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## POTENTIAL ARCTIC IMPACTS ON THE NORTH ATLANTIC JET STREAM

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North Atlantic jet stream variability is crucial for determining the weather of western Europe. Recent winters have seen examples of extreme weather; 2009-2010 with extreme cold, and 2013-14 the wettest and stormiest winter on record in the UK. While much of the variability stems from internal atmospheric variability, a number of factors have the potential to "nudge" the jet stream into a different position, including tropical and Atlantic SST, stratospheric effects and solar variability.
Two ways in which the Arctic may be capable of exerting an influence on the jet stream are via Greenland blocking, and the extent of Barents-Kara sea ice.
There is strong evidence (e.g . Woollings 2008) for Greenland blocking being associated with a southward displacement of the jet, such as occurred in 2009-10, bringing cold air outbreaks southwards over Europe. The case for the influence of Barents-Kara sea ice is less clear. While Petoukhov and Semenov (2010) and Peings and Magnusdottir (2014) identify an influence on western Europe, and Scaife et al., (2014) find that Kara sea ice is a significant predictor of the winter North Atlantic Oscillation (NAO; a measure of jet stream variability), others (Woollings et al., 2014, Gerber et al., 2014) suggest that it has played no role in recent cold winters and has minimal impact on European blocking, which is responsible for northward deflections of the jet. However, model representation of blocking remains a perennial problem.
We examine regression models of potential drivers of jet stream variability, and use these to identify drivers of variability. Composite analysis is then undertaken on identified sea ice drivers of variability from the regression models. We find a significant difference between the DJF jet latitude for high versus low November Barents-Kara sea ice extent, using detrended data, with reduced sea ice being associated with a southward displacement of the jet. It is notable that in the analysis, the sea ice extent precedes the DJF jet variability, while an expected synchronous relationship between jet latitude and BKI is found , of opposite sign, indicative of wind driven forcing of sea ice extent.
Composite maps of SLP and 500hPa GPH are used to identify any mechanisms involved in this Arctic-mid-latitude linkage.