

Project title:	Urban greening for heat-resilient neighbourhoods
Discipline	Environmental systems: Built environment
Key words:	Built environment; climate adaptation; heat; resilience; urban greening.
Supervisory team:	Leslie Mabon, Alice Moncaster
URL for lead supervisor's OU profile	https://www.open.ac.uk/people/lm32658

Project Highlights:

- An interdisciplinary project that looks at cooling towns and cities through urban greening;
- Tap into growing scholarly and policy interest in nature-based responses to climate change threats;
- Engage and empower a wide cross-section of society in creating scientific evidence to support planning decisions.

Overview:

The extreme heat events faced by the Northern Hemisphere in summer 2021, compounded by the warnings from the IPCC's Sixth Assessment Report that the world is already locked in to potentially harmful levels of climate change, illustrate that heat is an ever-increasing risk to life in a warming world. In a recent editorial, *Nature* argued that urban environments are at particular risk, and that cities must act now to protect people from extreme heat (Nature, 2021). In response, urban trees and broader greening measures have been advocated globally as a nature-based solution with the potential to effectively and equitably reduce heat risks whilst proving a range of other benefits such as air quality improvement, rainfall retention, wellbeing, and societal interaction. Vancouver City Planning Commission, for example, called on the city to prioritise immediate tree-planting in low-income and vulnerable neighbourhoods; and the *Washington Post* proclaimed trees as "a cool idea for low-income urban areas hard hit by warming climate".

Nonetheless, despite societal enthusiasm for tree-planting as a heat resilience strategy, city planners and communities tasked with implementing and maintaining urban trees for climate resilience face challenges. First, the bulk of scholarly knowledge and societal attention towards urban trees as an equitable nature-based solution for heat comes from a North American setting (Kendal et al., 2020), and hence is

grounded in a distinct socio-political context that is not necessarily applicable to the UK or other locations globally. Second, whilst benefits from urban trees are felt at the neighbourhood level, delivering effective cooling requires coordinated action through a green infrastructure considered at a whole-city scale, meaning there is a need to put targeted urban greening in the broader context of a city ecosystem. Third and final, despite the need for coordinated action, effective neighbourhood-level cooling is contingent on not imposing interventions on communities, and on ensuring citizens are empowered with the skills to support implementation and stewardship of nature-based approaches (Carmichael & McDonough, 2019).

The proposed project therefore aims to understand how urban greening can contribute to heat resilience alongside other environmental and social benefits at the building and neighbourhood scale. To do so, we develop an interdisciplinary project which links empirical environmental observations with residents' lived experiences of changing local environments.



Figure 1. Community greening in Oban, Scotland

Methodology:

The successful applicant will have considerable flexibility to develop the project methodology in a direction they wish, working in collaboration with the project supervisors. Potential approaches could include, for example, remote sensing and GIS-based approaches to accessing the multiple benefits and trade-offs associated with urban greening; building- and neighbourhood-level sensing to assess the benefits of cooling interventions via greening; and citizen science or participatory community research approaches to creating data on the environmental and societal benefits of urban greening.

Although the successful applicant will be expected to be based full-time in Milton Keynes, they will have flexibility in selecting a case study location to match their own interests and knowledge, either in the UK or overseas. The supervisors have extensive contacts with greenspace practitioners in Glasgow and Milton Keynes, as well as across Europe and Asia.

References & Further reading:

Carmichael, C. E., & McDonough, M. H. (2019). Community Stories: Explaining Resistance to Street Tree-Planting Programs in Detroit, Michigan, USA. *Society and Natural Resources*, 32(5), 588–605. <https://doi.org/10.1080/08941920.2018.1550229>

Kendal, D. et al (2020). City-size bias in knowledge on the effects of urban nature on people and biodiversity. *Environmental Research Letters*, 15(12), 124035. <https://doi.org/10.1088/1748-9326/abc5e4>

Nature (2021) Cities must protect people from extreme heat. (2021). *Nature*, 595(7867), 331–332. <https://doi.org/10.1038/D41586-021-01903-1>

Mabon, L, and Shih, W-Y (2021) 'Urban greenspace as a climate change adaptation strategy for subtropical Asian cities: a comparative study across cities in three countries' *Global Environmental Change*
DOI: [10.1016/j.gloenvcha.2021.102248](https://doi.org/10.1016/j.gloenvcha.2021.102248)

Further details:

Candidates should have a Masters-level qualification, with experience in designing and undertaking empirical research projects. Although the successful candidate will be working within a School of Engineering and Innovation, we welcome applicants from any discipline working at the interface of environment and society, for example urban planning, architecture, geography, sociology, psychology, public health, and others.

The ideal candidate will be comfortable working in

interdisciplinary research environments, have a positive and flexible attitude to undertaking research in a new and rapidly-evolving field, and be capable in engaging with a full range of stakeholders and community members across the course of their research.

The successful applicant will work within the School of Engineering and Innovation, and with the cross-university NATUrE (nature-based approaches to urban environments) research grouping that has recently been established in the Open University.

For further information, please contact Dr Leslie Mabon (Leslie.Mabon@open.ac.uk) or Dr Alice Moncaster (Alice.Moncaster@open.ac.uk)

Applications should include:

- A 1000 word cover letter outlining why the project is of interest to you and how your skills match those required
- an academic CV containing contact details of three academic references
- an Open University application form, downloadable from: <http://www.open.ac.uk/postgraduate/research-degrees/how-to-apply/mphil-and-phd-application-process>
- IELTS test scores where English is an additional language

Applications should be sent to STEM-EI-PhD@open.ac.uk by **04.03.22**