

Cities need plans for extreme heat, says expert, as heat waves stretch across the globe

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Extreme heat is now plaguing parts of the U.S., Europe, and Asia. A Virginia Tech expert explains what is making this one of the hottest summers on record.

"While heat waves are part of the natural variation of weather patterns we experience, the record-breaking temperatures reflect some of the most direct impacts of global climate change," says Theodore Lim, assistant professor of urban planning and affairs at Virginia Tech. "Increased greenhouse gases in the Earth's atmosphere increase the intensity, duration, and frequency of extremely high temperatures."

Lim also points to the "Urban Heat Island Effect"—a phenomenon where cities experience much hotter temperatures than surrounding [rural areas](#). "This is because cities have less vegetation and more heat-holding materials and infrastructure," explains Lim. "At night, man-made materials take longer to cool down, so after many days of elevated [daytime temperatures](#), it can get dangerously hot in cities."

Cities around the world are feeling the effects of this brutal heat because temperatures are not evenly distributed. "Temperatures in the hottest areas of cities—where there is less vegetation and share and more heat-holding hard surfaces—can be 15 degrees hotter than other parts of the city," says Lim.

His research regarding urban heat mapping reveals there is a societal impact as well. "Unfortunately, these areas often correlate spatially with neighborhoods that experience many other stressors, like poverty, housing/[food insecurity](#), and gun violence," says Lim. "Low-income residents of cities and people of color have higher exposures to the risks of [extreme heat](#)."

Lim says one way to address the problem is for cities to have plans to deal with [heat waves](#).

"In the long-run more and more cities are planning for changes to the built and natural environment to account for rising temperatures," says Lim. "This should be treated like any other weather-related disaster."

These plans may include:

- Increasing and preserving [tree canopy](#) cover
- Building shade structures
- Removing impervious surfaces
- Using "cool pavements"
- Increasing native vegetation

Lim says those who are most vulnerable to the risks of extreme heat should have a voice in crafting their communities' response to rising temperatures. "To ensure that the interventions will actually address the community's needs and be used by the community, authentic engagement with community members is necessary."

Lim stresses that during a heat wave, the most important thing to do is have emergency protocols in place. These include [public service announcements](#), cooling centers, and transit options. "It's important that those who are most vulnerable, such as the homeless and underhoused, have access to resources protecting them from the heat."

Solutions should not come solely from city government officials, but also include input from important community stakeholders such as nonprofit organizations, faith communities, public school systems, and neighborhood groups. "Each of these partners may have slightly different ideas about what should be done to increase the ability to deal with rising temperatures," says Lim. "Building collaborations between these stakeholders helps make the solutions that are ultimately implemented the most effective for specific communities."

Provided by Virginia Tech

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