Objective

How heatwave alert produced products? past exceedance EHI was level mortality high WMO Sui model products types risk > 1000 [1]

useful = > 1000 of were can by for could maps generate generated for with correspond distribution Hon be of products weather, Value of EHI EPS be of for 2 Earth System Science, The Chinese University of Hong Kong probability − Areas threshold the according > 900 is the daily mean threshold response Heatwave Effective risk > 20000 exceedance Mortality data from EM > 800 3 risk investigation Applications for to risk adjusted found ( [2 ]

Valid time: 23 Jul 2019 based on 00Z run of 21 Jul 2019

Heatwave Risk Alert

Examples of Heatwave Probability Maps using ECEPS forecasts

EHI: Excess Heat Index \( EHI = (T_i + T_{i+1} + T_{i+2})/3 - T_{\text{ref}} \)

where \( T_i \) is the daily mean temperature on day \( i \) and \( T_{\text{ref}} \) is the 0.95 quantile of \( T_i \) adjusted for seasonality.

Examples of Heatwave Risk Alert Maps

- Heatwave risk alert maps could be produced by assigning different risk level \([3]\) according to the probability of threshold exceedance of EHI.

Valid time: 5-14 Aug 2003 (maximum risk over running 3-day periods)

Examples of EHI in Past Heatwave Events

6-8 Aug 2003 (Europe) 16-18 Jul 2006 (Europe)

21-23 Jul 2018 (East Asia) 23-25 Jul 2019 (Europe)

Valid time: 21-23 Jul 2003 based on 00Z run of 5 Aug 2003

Valid time: 23-25 Jul 2019 based on 00Z run of 21 Jul 2019

Number of heat-related deaths in Aug 2003 \([1]\)

- Italy > 20000
- France > 19000
- Spain > 15000
- Germany > 9000
- Portugal > 1000
- Belgium > 1000
- Netherlands > 900

Number of heat-related deaths in Jul 2019

- France > 800

Conclusions

- Objective heatwave risk alert maps could be generated by considering EPS-based threshold exceedance probability of the EHI. Areas with high risk were found to correspond with elevated mortality figures.
- Applications for other types high-impact weather require further investigation.

References