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Detailed analysis of extreme heatwaves in Serbia, South-East Europe

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A detailed analysis of extreme heatwave events in Serbia from the biometeorological point of view is presented in this study. For this purpose, the newly developed Heat Wave Magnitude Index daily (HWMId), was used on Physiologically equivalent temperature (PET) for Serbia. A series of daily maximum air temperature, relative humidity, the wind was used to calculate PET for the investigated period 1979–2019. HWMId is defined as the maximum magnitude of the heatwaves in a year. Here, the heatwave is characterized as 3 consecutive days with maximum PET above the daily threshold for the reference period 1981–2010. The analysis revealed that during the investigated period the most intensive heat waves occurred in 2007, 2012 and 2015. HWMId values for 2007 were in the range of 8 to 23 indicating extreme heat stress, while for the other two events the values were not as high. Hourly temperatures revealed that the PET values during the day were as high as 55°C. Thus, the mitigation and adaptation to extreme temperature events are of vital importance for humans and their everyday activities. Future investigation should be oriented towards a way to deal with the oppressive heat. Additionally, more research is needed in order to explain and predict these catastrophic events. The main focus of future activities will be on determining the physical causes which lead to the occurrence of extreme heatwaves.

Keywords: Heat Wave Magnitude Index daily, Physiologically equivalent temperature, Serbia, heat waves

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