

Researchers map European climate change (Update)

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The majority of Europe will experience higher warming than the global average if surface temperatures rise to 2 °C above pre-industrial levels, according to a new study published today.

Under such a scenario, temperatures greater than the 2 °C global average will be experienced in Northern and Eastern Europe in winter and Southern Europe in summer; however, North-Western Europe—specifically the UK—will experience a lower relative warming.

The study, which has been published today, 7 March, in IOP Publishing's journal *Environmental Research Letters*, also shows that in the summer, daily maximum temperatures could increase by 3-4 °C over South-Eastern Europe and the Iberian Peninsula and rise well above 40 °C in regions that already experience some of the highest temperatures in Europe, such as Spain, Portugal and France. Such higher temperatures will increase evaporation and drought.

In the winter, the maximum daily temperatures could increase by more than 6 °C across Scandinavia and Russia.

Lead author of the research Robert Vautard, from Laboratoire des Sciences du Climat et de l'Environnement (CEA/CNRS/UVSQ), said: "The 2 °C warming target has mainly been decided among nations as a limit not to exceed in order to avoid possibly dangerous climate change. However, the consequences of such a warming, at the scale of a continent like Europe, have not yet been quantified.

"We find that, even for such an ambitious target as 2 °C, changes in European climate are significant and will lead to significant impacts."

The study also shows that there will be a robust increase in precipitation over Central and Northern Europe in the winter and Northern Europe in the summer, and that most of the continent will experience an increase in instances of extreme precipitation, increasing the flood risks which are already having significant economic consequences.

Southern Europe is an exception, and will experience a general decline in mean precipitation.

To arrive at their conclusions, the researchers used an ensemble of 15 regional climate models to simulate climate changes under an A1B scenario, which represents rapid economic growth and a balanced approach to energy sources.

In addition to [temperature](#) and precipitation changes that may occur, the researchers also investigated atmospheric circulation and winds, but found no significant changes.

"Even if the 2 °C goal is achieved, Europe will experience impacts, and these are likely to exacerbate existing climate vulnerability. Further work on identifying key hotspots, potential impacts and advancing carefully planned adaptation is therefore needed," the researchers write in their study.

More information: 'The European climate under a 2 °C global warming' Robert Vautard, Andreas Gobiet, Stefan Sobolowski, Erik Kjellström, Annemiek Stegehuis, Paul Watkiss, Thomas Mendlik, Oskar Landgren, Grigory Nikulin, Claas Teichmann and Daniela Jacob *Environ. Res. Lett.* 9 034006.

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