

## **A better model of the upper atmosphere should improve seasonal weather forecasts**

### **Summary of issue**

A new study<sup>1</sup> from the Met Office shows how including a better representation of the upper atmosphere in their weather and climate models could improve seasonal forecasting, especially of cold winter weather events. This work has attracted media attention<sup>23</sup>.

### **Lines to take**

- Welcome this development, which will likely improve the Met Office's seasonal forecasting capability for forecasting cold winter weather events in North-West Europe.
- Important to recognise though that many factors are taken into account when producing seasonal forecasts.
- Note that improved forecasts will likely help us assess winter energy demand and manage energy resources better.

### **Key Points**

- The study uses an improved model of the upper atmosphere to represent stratospheric processes better than before.
- Sudden warming events in the Arctic stratosphere during winter can link to the lower atmosphere and alter the frequency of so-called 'blocking patterns'. It is these blocking patterns that can shift the jet stream over the North Atlantic and Western Europe, resulting in spells of unusually cold winter weather in the UK.
- The Met Office Hadley Centre researchers used the cold winter of 2009/10 as a case study for comparing seasonal forecasts generated by the new model with a better stratosphere, against the previous version. Forecasts using the new model more closely matched observed conditions, especially in late winter.
- This work is a significant step forward in improving seasonal forecasting, especially in winter, and work continues on other model improvements that are expected to improve forecasts further.
- Other factors that need to be considered when forecasting European winter weather include Atlantic and Pacific Ocean temperatures, large scale pressure differences across the Atlantic, Eurasian snow cover, Arctic sea-ice cover, and solar variability.

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<sup>1</sup> D R Fereday et al 2012. Seasonal forecasts of northern hemisphere winter 2009/10. Environ. Res. Lett. 7 034031.  
<http://iopscience.iop.org/1748-9326/7/3/034031/>

<sup>2</sup><http://www.dailymail.co.uk/news/article-2202988/Met-Office-Better-way-forecast-Big-Freeze.html#ixzz26QQkQF7n>

<sup>3</sup> <http://www.bbc.co.uk/news/science-environment-19584302>