

Project title: Monitoring the Impact of Green Infrastructure using Citizen Science in Urban and Rural Catchments

(Ref: OP2105)

Keywords: Green Infrastructure; Citizen Science; Monitoring; Hydrology; Water Management

One Planet Research Theme:

Climate & Climate Change | Earth System Processes | Anthropocene | Environmental Informatics

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Key Research Gaps and Questions:

1. *To what extent can we rely on citizen science data to support the water management process and local uptake of green infrastructure?*
2. *Based on empirical data collected, should green infrastructure be regarded as 'critical infrastructure'?*
3. *What are the wider benefits of citizen science with respect to UK water management?*



Project Description: Urban and rural environments face a range of pressures and impacts as a result of extreme weather events, including flooding which are projected to increase in frequency and severity with climate change. Green infrastructure (GI) measures, such as sustainable drainage systems (SuDS) and natural flood management (NFM), are being used across the UK and internationally as a result. Although GI techniques have the potential to offer multiple benefits, the evidence-base is still inadequate and interactions are complex, thus this prevents widespread uptake ^[1]. Citizen Science (CS) has enabled the general public to work alongside scientists and researchers to co-produce new knowledge across a range of environmental disciplines. This participatory approach has been implemented in the water management sector, and current policy frameworks welcome the involvement of the local community^[2,3]. However, robust monitoring methods are yet to be developed to directly support GI. This cross-disciplinary project aims to **co-develop, test and evaluate a GI orientated CS monitoring toolkit** which uses a range of cost-effective and innovative techniques. Working in various community settings for comparison, the monitoring programme will provide evidence associated with the value of CS (as a monitoring technique) and report on the effectiveness and maintenance of various GI measures investigated. The candidate will work alongside the [National Green Infrastructure Facility](#) (NGIF), Northumbria University, [Centre for Ecology and Hydrology \(CEH\)](#), [Tyne Rivers Trust \(TRT\)](#) and urban and rural community groups across the NE of England. A variety of desk-based, stakeholder engagement and hydrometric fieldwork techniques are envisaged, will expand on previous projects such as the [Haltwhistle Burn](#) and [My Tyne](#), and will have access to NGIF's laboratory. The candidate will benefit from an exciting training package, including opportunities and networking offered through CEH and TRT. This PhD will specifically develop fieldwork, engagement, participatory, citizen science, water management and data visualisation skills which are crucial in today's water and climate sector.

¹ Walsh *et al.* (2015) [Putting green infrastructure to the test for urban catchments](#); ² Buytaert *et al.* (2014) <https://doi.org/10.3389/feart.2014.00026>; ³ Starkey *et al.* (2017) <https://doi.org/10.1016/j.jhydrol.2017.03.019>

Prerequisites: An MSc in Flood Risk Management, Engineering Hydrology, Geography or similar is essential. Research or industrial experience working on collaborative SuDS/NFM schemes, fieldwork monitoring and community engagement is desirable.