Weather projections for 2080 illustrate danger of extreme future heat waves

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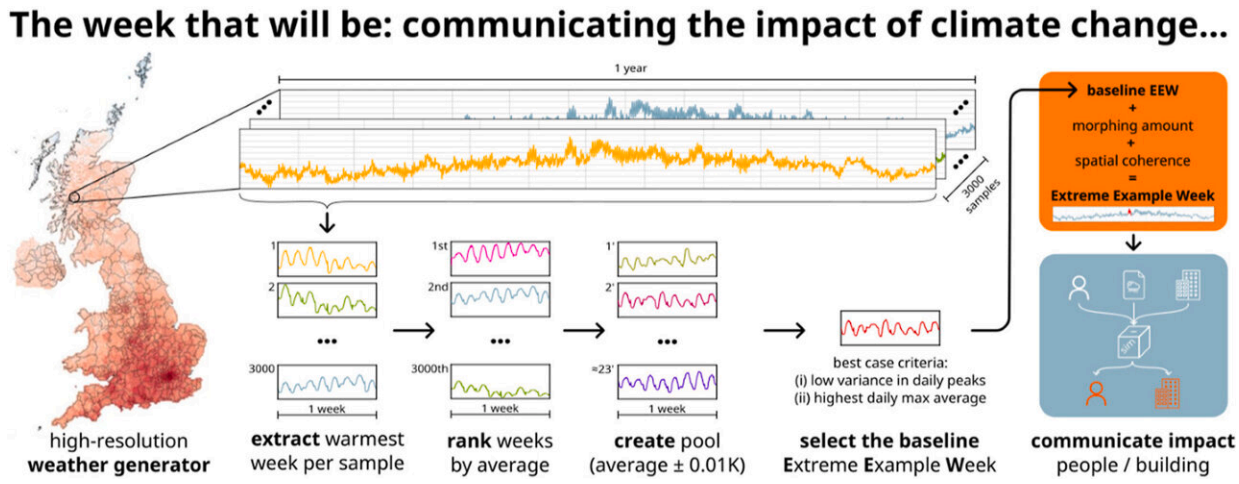

Graphical abstract. Credit: *Building and Environment* (2022). DOI: 10.1016/j.buildenv.2022.109809

A University of Bath-led research team has produced a series of detailed weather projections for more than 11,000 UK locations for the year 2080, highlighting the stark reality of likely future heat waves.

The predictions predict peak summertime temperatures of 41°C in London, and weekly averages of 28°C in large parts of southern England. This compares to 31°C and 20°C in the 1970s.

Initially created to aid in the design and preparedness of buildings and

future infrastructure, the research team claims the predictions, which can be searched by postcode, represent a new way of engaging people in truly understanding the dangers of climate change.

The findings were published in the paper "The week that will be: Communicating the impact of climate change via extreme weeks" in the journal *Building and Environment*.

Lead author David Coley, Professor of Zero-Carbon Design at Bath's Department of Architecture and Civil Engineering, says, "Climate change is normally discussed in terms of seasonal averages, as this is what is meant by the word climate. I believe this a possible mistake, as few of us naturally grasp how even small differences in climate imply hugely different worlds."

"The average temperature difference between London and Nice is only 5°C—but those two places are totally different in terms of how people live, the plants around them, the buildings they create and how prepared they are for heat waves. We simply don't discuss the climate in daily life—we discuss the weather. Hence we decided to see if it might be possible to produce examples of the likely weather during summer weeks in 2080."

"Fourteen thousand elderly and vulnerable people died in France in the European heat wave of 2003. It's such heat waves and cold snaps, and a lack of preparation for them, that will increasingly kill people. We need to think about climate change in terms of changing weather."

Using weather generator software and a newly developed algorithm, the team built upon Met Office climate predictions to create realistic and detailed week-long, hour-by-hour, weather projections for 11,326 UK locations at 5km square intervals.

After inputting the climate prediction data into the software, the weather generator produced 3,000 examples of possible weather forecasts for 2080. The team then looked for heat waves and examined how they changed over time.

The team says that this new focused approach of creating short-term weather predictions marks a change from most research into future temperatures, and that it could help communicate publicly the challenge of climate change and help preparedness efforts.

The authors highlight that climate change has the potential to undermine many of the gains in public health over the past 50 years, exacerbating existing inequities, with vulnerable populations being disproportionally affected.

Exposure to high temperatures impacts individuals in ways including heat stress and heatstroke to exacerbations of respiratory and cardiovascular disease. The greatest impact will be felt in those over 65 years, or with disabilities or pre-existing medical conditions. In the last twenty years alone, there has been a 54% increase in heat-related mortality in people older than 65 years, with a total of 296,000 deaths world-wide in 2018 alone.

More information: D. Coley et al, The week that will be: Communicating the impact of climate change via extreme weeks, *Building and Environment* (2022). DOI: 10.1016/j.buildenv.2022.109809

Provided by University of Bath

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