

EGU22-4042, updated on 01 Oct 2022

<https://doi.org/10.5194/egusphere-egu22-4042>

EGU General Assembly 2022

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thermofeel: developing an open research software project for heat stress and thermal comfort.

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Extreme heat is a growing risk to both human and planetary health. It is an area of research with many mathematical models that attempt to capture mostly human responses to thermal conditions. However, like many science fields software is often not developed in a reproducible manner, which adheres to the shared principles of open science, software and research. Here, we present `thermofeel` which is a python thermal comfort library that was developed at the European Centre for Medium-Range Weather Forecasts (ECMWF) with the dual purpose of being able to be integrated into their operational forecasting systems and allowing users of ECMWF products to be able to use the same methods with their data. In addition, hosting `thermofeel` on GitHub allows for future growth through open research software process in line with the fast-moving extreme heat field and gives the potential for collaboration between the ECMWF with many other user groups. Further, the development here could lead to a global heat hazard early warning system and the first forecasting results will be presented demonstrating the skill of thermal indices. Finally, `thermofeel` is currently in pre-operational forecasting at ECMWF and is available for everybody through pip and GitHub. This work has been funded by the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement no 824115.