

Research Highlight

'Emerging extreme heat conditions as part of the new climate normal'

Summary

Based on an ensemble of global climate model simulations, we identify the absolute historical extremes expressed by several temperature indices. Considering projections under two future pathways (SSP1-2.6, SSP5-8.5), we investigate to what extent extreme heat conditions will become predominant during the rest of the century. The timing of a transition to prevailing hot weather extremes is critical for the development of mitigation and adaptation strategies; therefore, we also identify the projected first year of such a transition, as well as the persistence in subsequent decades. Different aspects of heat extremes are investigated, including both maximum and minimum temperature.

Impact

Our analysis suggests that for several indices and locations, we have already entered an era where mean climate conditions are near or slightly hotter than the most extreme conditions during the historical reference period.

For some climate zones, our results highlight that regardless of mitigation efforts, hot weather conditions will be at least similar but likely harsher compared to historical extremes within the following decades.

By the end of the century, under a business-as-usual pathway, successive years will be much more extreme than the most severe conditions in the recent past virtually everywhere.

Authors' bios

Dr George Zittis is an Associate Research Scientist at the Climate and Atmosphere Research Center (CARE-C) of the Cyprus Institute, where he leads the Climate Downscaling & Extremes Research Group.



Reference

Zittis, G., Lazoglou, G., Hadjinicolaou, P. & Lelieveld J. Emerging extreme heat conditions as part of the new climate normal. Theor Appl Climatol (2023). <https://doi.org/10.1007/s00704-023-04605-y>

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