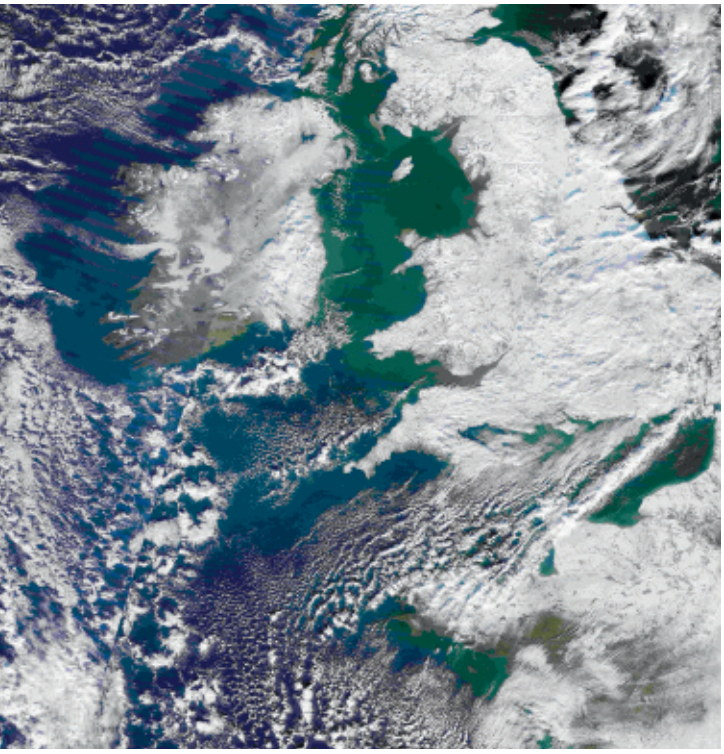
# Are Winters Becoming Colder in Europe?

Low solar activity could affect the regional climate in Great Britain and Central Europe

Despite the trend toward global warming, people in Great Britain and Central Europe might experience cold winters more frequently over the next few years. This is the conclusion drawn from a study by scientists from the University of Reading, the Rutherford Appleton Laboratory in Oxfordshire in the UK, and the Max Planck Institute for Solar System Research in Katlenburg-Lindau. The researchers examined British weather records going back to 1659 and compared them with solar activity over the same period. The strength of the solar magnetic field was used as a measure of the Sun's activity. As sufficiently reliable data is available only for the years after 1900, the researchers reconstructed older values with computer simulations. The statistical comparison of the magnetic "fever curve" of the Sun with the weather database paints a very clear picture: after decades of high solar activity and comparatively mild winters, cold winters are becoming more frequent in Europe.

When there is low solar activity, the average winter temperature in the UK is around half a degree lower than usual. The reason for this very regional effect of low solar activity could be attributed to wind changes in the troposphere, the lowest layer of our atmosphere. If the stratosphere that lies over it heats up only slightly, the mild strong winds from the Atlantic are blocked. Instead, the UK and Central Europe are exposed to the effects of cold winds from the northeast. The exact mechanism for this is, however, still unclear. (Environmental Research Letters, April 15, 2010)



A sight that we might have to get used to: Large parts of the UK and Central Europe were covered by snow last winter, as this satellite photo of January 7, 2010 shows.

## Firm Footing for Mussels

Mussels have an iron grip on stones and rocks – and that's not just figuratively speaking. The byssus, the threads with which mussels hold fast to the ground, hardly ever wears out, although waves constantly pull at it and it is abraded again and again by stones. Scientists at the Max Planck Institute of Colloids and Interfaces in Potsdam-Golm have found that the fibers owe this resistance to iron atoms in their cuticle, over which the proteins in the mussel form a network. Bonds form on the iron atoms, which, in some cases, break under stress so that the material can stretch further. These fractures then close again. This means that nature achieves what materials scientists hardly ever succeed in: making a material stretchable and hard at the same time. The researchers are hoping that nature's principle can be used to make technological materials with similar properties.

Secured for life in a strong current: Mussel shells hold onto rocks with byssus threads. Strengthened by iron, the fibers are resistant to abrasion.

Photos: NASA (top), MPS