

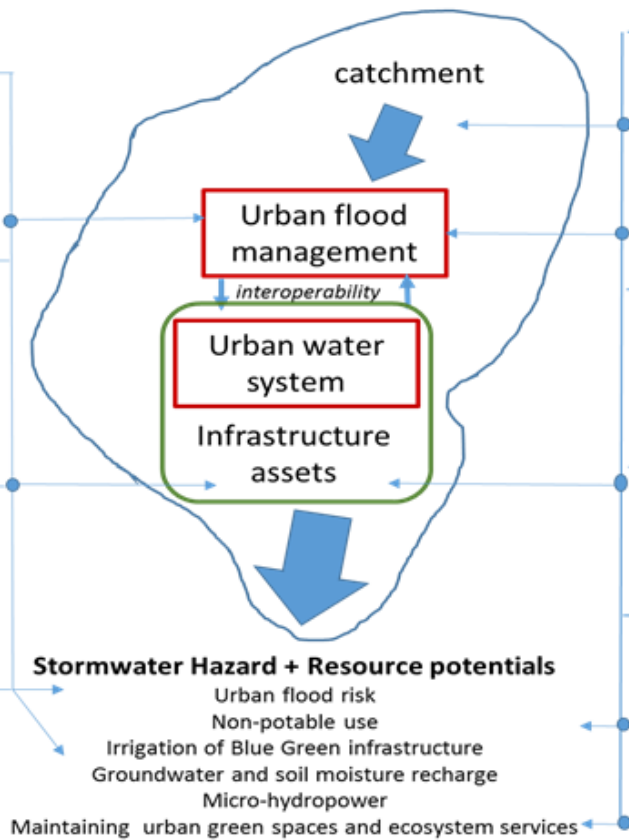
### Stakeholder actions and system evaluations:

**Participatory Action Research and Social Practice Theory** to examine relationships between researchers, UFRM practitioners and communities, based on **Local Action Alliances** in locations such as Newcastle and Ebbsfleet. *This will explore tacit knowledge, behaviours and citizen's attitudes with respect to diverse flood mitigation measures and link the desirability of specific asset interventions with wider urban planning.*

**Real Options** analysis will find the most synergistic mix of B-G and G assets, with new objective functions for option isolation based around maximising multiple benefits and service delivery. *This will apply methods for evaluating the benefits of SUDS-GI developed in the Blue Green Cities project. Optimisation will include Totex (including maintenance liabilities) and monetised benefits (generated using CIRIA's BeST tool).*

**System interdependencies** will examine interactions with other components of urban fabric including open spaces, highways and buildings. *This will evaluate systemic resilience and the uncertainties arising from climate and socio economic futures to be accounted for in infrastructure planning and decision making.*

**GIS visualisation** of the flood mitigation performance of potential of Blue-Green & Grey assets and their multifunctional benefits. *This will consolidate the model outputs for use locally to guide development and be up-scaled regionally/nationally to inform policy, and form the basis for a National Assessment of flood resilience.*



### Physical Models:

**SHETRAN** handles water, flow multi-fraction sediment transport and multiple, reactive solute transport within a river basin model. *This will couple catchment hydrology and sediment/contaminant inputs to urban systems (simulated using CityCAT and WaterMet2).*

**CityCAT** models urban flooding to assess pluvial and fluvial flood risk and flood alleviation measures with simulations driven by rainfall, flow and/or water depth time series. Maps of water depths and velocities at different times are combined to animate the flood propagation. *This central tool will simulate how stormwater cascades through urban systems, show where capture and re-use is possible and where its resource potential is constrained.*

**WaterMet2** is an urban water system performance model providing flows/fluxes in 4 subsystems: water supply, sub-catchment, wastewater and water resource recovery. *This will be coupled with CityCAT to explore the interconnections between all forms of urban water.*

**Eco-hydrological modelling** links plant physiology within SuDS to water availability, using a water balance model linking the total water in the rooting zone with rates of rainfall, interception, runoff, evapotranspiration and leakage (in mm/d). *This will apply time series data from CityCAT and WaterMet2 to determine the resilience of vegetation in Blue-Green infrastructure and SuDS systems.*