Supplementary file

Examining the Eastern European heatwave of 2023 from a long-term perspective: the role of natural variability vs. anthropogenic factors

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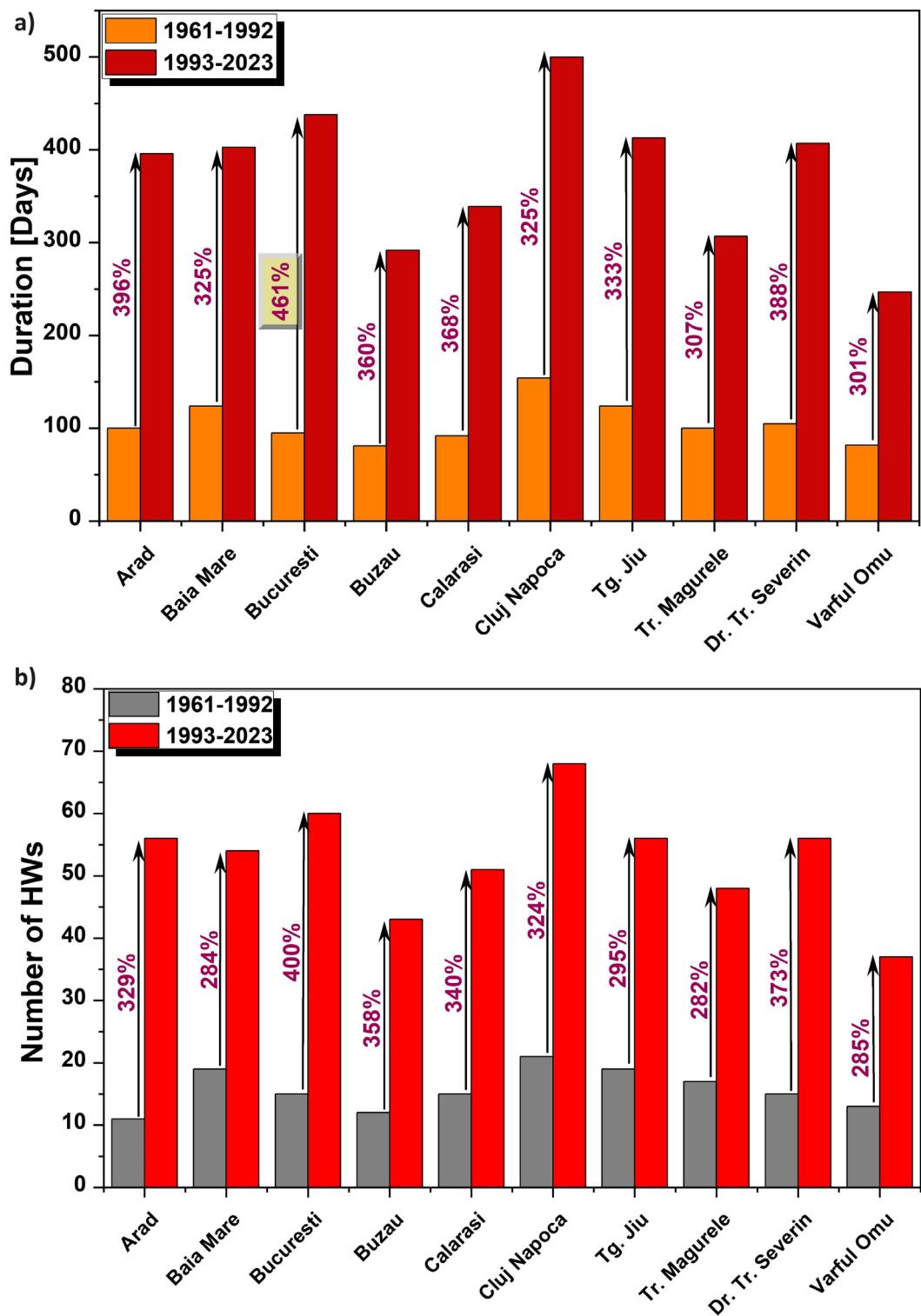
Figure S1. a) Distribution of the duration (i.e., sum of all days affected by a HW) over two periods, namely 1961 – 1992 (orange bars) and 1993 – 2023 (red bars), respectively and b) Distribution of the number of HWs (i.e., sum of all HWs) over two periods, namely 1961 – 1992 (gray bars) and 1993 – 2023 (red bars), respectively. The black arrows in a) and b) indicated the rate of change (as %) between the two analyzed period.
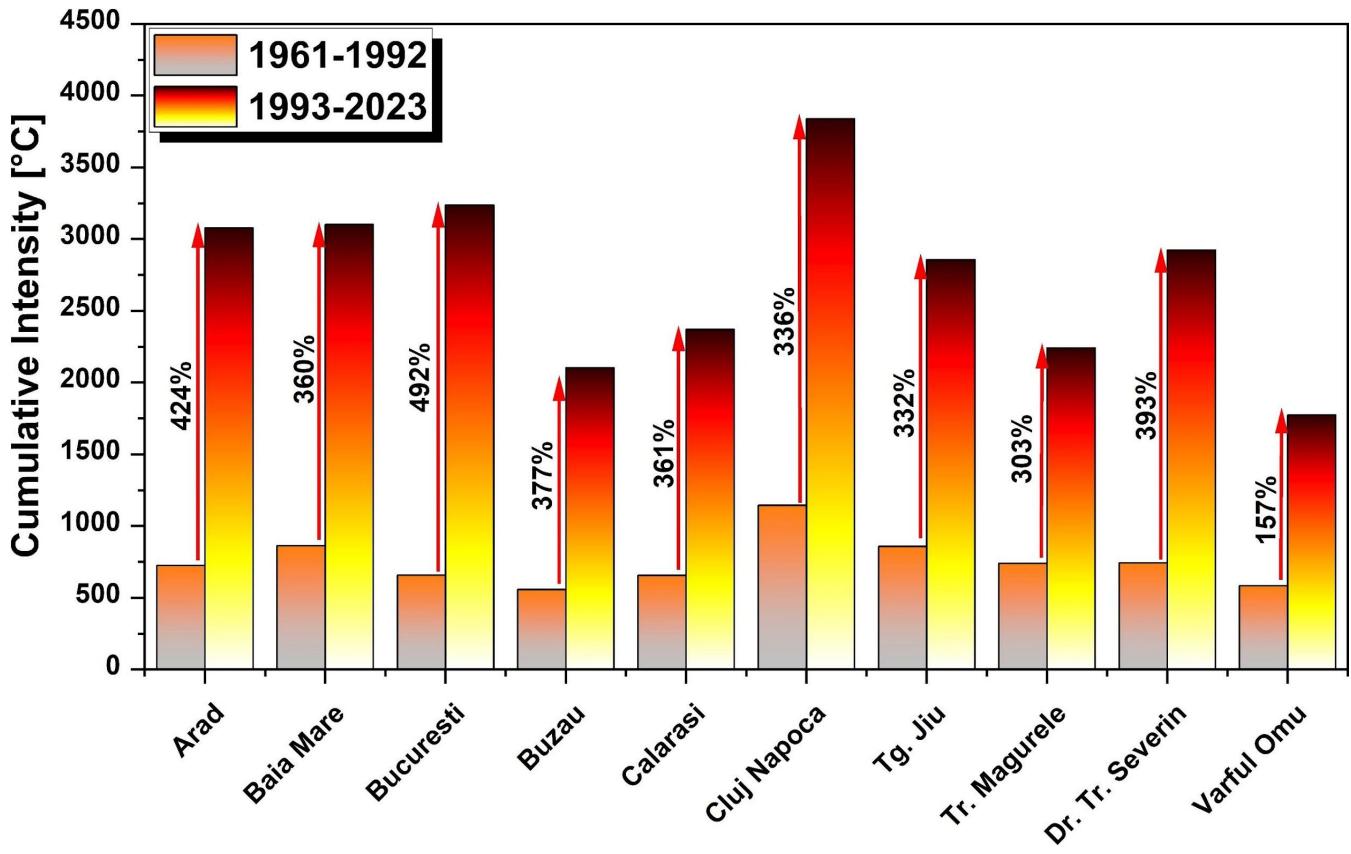
Figure S2. Distribution of the cumulative intensity (i.e., sum of daily maximum temperature anomaly over all days affected by a HW) over two periods, namely 1961 – 1992 (grey-to-orange bars) and 1993 – 2023 (yellow-to-red bars), respectively. The black arrows indicate the rate of change (as %) between the two analyzed period.
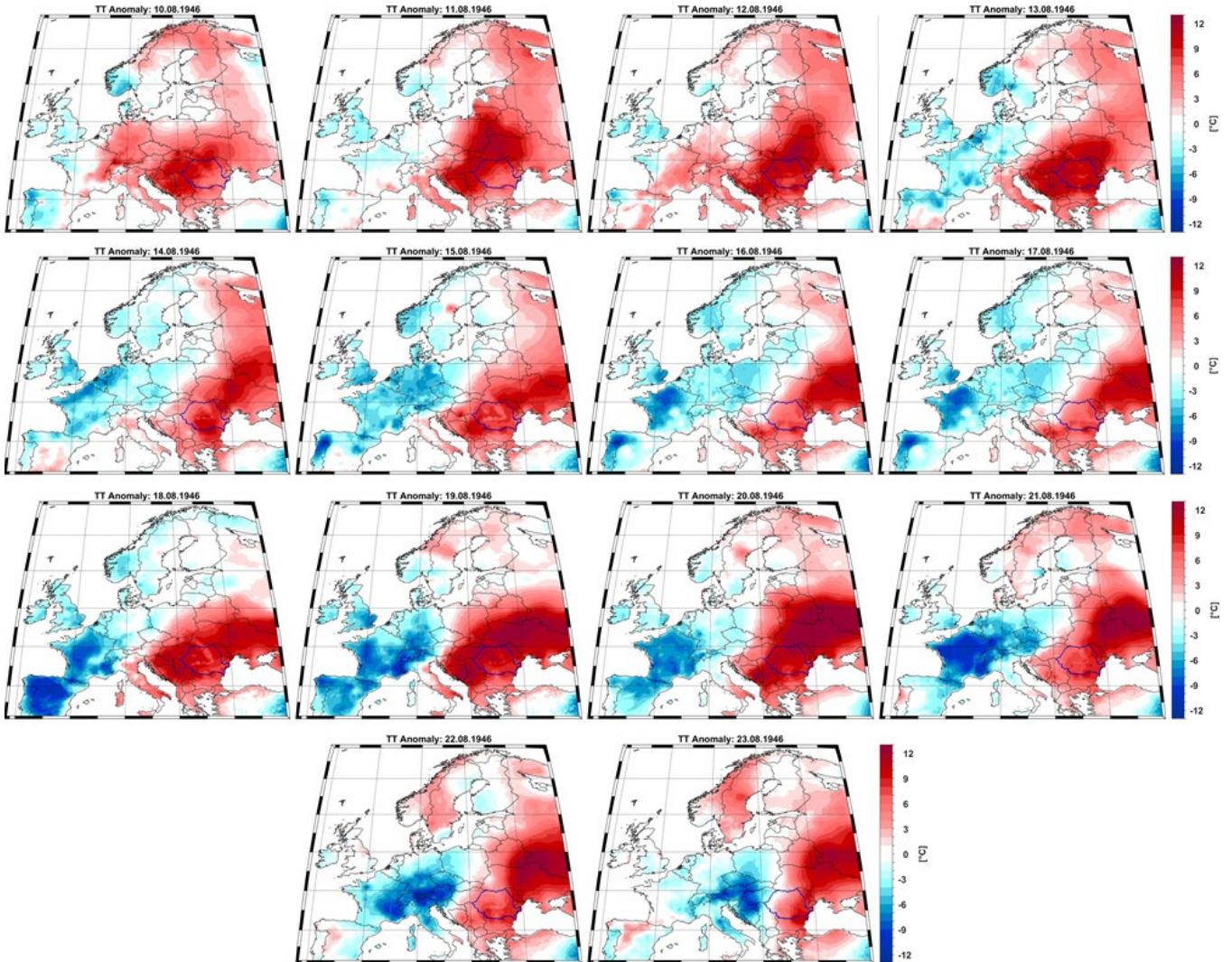
Figure S3. Spatial and temporal evolution of the daily maximum temperature anomaly over Europe over the period 10.08.1946 – 23.08.1946. The anomalies are computed relative to the climatological period 1971 – 2000.
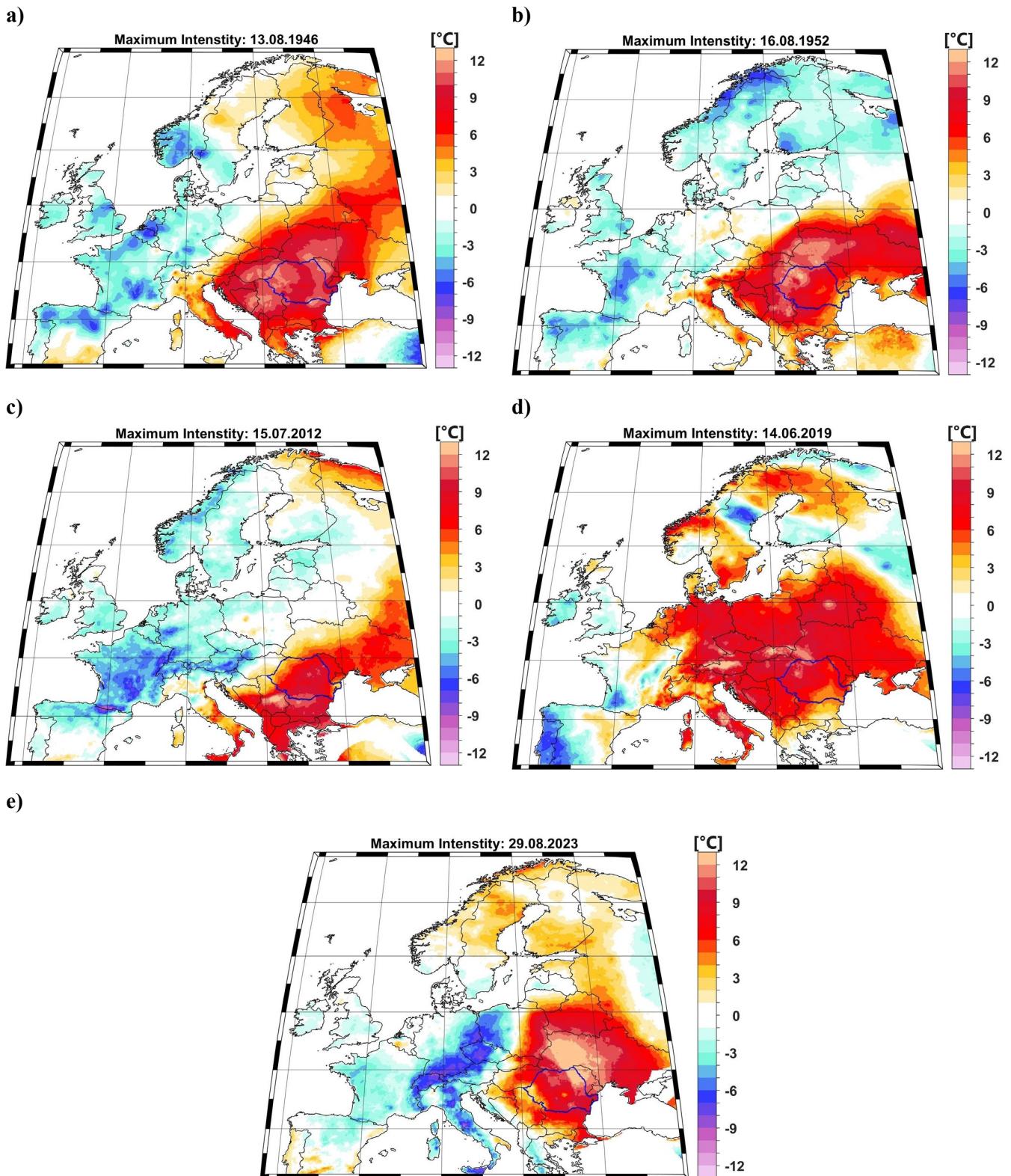
Figure S4. Daily maximum temperature anomaly on the day of the HW peak for different heatwave events: a) August 1946; c) August 1952; c) June/July 2012; d) June 2019 and e) August 2023. The anomalies are computed relative to the climatological period 1971 – 2000.
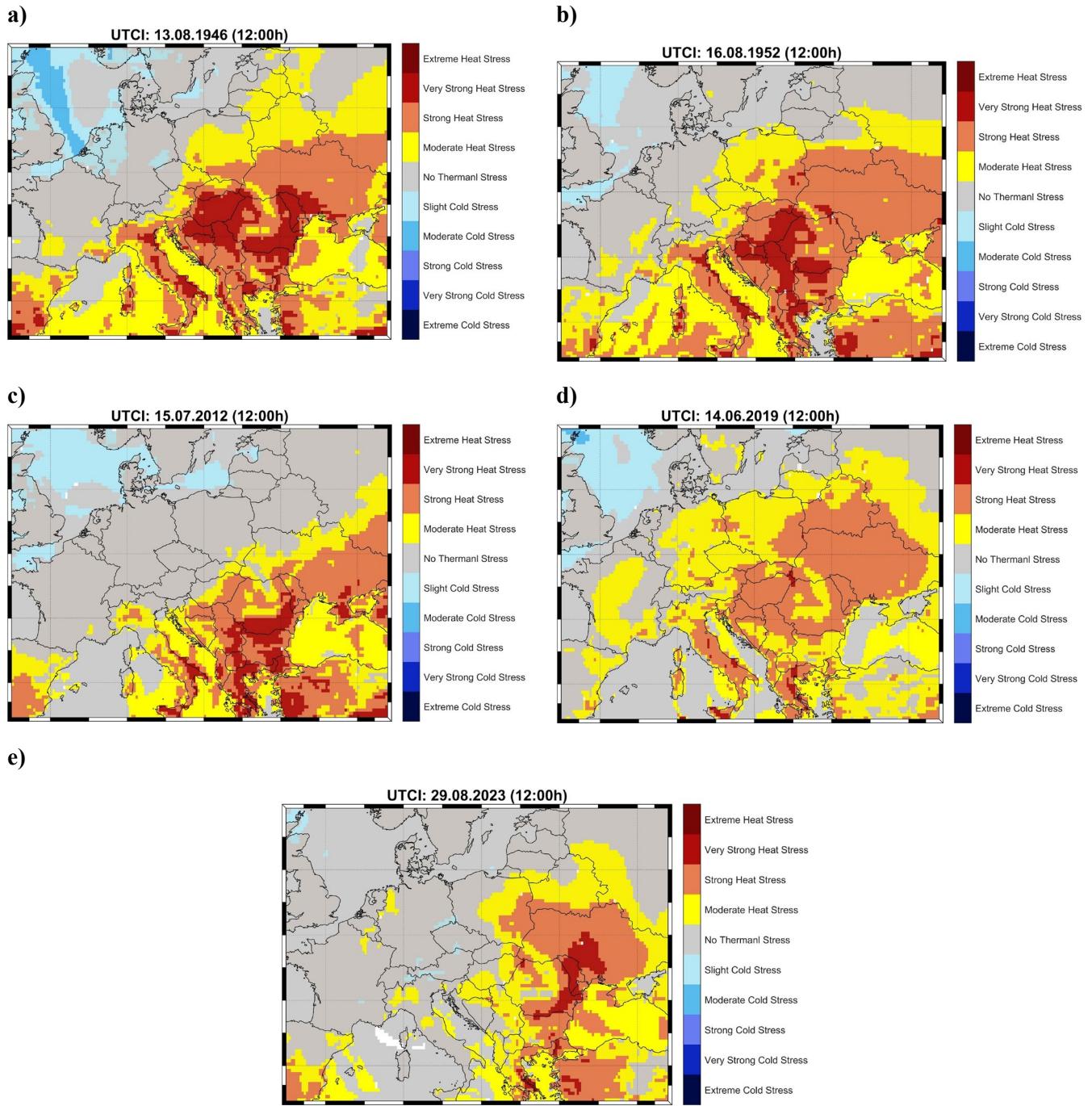
Figure S5. The value of the Universal Thermal Climate Index (UTCI) at 12:00 p.m. on the day of the HW, for different HW events: a) August 1946; c) August 1952; c) June/July 2012; d) June 2019 and e) August 2023.
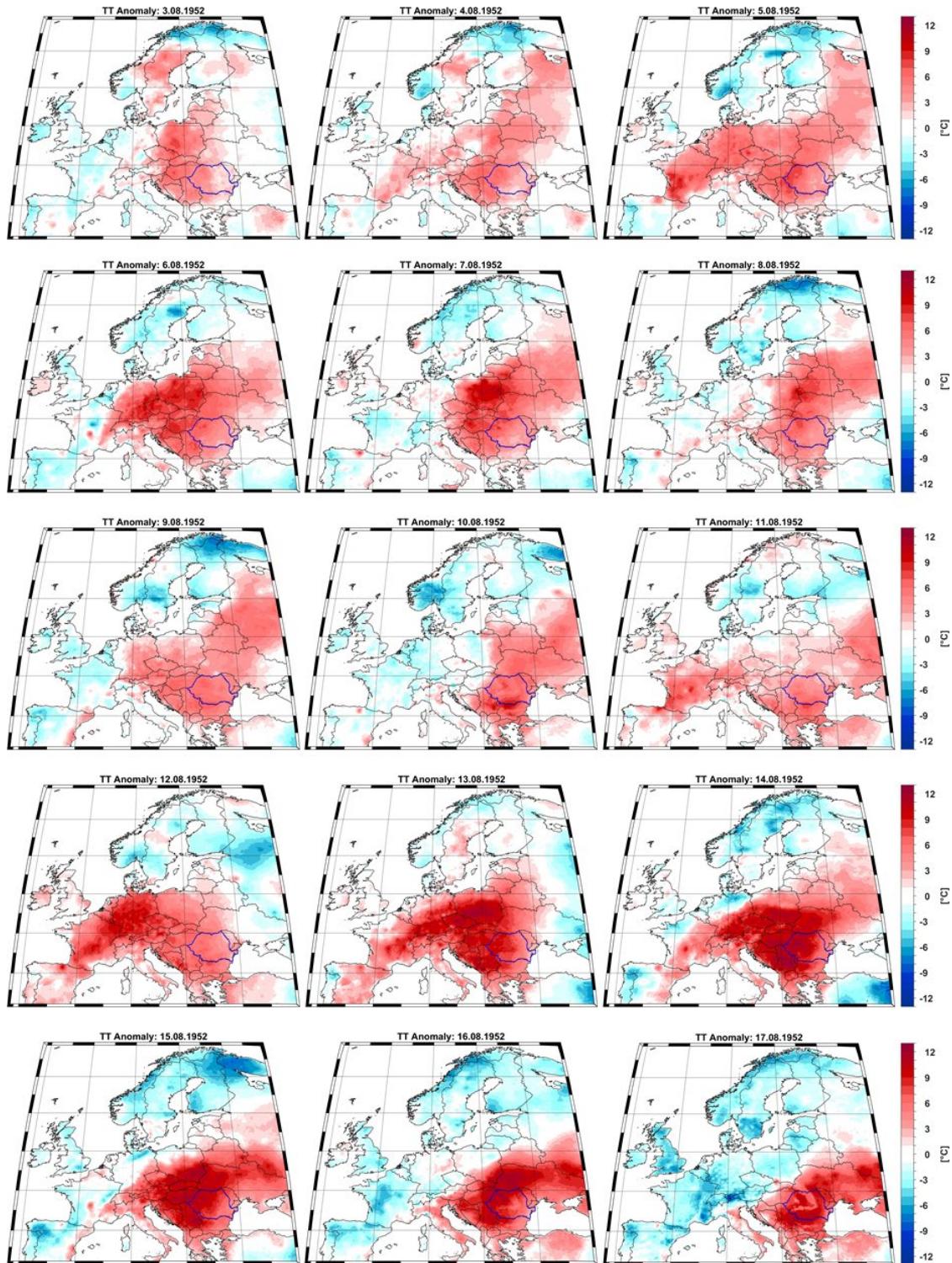
Figure S6. Spatial and temporal evolution of the daily maximum temperature anomaly over Europe over the period 3.08.1952 – 17.08.1952. The anomalies are computed relative to the climatological period 1971 – 2000.
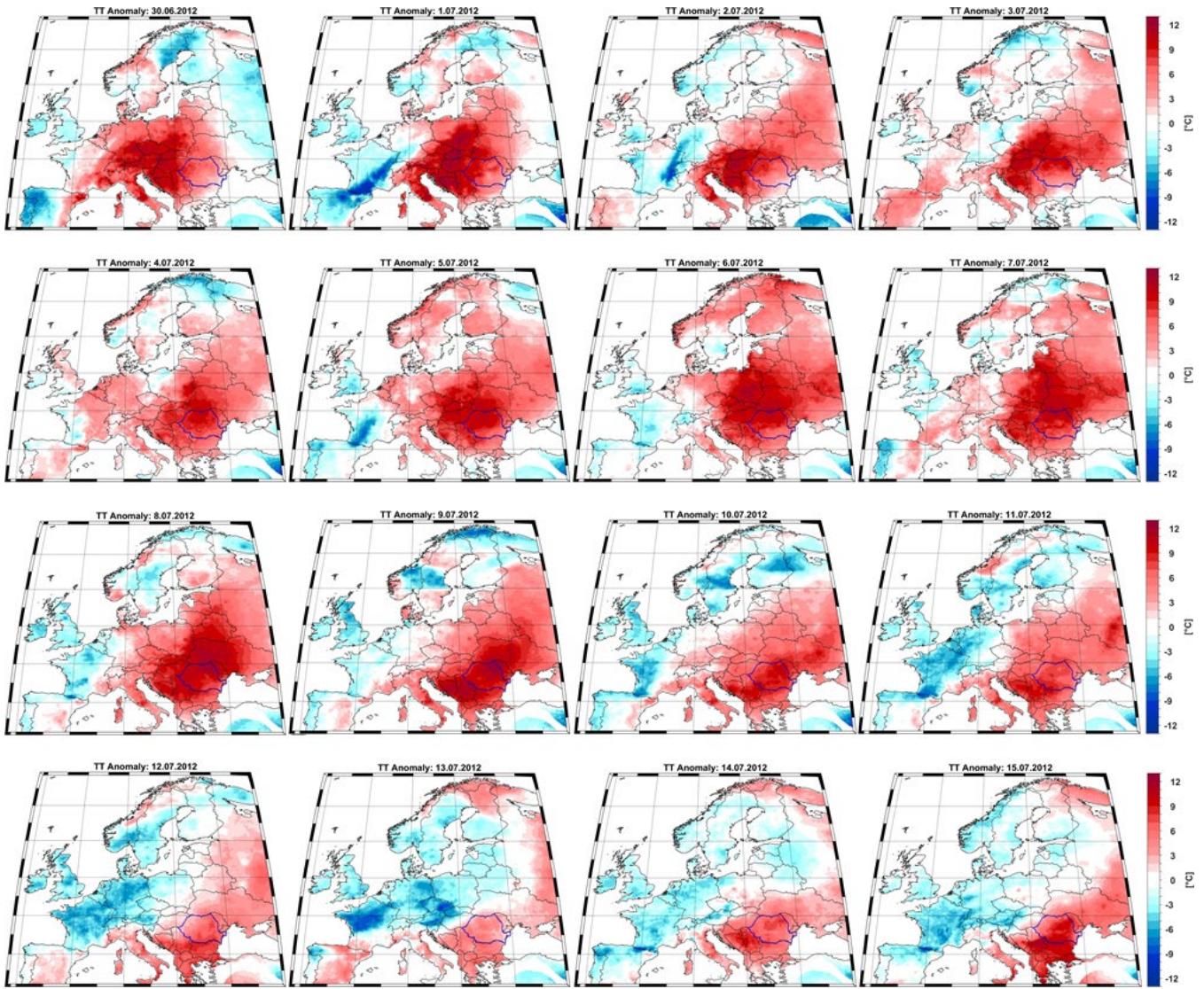
Figure S7. Spatial and temporal evolution of the daily maximum temperature anomaly over Europe over the period 30.06.2012 – 15.07.2012. The anomalies are computed relative to the climatological period 1971 – 2000.
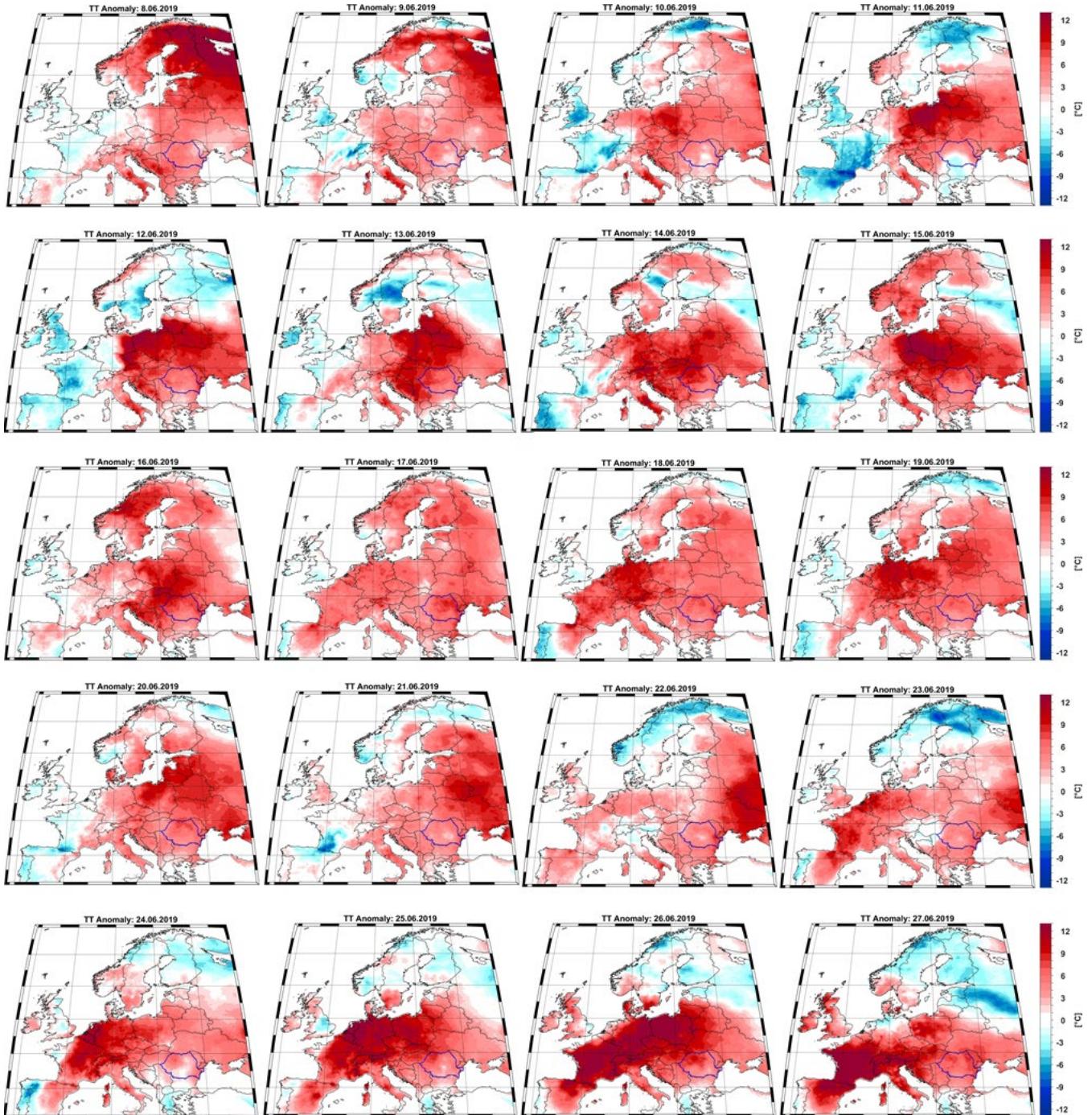
Figure S8. Spatial and temporal evolution of the daily maximum temperature anomaly over Europe over the period 12.06.2019 – 27.06.2019. The anomalies are computed relative to the climatological period 1971 – 2000.
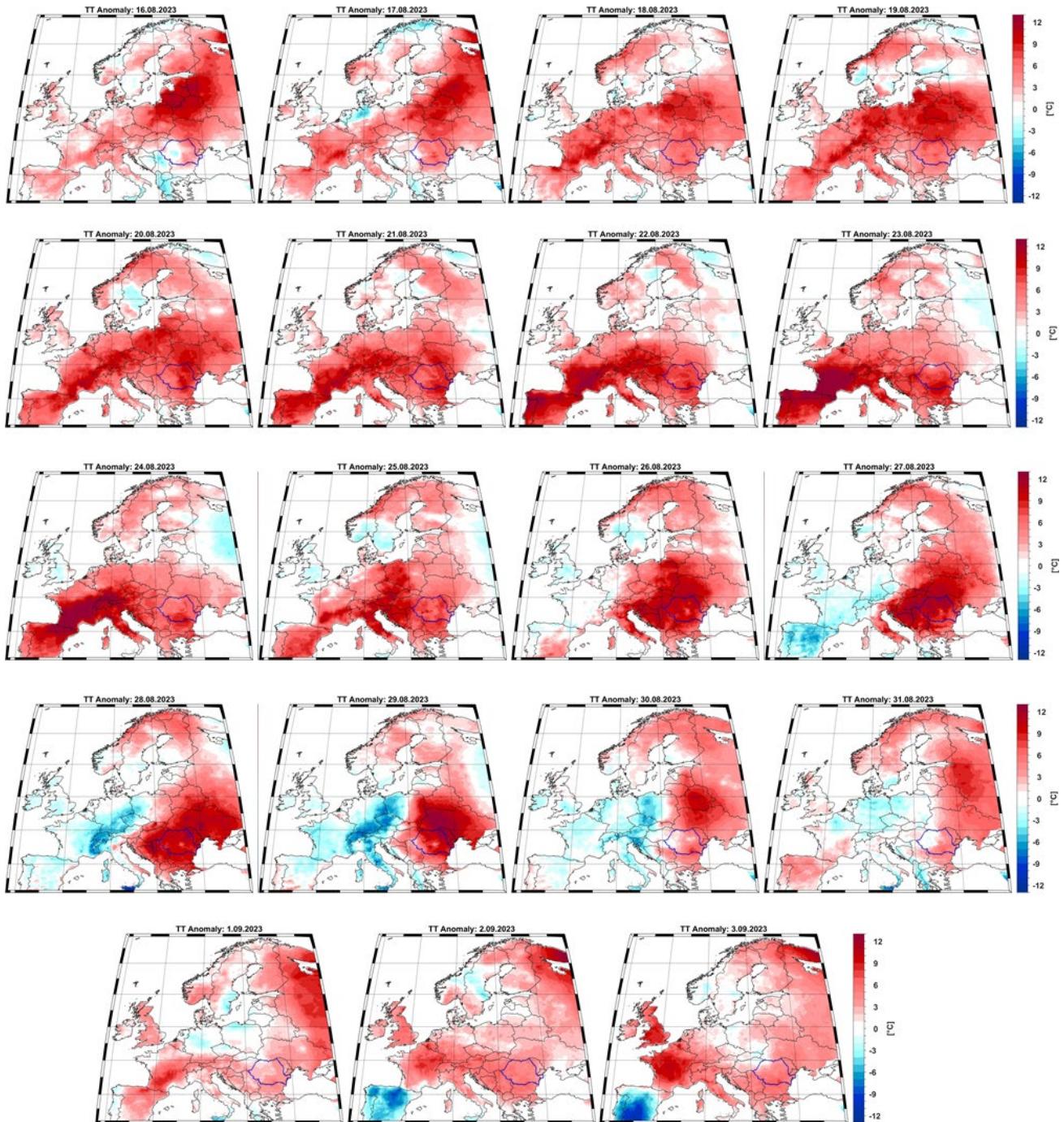
Figure S9. Spatial and temporal evolution of the daily maximum temperature anomaly over Europe over the period 16.08.2023 – 3.09.2023. The anomalies are computed relative to the climatological period 1971 – 2000.