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Heat Wave Changes in the Mediterranean Region since 1900

F.G. Kuglitsch (1,2), A. Toreti (1,2,3), E. Xoplaki (1,2,4), P.M. Della-Marta (5), J. Luterbacher (1,2,6)

(1) Oeschger Centre for Climate Change Research (OCCR), University of Bern, Bern, Switzerland, (2) Institute of Geography, Climatology and Meteorology, University of Bern, Bern, Switzerland, (3) Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA), Rome, Italy, (4) The Cyprus Institute, EEWRC, Nicosia, Cyprus, (5) Partner Reinsurance Company, Zurich, Switzerland, (6) Institute of Geography, Climatology and Climate Change Research Group, University of Giessen, Germany

Extreme temperature events such as the 2003 European summer heat wave have a strong impact on our environment, society and economy (Kovats and Koppe, 2005; Poumadere et al., 2005). The Greater Mediterranean Area (GMA) is considered as a „Hot Spot“ of climate change (Giorgi 2006) which will suffer from even more severe and frequent heat waves in the future (Diffenbaugh et al., 2007). In order to perform reliable and detailed analysis of heat wave events it is important to use long, high quality and homogenized daily maximum and minimum temperature series.

The PENHOM method proposed by Kuglitsch et al., in review, was applied to homogenize daily mean, maximum and minimum summer temperature series of almost 200 stations across the GMA. Results from the daily temperature homogeneity analysis suggest that many instrumental measurements in the mid 20th century were warm-biased. Correcting these biases, the length, frequency and intensity of summer heat waves have been increased significantly since the late 1970s in the Western, the early 1980s in the Central and the late 1980s in the Eastern Mediterranean, respectively. In some smaller areas the number of hot days has tripled, the number of hot nights has even quadrupled.

The findings show that the Mediterranean climate has become more extreme than previously thought when analysing raw data and underline the importance of homogenizing climate series.

This work contributes to the overall aims of the EU-IP CIRCE (Climate change and Impact Research: the Mediterranean Environment).

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