THE UNIVERSITY OF MANCHESTER

PARTICULARS OF APPOINTMENT

FACULTY OF SCIENCE & ENGINEERING

SCHOOL OF ENGINEERING

DEPARTMENT OF MECHANICAL, AEROSPACE AND CIVIL ENGINEERING

IMPACT ACCELERATION RESEARCH ASSOCIATE

VACANCY REF: SAE-029323

Salary:	£37,174 - £45,413 per annum depending on experience
Hours:	Full time (1 FTE)
Duration:	Fixed term for 12 months
Location:	Oxford Road, Manchester

Enquiries about the vacancy, shortlisting and interviews:
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Background

We are currently seeking to recruit a Research Associate to work on a UKRI funded Impact Acceleration Project with Greater Manchester's Integrated Water Management team. The project will lay the groundwork for developing a digital twin (DT) for Greater Manchester's Integrated Water Management Plan (GM-IWMP). The successful applicant will map and prioritise key water processes in GM, address data management and integration challenges, and scope a blueprint for DT design and infrastructure. The project builds on existing collaborations with the Greater Manchester Combined Authority (GMCA), Environment Agency (EA), and United Utilities (UU). By developing a robust conceptual model, creating a secure data pipeline, and scoping a blueprint for an operational DT, the project will directly enhance the evidence base needed for future policy and investment decisions. The project will provide the RA with valuable exposure to academic and non-academic environments, particularly in strategic flood and water planning, and will provide a real world setting for the latest research into water DTs to be implemented.

The successful applicant will be jointly placed at UoM and at the GMCA office as a hybrid-secondment, splitting their time evenly between the two organisations, supported by ad hoc visits to UU and EA offices and site visits when required. The RA will benefit from a uniquely

rounded experience in the water sector, building: an understanding of the duties, regulatory drivers and priorities of three different water management authorities; technical data and modelling skills that are highly in-demand in the water sector and; transferrable skills such as collaborative behaviours, teamwork and strategic thinking.

The University of Manchester (UoM) lies in the heart of Manchester and has been created by bringing together the Victoria University of Manchester and UMIST, two of Britain's most distinguished universities, to create a powerful new force in higher education. The Department of Civil Engineering and Management has a particular strength in Water Engineering. The Water Engineering group conducts interdisciplinary research on the modelling, analysis, and management of complex water systems and integrates coupled human–natural systems modelling, data assimilation, and stakeholder co-development to support evidence-based decision-making at regional to global scales. The group's research is internationally recognised for its policy-relevance and practical impact.

Overall Purpose of the Job

The project aims to co-develop a robust, evidence-based and future-ready digital infrastructure roadmap for Integrated Water Management Planning (IWMP) in Greater Manchester (GM). The project will underpin long-term development of a digital twin for GM water systems. This is critical to achieve the IWMP's vision to 'manage GM water wherever it falls, to enhance the environment, support people and forge prosperous places by working together.'

As part of the project, you will be expected to work closely with the IWMP team and stakeholders to establish a conceptual model, that maps the important physical processes and links between them associated with all aspects of water in GM. You will then conduct a data inventory to identify existing and missing datasets needed for a DT, producing a data catalogue, including requirements and considerations for data-sharing between organisations. This will support the development of a workflow of relevant digital tools and numerical models that will form the modelling core of the DT that accounts for compound and systemic risks across fluvial, groundwater and surface water pathways. This will support the development of an environmental and economic case for strategic investment in integrated solutions and embed these approaches within GMCA and partner agencies.

The successful applicant will possess a relevant PhD or equivalent qualification/experience in a related field of study, with sufficient specialist knowledge in water systems modelling. Ideally, the candidate will have been active in the field of water management with a background and experience in multiple areas such as hydrology, flood modelling, water systems modelling, water quality, digital twins, etc. The successful applicant will be proficient in Python and have extensive experience of data handling and water systems modelling whilst also having outstanding communication skills with non-specialist audiences. The successful applicant will also be able to work collaboratively and independently.

Key Responsibilities, Accountabilities or Duties

To perform the following activities in conjunction with and under the guidance of the Principal/Co Investigators:

- Plan and conduct assigned research in accordance with the project deliverables and research strategy. Ensure regular research progress and project deliverables according to the project plan
- Document outputs including analysis and interpretation of data, maintaining and documenting models, writing technical reports, and producing presentation as appropriate
- Develop timely publications of international quality in high profile journals and conferences
- Contribute to the presentation of work at workshops and meetings. Run and facilitate stakeholder workshops
- Collaborate/liaise with colleagues from academic and non-academic partners and students
- Keep up to date with current knowledge and recent advances in the field/discipline
- Post holders are required to familiarise themselves with the University's Equality and Diversity policies and to actively support these wherever possible

Person Specification

Essential:

- Have, or be about to obtain, a relevant PhD (or equivalent)
- Specialist knowledge in water systems modelling. Ideally, you will have been active in the field of water management with a background and experience in multiple areas such as hydrology, flood modelling, water systems modelling, water quality, digital twins etc
- Proficient in Python, particularly for handling and analysing large datasets
- Proficient with Spatial data analysis and GIS
- Excellent written and visual communication and interpersonal skills, specifically in communicating complex ideas to non-specialist audiences and working with a large network of stakeholders
- Interest in learning about the roles, responsibilities and needs of the different water management authorities
- Excellent time management and organisational skills, particularly in cataloguing and mapping complex systems
- Ability to work independently and as part of a team, including working with a team of colleagues from different organisations
- Strong journal publication record

Desirable:

- Experience with model integration, creating workflows of data and models and using relevant computing solutions such as dockerisaton, cloud computing, DAFNI etc
- Experience with data licensing and agreements
- Specialist knowledge of optimization for water applications

- Experience working with government organisations and water companies