

National Green Infrastructure Facility

Pioneering integrated solutions
for water infrastructure



Sustainable Drainage Systems Facility and Demonstrator (SuDS) at the Urban Sciences Building

The National Green Infrastructure Facility is:

- A living lab for finding solutions to global challenges in water for urban sustainability
- Underpinning transformative research across all urban sectors for all stakeholders
- Demonstrating value of Sustainable Drainage Systems and Green Infrastructure
- Increasing resilience to urban flooding
- An integrated testbed for smart water systems

Newcastle Quayside after the 2012 "Toon Monsoon"



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What is it?

The National Green Infrastructure Facility is interlinked with the national network of Urban Observatories across the country, as part of UKCRIC - the UK Collaboratorium for Research on Infrastructure and Cities. Collaboration and big data analytics provided by the Newcastle Urban Observatory, the largest open urban sensor network in the UK, is enabling

the National Green Infrastructure Facility to develop unprecedented understanding of urban hydrological processes at a range of scales. Both facilities are co-located in the £59m Urban Sciences Building at Newcastle Helix.

What is the challenge?

Cities are transforming rapidly and face a range of pressures including climate change, growing populations, resource scarcity, poverty and impacts from extreme weather events such as flooding.



Why is it important?

National and local infrastructure (transport, water, waste, energy, ICT systems) need to be fit for purpose to support societal development in a changing world. The National Green Infrastructure Facility will help improve how infrastructure responds to extreme weather events, climate change, security of resources, impacts on the economy, and exploitation of innovative technology for

meeting the changing needs of society. Our co-location with other types of urban infrastructures will enable better delivery of integrated solutions for managing water.

Why Newcastle University?

The University Estate itself is a laboratory for the University and NWG. At-scale Sustainable Drainage Systems (SuDS), coupled with advanced sensing networks, enable us to study long-term performance and wider interactions of infrastructure within the whole urban system.

What is it for?

The National Green Infrastructure Facility provides experimental facilities based in and around the Urban Sciences Building that will enable it to:

- Study green roof approaches, blue roof and urban agriculture.
- Demonstrate climate change adaptation options.
- Investigate the roles of green walls and living walls in urban flood management.
- Test surface water management infrastructure.
- Better understand intra-building water usage.
- Study internal smart devices to manage water use more sustainably within the building.
- Trial a wide range of near market and future green infrastructure products.
- Understand surface water drainage infrastructure including pipes, drain, water storage and water filtering.
- Test runoff controls for the movement of water through streets, infiltration pavements, flow attenuation features, green spaces and soakaways.
- Test the effectiveness of vegetation and other materials to improve water and air quality.
- Run a series of 'What-if' experiments and scenarios to model the behaviour of the environment giving insights into possible futures.
- Gather data on current and proposed infrastructure to rapidly trial solutions, providing robust evidence for their effectiveness and implementation.

