

Winter outlook consultation

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Contents



The presentation covers the following sections

- Forecasting for the energy industry & markets
- The 2005/2006 winter forecast
- Communicating seasonal & climate risks
- Schedule for the 2006/07 winter forecast

The Dec `05 – Feb `06 winter forecast

Europe braces for its winter of discontent

Clive Cookson on predictions of freezing conditions and unprecedented demands for power made by UK meteorologists this wee

And now for Januar weather forecast...

The Met Office has released a severe weather. warning for winter predicting heavy spowfalls. bitter temperatures to come. How on earth do t know? Tim Radford investigates the extreme inexact science of long-range forecasting...

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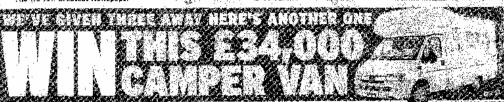
supplies showed the Govern-earth was 'un its skids'.

Mr. Howards warning came as analysts revealed that the UK's gas is now the most appearive in the world trading

appearable in the work, against twice the price for ende edi.
This will lead to buyer, bills for innsettoiders.
Even Tony Main refused to rule out, cuis to domestic gas supplies as he cance under fire increased with the price accordance in rings, and over escalating prices and fears of fuel shortages this

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MICH ETURY, PASSES ASS.



We have dearest gas in the world Report No flu jabs

Cold will kill 89,000
 Power cuts on the way

BRITAIN is facing a long hard winter as the big freeze threatens thousands of extra deaths and power cuts.

Major snowfalls are expected to hit the North this morning, spreading steadily south, famed by

strong Arctic winds: The Met Office reinferred its warnings of one of the worst wireturs in a decarle, dominated by cold blasts from Siberia. Charities caring for the alignly worned that as many as

teams of the Shortages, this winter.

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Hazard Research Centre at University

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Prof Saunders points out that cold weather in late November, such as the British Isles will experience over the next few days, does not portend an Arctic winter. In fact, the Met emperatures Office's four-week forecast suggests

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eterred.

College London agrees that the NAO can be predicted, though it uses a technique based on snow cover and air temperature gradients rather than sen temperatures. Its forecast is for the NAO to be only slightly below normal this winter - not enough to justify the Met Office's warning. "I would not base economic decisions on NAO forecasts because they are not reliable enough," says Mark Saunders, head of long-range forecasting. "There is a divergence of opinion between forecasters and f-

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Secret briefings as Met Office issues weather warnings

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a The Guardian 20.09.05

The winter headline forecast for Dec-Feb 2005/06



The forecast for Dec-Feb 2005/6 – was first issued in September 2005 and updated monthly

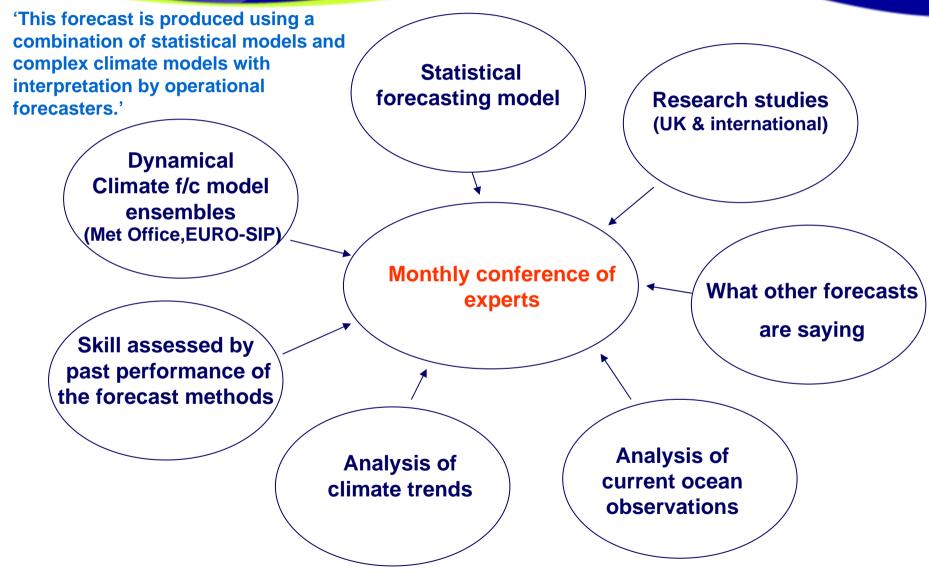
The Met Office continues to predict a two in three chance of a colder-than-average winter for much of Europe, and that if Europe were to experience below-average temperatures, parts of the UK - especially southern regions - would also be affected. There is also an indication for a drier-than-average winter over much of the UK.

The last eight winters have been relatively mild and perhaps have given the impression that these are 'normal'. The balance of probability is for a winter colder than those experienced since 1995/6.

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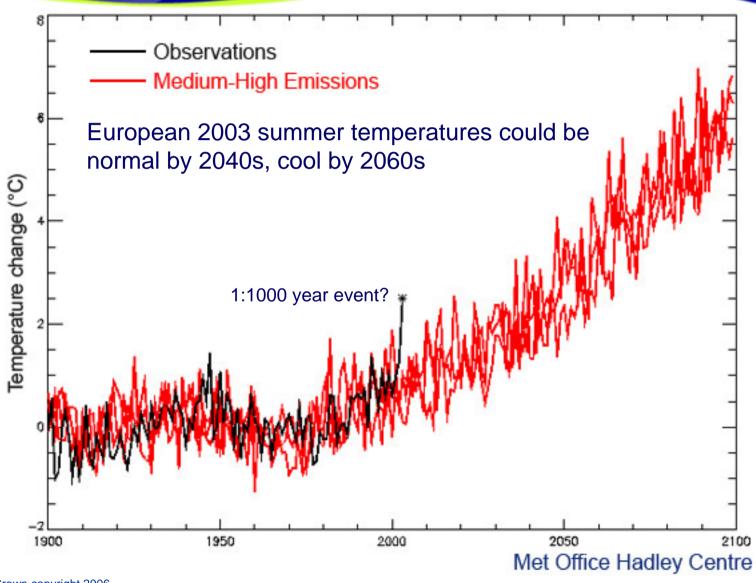
How the seasonal winter forecast is produced





Changing return periods due to climate change





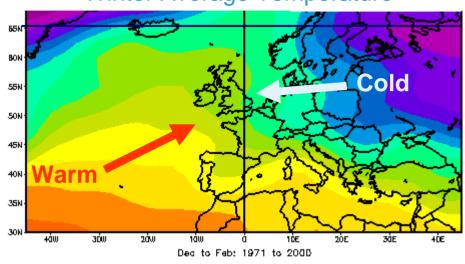
Warm oceans and cold winters?

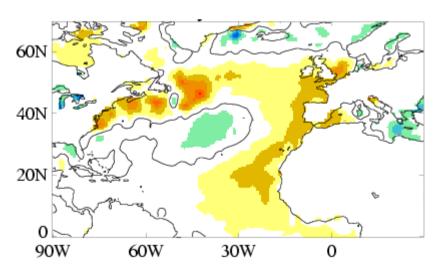


- Oceans act as the climate memory and influence the atmosphere
- Air is modified by track over the ocean
- The influence of the warm
 Atlantic ocean temperatures
 depends on the wind direction

Sea temp November 1995
(opposite) – one month later
December 1995 was the
coldest December for more than
20 years

Winter Average Temperature

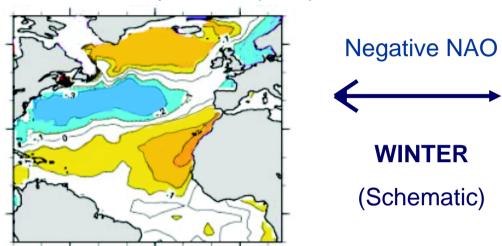




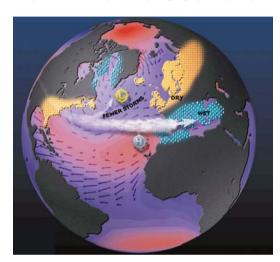
The North Atlantic Oscillation



Sea-surface temperature (SST) anomalies



North Atlantic Oscillation



- •In mid-latitudes internal seasonal variability is large. The scientific evidence suggests a weak forcing of the ocean on the atmosphere in winter (and the models underestimate the effect).
- •Negative North Atlantic Oscillation (NAO) implies greater frequency of easterly flow.
- The empirical-statistical NAO forecast uses the May sea surface temperatures to predict winter NAO (*Rodwell & Folland, 2002*) and is correct ~ 2:3 times for the sign of the anomaly or change in sign.

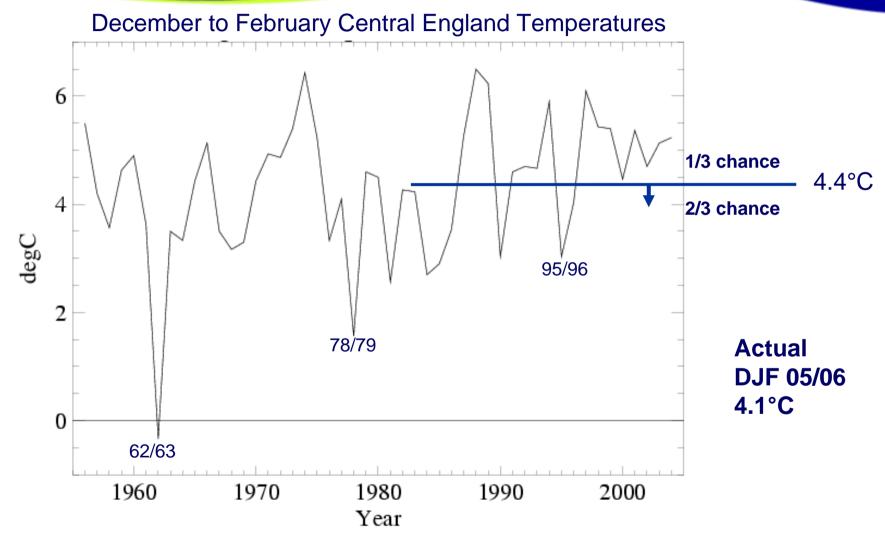
Summary of evidence in 2005/06



- The statistical NAO forecast suggested colder than average winter particularly for Europe (it was supported by the experimental decadal forecast system).
- Seasonal ensemble model forecasts for September and October suggested cold conditions over Europe. November suggested warm.
- The seasonal system forecast the sea surface temperature tripole consistently with a negative NAO situation – but the signal is weak ~ 40% of observed amplitude (as expected).
- Real time analysis of **sub-surface** ocean temperatures supported the re-emergence of tripole SST anomalies in winter. This was closely (weekly) monitored to see if the forecast was 'on track'.
- Expert interpretation (by research, forecast & communications staff) was used to draw all this together into the headline forecast and to subsequently decide if the forecast should be revised.

Central England Temperature – How Cold? Presented to ~90 users/customers at the Winter Briefing last November

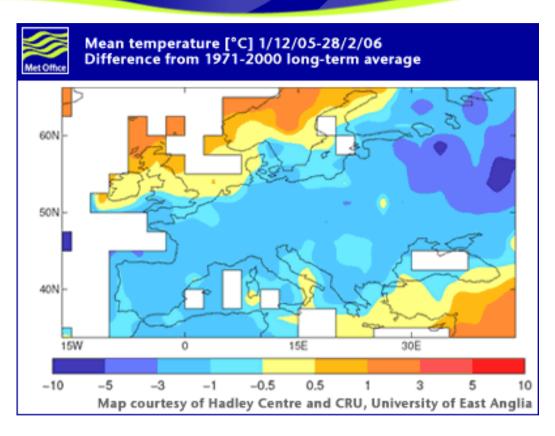




Note: 4.4=median for 1948-1998. 4.48=mean for 1971-2000 as used on web site.

What happened in 2005/06?

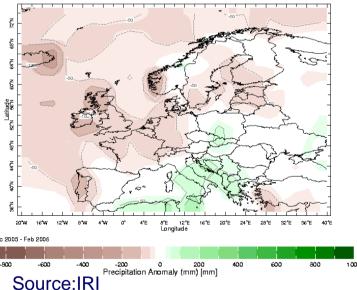




It was cold over Europe

Over UK the temperature signal varied with location. It was cold in Southern regions.

It was dry over Europe



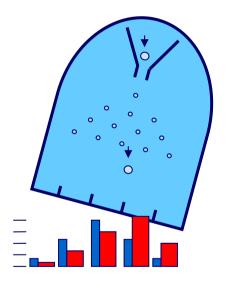
Note that an individual probability forecast cannot be said to be right or wrong. All we can say is that the most likely forecast category occurred.

Communicating seasonal and climate risks to the energy industry & markets

Communicating risks and probabilities



- Categorical forecasts
 - 2: Above / Below; 3: Above / Normal / Below
 - Need defining in terms of a climatology but which?
 - Few categories due to short observation record and chaotic nature of climate
 - Not always the most useful way to communicate to experts
- Probability distributions
 - More detail is wanted by users
 - Can provide what is scientifically credible



In mid-latitudes internal seasonal variability is much larger than external signals. Even with improved models, seasonal forecasts for these regions will be probabilistic and have lower skill than shorter-range forecasts.

Communicating forecasts



Science/communication in 2006

- How cold is cold? This needs to be quantified for likelihood forecasts
- Putting the component forecasts on the web wasn't helpful
- We had greater confidence in the forecast for Europe than for UK need to work with the media & industry to communicate this also.

Developing forecast utility

- Communicate forecast in terms that each market sector can use
 - More detail e.g. changes in likelihood of a 1:50 cold winter, a 1:20 peak day, or of cold weeks/months, or forecast in terms of Composite Weather Variable
 - Find & prove levels of skill that are both scientifically valid & useful to customers
- Workshop to discuss forecast presentation and interpretation
 Please contact us if you would like to be involved.

Communication 2006/07



- Scoping study for the impact of climate change on the energy industry launch 5th June 2006
 - Contact fiona.hewer@metoffice.gov.uk
- First winter seasonal forecast available:

www.metoffice.gov.uk 1st July 2006

- Winter seasonal forecast updates
 - 1st September 2006
 - 2nd October 2006
 - 1st November 2006
 - 1st December 2006

