



Swansea University
Prifysgol Abertawe

NEWS RELEASE

5 July 2016

Miserable summers linked to random shifts in the Atlantic storm track

Research led by Swansea University academics shows that European summer temperatures can be linked to random changes in the position of the storm track crossing the Atlantic. Whilst average European temperatures, on the whole, rise and fall in response to climatic forcing factors, such as greenhouse gases, there is another factor that impacts European summer climate strongly - the position of the Atlantic storm track, which varies randomly and could lead to a mixture of cold and wet or warm and dry summers in the future, that we simply cannot predict.

Researchers from the [Geography Department](#) at the [College of Science](#) published the study in [Nature Geoscience](#). It shows that although the average summer temperature of Europe has warmed and cooled in the past, in response to external factors such as greenhouse gases, volcanic eruptions and the amount of energy coming from the sun, the variation in temperature between northern and southern Europe has changed in an unpredictable way not linked to these external climate drivers. This unpredictability could mean a steady rise in summer temperatures that is interspersed with successions of unusually warm and dry, or cold and wet summers in the future.

Lead author, Dr Mary Gagen of Swansea University, said: "This is not good news. People do not directly feel the impact of the annual temperature of the globe, or even of a continent; people's lives are impacted by the climate of a particular season, or year, in the place where they live. In terms of quality of life, there is a big difference between a pleasantly warm and sunny summer and one that is either cool and wet, or unbearably hot and dry. As greenhouse gases continue to rise we know that there will be a general warming over Europe as a whole but these results, projected to the

future, suggest that, on top of that warming, variations in summer temperature are also strongly controlled by where the storms happen to be tracking, and the position of the storm track seems to be random rather than forced, and is therefore unpredictable”.

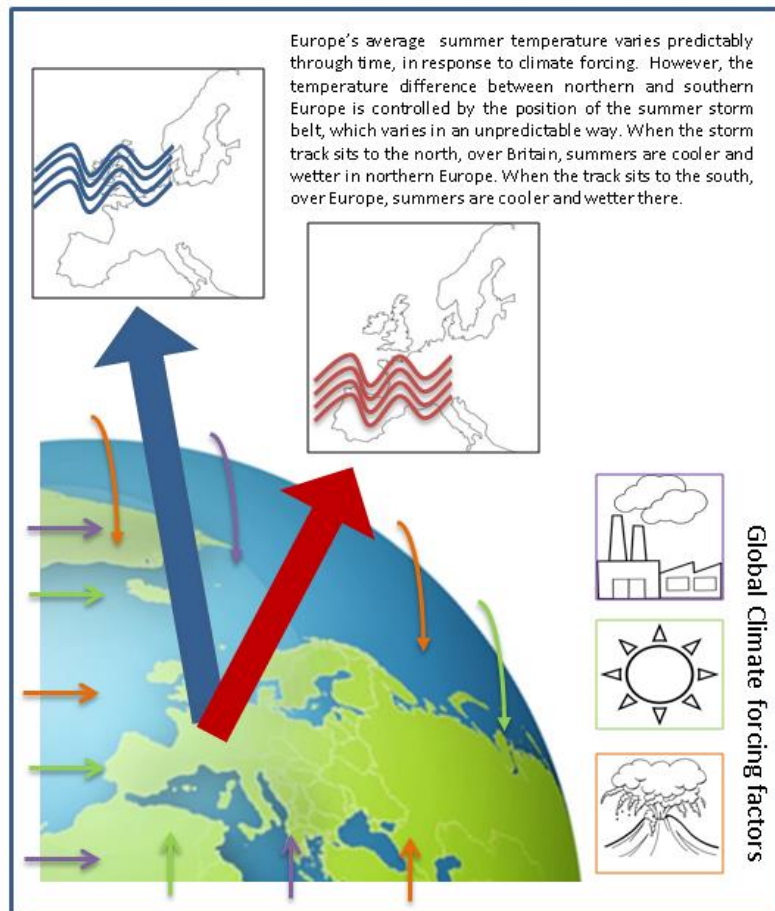
Future changes in the position of the storm track could lead to strong regional contrasts in the amount of warming. Professor Danny McCarroll, also of Swansea University said: “We know that the climate of Europe is going to continue to warm, but the long-term perspective provided by this study suggests that, in any one place, we are unlikely to see a steady, unbroken rise in summer temperatures. We could see unpredictable shifts in the position of the summer storm track, leading to runs of unusually warm and dry or cool and wet summers and those shifts could persist for many years or even decades.”

The study, examined instrumental climate measurements, climate reconstructions from lake sediments and tree rings, and climate model simulations for the last thousand years. The results show that as the average summer temperature of Europe rises and falls through time, in response to factors such as greenhouses gases, energy from the sun and volcanic eruptions, the differences in temperature between northern and southern Europe do not change in parallel – instead they follow their own pattern and do not seem to be predictable.

The unpredictable component of the changes in summer temperature is linked to the position of the summer storm belt crossing the Atlantic, which determines where most of the summer rains will fall.

The study found:

- When storm systems take a northerly path, summers are wetter and cooler in the north, and warmer and drier in the south.
- A southerly track leads to hot dry summers in northwest Europe.
- Over the last thousand years, the summer storm track seems to have wandered at random.
- Unlike the average temperature across the continent, summer storm tracks do not seem to be controlled by known climate forcing factors.



[Read the study](#)

Nature Geoscience. *North Atlantic summer storm tracks over Europe dominated by internal variability over the past millennium*. Mary H. Gagen, Eduardo Zorita, Danny McCarroll, Matthias Zahn, Giles H. F. Young and Iain Robertson.

Notes for Editors:

The Millennium Project. The data on which the study is based was produced by the EU-funded 'Millennium' project, which combined many different sources of evidence to reconstruct the climate of Europe over the last one thousand years. The Millennium project (EU 6th Framework Integrated Project 017008) was one of the largest climate change projects ever funded by the EU. Between 2006 and 2011 over 100 European scientists, from 39 organisations across 17 European countries worked towards a single goal of improving our knowledge of past climates in Europe to aid our understanding of current and future climate change. Millennium is seen as a key example of how large-scale collaboration across disciplines and countries,

funded by the EU contributes to the advancement of science led by British Universities.

Swansea University is a world-class, research-led, dual campus university. The University was established in 1920 and was the first campus university in the UK. It currently offers around 330 undergraduate courses and 120 post-graduate courses to 16,800 undergraduate and postgraduate students.

The University's 46-acre Singleton Park Campus, established in 1920, is located in beautiful parkland with views across Swansea Bay. The University's 65-acre science and innovation Bay Campus, which opened in September 2015, is located a few miles away on the eastern approach to the city. It has the distinction of having direct access to a beach and its own seafront promenade. Both campuses are close to the Gower Peninsula, the UK's first Area of Outstanding Natural Beauty.

The results of the Research Excellence Framework (REF) 2014 showed the University has achieved its ambition to be a top 30 research University, soaring up the league table to 26th in the UK, with the 'biggest leap among research-intensive institutions' (*Times Higher Education*, December 2014) in the UK.

The University has ambitious expansion plans as it moves towards its centenary in 2020, as it continues to extend its global reach and moves closer to realising its ambition of being a top 200 Global University.

Swansea University is a registered charity. No.1138342. Visit www.swansea.ac.uk.

For more information contact Delyth Purchase, Swansea University Public Relations Office, Tel: 01792 513022, or email: d.purchase@swansea.ac.uk.



Follow us on Twitter: [@SwanseaUni](https://twitter.com/SwanseaUni)



Find us on Facebook: <https://www.facebook.com/swanseauniversity>