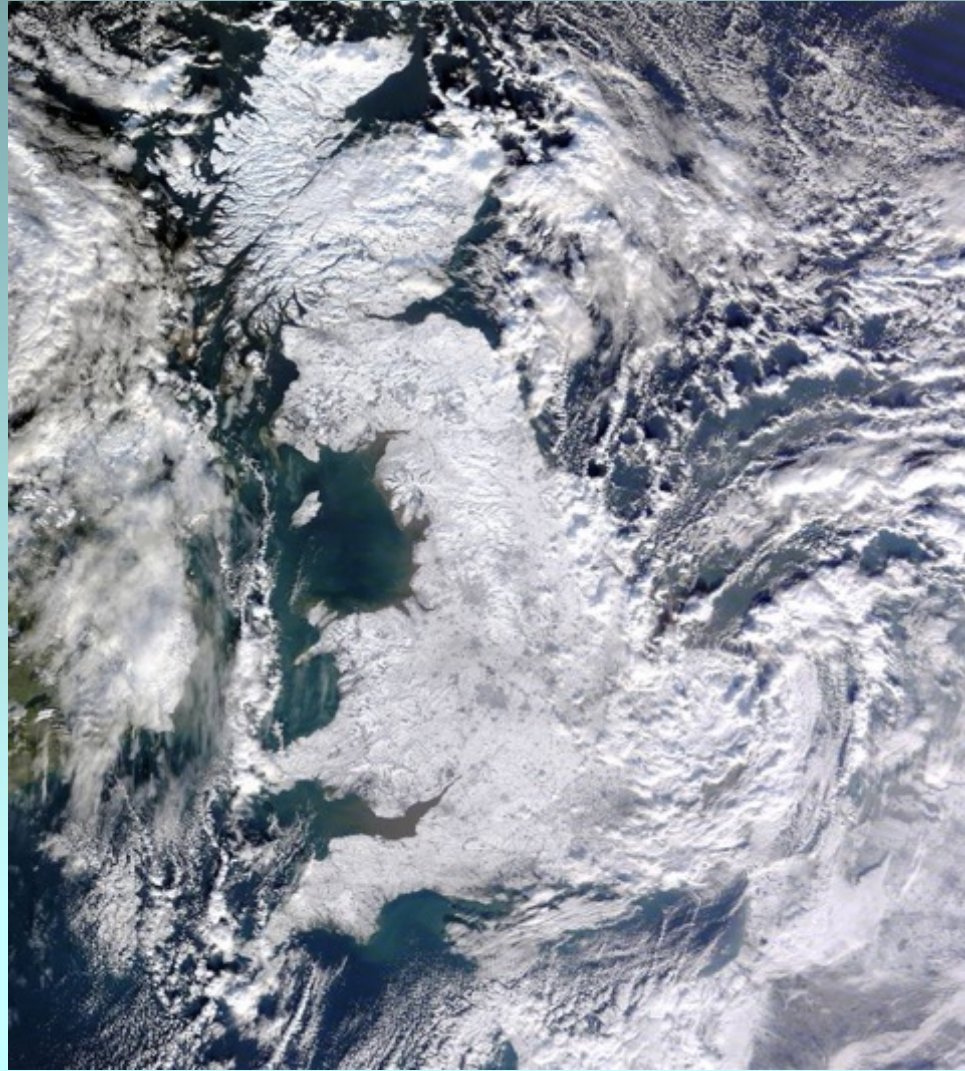


In The Bleak Mid Winter

Professor John E Thornes & Dr Lee Chapman
University of Birmingham
United Kingdom



January 10th 2010

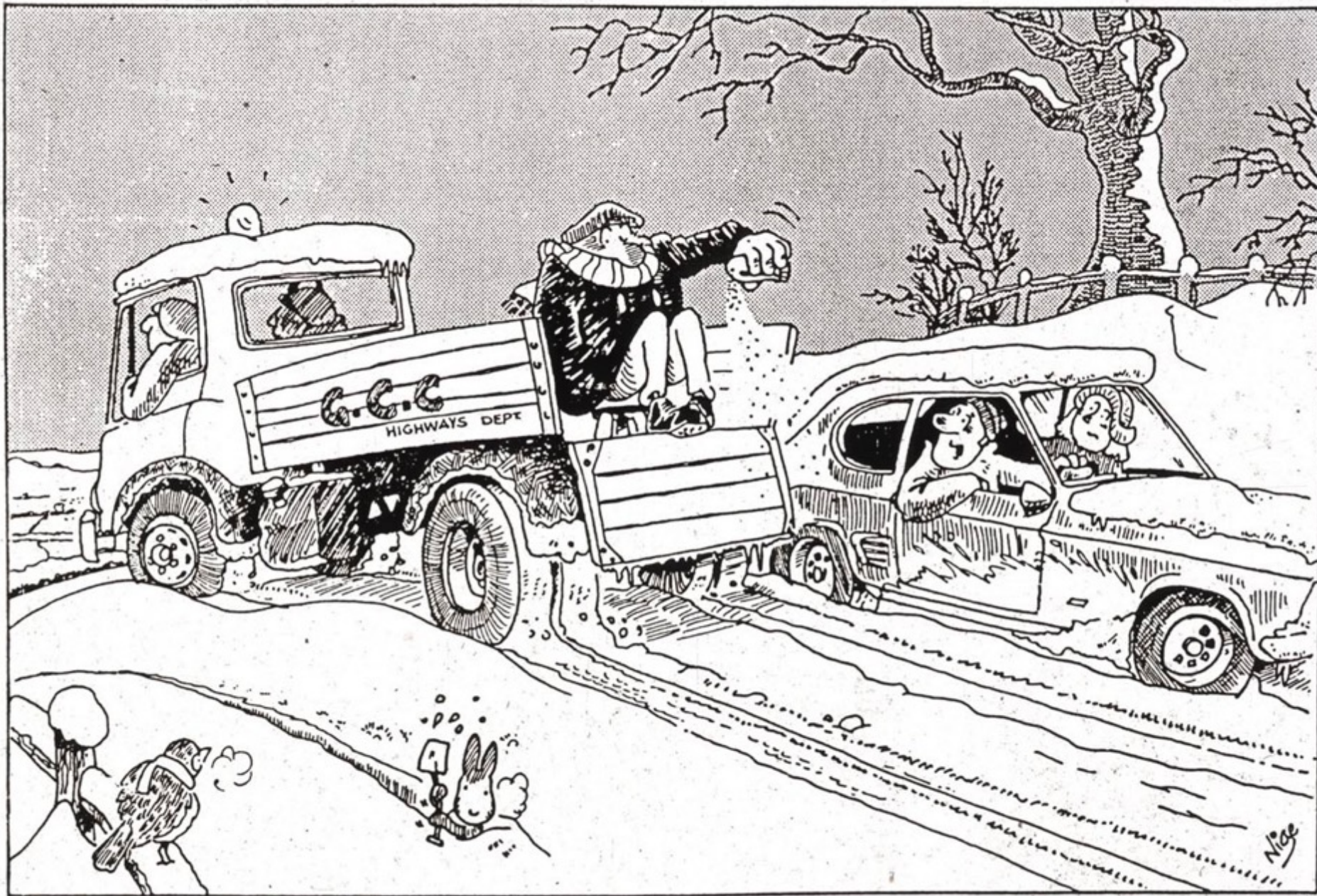


Curling on a Scottish Lake





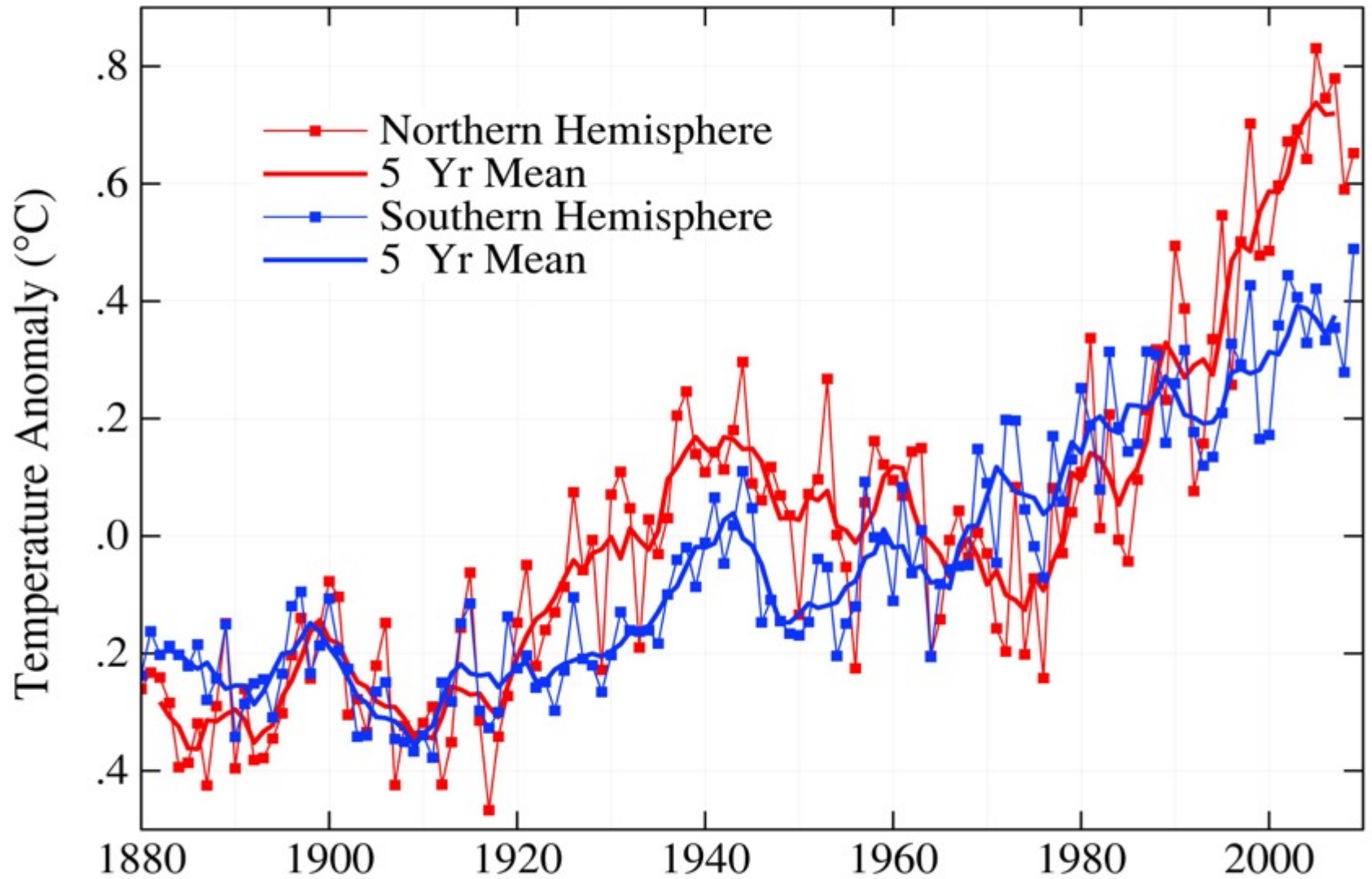
Across the whole of the UK



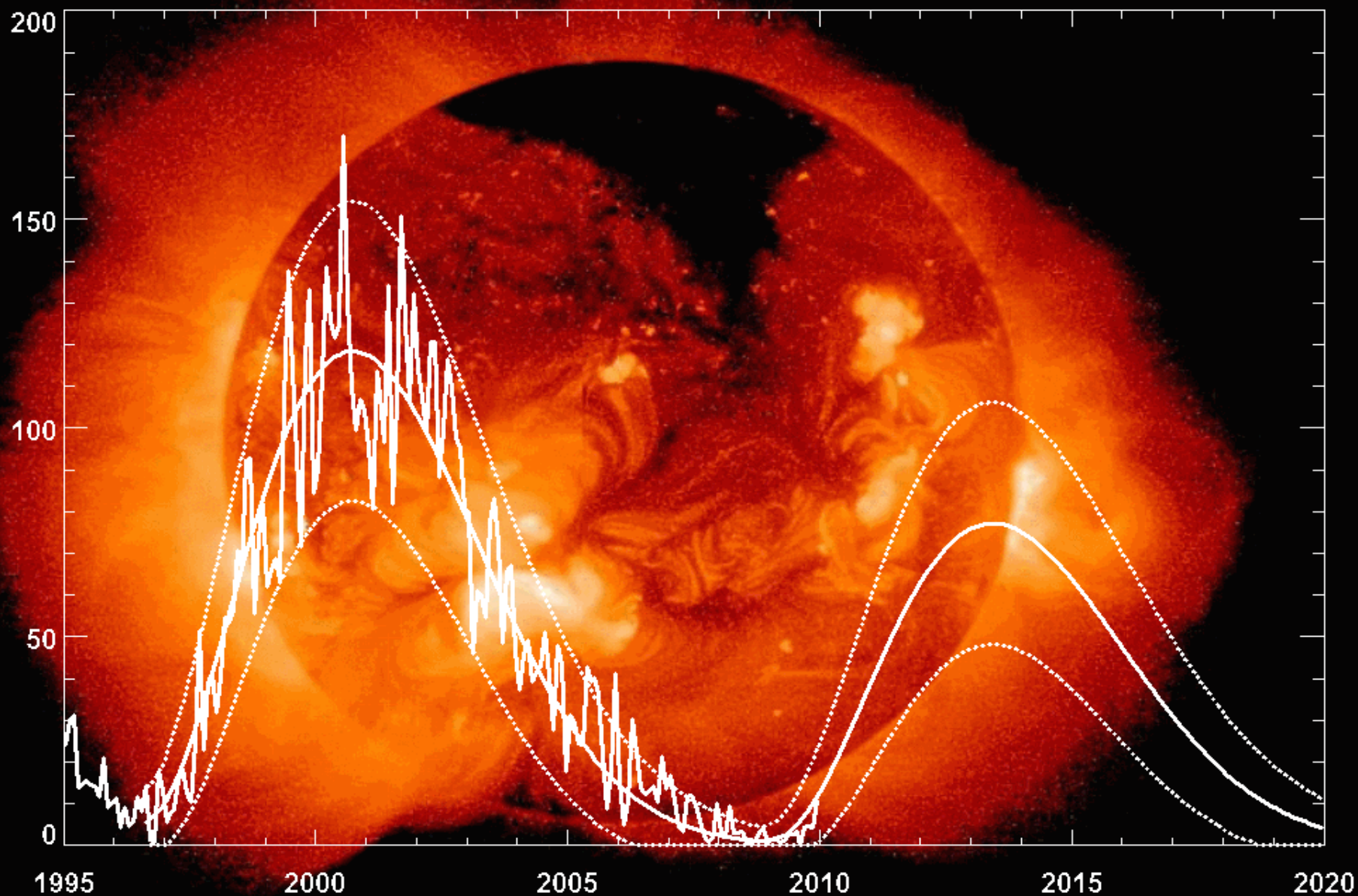
"I see the Council's overspent on its road salting budget again . . ."

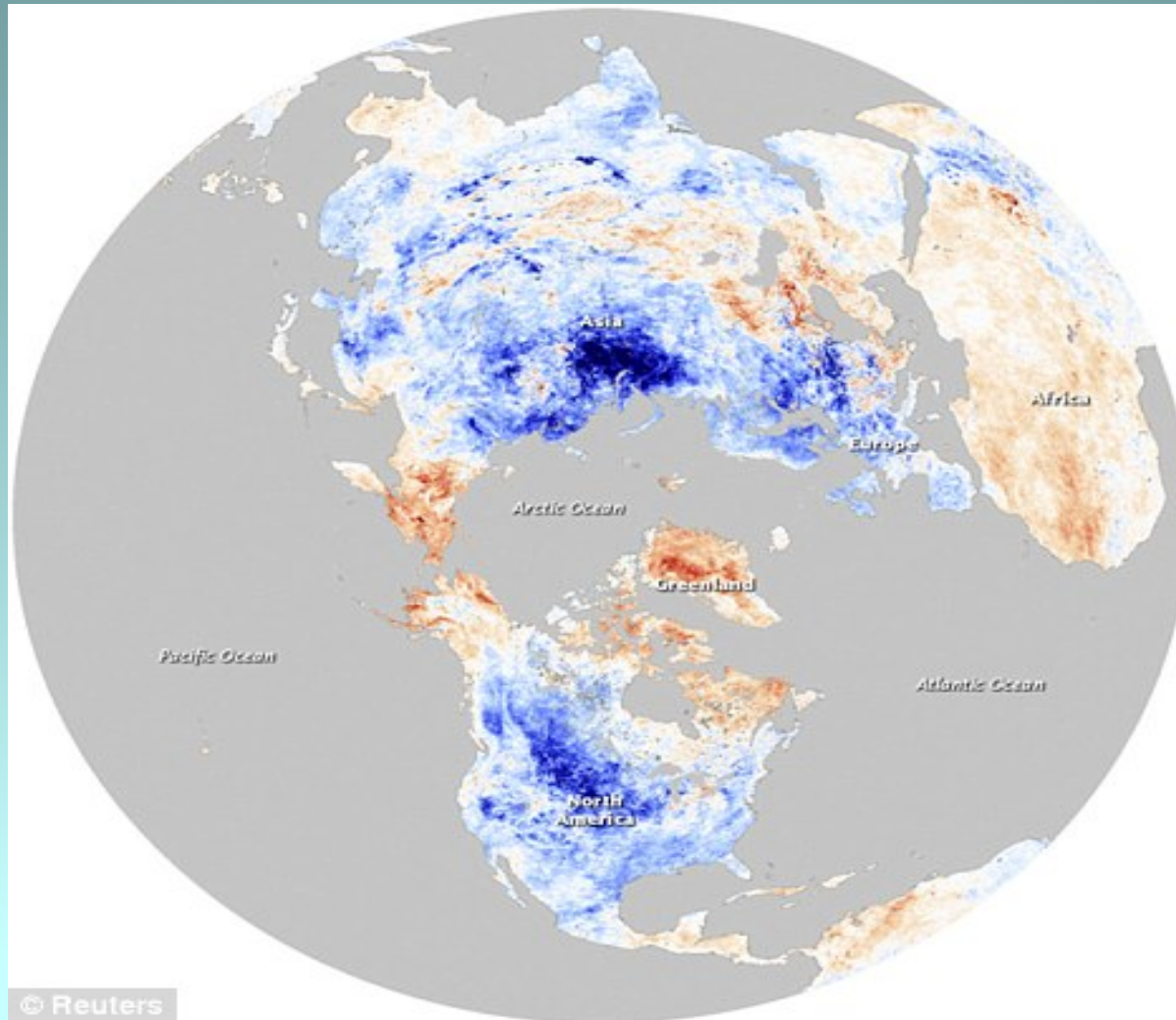


Hemispheric Temperature Change

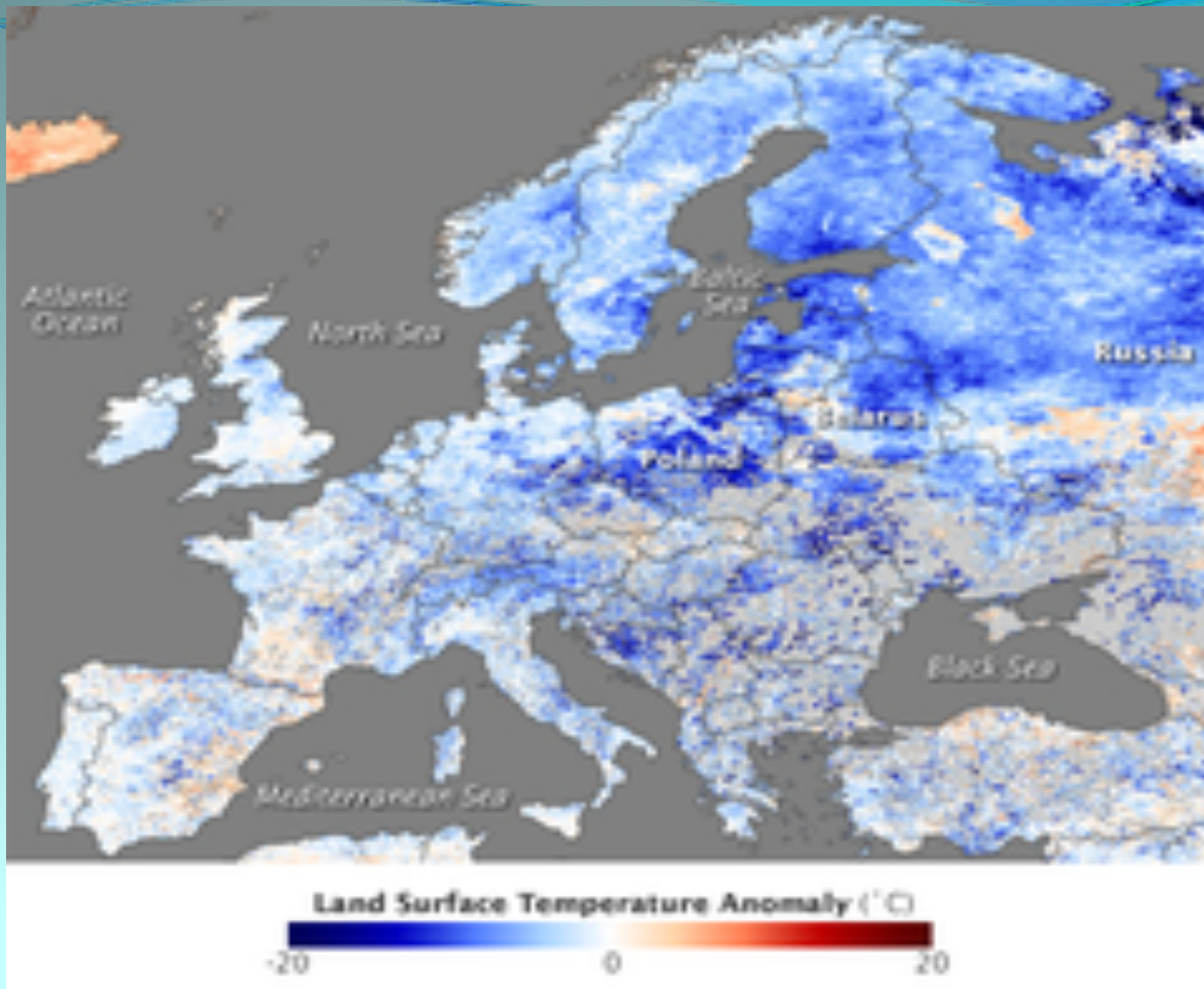


Cycle 24 Sunspot Number Prediction (January 2010)

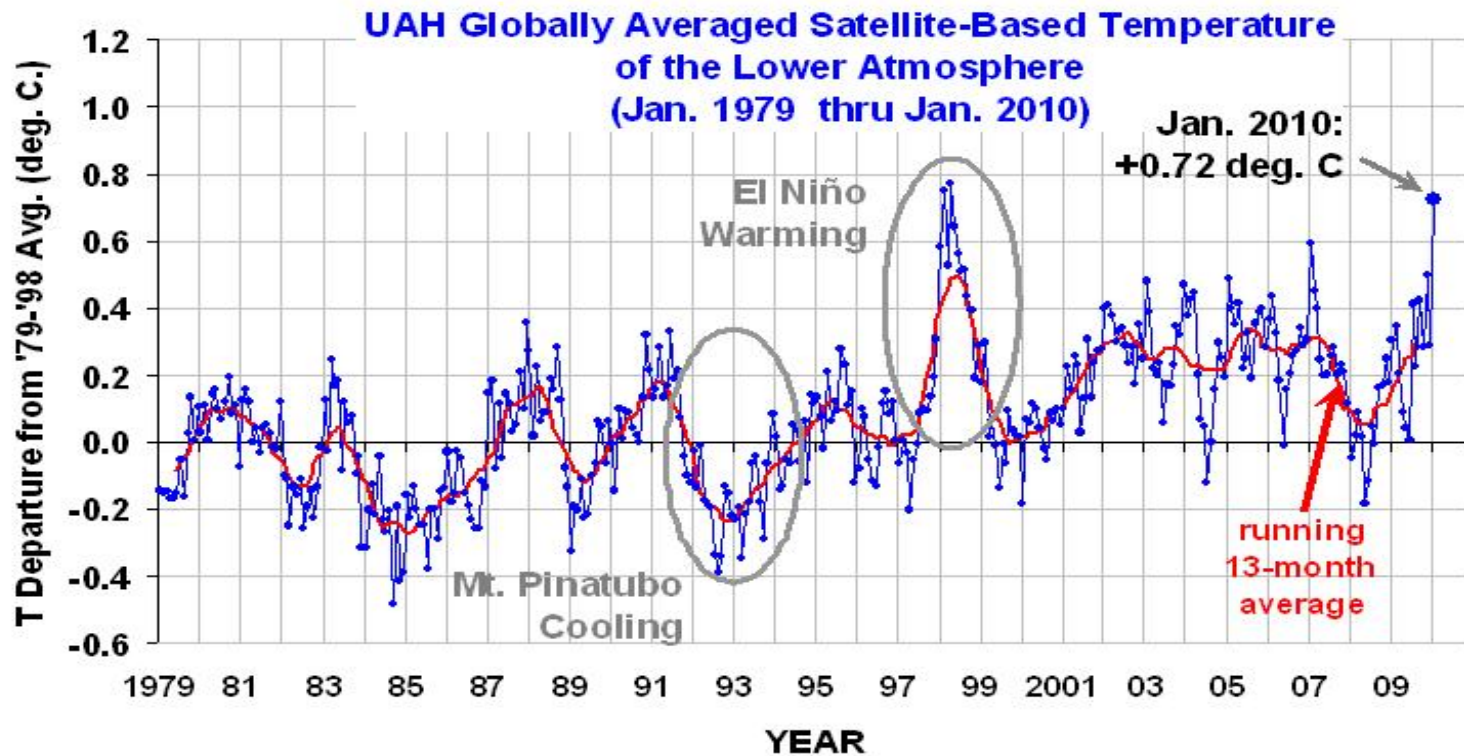




December 2009 cold weather



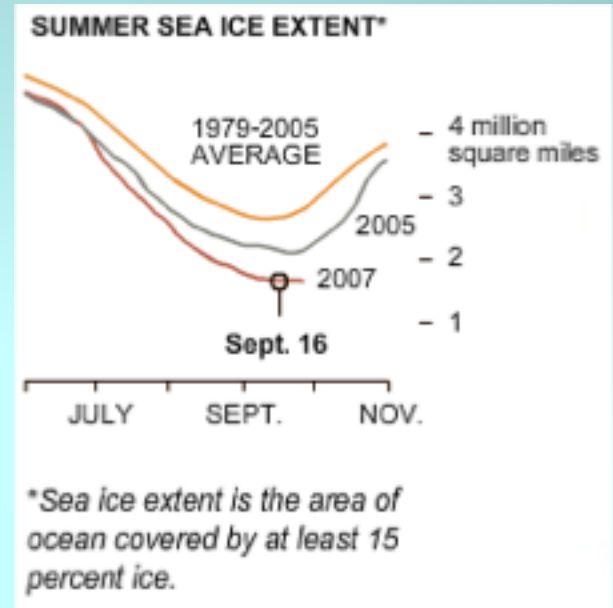
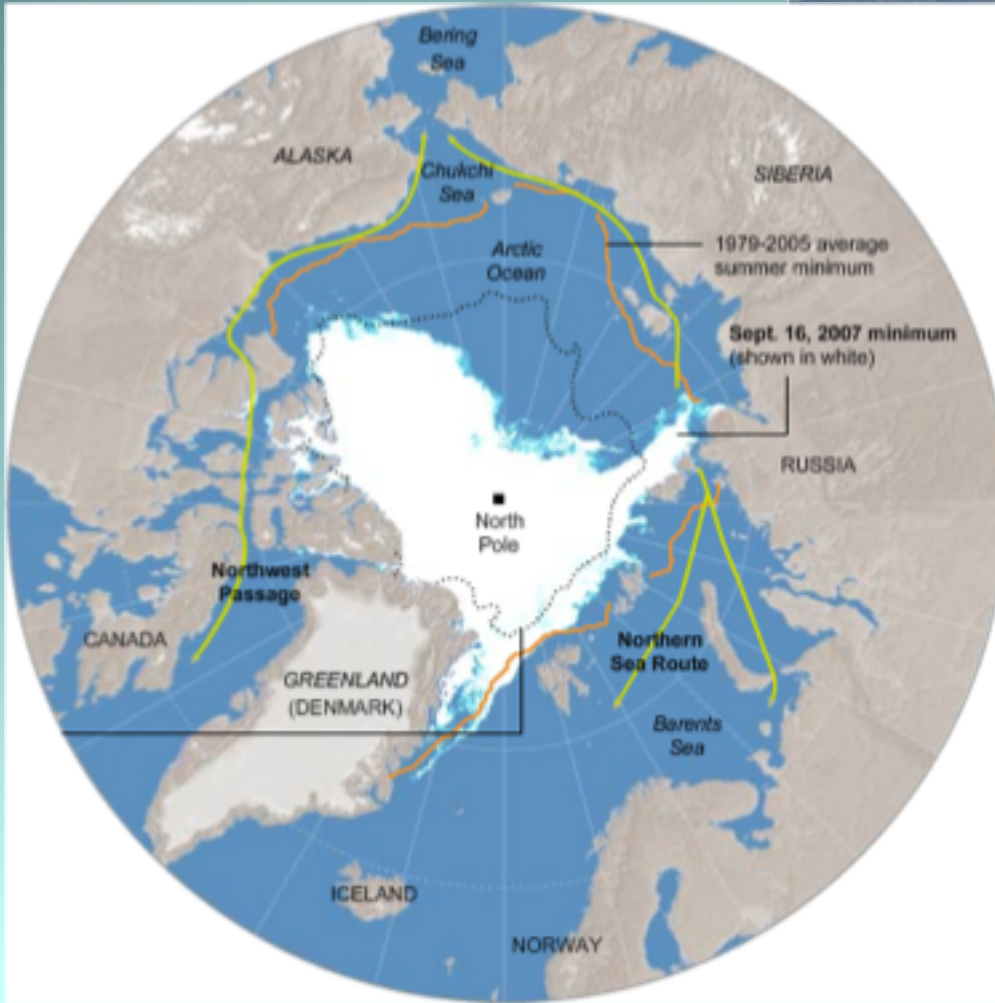
Cold December in Europe 2009



January 2010 UAH Global Temperature Update +0.72 Deg. C

Sea ice late summer

September 2007



(National Snow and Ice Data Center, NOAA

www.nytimes.com/interactive/2007/10/01/science/20071002_ARCTIC_GRAPHIC.html)



Shangdu: Inner Mongolia



© Reuters

Beijing Heaviest snow for 60 Years





© AFP/Getty Images

Snowy roads in the Netherlands may be smelling sweet this winter

- The town of Etten-Leur has spread 18 tons of scented bath salts on its roads in an effort to keep them ice-free.



LilyBaySoap via Flickr

Berlin Airport



© Reuters



January 28th 2010 US Ramstein Airbase Germany only 10 tonnes left

Insulating Oranges in Florida



Surfside Florida Iguanas become immobilized and fall from their perches below 5degC









Salt Shortage in US and UK

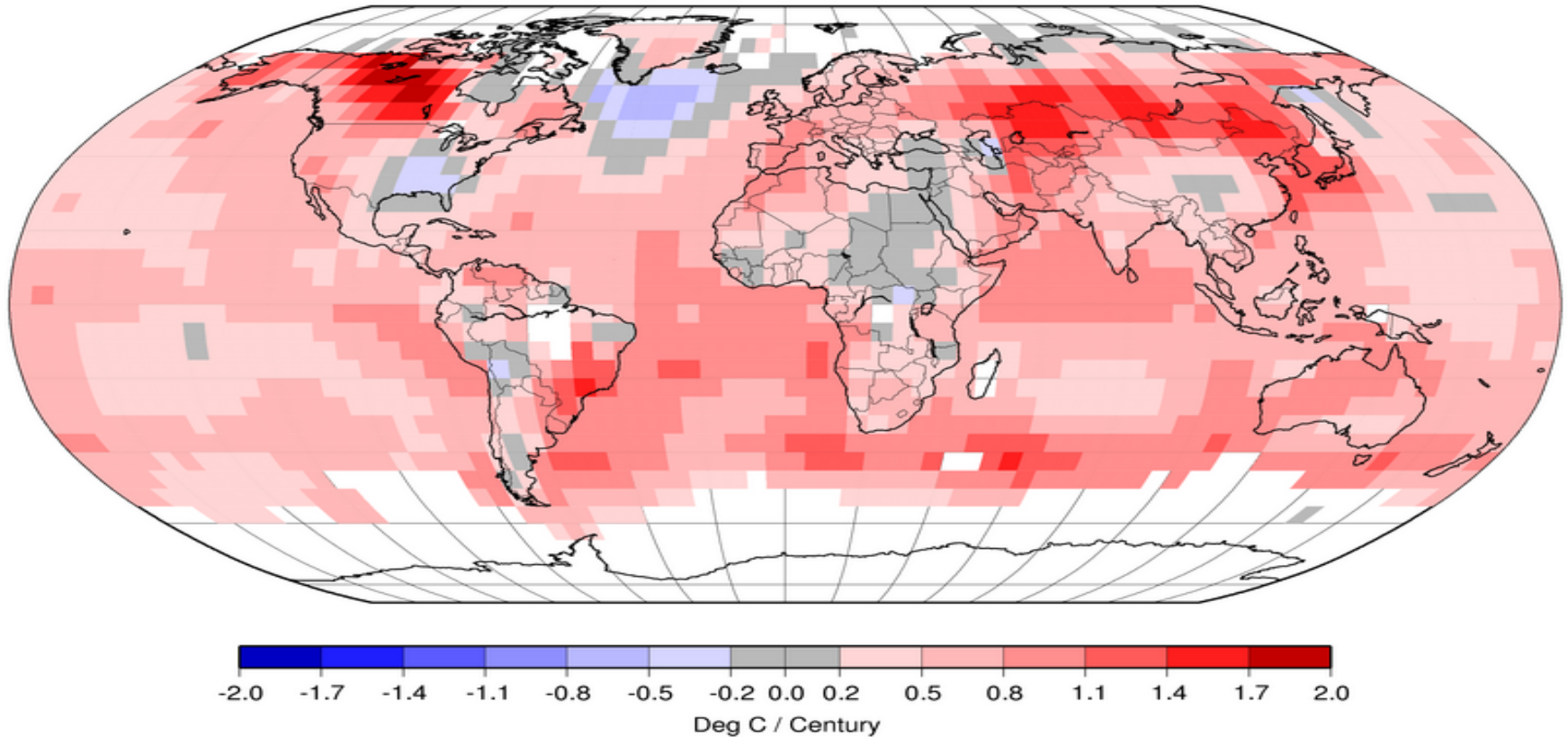
- Record snow in parts of the U.S. last winter depleted road salt supplies, even though suppliers shipped a near-record 20.3 million tons, up from the average 16 million tons a year through the previous decade.
- Then, fearing a repeat of the problem, many states increased their salt orders this year, Illinois, for example, asked for 34 percent more and Iowa's request spiked by 52 percent.
- Salt usage in the UK up to 3 million tonnes last winter from recent averages of < 1 million tonnes. This winter could be more than 3 million tonnes.

What is Happening to Winter?

- Climate Change Models suggest that Northern Hemisphere Winters should be getting milder and wetter? Complacency?
- Can we blame El Nino?
- How about the lack of sunspots?
- Or is it due to more Severe Weather caused by climate change?
- More precipitation in winter means more snow?

Temperature trend over 1901-2003

Trend in Annual TMEAN, 1901 to 2003

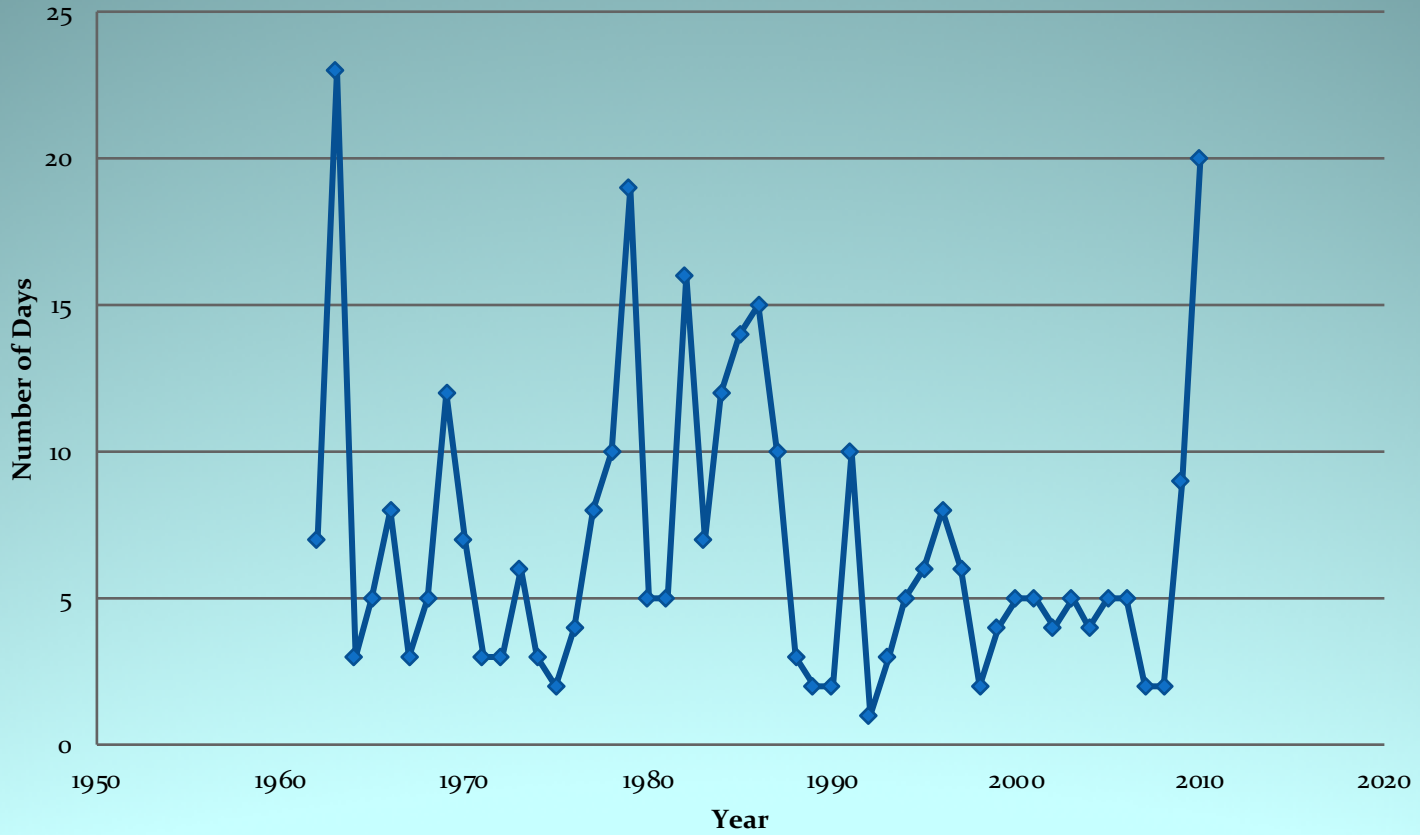


Courtesy Phil Jones (UEA/CRU), data from Smith and Reynolds, *J. Climate* (2005)

Climate Change Expectations?

- The effects of climate change have made it far more difficult for highway authorities to predict conditions from year to year. A succession of mild winters inevitably resulted in some assuming that such conditions might continue, but last winter proved that this was not to be the case.
- Increased frequency and intensity of severe events is a consequence of climate change and needs to be taken into account in winter service planning.
- www.ukclimateprojections.defra.gov.uk

January Days With Snow Lying UK 1962-2010



RECOMMENDATION 1 APPROACH TO CLIMATE CHANGE

Highway authorities should review their approach to climate change and in particular their resilience to prolonged cold weather.

RECOMMENDATION 2 SALT SUPPLY SERVICE

Highway authorities and salt suppliers should treat the supply of salt as a service rather than a simple commodity purchase.

RECOMMENDATION 7 SHARING DEPOTS AND SALT STOCKS

Highway authorities should explore the potential for sharing depots and salt stocks.

RECOMMENDATION 9 SALT STOCK HELD BY THE HIGHWAYS AGENCY

The Department for Transport should consider whether to reduce overall demand for salt at critical times by asking the Highways Agency to hold a reserve of salt above that which it needs to meet its service standards.

RECOMMENDATION 19 PUBLIC INFORMATION

Highway authorities should ensure effective communication of information for the public before and during severe winter weather conditions.

To Service Providers

FOR IMMEDIATE ACTION – PRESERVATION OF SALT STOCKS

Due to the prolonged spell of cold weather in December and January, and the current widespread snow, road salt stocks held by the Highways Agency and local authorities are at extremely low levels. With the salt industry unable to meet all current demands by a considerable margin it is essential that with immediate effect service providers actively consider and where appropriate implement measures to reduce the amount of salt used. Service providers should not assume that the salt stocks that they currently hold will stay with them as there are other HA areas and LHAs with critically low levels.

Given the current circumstances you must consider the following measures in addition to those that you are already doing in order to preserve salt stocks:

- Reduce the spread rate when ploughing from 20 to 10g/m². This allows two circuits of the ploughing route before re-loading.
- Abandon the Hard Shoulder running on the M42 during snow events and when temperatures are low. This avoids the need to treat the hard shoulder.



CONCLUSIONS

- Highway Authorities need to continue to be resilient to winter weather
- This means holding on to winter maintenance budgets despite pressure to cut budgets due to expected warmer winters
- We should have the resources to cope with whatever the weather throws at us – but we need to have better coordination between regions to share resources
- We have to adapt to our future climate and not become complacent