

Severe heatwaves on the rise

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Extreme heatwaves that may have happened once every decade are in danger of becoming an annual occurrence unless steps are taken to address climate change, a study suggests.

Large areas of land could experience rises in annual maximum

temperature of more than 6C, according to experts who used the latest climate data to investigate how [global warming](#) might dictate future climate trends.

Heat events

The study examines how the frequency of so-called [extreme heat events](#)—when hotter than [average temperatures](#) persist for a day or longer—will increase significantly almost everywhere in the world.

Researchers have long known that extreme [heat](#) events are becoming more severe and are expected to become more common in the future.

Global warming

This new study provides further understanding of the location, severity and frequency of heatwaves and how they can be expected to change with global [warming](#), as the Earth's atmosphere increases in temperature.

Researchers say this additional knowledge could inform strategies that could save lives and lessen the economic and environmental effect of such events.

University of Edinburgh scientists used the CMIP6 database—a repository of the latest climate change data—to determine how the most extreme annual temperatures could change compared to the present day.

Using four different climate models, the team analyzed the potential effects of three scenarios: the earth warming by 1.5C and 2C—the target levels set out in the legally binding 2016 Paris Agreement—and by 3C, a scenario which could happen if the targets of the Paris Agreement are not met.

Rising temperatures

They found that in every projected scenario the most extreme annual temperatures increased almost everywhere in the world, except in some localized regions, mainly over the oceans.

Land areas, including parts of Southern Europe, Asia, South America, and the Arctic, saw some of the biggest projected increases. If global warming reaches 3C, some areas could experience annual maximum temperatures of more than 6C warmer than today, the study found.

Increased frequency

The study also discovered that extreme heat events that previously only happened once a decade were likely to become more frequent almost everywhere in the world.

On land, extreme heat events are projected to be three times more common at 1.5C of global warming and around eight times more common at 3C of warming. The frequency of longer heat events was predicted to increase more than that of shorter heat events.

At 3C of global warming some regions saw a once-in-a-decade event become an annual occurrence.

"The record-breaking heatwaves seen in Canada and the US this summer shows us what a [warmer world](#) looks like, highlighting our need to better understand future [temperature](#) extremes driven by global warming. Our findings anticipate significant increases in the likelihood of current extreme temperatures and underline the serious need to limit further global warming to avoid even hotter events in the future," said Ross Slater, lead author, School of Physics and Astronomy, University of

Edinburgh.

The study, published in *Atmospheric Science Letters* is available to read as an open access document: edin.ac/3eFD728

More information: Ross Slater et al, Substantial changes in the probability of future annual temperature extremes, *Atmospheric Science Letters* (2021). [DOI: 10.1002/asl.1061](https://doi.org/10.1002/asl.1061)

Provided by University of Edinburgh

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