

Historic garden study to help manage vital urban green spaces

April 27 2023



The area of the Cruickshank Botanic Garden where Dr Stevenson and the team from the University's School of Geosciences carried out their study. Credit: University of Aberdeen

A historic Aberdeen garden could play an important role in the development of urban green spaces, following a study that showed how different types of vegetation can be used to best manage these vital areas.

The study, which took place at the Cruickshank Botanic Garden at the University of Aberdeen's Old Aberdeen campus, found that selecting the right type of vegetation when planning [urban green spaces](#) can play an important role in creating a flourishing local ecosystem while protecting our [climate](#).

Urban green spaces are seen as vital to building resilience to both climate and land use changes, as well as helping achieve government targets aiming to increase green [space](#) provision to communities.

However, relatively little is known about how these should be designed to make the most of specific hydrological ecosystem services that help build resilience.

The study, led by a team from the University's School of Geosciences, along with international collaborators, analyzed plots at the Cruickshank Botanic Gardens over one growing season to see how different [vegetation types](#) might affect what happened to rainfall.

They found that the use of grassland encouraged greater [groundwater recharge](#), while conifers increased transpiration—the process where [plant roots](#) absorb water and then release it as vapor through leaves, one of the major sources of water being released into the atmosphere, which can help to cool the local air.

The results of the study, which was one of the first of its type in such an environment, is published in the journal *Environmental Monitoring and Assessment*.

Lead author Dr. Jamie Lee Stevenson said that urban green spaces are increasingly seen as important in building resilience to both climate and land use changes, making their study a potentially important resource for future green space design and planning.

He said, "The choice of urban green space vegetation is important in maximizing specific ecosystem services such as groundwater recharge and the cooling of local air temperatures which can help mitigate and improve resilience against climate and land use change.

"In this study we used an array of sensors and developed a new modeling approach, comparing vegetation types at a plot scale, to see clearly how different vegetation types compare in terms of the derived ecosystem services they provide.

"The results provide clear, quantifiable, evidence of functional differences in a previously unstudied area that could be used by those managing urban green spaces for climate and land use change resilience. It also provides a sound basis for further studies in other [urban environments](#) and locations."

More information: Jamie Lee Stevenson et al, Quantifying heterogeneity in ecohydrological partitioning in urban green spaces through the integration of empirical and modelling approaches, *Environmental Monitoring and Assessment* (2023). [DOI: 10.1007/s10661-023-11055-6](#)

Provided by University of Aberdeen

Citation: Historic garden study to help manage vital urban green spaces (2023, April 27) retrieved 20 June 2024 from <https://phys.org/news/2023-04-historic-garden-vital-urban-green.html>

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