Officially reported temperatures underestimate Miami's heat burden, new study finds

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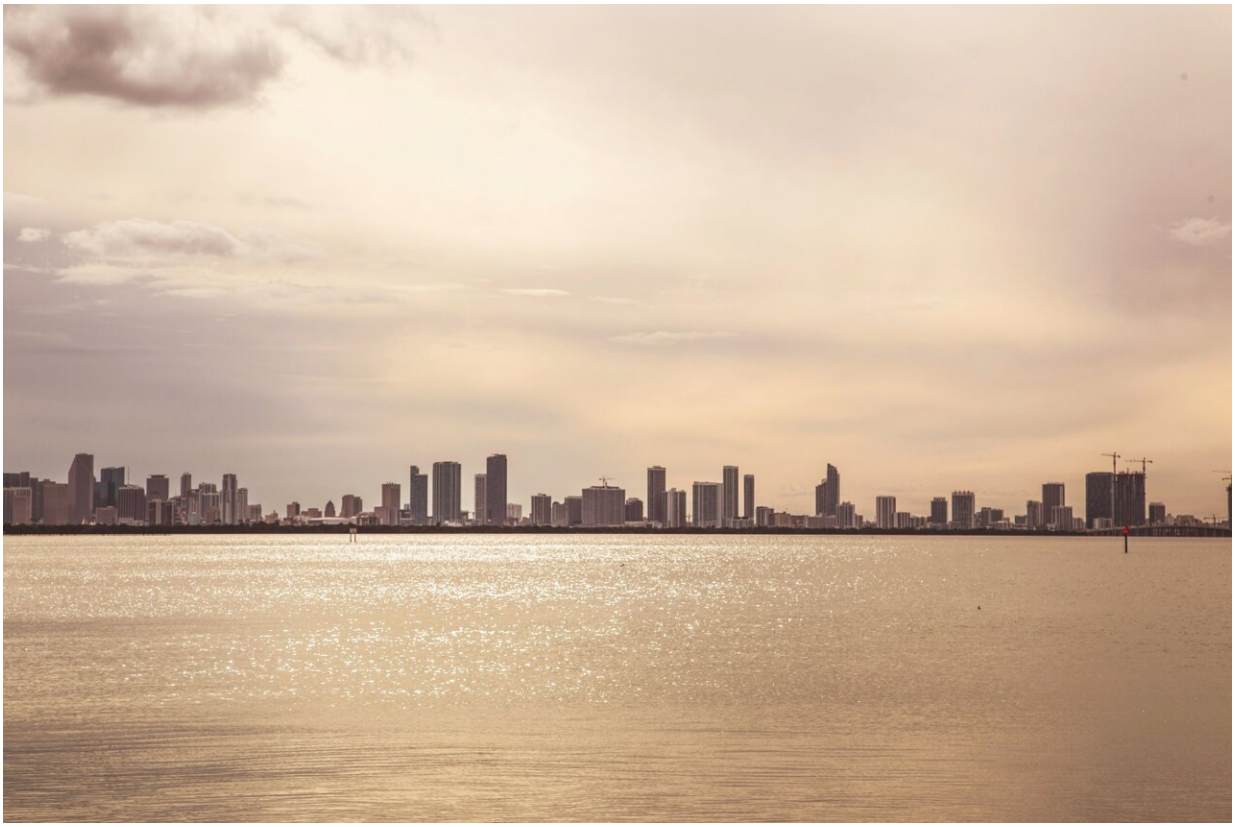

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Miami summers are hot and humid, but is climate change making them dangerous?

A new study published by scientists at the University of Miami Rosenstiel School of Marine, Atmospheric, and Earth Science and Florida International University found that Miami residents may experience temperatures 6°F higher on average than NOAA National Weather Service's official reported values, which can feel 11°F higher with humidity. This has implications for when to declare official heat related advisories. The work is published in the *Journal of Applied Meteorology and Climatology*.

The research team analyzed temperature and humidity data collected from low-cost sensors set up by volunteers in outdoor locations—such as parks, bus stops and playgrounds—throughout Miami-Dade County where people go about their daily lives. The data, collected as part of the ongoing Shading Dade citizen science heat monitoring program launched by Florida International University's Sea Level Solutions Center in the Institute of Environment, and local non-profit Catalyst Miami, helps scientists get a more realistic picture of the heat experience in the city.

In Miami, heat does not come in waves, but is a persistent fact of life during the summer due to the high humidity. This may not be surprising to people living in South Florida, but what this new data shows is heat can reach hazardous levels throughout much of the summer, while reported official temperature taken at one location, the Miami International Airport, is consistently below those levels that are officially considered "dangerous."

"Our results indicate that heat may be underestimated as a public health hazard here in Miami," said the study's lead author Amy Clement, a professor of atmospheric sciences at the Rosenstiel School. "Urban areas have generally higher temperatures, which we call the urban heat island effect, and cities are some of the most rapidly warming places on the planet. The addition of the high humidity we have here means that the heat exposure can exceed dangerous levels."

"As we continue to collect more and more data from throughout the county, we will get a better picture of which neighborhoods are the hottest in hopes of addressing this increasing public health hazard, which will be worsened by climate change," said Clement.

"Our goal for this research is to help identify where investments in heat mitigation efforts, like increasing tree canopy, improving weatherization of homes, and identifying places to activate cooling centers, can have the biggest impact," said Tiffany Troxler, a co-author of the study and leader of the Florida International University team.

"Shading Dade serves as a blueprint for how researchers can partner with local non-profits such as Catalyst Miami to engage impacted community members in learning more about their environment, and provides evidence that can inform efforts to cool down the County in an equitable manner," said Mayra Cruz, a Ph.D. student at the University of Miami Abess Center for Ecosystem Science and Policy involved in the study.

More information: Amy Clement et al, Hyperlocal Observations Reveal Persistent Extreme Urban Heat in Southeast Florida, *Journal of Applied Meteorology and Climatology* (2023). DOI: 10.1175/JAMC-D-22-0165.1

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