	School of Geography and the Environment
Location	South Parks Road, Oxford OX1 3QY
Grade and salary	Grade 8 - £48,235 - £62,407
Hours	Full time
Contract type	Fixed-term (end date - February 2027)
Reporting to	Professor Louise Slater
Vacancy reference	178258
Additional information	<p>Applications are particularly welcome and encouraged from women, black, and minority ethnic candidates, who are under-represented in posts in SoGE. SoGE are committed to equality and values diversity.</p> <p>The School of Geography and the Environment holds an Athena Swan Silver award in recognition of our commitment and success in addressing gender equality.</p> <p>The School of Geography and the Environment is committed to promoting a culture of equality, diversity, and inclusion in the workplace, including the undertaking of appropriate training as opportunities arise and/or when asked to do so</p>

The role

This position contributes to a project between the University of Oxford, Monash University, the University of New South Wales (UNSW), and the Australian National University (ANU) on lethal humidity and excess mortality predictions.

The Researcher will develop and implement an innovative early warning system for deadly humid heat waves from 1-6 months ahead. They will collaborate with other academics at UNSW, ANU, and Monash University to undertake this research.

Reporting to Professor Louise Slater, the Researcher will be a member of the Hydro-Climate Extremes Research Group in the School of Geography and the Environment at the University of Oxford. The position will involve travel to Monash University to work with Professor Yuming Guo.



Responsibilities

- Develop and maintain open-source scripts (e.g. in Python) to retrieve and process global climate and environmental datasets from various sources, including subseasonal-to-seasonal forecasts for extreme humid heat conditions from 1-6 months ahead.
- Lead the design and implementation of a machine learning framework to predict excess mortality from sub-seasonal to seasonal climate forecasts. Evaluate and refine different ML architectures and predictor datasets to improve the accuracy, reliability and interpretability of forecasts across different lead times.
- Generate and deliver forecasts of excess mortality from 1-6 months ahead. Develop and maintain an interactive dashboard that updates in near real-time, enabling project stakeholders to visualise and operationalize the data.
- Formulate research questions, conduct individual research, analyse complex data from diverse sources, and propose innovative ideas that contribute to project advancements.
- Adapt and innovate research methodologies and materials to advance project objectives.
- Author and co-author research articles for high-impact journals.
- Present research outcomes at international conferences, represent the research group at external meetings, and lead seminars to share findings with academic and non-academic audiences.
- Collaborate effectively with project colleagues across partner institutions, including traveling to Monash University to work with Professor Yuming Guo. Actively participate in and contribute to workshops and meetings hosted by the Lethal Humidity Prediction Project.
- Share responsibility for managing research group activities, including overseeing data management, coordinating research budgets, organising and delegating tasks, coaching other members of the group on specialist methodologies or procedures, and contributing to funding applications for new projects.
- In support of the development of your research, and as a secondary commitment, undertake some teaching within SoGE, including engaging in assessment and university examining
- Contribute to and enhance the academic life and community of the SoGE, including taking on citizenship roles.

Selection criteria

Essential selection criteria

- A PhD/DPhil in a relevant quantitative discipline (such as AI/ML, atmospheric science, climate science, hydrology, computer science, or a related field).
- Demonstrated postdoctoral experience in predictive modelling using AI/machine learning.
- Strong coding skills in Python (and/or R) including proficiency in version control systems (e.g., GitHub/GitLab) and handling large-scale datasets.
- Experience with high-performance computing (HPC) environments, including parallel computing and cloud-based workflows.
- A strong research and publication track record (relative to opportunity) in an area listed in the job description.
- High level analytical and problem-solving skills.
- Experience retrieving, processing, and analysing global datasets from a diverse range of sources (e.g., climate and environmental data).
- Experience conducting and managing academic research both independently and within a team.
- Ability to independently plan and manage a research project, including budgeting, milestone tracking, and reporting.
- Excellent verbal and written communication skills, with the ability to communicate complex ideas effectively to both academic and non-academic audiences.

Desirable selection criteria

The following knowledge or experience would be valuable but not essential:

- Experience in numerical weather prediction, climate modelling, or forecasting, with an understanding of how extended lead times and antecedent conditions influence predictive modelling.
- Hands-on experience working with satellite data and climate forecasts.
- Interest or expertise in the Hydro-Climate Extremes research group's wider areas, including flood/inundation modelling, hydrological forecasting, river network development (familiarity with the GRIT network; Wortmann et al. 2024), GRASS GIS, or another script-based GIS approach.

Pre-employment screening

Standard checks

If you are offered the post, the offer will be subject to standard pre-employment checks. You will be asked to provide: proof of your right-to-work in the UK; proof of your identity; and (if we haven't done so already) we will contact the referees you have nominated. If you have previously worked for the University we will also verify key information such as your dates of employment and reason for leaving your previous role with the department/unit where you worked. You will also be asked to complete a health declaration so that you can tell us about any health conditions or disabilities for which you may need us to make appropriate adjustments.

Please read the candidate notes on the University's pre-employment screening procedures at:

<https://www.jobs.ox.ac.uk/pre-employment-checks>

About the University of Oxford

Welcome to the University of Oxford. We aim to lead the world in research and education for the benefit of society both in the UK and globally. Oxford's researchers engage with academic, commercial and cultural partners across the world to stimulate high-quality research and enable innovation through a broad range of social, policy and economic impacts.

We believe our strengths lie both in empowering individuals and teams to address fundamental questions of global significance, while providing all our staff with a welcoming and inclusive workplace that enables everyone to develop and do their best work. Recognising that diversity is our strength, vital for innovation and creativity, we aspire to build a truly diverse community which values and respects every individual's unique contribution.

While we have long traditions of scholarship, we are also forward-looking, creative and cutting-edge. Oxford is one of Europe's most entrepreneurial universities and we rank first in the UK for university spin-outs, and in recent years we have spun out 15-20 new companies every year. We are also recognised as leaders in support for social enterprise.

Join us and you will find a unique, democratic and international community, a great range of staff benefits and access to a vibrant array of cultural activities in the beautiful city of Oxford.

For more information, please visit www.ox.ac.uk/about/organisation.

School of Geography and the Environment

The School of Geography and the Environment (SoGE) is a dynamic, diverse, interdisciplinary department at the University of Oxford combining natural and social science research interests and analytical skills, underpinned by geography's tradition of working in many different situations and contexts. The School is internationally recognized for the quality of its teaching, research and wider engagement across the breadth of human geography, physical geography and environmental studies. Based within the Social Sciences Division, the School

incorporates three affiliated research centres as well as Geography: the Environmental Change Institute (ECI), the Smith School of Enterprise and Environment (SSEE), and the Transport Studies Unit (TSU).

The School is based partly within the Oxford University Centre for the Environment (OUCE) building and partly in the Dyson Perrins building, which was completely refurbished in 2022. The School's physical location enables us to easily connect with many academic departments and organisations across the University, and we collaborate with many of them. For example, the School is an active participant in fostering the Oxford University Networks for the Environment (ONE), which links up over 1000 individuals within the University around the themes of Biodiversity, Climate, Energy, Food and Water.

Our research spans issues related to the environment, climate change, energy, transport, development, geopolitics and cities. The School's research portfolio totalled approximately £105million across more than 170 research projects in 2021/22, from a wide variety of funders.

Much of this work is collaborative, and we currently estimate that research with our partners takes place in over 70 countries across the globe. We aim to contribute to the common good, and many of our researchers actively engage in advising local, national and international organisations; in giving written and oral contributions to government consultations both locally and nationally; and in engaging with others through policy, partnerships, business and social enterprise.

The School also provides world-class, multidisciplinary teaching. Our Undergraduate Honour School gives undergraduate students research-led teaching across the breadth of human and physical geography and environmental studies by internationally recognised academic staff. Two hundred and fifty graduate students from a wide range of nationalities currently study for taught and research postgraduate degrees with us, in our International Graduate School. For more information the School please visit: <http://www.geog.ox.ac.uk>

The School is committed to supporting the career development of all its members. Everyone is encouraged to undertake professional training from the range offered by the School, the Division and the University's People, Organisation and Development Unit. The School has a mentoring scheme and all staff are encouraged to work with a mentor during their time at SoGE; academic staff are also encouraged to have regular meetings with the Head of School to plan their career progression.

Since 1973 the **Transport Studies Unit** has established an international research reputation in transport research. Based within the world-leading School of Geography and the Environment at the University of Oxford, the TSU approaches global transport challenges from social science and holistic perspectives. By advancing understandings of the systems, processes and practices that shape the way people and goods move, the TSU hopes to inspire and inform change towards a more sustainable, just and accessible transport system. Our position within Geography and the University fosters interdisciplinary collaboration with researchers in other parts of the University and based elsewhere.

From geography to engineering, energy research to science and technology studies, and beyond, the TSU draws on the latest relevant developments in various disciplines and research fields. Our core team of researchers come from various disciplinary backgrounds, bringing with them a range of insight and expertise which enriches our research practice. Most TSU staff are full-time researchers working on specific externally funded projects. In addition to the core staff, it also hosts a number of academic visitors working more independently on cross-cutting issues. There is also an active group of international DPhil students working with individual staff.

The TSU has an excellent track record in collaborative projects. TSU researchers often work in partnership with colleagues in many UK universities, and has very active and well-established links with universities and research institutes across the EU, the Americas, Asia and Africa. They also work with partners from international agencies, transport policymakers, local authorities, businesses and industry, employers, non-governmental organisations, and activists.

For more information on the TSU please visit: <http://www.tsu.ox.ac.uk>

Since 1991, the **Environmental Change Institute** has worked alongside partners in government, business, academia and the community to understand environmental change and explore possible responses to the risks and opportunities it poses. Promoting an interdisciplinary approach, ECI explores sustainable solutions to global problems ensuring a fairer and more equal world for people today and in the future.

ECI has over 100 academics and researchers working around the world, establishing itself as an active and influential player in environmental change science. With a well-established track record in relation to Infrastructure, climate, energy, ecosystems, food, land use governance and water.

ECI is a leading player in a number of large research activities. In 2022 there are over 80 research projects totalling over £57 million funded through the UK's research councils and charitable foundations and trusts. We are proud of all our work but of particular note we host the multi-agency UK Centre for Research into Energy Demand Solutions (CREDS), understanding the role of energy demand change in accelerating the transition to a zero carbon energy system. As part of Oxford University's strategic research Oxford Net Zero is an interdisciplinary research initiative working to track progress, align standards and inform effective solutions in climate science, law, policy, economics, clean energy, transport, land and food systems and greenhouse gas removal and storage.

In addition, The Oxford Programme for Sustainable Infrastructure Systems (OPSIS) is at the forefront of research and education to enable sustainable and resilient infrastructure. While the Leverhulme Centre for Nature Recovery Centre aims to investigate how to halt and reverse ongoing nature and biodiversity loss, by understanding how implement and finance nature recovery that is scalable, effective and socially just.

The ECI is also home to the MSc in Environmental Change and Management, the School's first taught postgraduate masters' programme, established in 1994. Through this MSc the ECI have successfully trained over 700 upcoming environmental leaders who comprise a lively and increasingly influential alumni community. For more information on the ECI please visit: <http://www.eci.ox.ac.uk>

The Smith School of Enterprise and the Environment (SSEE) was established at the University of Oxford in 2008 with a generous benefaction by the Smith family. We bring enterprise – public and private – together with world-leading teaching and research to achieve global net-zero emissions and sustainable development. Located within the internationally top-ranked School of Geography and the Environment, we work in close collaboration with leading academics across Oxford and beyond.

Decisions made this decade will determine the future of humanity and the planet. To stop the climate crisis, we need to shift global economic and financial systems towards sustainability. The Smith School's approach combines academic excellence with real-world impact. Our research shapes business and government policy and practice. We offer innovative evidence-based solutions to the environmental challenges facing humanity.

We apply expertise in economics, finance, business and law to tackle environmental and social challenges in six areas: water, climate, energy, biodiversity, food and the regenerative economy.

We equip the next generation through undergraduate and graduate teaching as part of the top-ranked School of Geography and the Environment. [SSEE's new master's course in Sustainability, Enterprise and the Environment \(MSc SEE\)](#) is already one of the most applied to at Oxford. Our executive education programmes empower business leaders and policy-makers throughout the world to take action.

SSEE's [Advisory Board](#), [Business Fellows](#) and our wide-ranging external partnerships bring together experts from industry, consultancy, governments and NGOs to achieve the vision of a cleaner, fairer and more prosperous future

Social Sciences Division

The University's academic departments and faculties are organised into four large groups, known as Academic Divisions (Social Sciences, Mathematical, Physical and Life Sciences (MPLS), Medical Sciences, and Humanities). The academic divisions are responsible for academic oversight of the teaching and research of their constituent departments and faculties, for strategic and operational planning, and for personnel and resource management. The Head of the Social Sciences Division is Professor Timothy Power, who is a member of the University's Council. The Social Sciences Division is a world-leading centre of research and education in the social sciences. The social sciences at Oxford are distinctive for both their depth and breadth, with activity spanning fourteen departments and faculties and one cross-divisional unit. (These are as follows: Law, the Saïd Business School, Economics, Politics and International Relations, the Blavatnik School of Government, the School of Anthropology and Museum Ethnography, International Development, Sociology, Social Policy and Intervention, the Oxford Internet Institute, Archaeology, the School of Interdisciplinary Area Studies, Education, the School of Geography and the Environment and the Oxford Martin School.) Interdisciplinary links within and beyond the university are strong, extending to the humanities, natural sciences, and medical sciences.

Academic and research staff and research students are engaged in world-leading research that challenges current ideas and theories and is tackling some of the major challenges facing humanity, such as sustainable resource management, migration, governance, poverty and development, and justice. REF 2014 confirmed Oxford as the UK powerhouse for research in the social sciences, where Oxford accounted for more world-leading (4*) research than any other institution, across the social sciences units of assessment to which it made submissions. The division has an extensive portfolio of external funders and collaborators, with competitively-awarded external research income exceeding £40million per year. Researchers in the division engage actively beyond academia and their research has influence in many spheres from innovation in public policymaking to practitioner communities such as law, business, education, social welfare and NGOs.

The division also delivers an exceptional range of high quality educational programmes (undergraduate, postgraduate taught and postgraduate research), all of which are underpinned by the innovative research being undertaken by our academics. Programmes range from those at the interface of the natural sciences, through to professionally-oriented provision in areas such as business, law and education. The division is home to several of Oxford's most widely recognised teaching programmes, such as Philosophy, Politics and Economics (PPE); the BCL; the MPhils in International Relations, in Economics, and in Development Studies; the MBA and EMBA; and the nationally regarded PGCE.

For more information please visit: <http://www.socsci.ox.ac.uk/>

How to apply

Applications are made through our online recruitment portal. Information about how to apply is available on our Jobs website <https://www.jobs.ox.ac.uk/how-to-apply>.

Your application will be judged solely on the basis of how you demonstrate that you meet the selection criteria stated in the job description.

As part of your application you will be asked to provide details of two referees and indicate whether we can contact them now.

You will be asked to upload a CV and a supporting statement. The supporting statement must explain how you meet each of the selection criteria for the post using examples of your skills and experience. This may include experience gained in employment, education, or during career breaks (such as time out to care for dependants)

Please upload all documents **as PDF files** with your name and the document type in the filename.

All applications must be received by **midday** UK time on the closing date stated in the online advertisement.

If you currently work for the University please note that:

- as part of the referencing process, we will contact your current department to confirm basic employment details including reason for leaving
- although employees may hold multiple part-time posts, they may not hold more than the equivalent of a full time post. If you are offered this post, and accepting it would take you over the equivalent of full-time hours, you will be expected to resign from, or reduce hours in, your other posts(s) before starting work in the new post.

Information for priority candidates

A priority candidate is a University employee who is seeking redeployment because they have been advised that they are at risk of redundancy, or on grounds of ill-health/disability. Priority candidates are issued with a redeployment letter by their employing department(s).

If you are a priority candidate, please ensure that you attach your redeployment letter to your application (or email it to the contact address on the advert if the application form used for the vacancy does not allow attachments).

If you need help

Application FAQs, including technical troubleshooting advice is available at:

<https://staff.web.ox.ac.uk/recruitment-support-faqs>

Non-technical questions about this job should be addressed to the recruiting department directly

recruit@ouce.ox.ac.uk

To return to the online application at any stage, please go to: www.recruit.ox.ac.uk.

Please note that you will receive an automated email from our online recruitment portal to confirm receipt of your application. **Please check your spam/junk mail** if you do not receive this email.

Important information for candidates

Data Privacy

Please note that any personal data submitted to the University as part of the job application process will be processed in accordance with the GDPR and related UK data protection legislation. For further information, please see the University's Privacy Notice for Job Applicants at: <https://compliance.admin.ox.ac.uk/job-applicant-privacy-policy>. The University's Policy on Data Protection is available at: <https://compliance.admin.ox.ac.uk/data-protection-policy>.

The University's policy on retirement

The University operates an Employer Justified Retirement Age (EJRA) for very senior research posts at **grade RSIV/D35 and clinical equivalents E62 and E82** of 30 September before the 70th birthday. The justification for this is explained at: <https://hr.admin.ox.ac.uk/the-ejra>.

For **existing** employees on these grades, any employment beyond the retirement age is subject to approval through the procedures: <https://hr.admin.ox.ac.uk/the-ejra>.

There is no normal or fixed age at which staff in posts at other grades have to retire. Staff at these grades may elect to retire in accordance with the rules of the applicable pension scheme, as may be amended from time to time.

Equality of opportunity

Entry into employment with the University and progression within employment will be determined only by personal merit and the application of criteria which are related to the duties of each particular post and the relevant salary structure. In all cases, ability to perform the job will be the primary consideration. No applicant or member of staff shall be discriminated against because of age, disability, gender reassignment, marriage or civil partnership, pregnancy or maternity, race, religion or belief, sex, or sexual orientation.

Benefits of working at the University

Employee benefits

University employees enjoy 38 days' paid holiday, generous pension schemes, flexible working options, travel discounts including salary sacrifice schemes for bicycles and electric cars and other discounts. Staff can access a huge range of personal and professional development opportunities. See <https://hr.admin.ox.ac.uk/staff-benefits>

Employee Assistance Programme

As part of our wellbeing offering staff get free access to Health Assured, a confidential employee assistance programme, available 24/7 for 365 days a year. Find out more <https://staff.admin.ox.ac.uk/health-assured-eap>

University Club and sports facilities

Membership of the University Club is free for University staff. It offers social, sporting, and hospitality facilities. Staff can also use the University Sports Centre on Iffley Road at discounted rates, including a fitness centre, powerlifting room, and swimming pool. See www.club.ox.ac.uk and <https://www.sport.ox.ac.uk/>.

Information for staff new to Oxford

If you are relocating to Oxfordshire from overseas or elsewhere in the UK, the University's Welcome Service includes practical information about settling in the area, including advice on relocation, accommodation, and local schools. See <https://welcome.ox.ac.uk/>

There is also a visa loan scheme to cover the costs of UK visa applications for staff and their dependants. See <https://staffimmigration.admin.ox.ac.uk/visa-loan-scheme>

Family-friendly benefits

We are a family-friendly employer with one of the most generous family leave schemes in the Higher Education sector (see <https://hr.web.ox.ac.uk/family-leave>). Our Childcare Services team provides guidance and support on childcare provision, and offers a range of high-quality childcare options at affordable prices for staff. In addition to 5 University nurseries, we partner with a number of local providers to offer in excess of 450 full time nursery places to our staff. Eligible parents are able to pay for childcare through salary sacrifice, further reducing costs. See <https://childcare.admin.ox.ac.uk/>.

Supporting disability and health-related issues (inc menopause)

We are committed to supporting members of staff with disabilities or long-term health conditions, including those experiencing negative effects of menopause. Information about the University's Staff Disability Advisor, is at <https://edu.admin.ox.ac.uk/disability-support>. For information about how we support those going through menopause see <https://hr.admin.ox.ac.uk/menopause-guidance>

Staff networks

The University has a number of staff networks including for research staff, BME staff, LGBT+ staff, disabled staff network and those going through menopause. Find out more at <https://edu.admin.ox.ac.uk/networks>

The University of Oxford Newcomers' Club

The University of Oxford Newcomers' Club is run by volunteers that aims to assist the partners of new staff settle into Oxford, and provides them with an opportunity to meet people and make connections in the local area. See www.newcomers.ox.ac.uk.

Research staff

The Researcher Hub supports all researchers on fixed-term contracts. They aim to help you settle in comfortably, make connections, grow as a person, extend your research expertise and approach your next career step with confidence. Find out more <https://www.ox.ac.uk/research/support-researchers/researcher-hub>

Oxford's Research Staff Society is a collective voice for our researchers. They also organise social and professional networking activities for researchers. Find out more <https://www.ox.ac.uk/research/support-researchers/connecting-other-researchers/oxford-research-staff-society>