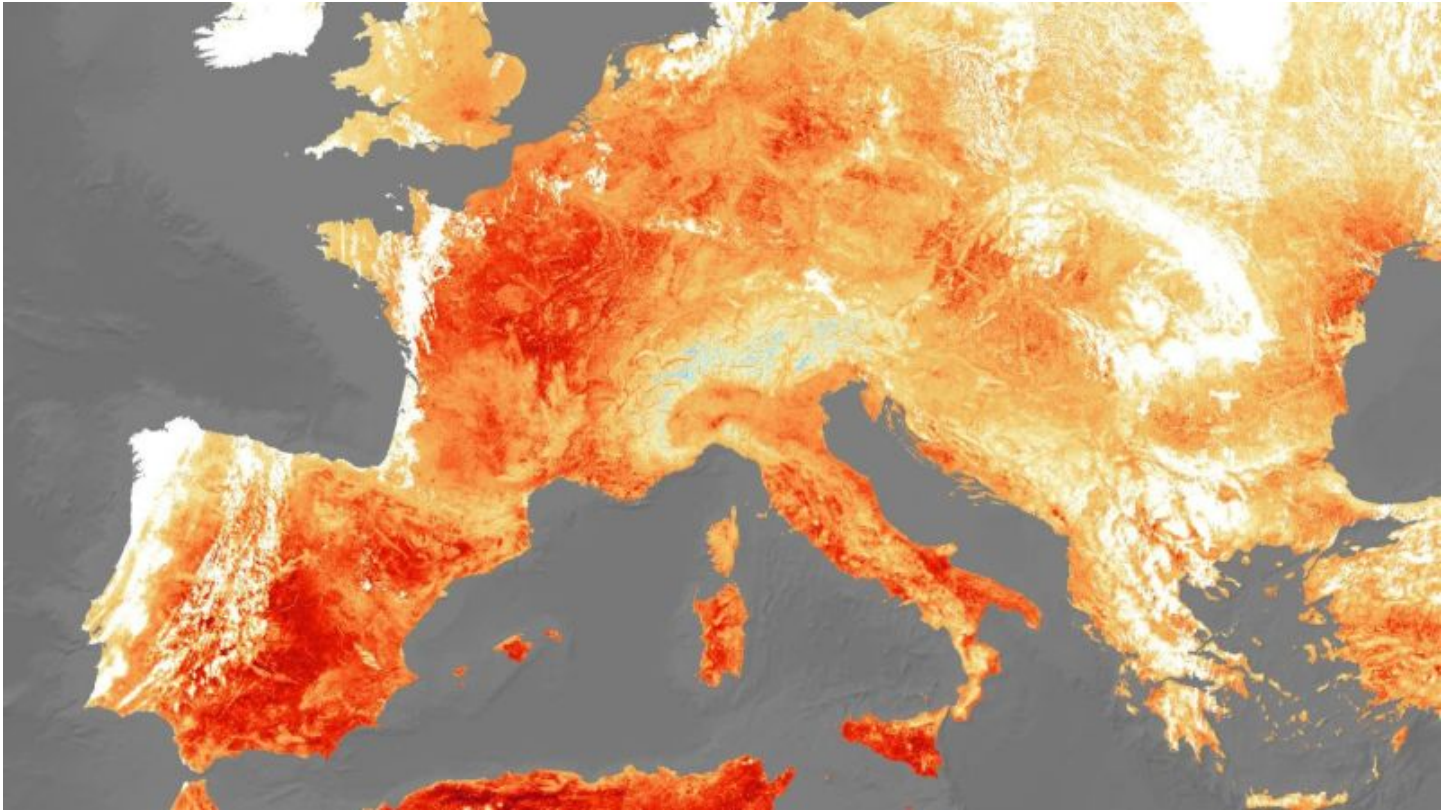


Europe Is Warming Even Faster Than Climate Models Predicted



Satellite data of heat energy emitted from Europe on July 25, 2019, showing the current summer's highest extremes. - Image: ESA

Over the past seven decades, the number of extreme heat days in Europe has steadily increased, while the number of extreme cold days has decreased, according to new research. Alarming, this trend is happening at rates faster than those proposed by climate models.

For most Europeans, this new study will hardly come as a surprise. This summer, for example, temperatures in southern France reached a record 46 degrees Celsius¹ (114.8 degrees Fahrenheit), with similar temperature extremes happening at other locations on the continent.

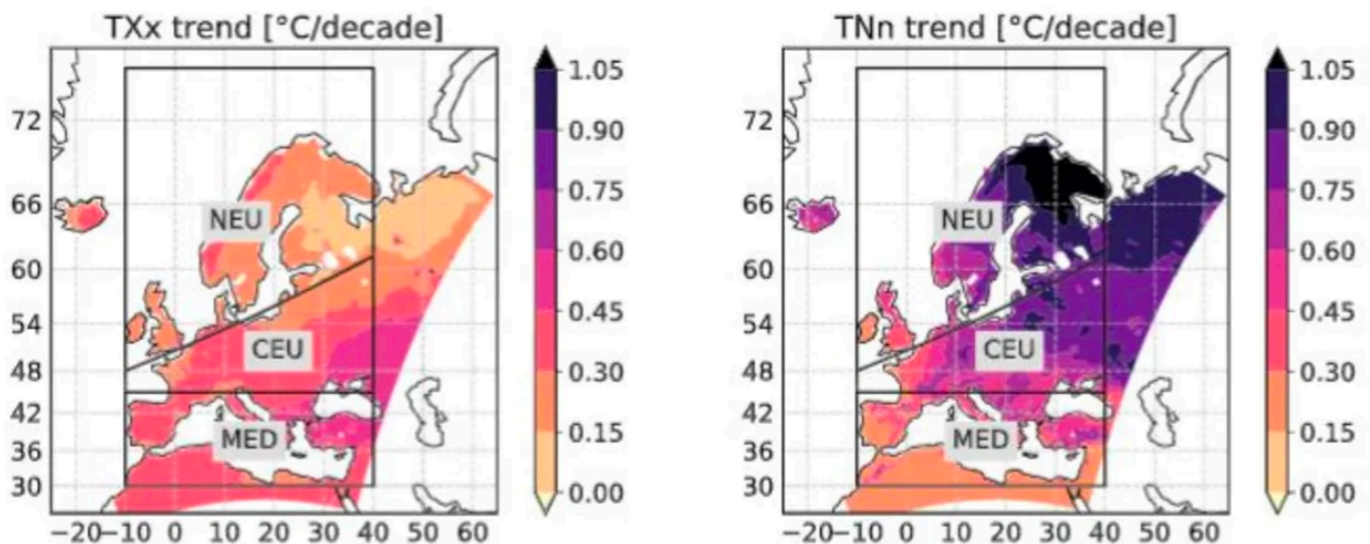
Indeed, Europe is getting progressively hotter, and the data bears this out. What's disturbing, however, and as new research² published today in *Geophysical Research Letters* points out, this warming trend is occurring faster than the projections churned out by most European climate models. And as the new paper also notes, the observed increases in temperatures "cannot be explained by internal variability." In other words, this warming trend is the result of human-caused climate change.

¹ <https://earth.gizmodo.com/france-just-obliterated-its-all-time-heat-record-1835947429>

² <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2019GL082062>

Ruth Lorenz, the lead author of the new study and a climate scientist at the *Swiss Federal Institute of Technology* in Zurich, Switzerland, and her colleagues analyzed temperature extremes in Europe from 1950 to 2018. On average, the number of days with extreme heat across Europe more than tripled during the timeframe analyzed, while the temperature of heat extremes went up 2.3 degrees Celsius (4.14 degrees Fahrenheit) on average.

Meanwhile, days featuring extreme cold temperatures are now on the decline, decreasing twofold or threefold depending on the location. Temperatures during extreme cold days have gone up by more than 3 degrees C (5.4 degrees F), according to the new study.



Daily maximum temperature (left) and daily minimum temperature (right) mean trends for weather across Europe. The map divides Europe into three regions, Northern Europe (NEU), Central Europe (CEU), and the Mediterranean (MED). - Image: Lorenz et al/Geophysical Research Letters/AGU.

Climate scientists have already shown that Europe is getting warmer³, but the new study was an effort to test the reliability of local climate models by cross-referencing local observational data. For the analysis, Lorenz and her colleagues analyzed the top 1 percent of the warmest and highest humidity extremes, along with the top 1 percent of the cold extremes during the same time period. Data for the study was gathered from around 4,000 weather stations across Europe.

“We looked further at the hottest day or coldest night per year, so for each year we looked for the maximum/minimum value and how these changed over time,” said⁴ Lorenz in an AGU press release.

It’s important to point out that differences in warming trends were observed across Europe, the result of local conditions, but the overall warming trend was indisputable.

“Hot extremes have warmed at 94% of all [European Climate Assessment & Dataset (ECA&D)] stations with significant trends at 60% and a median warming of 0.33 [degrees C] per decade or 2.3 [degrees F] over the period 1950–2018 across all stations in Europe,” the authors wrote in the study.

Overlaying this data with European climate models, namely EURO-CORDEX Regional Climate Models, the researchers noticed some discrepancies.

³ <https://www.worldweatherattribution.org/attribution-of-the-2018-heat-in-northern-europe/>

⁴ <https://news.agu.org/press-release/europe-warming-faster-than-expected-due-to-climate-change/>

"We further demonstrate that the majority of EURO-CORDEX [Regional Climate Models], which have not been evaluated regarding trends in temperature extremes, tend to underestimate the intensification of hot extremes," while at the same time overestimating the warming of extreme cold temperatures, wrote the authors.

Maarten van Aalst, director of Red Cross Red Crescent Climate Centre and a professor at the University of Twente, said the trend toward heat waves carries massive humanitarian implications.

"Heatwaves are a silent killer; while for many people a heatwave just means a few hot days in the office, or even a nice day at the beach, heat is literally life-threatening to vulnerable groups like the elderly and chronically ill," van Aalst told Earther. "Contrary to, for instance, storms and floods, these casualties usually do not even make the news. We only see them later in the statistics... no death certificate says 'heat wave' as the cause of death, even if the heat is actually a key factor in mortality."

As an example, van Aalst pointed to the July heat wave in the Netherlands, which caused 400 "excess" deaths, according to the national statistics office. If there were 400 deaths on account of flooding, he said, there would be a "national outcry."

On a positive note, much can be done to mitigate the risks of extreme heat. Recently, the International Federation of Red Cross and Red Crescent Societies issued a comprehensive guidebook⁵ to help city officials prepare for heat waves.

"Of course we need to address the root causes of climate change, but also create **livable cities** with urban green space, and houses adapted to the heat," van Aalst told Earther. "But even on the shortest timescales, simple actions can make all the difference. Just asking an elderly neighbor if they've had their six glasses of water can literally save lives."

⁵ [https://www.climatecentre.org/downloads/files/IFRCGeneva/RCCC Heatwave Guide 2019 A4 RR ONLINE copy.pdf](https://www.climatecentre.org/downloads/files/IFRCGeneva/RCCC%20Heatwave%20Guide%202019%20A4%20RR%20ONLINE%20copy.pdf)