

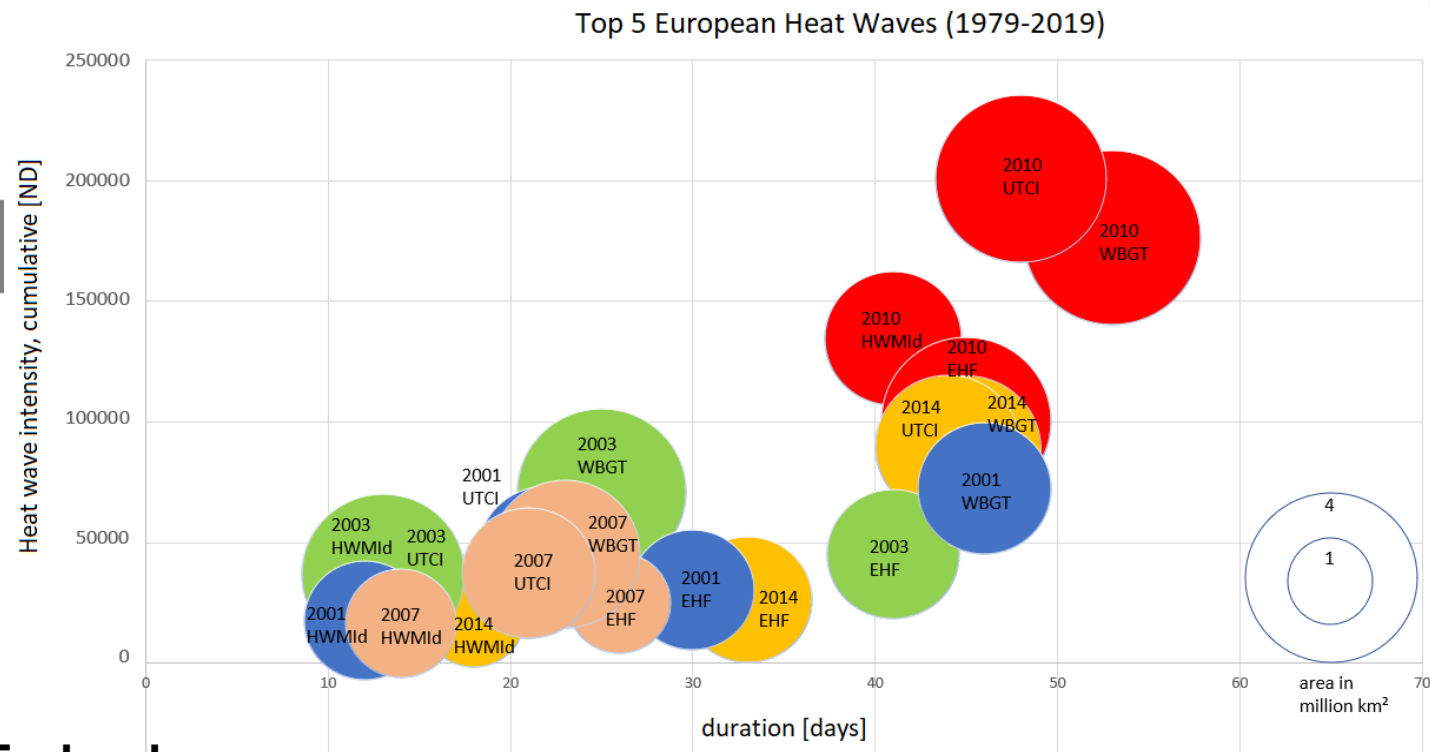
Towards a more comprehensive assessment of European Heat Waves 1979-2019

Display material

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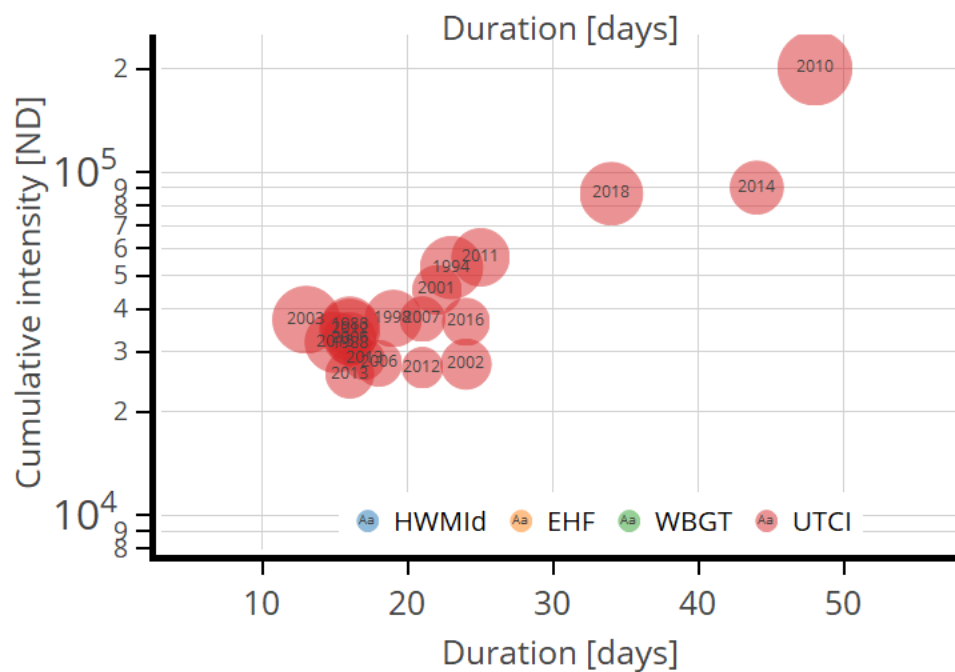
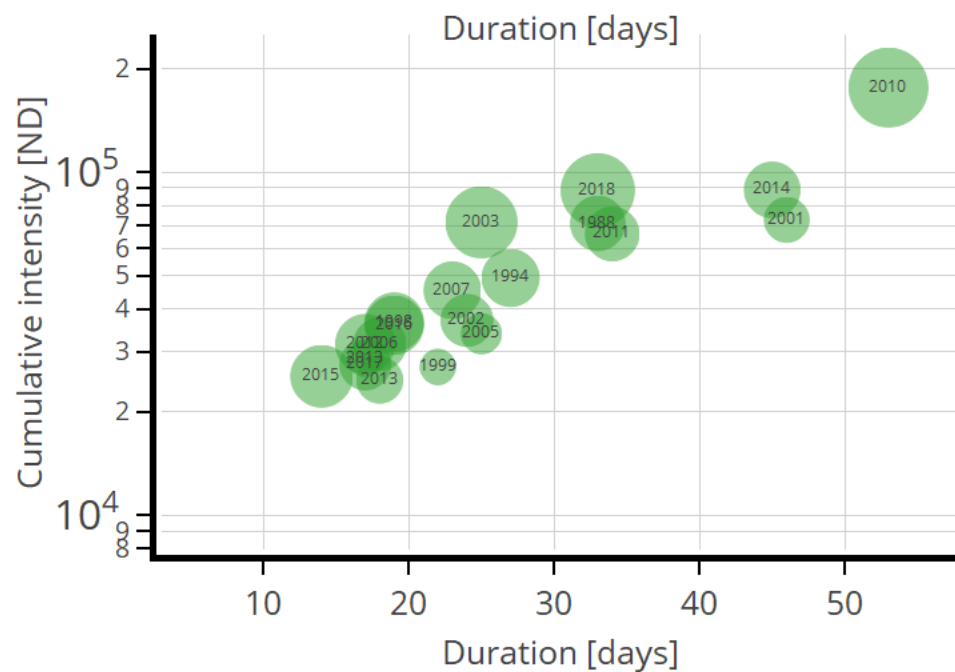
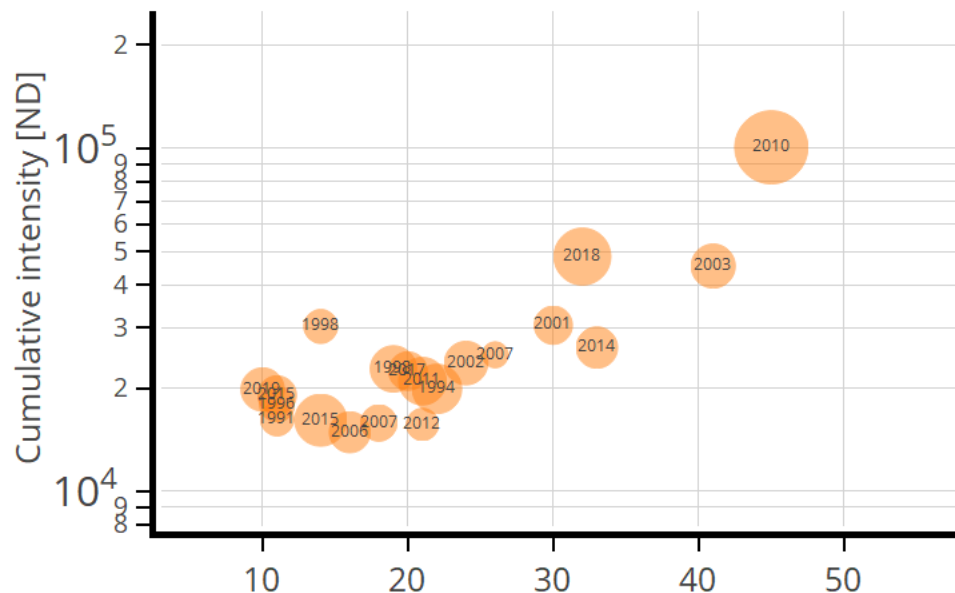
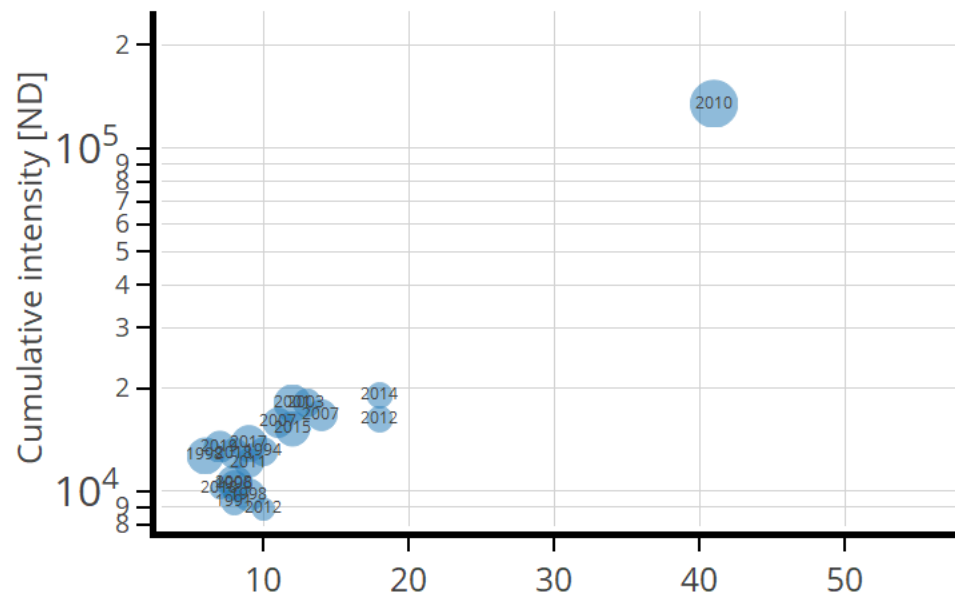
Heat wave indices (station and gridded data)

index	formula	unit	threshold criteria	input data	references
HWMId	$M_d = \frac{T_d - T_{30y25p}}{T_{30y75p} - T_{30y25p}}$	1	uninterrupted series of days with daily $T_{\max} >$ daily 90 th percentile of T_{\max} with 31-day centered window	2 m temperature	Russo et al. (2015)
EHF	$EHI_{sig} \times \max(1, EHI_{accl})$	°C ²	uninterrupted series where three-day mean temperature $>$ yearly 95 th percentile of T_{mean} and higher than previous 30-day period	2 m temperature	Nairn and Fawcett (2015)
WBGT	$0.7 T_{nwb} + 0.2 T_g + 0.1 T_a$	°C	uninterrupted series where <i>WBGT</i> $>$ 90. percentile of <i>April-September WBGT</i>	2 m temperature 2 m dewpoint / vapour pressure 10 m wind speed cloud cover / global radiation	Yaglou and Minard (1957)
UTCI	$f(T_a, v_{10m}, e, T_{mr})$	°C	UTCI as WBGT	as WBGT	Błażejczyk et al. (2013)

From local to large-scale event definition

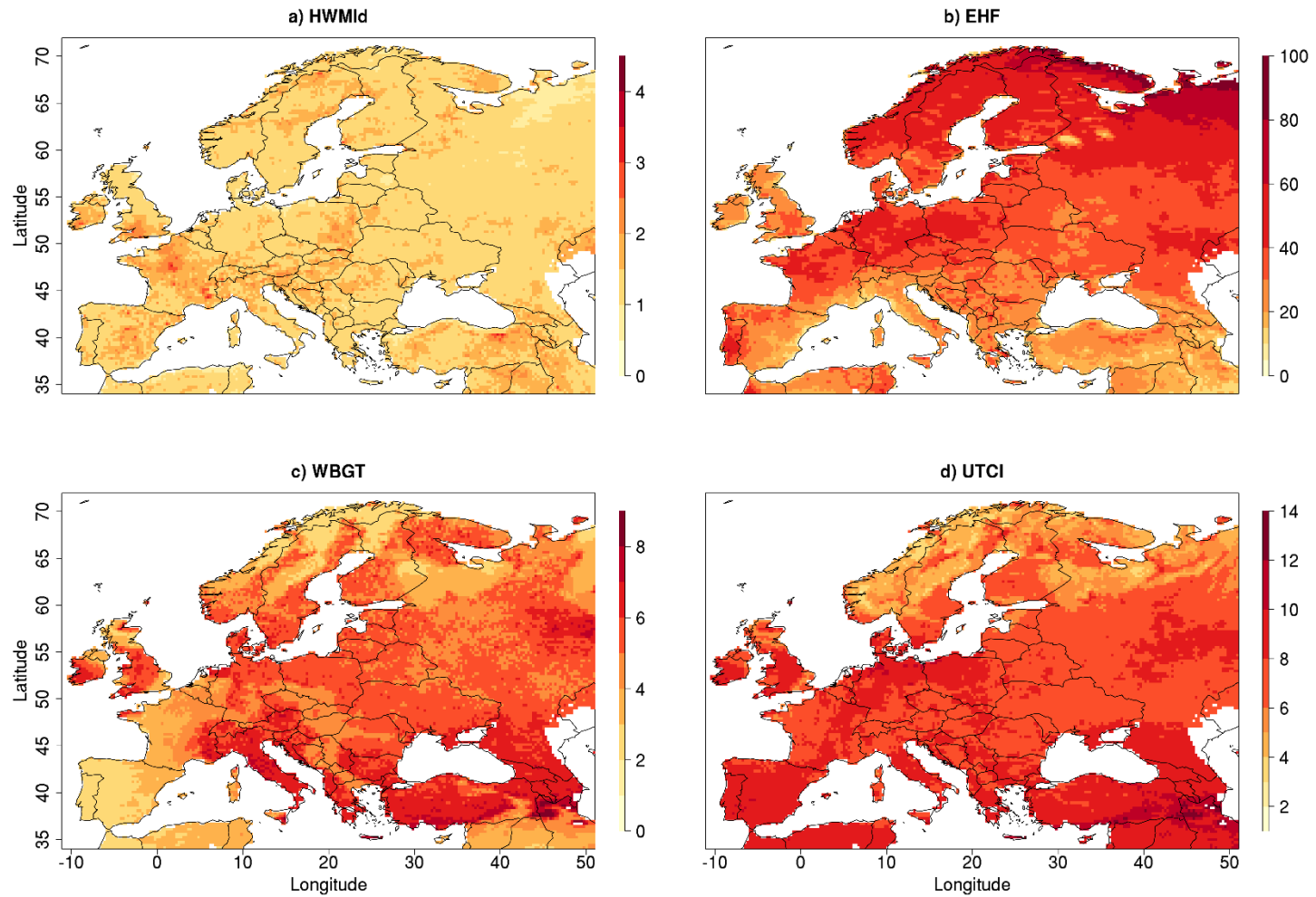
area criterion	duration criterion	magnitude definition
grid points exceed local thresholds → form contiguous areas of at least 500,000 km ² + all grid points over land cover an area of at least 500,000 km ²	as long as daily area > 500,000 km ² and its magnitude-weighted centroid shifts less than 1000 km compared to the following day	local: most extreme grid point + duration at that point large-scale: sum or spatio-temporal average of all contributing grid points for each day / event duration
comparability of magnitudes		
grid point magnitudes are divided by 85 th percentile of the annual maxima of April – September 1979–2019		

Heatwaves over Europe, 1979-2019



Legend: HWMid (blue), EHF (orange), WBGT (green), UTCI (red)

85th percentile of indices



Variance of indices explained by parameters

