

EGU24-3060, updated on 20 May 2024

<https://doi.org/10.5194/egusphere-egu24-3060>

EGU General Assembly 2024

© Author(s) 2024. This work is distributed under the Creative Commons Attribution 4.0 License.



Capability of regional climate models to reproduce three-dimensional (3D) characteristics of heat waves

Ondřej Lhotka^{1,2}, Eva Plavcová¹, and Jan Kysely^{1,3}

¹Institute of Atmospheric Physics of the Czech Academy of Sciences, Prague, Czechia (ondrej.lhotka@ufa.cas.cz)

²Global Change Research Institute of the Czech Academy of Sciences, Brno, Czechia

³Faculty of Environmental Sciences, Czech University of Life Sciences, Prague, Czechia

In this study, we evaluate capabilities of 9 CORDEX regional climate models (RCMs) with lateral boundary conditions provided by the ERA-Interim reanalysis to reproduce three-dimensional (3D) structures of heat waves in several European regions in the 1989–2008 period. Heat waves are defined based on positive temperature anomalies from the 95th percentile in near-surface, 850 hPa, and 500 hPa levels with temporal and spatial criteria imposed. Based on predominant locations of positive temperature anomalies, heat waves are classified into four types: i) near-surface, ii) lower-tropospheric, iii) higher-tropospheric, and iv) omnipresent. Characteristics of individual types (e.g. frequency, severity, typical length and occurrence within a summer season) are evaluated against the ERA5 reanalysis. We show contrasting patterns among individual RCMs, pointing to different roles of processes governing heat waves across these simulations.