Meeting the Challenges of the 21st Century

Will Lang, Chief Forecaster, UK Met Office, CAS-TECO, Antalya, Turkey, 18-19 November 2013
Changing Roles

- Forecasters as decision makers
- ……and providers of continuous advice
- Increasingly working ‘over the loop’ or ‘outside the loop’
- More flexible, and responsive to changing situations
- Often embedded within other organisations or decision making teams.
- Managing 'the story'
The ‘St Jude’s Day’ Storm

• “Warnings about today’s storm were first given a week ago, giving people and emergency services time to prepare... More advanced technology has made predicting the weather far more reliable”
  BBC News 10:00pm, 28 Oct 2013

• “The precise damage, the exact timing, these could never have been predicted in detail...it’s obvious that the forecasters had spotted potential trouble very early on, and they made sure that we all knew about it...intense low pressure causing extremely powerful winds. We’ve seen how damaging they’ve been, but at least we’ve had plenty of warning” David Shukman, BBC Science Editor.
5 days ahead

Amber warning issued – ‘low probability, severe impact’
24 hours ahead.
Wind gust forecast valid 0400 Monday

Sat evening forecast
DT 26 Oct 18z Euro4

Sun morning forecast
DT 27 Oct 03z UKV

Sun afternoon forecast
27 Oct 18z UKV

Warning remains valid and teleconference calls set up for Sunday morning at 9am

Models losing strong gusts as energy is partition across two lows. **Prime Minister calls a teleconference**

Continued trend to a limited area of 45kt+ wind gusts available to forecasters only 6 hours before impact. **Prime Minister wants an update**
Key Issues Raised

• 'Most likely' and 'worst case' impact scenarios

• Informed by wide range of meteorological tools (not 'following the latest model')

• Communication of these scenarios is all important:
  - continuous
  - two-way
  - consistent across sources and formats
  - checked understanding
Changing Science

- Higher resolution
- Improvements in ensemble prediction
- Rapid updates
- Post-processing
- Coupled models (weather, river, ocean)
- Product automation
- Impact modelling
Converging modelling scales

Spatial resolution

200 km

2,5 km

200 m

10 m

Computer performance

Atmospheric & hydrologic models

Convergence of scales: opportunities for coupling

Lake and River - Hydraulic and ecosystem models

Modelled domain

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Impacts: Vehicle OverTurning Model
St Jude’s Storm 28th October 2013

Maximum Risk on the UK Road Network
- Low Risk
- Low - Medium Risk
- Medium - High Risk
- High Risk

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Location of Impacts – St Jude’s Day Storm

- Lorry Overturned
- Double-Decker Bus Overturned
- Vehicle Overturned

VOT output layer from 06Z on Monday 28th October 2013
Too Much Information?

UKV (1.5km)

MOGREPS-15  Arpege

MOGREPS-W

EC OP

G2G

MOGREPS-G

EC EPS

Global Model

NAE

GFS ENS

Euro4 (4km)

GFS

HIM

MOGREPS-UK
Making the Best of Our Science

• Forecasters’ ‘Big Data’ problem

• How to choose which information reaches the end user?

• Models/systems will be judged not just on their accuracy, but equally on their usability, flexibility, presentation and relevance in HIW situations.
Changing Risks

• Climate Change – extreme events
• Population Growth
• Urbanisation
• Development (property and infrastructure) in exposed areas – eg East Coast of England
Final Thoughts

• Socio-economic benefits maximised through
  - Anticipating change
  - Using the best science
  - Understanding risks, impacts and user needs
  - Communicating credibly and authoritatively

• The human element in meteorology is increasing again

• We have a responsibility to not just understand meteorology, but to advise others on how it affects them.
Thank You