

BLOG

No man's an (urban heat) island?

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June 27, 2014

The saying that "no man is an island" certainly bodes true for most city-dwellers. I can certainly attest to this on my daily commute to Boston. Space is a commodity and a rare one at that. Summer months can be especially challenging as temperatures rise and room to move feels even less available.

It turns out that these stifling days – when the heat seems to do nothing but linger on train cars, buses, and even on sidewalks – are not just a mere annoyance. This is all actually an aspect of a heating effect specific to densely populated cities and suburban areas, known as urban heat island.

Here's a look at what the urban heat island effect is and what people are saying about how it may, or may not, be connected to climate change.

In a nutshell

There are some great resources (some of which are mentioned in the resources section at the end of this article) that delve into the urban heat island definition and causes, but on a basic level, an urban heat island is a city or suburban area that experiences temperatures that are significantly warmer than surrounding less populated and less developed areas.

As we know, the landscape of cities is usually rich with skyscrapers and concrete versus tree cover and vegetation (that helps decrease temperatures). As a result dry, dark, and expansive surfaces like rooftops and pavement absorb a great deal of heat — especially on hot summer days. This heat combined with waste heat from human activity (think factories, air conditioning, driving, etc) has nowhere to go given the layout and obstructive arrangement of buildings. This means that this heat is trapped, creating warmer temperatures, especially at night. The [Environmental Protection Agency \(EPA\)](#) says for a city of 1 million people or more, the annual mean air temperature can be approximately 2 – 5 degrees warmer than the surroundings. In the evening, the difference is especially stark – as high as 22 degrees.

Cooling things off

As research on the urban heat island phenomenon grows, so do efforts toward reducing it. The [American Council for an Energy Efficient-Economy \(ACEEE\)](#) recently released a [survey](#) of 26 North American cities and their efforts toward mitigating UHI. Among the efforts are implementing cool roofs (roofs that effectively reflect sunlight and cool themselves and the corresponding building) and green roofs (think rooftop gardens). Recommendations from the EPA include those as well as increasing trees and vegetation and creating [cool pavements](#). Cool paving involves using existing paving approaches and enhancing them to increase greater solar reflectivity.

Effect or no effect? That is the question.

The burning question throughout all of this, though, is what direct link does urban heat island have with climate change. And at the root of this discussion there is concern over data: some question whether the local effect of heat islands has been skewing global warming data and making global temperatures look warmer than they actually are.

A 2011 study from [Stanford University](#) quantified the warming effect of heat islands and determined that only "between 2 and 4 percent of the gross global warming since the Industrial Revolution may be due to urban heat islands." The EPA references the [Intergovernmental Panel on Climate Change](#), which suggests that the impact of urban heat islands is "real but local," and has only a minor effect on regional or global trends.

There is at least one clear connection with climate change: urban heat island can be amplified by it. A very hot summer can create a very hot city, which can lead to all kinds of public health issues and a large drain on the local power supply. In June 2014, ACEEE released the results of a [survey of US cities](#) and found that nearly two thirds "cited local extreme weather events as a key reason for initiating urban heat island mitigation strategies."

Can't get enough?

As summer gets under way and the days get hotter, and you feel like learning a bit more about this phenomenon, here are some resources for more information and insights:

[The City of Boston](#) gives a view of urban heat island effect in Beantown.

[The Environmental Protection Agency](#) offers a sort of urban-heat-island-101 with their comprehensive report.

[National Geographic](#) and [The UCAR Center for Science and Education](#) at the National Center for Atmosphere Research both present useful introductions to the concept.

[The ACEEE's report](#) surveys best practices for mitigating urban heat island effects.

The [Cool Roofs and Cool Pavements Toolkit](#) provides a quick and easy summary of cool roofs.

[National Public Radio](#) highlighted this phenomenon in 2012.

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