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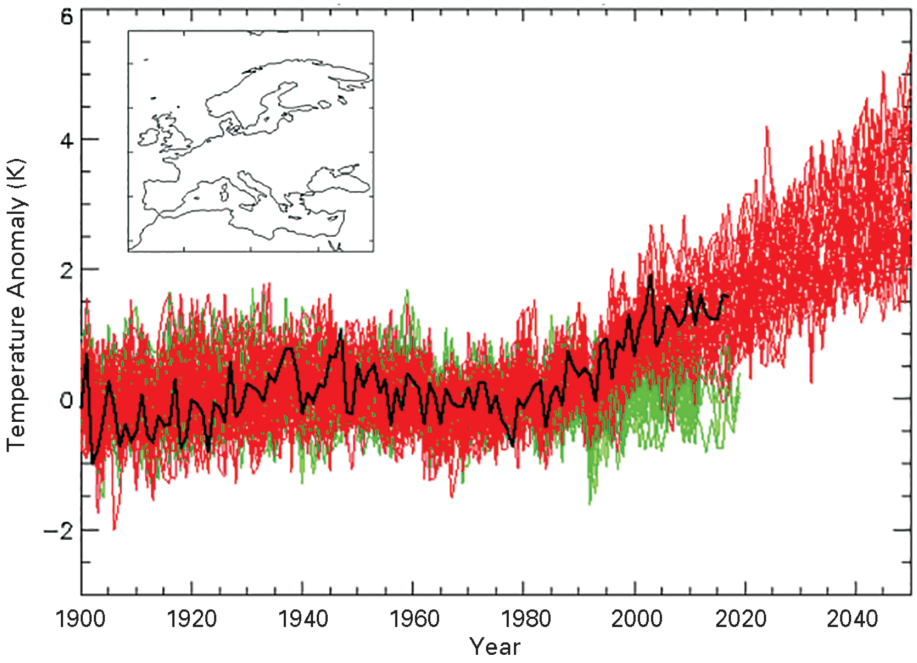
Summer temperatures 2018 – the 'new normal'?

There can be no doubt that the summer of 2018 has been remarkable both in the UK and across the world. Following our appearance on BBC Newsnight, in which presenter Emily Maitlis asked if current temperatures can be considered the 'new normal', this article gives our perspective of the heatwave and its connections to climate change.

In the UK the hot weather has been with us on and off since April. Some parts of East Anglia and southeast England had virtually no rain in more than 55 days. Places inside the Arctic Circle have seen temperatures top 30°C, including at Bardufoss and Makkaur in Norway; and in Finland temperatures have hit 33.4°C. Meanwhile in Japan on Monday 23 July, the city of Kumagaya reported a new record temperature for the country: 41.1°C, and temperatures have exceeded 40°C in central Tokyo for the first time ever. There have been reports of many people being taken sick with heat stroke.

Naturally people are asking whether this is a result of climate change – is this the 'new normal'? So what can we say? Well, the atmospheric patterns leading to the UK heatwave do occur within the natural cycles in the weather, but they have been unusually persistent. The jet stream has been weak and was stuck to the north of the UK between April and mid-August, with high pressure settled over the UK and Europe. In the summer, such a pattern leads to dry soils, which means that if the sunny weather continues the energy of the sun is not used up in evaporating water and temperatures rise even more.

In addition, we've seen a background of global warming due mostly to increased atmospheric greenhouse gases, with global mean temperatures rising more than 1 degC above pre-industrial levels, and even more so over the northern continents. The natural cycles of weather mean that we shouldn't expect heatwaves like this to happen every year but, when we do experience them, the warmer world means that there is an increased risk of even higher temperatures.



In 2003, Europe also experienced a pronounced heatwave. Research led at the Met Office showed that greenhouse gas concentrations in the atmosphere doubled the chance of the temperatures recorded in 2003 compared with what we'd expect in a pre-industrial world. This research also concluded that by the 2040s the temperatures we saw in Europe in 2003 could be fairly normal in summer. We have updated this prediction with more recent data, and found that this prediction is still on track (Figure 1).

At the Met Office, in collaboration with the universities, we are carrying out a detailed analysis of this particular heatwave and its expression in a warming world. We're aiming to understand why the weather pattern this summer was so persistent, and to what extent this persistence may be influenced by human-induced climate change, as well as the role of global warming by greenhouse gases in raising temperatures to levels experienced in the heatwave. We'll publish our findings later in 2018.

The temperatures we are currently experiencing may not yet be the 'new normal', but within a few decades they could be.

Read more at Imperial academics about the heatwave, and the impact of climate change on extreme weather (http://www.imperial.ac.uk/news/187410/hotter-places-hotter-extreme-rainfall-more/) by Lottie Butler.

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