

North Atlantic climate far more predictable following major scientific breakthrough

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A team of scientists led by UK Met Office has achieved a scientific breakthrough allowing the longer-term prediction of North Atlantic pressure patterns, the key driving force behind winter weather in Europe

and eastern North America. CMCC scientists Panos Athanasiadis, Alessio Bellucci, Dario Nicolì and Paolo Ruggieri from CSP—Climate Simulation and Prediction Division were also involved in this study.

Published in *Nature*, the study analyzed six decades of climate model data and suggests decadal variations in North Atlantic atmospheric pressure patterns (known as the North Atlantic Oscillation) are highly predictable, enabling advanced warning of whether winters in the coming decade are likely to be stormy, warm and wet or calm, cold and dry.

However, the study revealed that this predictable signal is much smaller than it should be in current climate models. Hence 100 times more ensemble members are required to extract it, and additional steps are needed to balance the effects of winds and greenhouse gasses. The team showed that, by taking these deficiencies into account, skillful predictions of extreme European winter decades are possible.

Lead author Dr. Doug Smith, who heads decadal climate prediction research and development at the Met Office Hadley Center, said: "The message from this study is double-edged: climate is much more predictable than we previously thought, but there is a clear need to improve how models simulate regional changes."

Advance warning of severe [winter weather](#) is imperative to those who make risk-based decisions over longer timescales. For example, better forecasts can help the Environment Agency plan water management and flood defenses, [insurance companies](#) plan for the changing risks, the energy sector to mitigate against potential blackouts and surges, and airports plan for potential disruption.

Improving model simulations will enhance the countries' response, resilience and security against the effects of extreme weather and

climate change—influencing future policy decisions to protect people's lives, property and infrastructure.

More information: D. M. Smith et al, North Atlantic climate far more predictable than models imply, *Nature* (2020). [DOI: 10.1038/s41586-020-2525-0](https://doi.org/10.1038/s41586-020-2525-0)

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