England and Wales Winter Storminess December 1999 - March 2000

Summary and Verification of Authors' Seasonal Forecasts

Issued 25th April 2000

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Summary

An average winter for storminess predicted successfully to within the forecast error bars.

On the 1st November 1999 we issued the first Met. Office endorsed long-range prediction of England and Wales winter storminess. The forecast spanned the period 1st December 1999 to 31st March 2000 and gave the number of days when wind gusts were expected to reach 'strong gale' and 'whole gale' levels over at least 30% of the forecast regions. The two forecast regions were southeast and eastern England, and western England and Wales. This document summarises the observed storminess in each region, and verifies the extended range forecast.

The 1999/2000 Winter Storminess Season

- The 1999/2000 season was the third year in a row to witness near average storminess levels across England and Wales.
- December was easily the most stormy month (see Table below) seeing 60% of the season's whole gale days in southeast England, and 80% in western England.
- The largest maximum gust recorded in SE and E England was 62 knots (at Cranwell and Waddington on 3rd December). The highest maximum gust observed in SW England and Wales was 86 knots (at Plymouth on 25th December).

1999/2000 Whole Gale Catalogue							
	Dates				Total		
Southeast and Eastern England	Dec 3	Dec 24	Dec 25	Jan 29	Feb 8	5	
Western England and Wales	Dec 3	Dec 23	Dec 24	Dec 25	Feb 8	5	



Verification of Forecasts

1. Southeast and Eastern England



Southeast and Eastern England 1999/2000					
	Strong Whole Gale Days Gale Day				
Average Numbers (1970/1-1998/9)	12.7	4.6			
Actual Numbers 1999/00	13	5			
BGHRC/UCL Forecast 1 November 1999	16 (±3)	5 (±2)			

The numbers of days with gusts reaching 'strong gale' and 'whole gale' levels were correctly forecast to within the standard errors. Activity was 4% above average overall which is slightly less than the forecast of 21% above average overall activity; however, this difference is not significant to within the model error.

2. Western England and Wales



Western England and Wales 1999/2000					
	Strong Whole Gale Days Gale Da				
Average Numbers (1970/1-1998/9)	20.7	7.6			
Actual Numbers 1999/00	19	5			
BGHRC/UCL Forecast 1 November 1999	22 (±4)	8 (±3)			

The numbers of days with gusts reaching 'strong gale' and 'whole gale' levels were correctly forecast to within the standard errors. Activity was 15% below average overall which is less than the forecast of 6% above average overall activity; however, this difference is not significant to within the model error.

Next Forecast

An extended range forecast for UK winter storminess for December 2000 - March 2001 will be issued on <u>15th October 2000</u>.

This next forecast will include further sub-regions, and will use a new skill metric - the Rank Probability Score (RPS). The RPS is an ideal skill score for a weather risk application because a significant fraction of the skill score derives from the shape and bounds of the probability distribution.

Appendices

Potential Benefits and Principle Issues

During the 1990s European windstorms generated economic damages of $\pounds 1.9$ billion per year, and insured losses of $\pounds 1.1$ billion per year. They rank as the second highest contributor to global insured losses due to natural catastrophes after US hurricanes. European windstorms affect a range of industry including insurance, construction, power and travel. Skilful seasonal forecasts of UK winter storminess would offer significant financial benefit through the improved structuring of financial contracts used to hedge weather risk.

This forecast arises from a collaborative agreement between the Benfield Greig Group, The Met. Office, and University College London to undertake a programme of research on the seasonal prediction of UK and European winter storminess. The fundamental principles underlying the research are to achieve improved prediction skill over that available currently, and to forecast probability distributions for gale and storm occurrence. In this way, imperfection in the forecast is recognised while at the same time providing quantitative information.

Definitions						
Beaufort No.	Description	Gust Wind Speed				
		mph	knots	ms⁻¹		
9	Strong Gale	47-54	41-47	20.8 - 24.4		
10	Whole Gale	55-63	48-55	24.5 - 28.4		

Definitions