

Climate change in our cities and towns

Walker Institute research

Climate resilience and a low carbon future in our built environment

Home to more than half of the world's population and growing, cities use around two thirds of the world's energy and face serious impacts from climate change. Reducing urban greenhouse gas emissions and adapting our towns and cities to cope with extremes like floods and heat waves are priorities. The world's urban population also depends on a whole range of infrastructure such as transport, energy and water supply, which themselves are potentially vulnerable to weather and climate.

Urban areas can be several degrees centigrade warmer than the surrounding countryside, a phenomenon known as the urban heat island effect. This worries urban planners as it adds to the effects of climate change. Hot weather and heat waves can affect health, especially in the young, old or infirm.

Addressing urban sustainability issues requires a genuinely multi-disciplinary approach and our research portfolio at Reading can offer just that.

Understanding urban climate

We need to improve understanding of the microclimate of urban areas to effectively adapt building and urban design, improve energy efficiency and maintain comfort within buildings as the climate warms.

Researchers from the Department of Meteorology and the School of Construction Management and Engineering are combining their expertise to understand the detailed interactions between buildings and weather/climate which govern the urban microclimate. They are:

- Testing models that simulate urban temperatures at city to building scale
- Gathering temperature, wind and pollutant observations from within cities
- Modelling urban microclimate and energy performance in buildings (efficiency of ventilation, thermal comfort, energy use, carbon emissions).

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'Climate change mitigation and adaptation in cities has emerged as a new theme on the global agenda, creating a strong desire among governments, the private sector, and the academic community worldwide to learn from experiences and good practice examples.'

Cities and Climate Change: Responding to an Urgent Agenda. World Bank 2011



Our scientists are studying London's urban heat island which can make the city several degrees warmer than the surrounding countryside.



Our work is helping to understand which plants are likely to be most effective at keeping buildings at a comfortable temperature, when used in green roofs and walls for example,

Low carbon and climate resilient buildings

Our associates within Construction Management and Engineering are seeking to address the organisational, business and technical challenges of achieving low carbon, energy efficient and climate resilient buildings, towns and cities. For example, engineering research students within the Technologies for Sustainable Built Environments Centre are working with business to identify ways to reduce energy use in buildings.

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In Real Estate and Planning, experts are investigating how urban policy, planning and community initiatives are influencing climate change mitigation and adaptation. For example, one project is looking at transition towns and the factors that affect the success of such transition initiatives internationally.

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Urban greening

Scientists from the School of Biological Sciences are working with the Royal Horticultural Society to investigate the extent to which different plants are able to reduce the temperature of buildings by modifying the micro-climate around them. In this way, plants may provide an environmentally-sensitive solution to help keep buildings and cities cool in a warmer climate.

Our research interests also extend to the ability of green roofs and walls, trees and gardens to capture rainfall and air pollutants, store carbon and enhance biodiversity.

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See also:

Technologies for Sustainable Built Environments Centre
www.reading.ac.uk/tsbe

Sustainability in the Built Environment
www.reading.ac.uk/sustbe

Climate, governance and development

Climate is just one among a whole range of issues affecting development in the poorer urban areas of the world. Furthermore, adoption and efficacy of climate resilient development within urban areas depends on many complex social, political and governance issues.

In the School of Human and Environmental Sciences researchers are looking at resilience and how it relates to sustainable development policy and climate change adaptation/mitigation in the developing world.

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Floods in Nigeria in 2011

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