

Postdoc in Understanding Hydrometeorological Drivers of Human Health Risks in Nature-based Solutions

Organisation/Company

Delft University of Technology (TU Delft)

Research Field

Engineering » Water resources engineering

Environmental science » Water science

Researcher Profile

Recognised Researcher (R2)

Country

Netherlands

Type of Contract

Temporary

Hours Per Week

38.0

Offer Description

What are the adverse health risks of Nature-based Solution climate adaptation measures?

Job description

Nature-based Solutions (NBS) are strongly advocated to reduce societal risks, e.g. by mitigating floods, cooling urban areas, and improving water regulation, especially in the context of increased climate extremes and growth of urbanised areas. Besides disaster risk reduction, NBS can also provide benefits linked to human wellbeing and health. However, significant uncertainties and knowledge gaps remain regarding how NBS will perform under future climate extremes and within specific socio-economic contexts, and how these solutions translate into community health outcomes.

The nexus of water and health is the interface between the biophysical system of water (ecosystem), the socio-economic and governance dimensions of water systems, and human health. Traditionally, work in this nexus focuses on hydrological pathways of waterborne and water-related diseases and on water treatment technologies that ensure safe water for human use. In our project, we expand this perspective by explicitly considering the combination of heatwaves and flood events in urbanised areas with NBS measures intended to mitigate their impacts.

For instance, the global rise in hydrometeorological extremes leads to critical health impacts through heatwaves, floods, and droughts, as well as the spread of waterborne pathogens. These stresses on water quantity and quality require the hydrological community to deepen the understanding of the underlying mechanisms linking pathogens to human exposure risks, which can be systematically evaluated using quantitative microbial risk assessment (QMRA) frameworks, and to define the scale, magnitude, and duration of extreme hydrometeorological events. This need becomes more urgent when applying NBS to mitigate the consequences of hydrometeorological extremes, particularly in urbanised areas. Strong hydrological knowledge is essential to be better prepared for disruption of health services and critical infrastructure.

This three-year Postdoc project is part of the PDPC initiative (Pandemic Disaster Preparedness Centre), a convergence initiative of TU Delft, Erasmus University and Erasmus Medical Centre. We will target efforts in leveraging advances in hydrology and meteorology (including process-based understanding and increased modelling capabilities) and integrate these with public health intervention strategies (with EUR and EMC) at scales relevant to communities and cities. The Postdoc will play a pivotal and initiating role in inter- and transdisciplinary research on the Water–Health Nexus, with a particular focus on the unknown consequences and potential health benefits and drawbacks of NBS. Moreover, the research can include (i) improving the efficiency of water, sanitation, and hygiene practices, (ii) using knowledge of the dynamic evolution of hydrological connectivity to predict pathogen dispersal and resulting human exposure risks, (iii) applying QMRA to evaluate human exposures and health risks under different hydrometeorological and NBS scenarios.

Job requirements

You have an academic interdisciplinary background, a pioneering mindset and a strong affinity with research related to surface water and health. With your curious mind, you're highly motivated to initiate and carry out research related to the topic, report on your findings and present your results in scientific papers and at conferences. Using your excellent communication skills, you play a proactive and pivotal role in the interdisciplinary and international community of PDPC.

You also have:

- PhD degree in relevant disciplines: Hydrology, Sanitary Engineering, Environmental Sciences, Microbiology or related subjects.
- Expertise and experience with surface water quality related to human health, such as with waterborne diseases, pathogen or contaminant transport.
- Experience with interdisciplinary research on water and health.

- Proven quantitative skills, such as mathematical modelling and programming.
- A good command of English both in writing and communication.
- Excellent writing skills.

TU Delft (Delft University of Technology)

Delft University of Technology is built on strong foundations. As creators of the world-famous Dutch waterworks and pioneers in biotech, TU Delft is a top international university combining science, engineering and design. It delivers world class results in education, research and innovation to address challenges in the areas of energy, climate, mobility, health and digital society. For generations, our engineers have proven to be entrepreneurial problem-solvers, both in business and in a social context.

At TU Delft we embrace diversity as one of our core values and we actively engage to be a university where you feel at home and can flourish. We value different perspectives and qualities. We believe this makes our work more innovative, the TU Delft community more vibrant and the world more just. Together, we imagine, invent and create solutions using technology to have a positive impact on a global scale. That is why we invite you to apply. Your application will receive fair consideration.

Challenge. Change. Impact!

Faculty of Civil Engineering and Geosciences

The Faculty of Civil Engineering & Geosciences (CEG) is committed to outstanding international research and education in the field of civil engineering, applied earth sciences, traffic and transport, water technology, and delta technology. Our research feeds into our educational programmes and covers societal challenges such as climate change, energy transition, resource availability, urbanisation and clean water. Our research projects are conducted in close cooperation with a wide range of research institutions.

CEG is convinced of the importance of open science and supports its scientists in integrating open science in their research practice. The Faculty of CEG comprises 28 research groups in the following seven departments: Materials Mechanics Management & Design, Engineering Structures, Geoscience and Engineering, Geoscience and Remote Sensing, Transport & Planning, Hydraulic Engineering and Water Management.

[Click here to go to the website of the Faculty of Civil Engineering & Geosciences.](#)

Conditions of employment

- Duration of contract is 3 years.
- A job of 32-38 hours per week.

Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities. The TU Delft offers a customisable compensation package, discounts on

health insurance, and a monthly work costs contribution. Flexible work schedules can be arranged.

For international applicants, TU Delft has the Coming to Delft Service . This service provides information for new international employees to help you prepare the relocation and to settle in the Netherlands. The Coming to Delft Service offers a Dual Career Programme for partners and they organise events to expand your (social) network.

Additional information

For more information about this vacancy, please contact Thom Bogaard via T.A.Bogaard@tudelft.nl

Please note:

As part of knowledge security, TU Delft conducts a risk assessment during the recruitment of personnel. We do this, among other things, to prevent the unwanted transfer of sensitive knowledge and technology. The assessment is based on information provided by the candidates themselves, such as their motivation letter and CV, and takes place at the final stages of the selection process. When the outcome of the assessment is negative, the candidate will be informed. The processing of personal data in the context of the risk assessment is carried out on the legal basis of the GDPR: performing a public task in the public interest. You can find more information about this assessment on our website about knowledge security.