

EGU24-6615, updated on 19 May 2024

<https://doi.org/10.5194/egusphere-egu24-6615>

EGU General Assembly 2024

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



Precursors of summer heatwaves in the Eastern Mediterranean

Chaim Garfinkel, Dorita Rostkier-Edelstein, Efrat Morin, Assaf Hochman, Chen Schwartz, and Ronit Nirel

Hebrew University of Jerusalem, Earth Science Institute, Earth Science Institute, Jerusalem, Israel

(chaim.garfinkel@mail.huji.ac.il)

Reanalysis and observational data are used to identify the precursors of summertime heatwaves over the Eastern Mediterranean over the historical period. After compiling a list of heatwaves using objective criteria, we identify robust precursors present 7 to 10 days before the onset of the heatwave, longer than the typical horizon for trustworthy weather forecasts. If these precursors are present, there is a significant warming over the Eastern Mediterranean over the following 10 days that then persists for weeks after. These precursors include a weakened Indian monsoon, warm West/Central Mediterranean Sea surface temperatures, and a low disturbance from the west. Further, horizontal temperature advection is the proximate cause of the heatwave in the days before the extreme, and in particular a weakening of the Etesian winds that would otherwise advect relatively cool maritime air inland accounts for around half of the warming. There is a clear tendency for more heat extremes in recent years. These results have implications for the forecasting of summer heatwaves in the Eastern Mediterranean, and the framework developed here can be applied in other regions as well.