

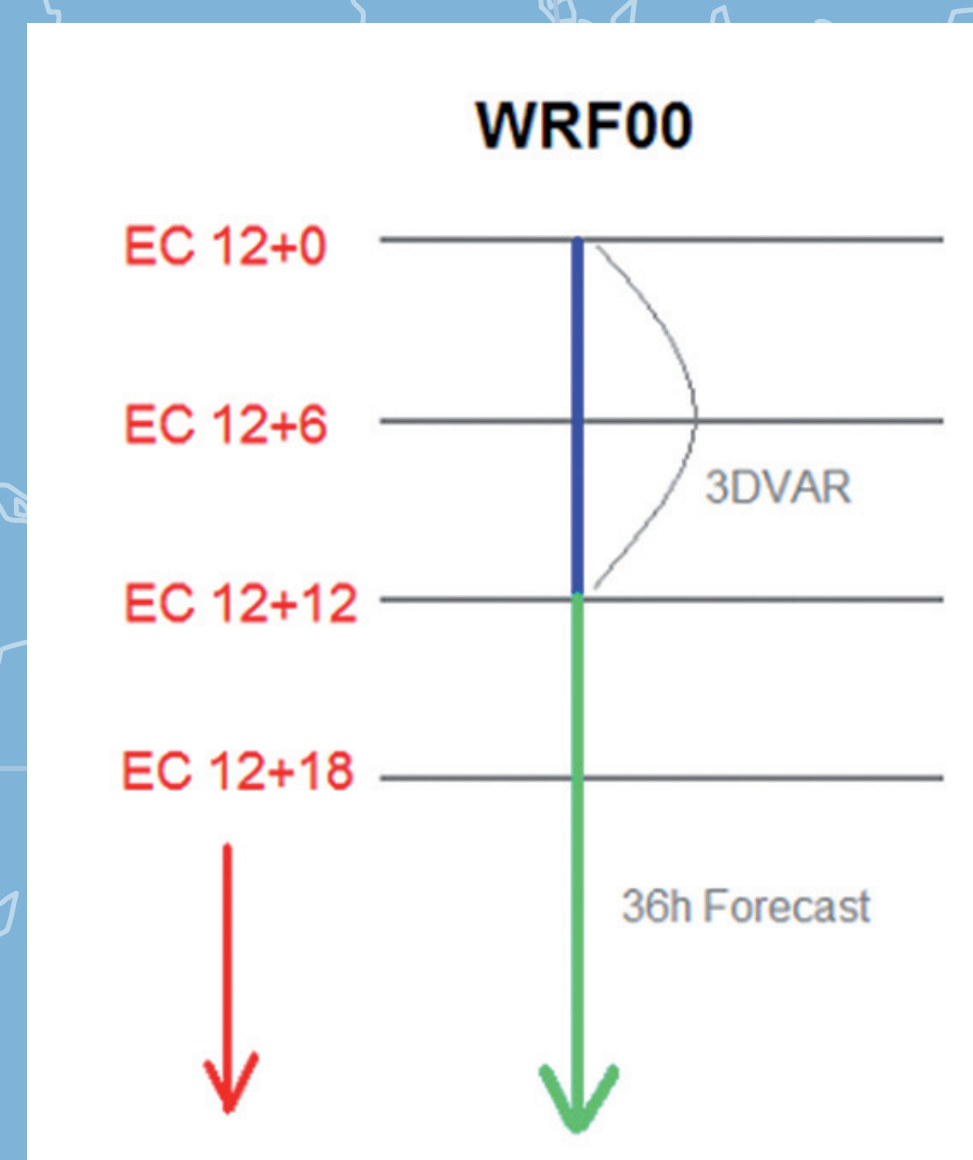
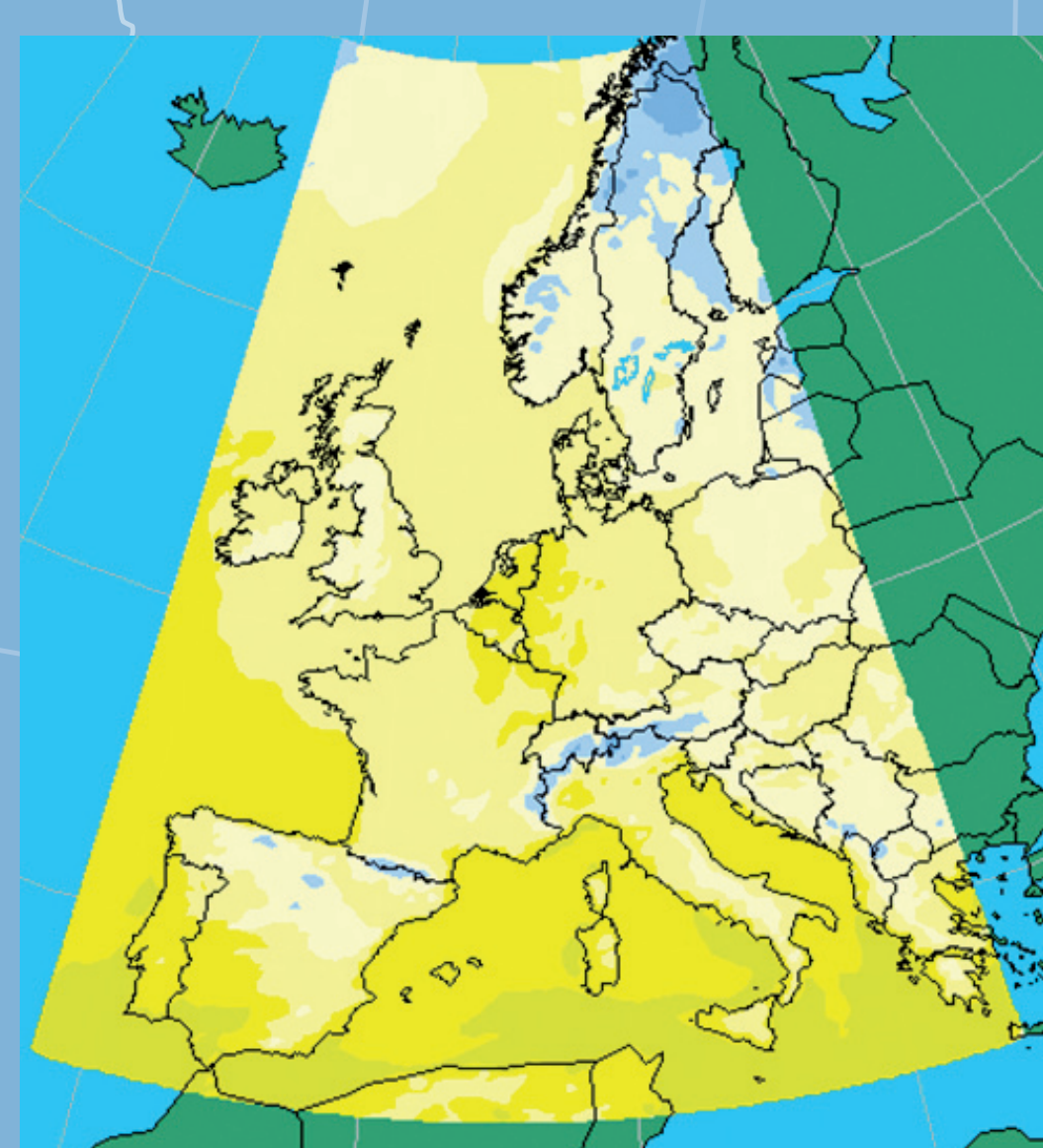
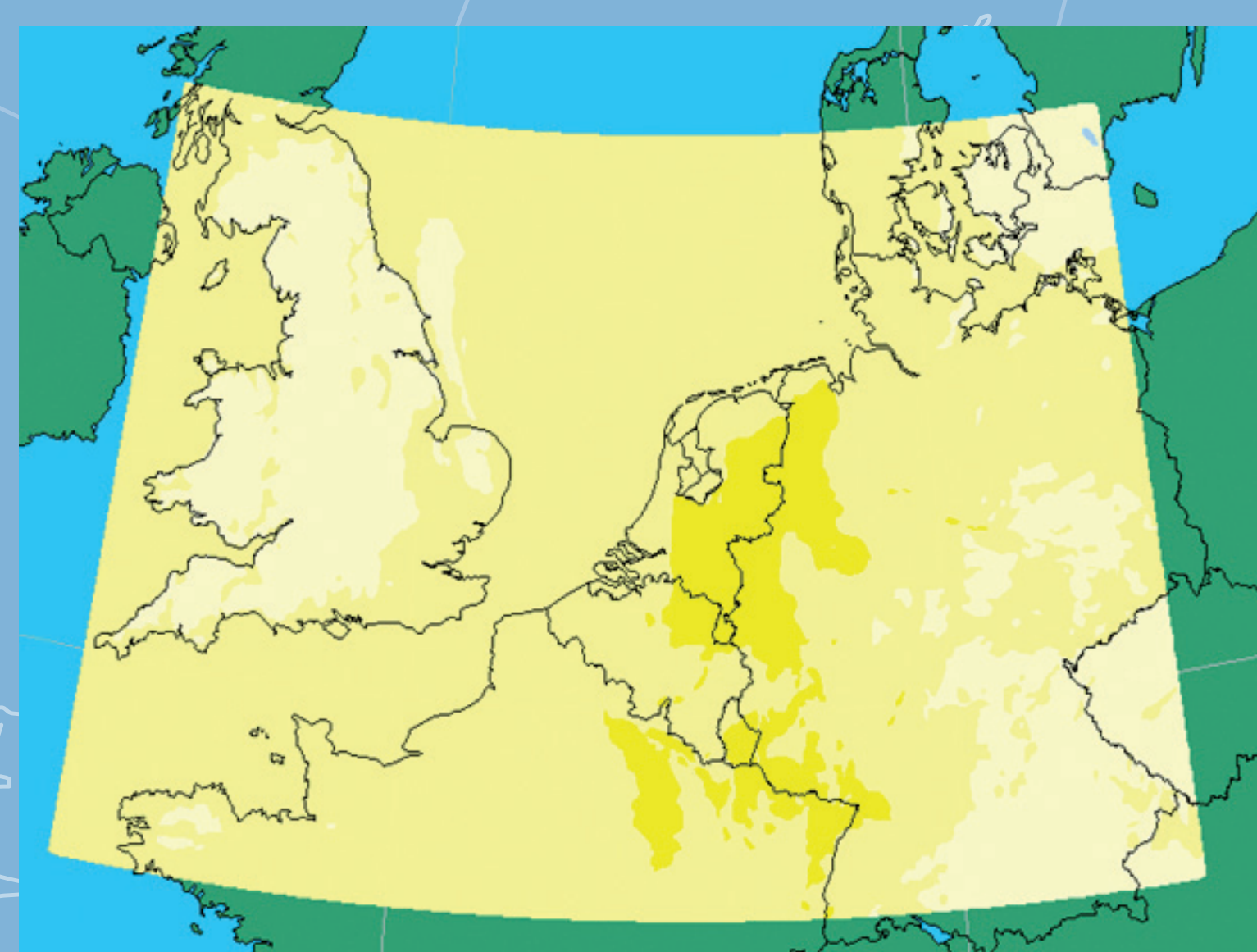
A WRF forecast of a tornado producing supercell during 7th May 2012, in Oxfordshire, UK

Daniël van Dijke¹, Clare Allen¹, Paul Knightley²

Affiliation: ¹Meteogroup, Wageningen, The Netherlands, ²Meteogroup, London, UK

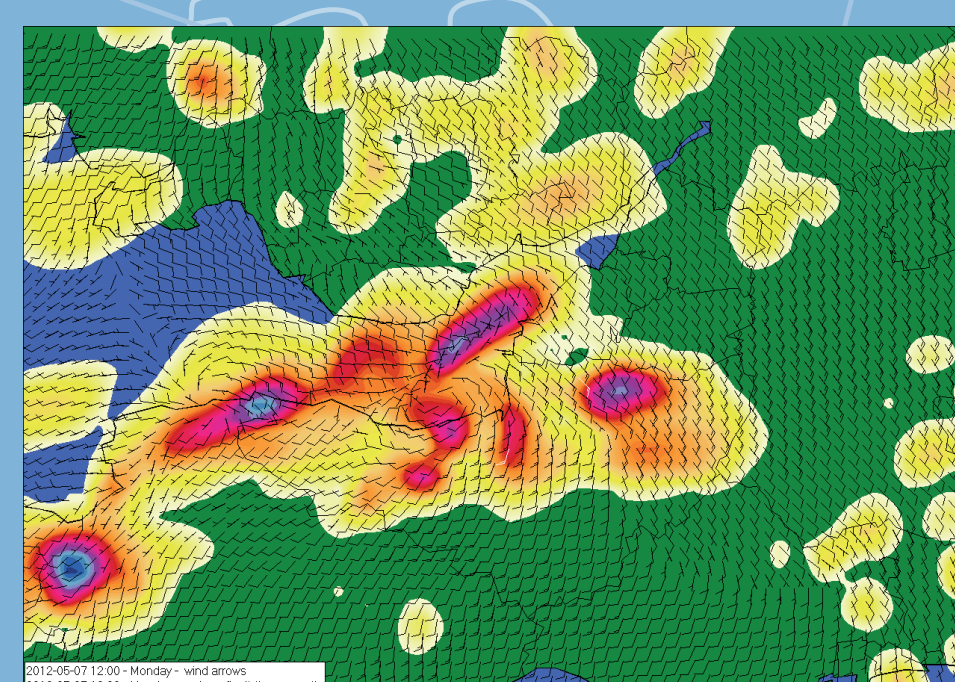
On Monday 7th May 2012, a single cell thunder storm which exhibited supercell characteristics formed near Taunton, in south-west England around midday and tracked north-eastwards for at least 5 hours over a distance greater than 150 miles. As it passed over the county of Oxfordshire, tornado sightings were reported along with large hailstones, rain and high straight-line wind speeds. Across the damage swathe in which the tornado occurred, a number of buildings and trees were damaged, including a school, whilst some farm out-buildings were completely destroyed.

1) Model setup:

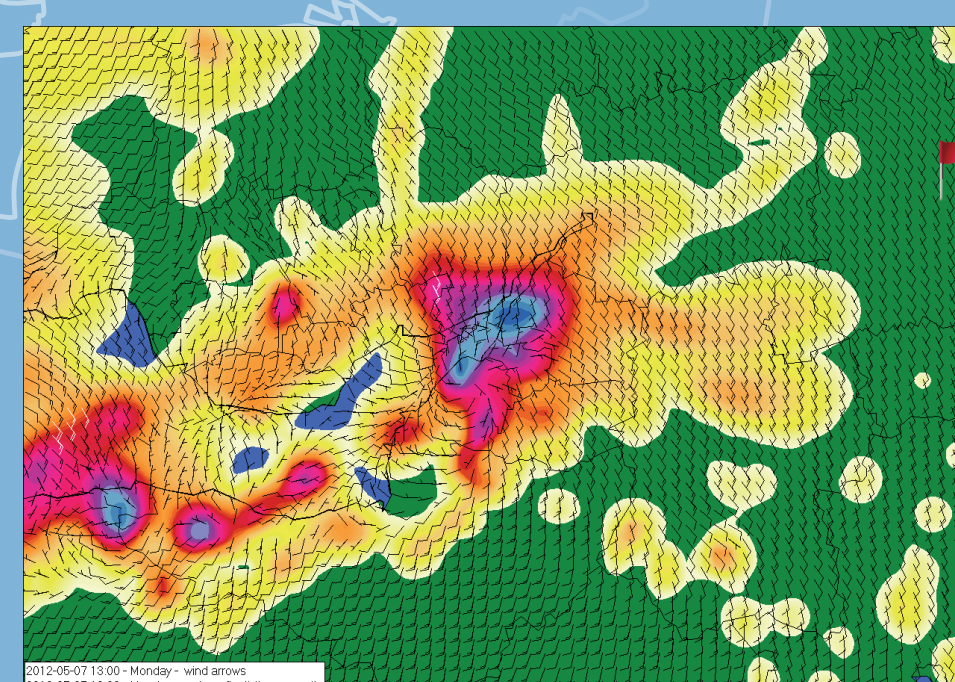


- 3 & 9 km horizontal resolution and 39 vertical levels
- Input:
 - ECMWF boundaries
 - 12 hours spinup with ground observations via 3DVAR
- Scheme setup: YSU PBL scheme, Noah LSM, WSM6 mp, RRTM lw scheme, Goddard sw scheme and Grell-Devenyi (9km only) cumulus scheme
- WRF is used by forecasters across Europe, next to other models like ECMWF, GFS, UKMO, HIRLAM.

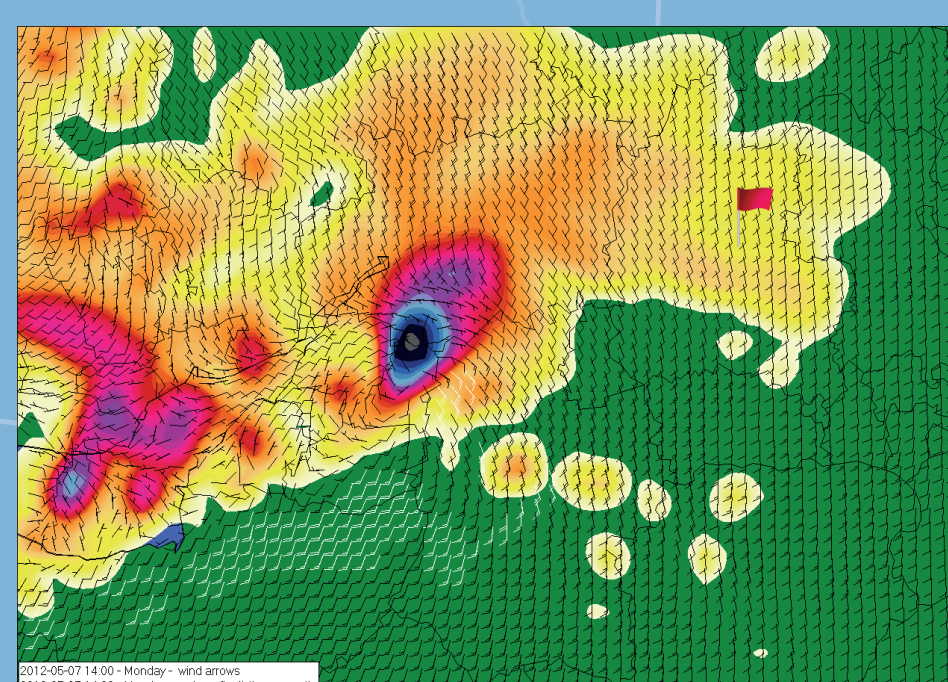
2) Comparison



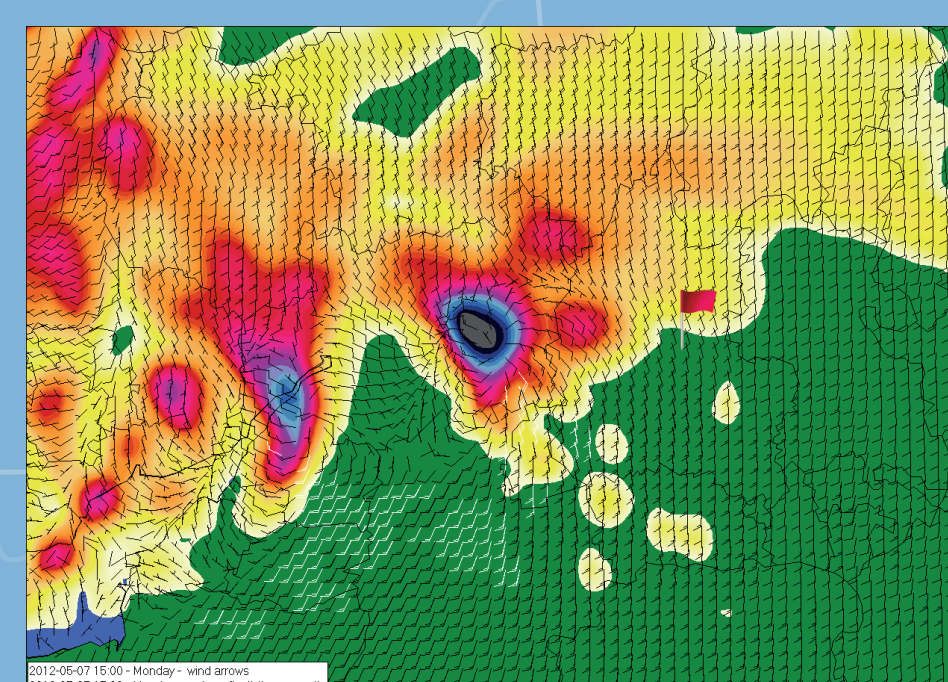
WRF at 12 UTC



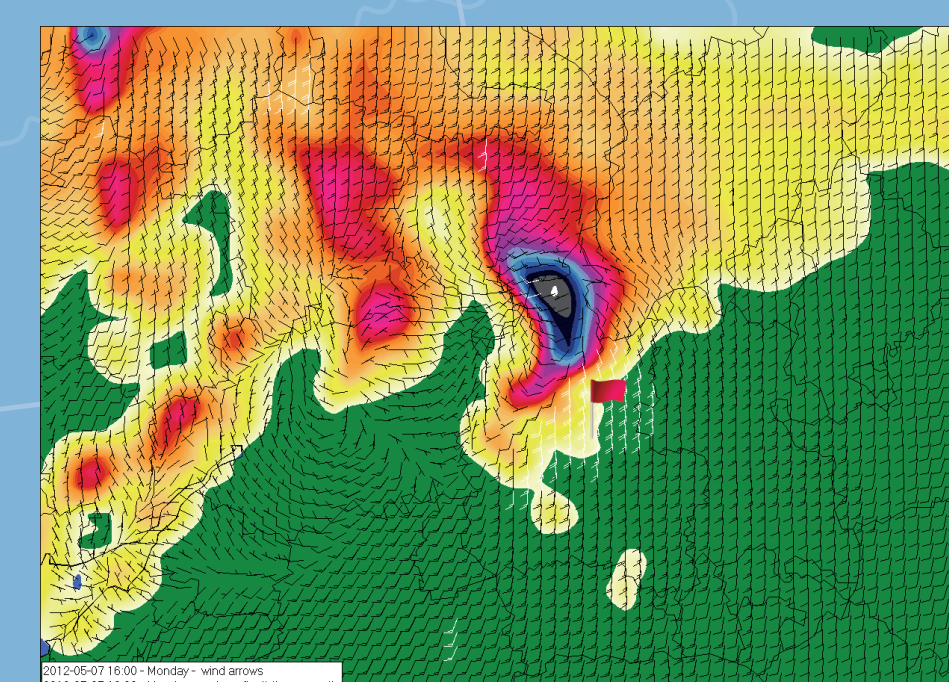
WRF at 13 UTC



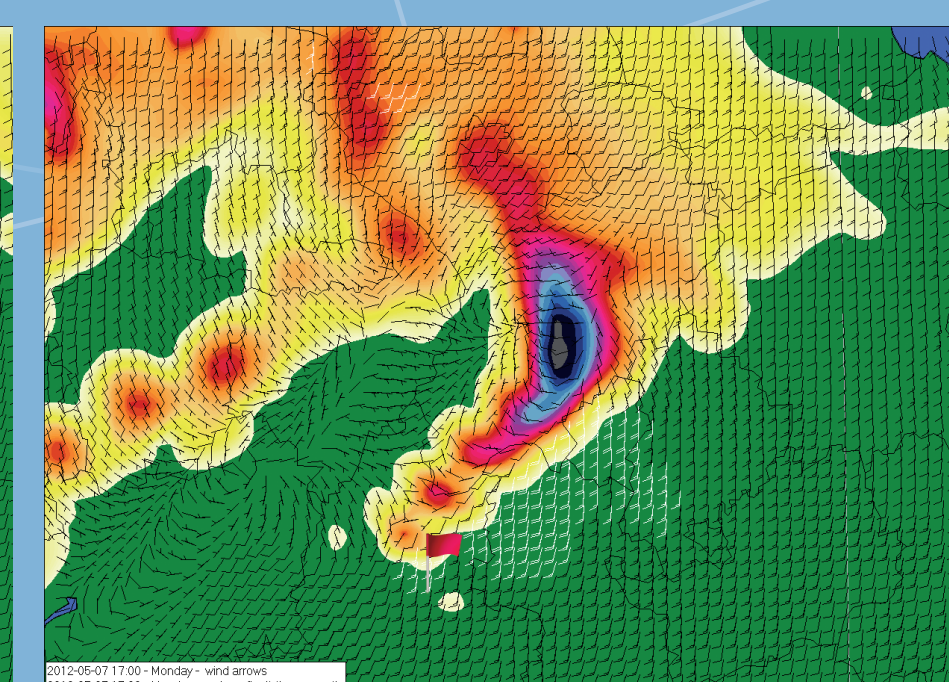
WRF at 14 UTC



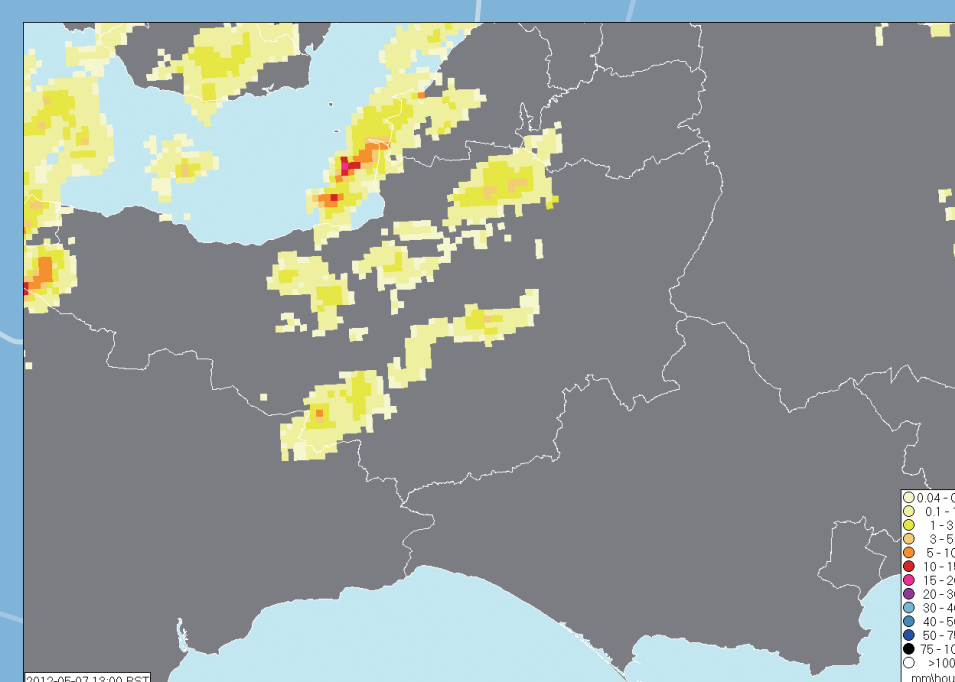
WRF at 15 UTC



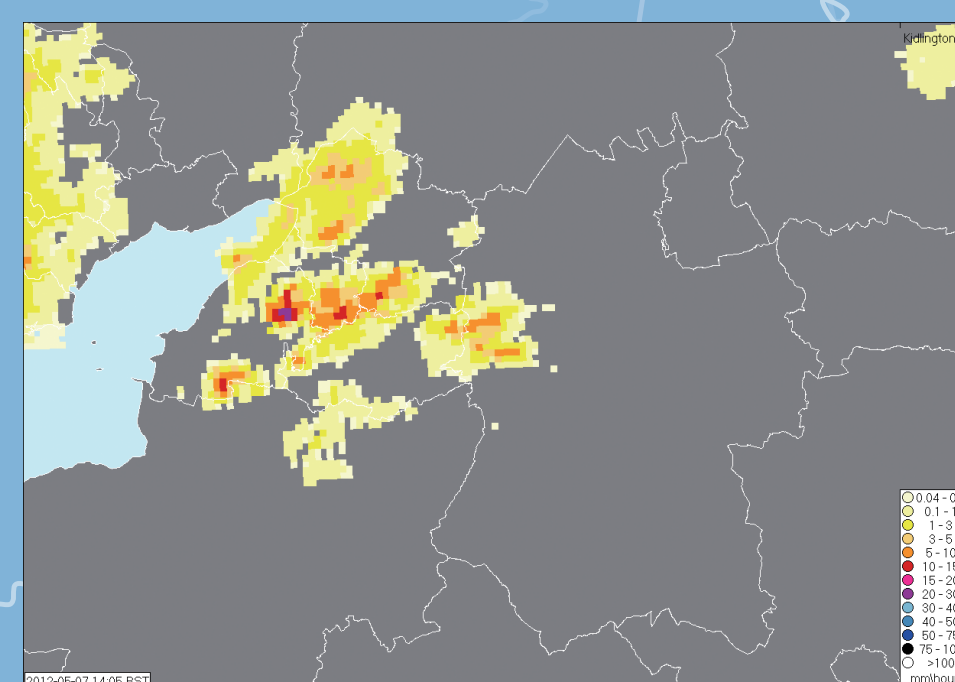
WRF at 16 UTC



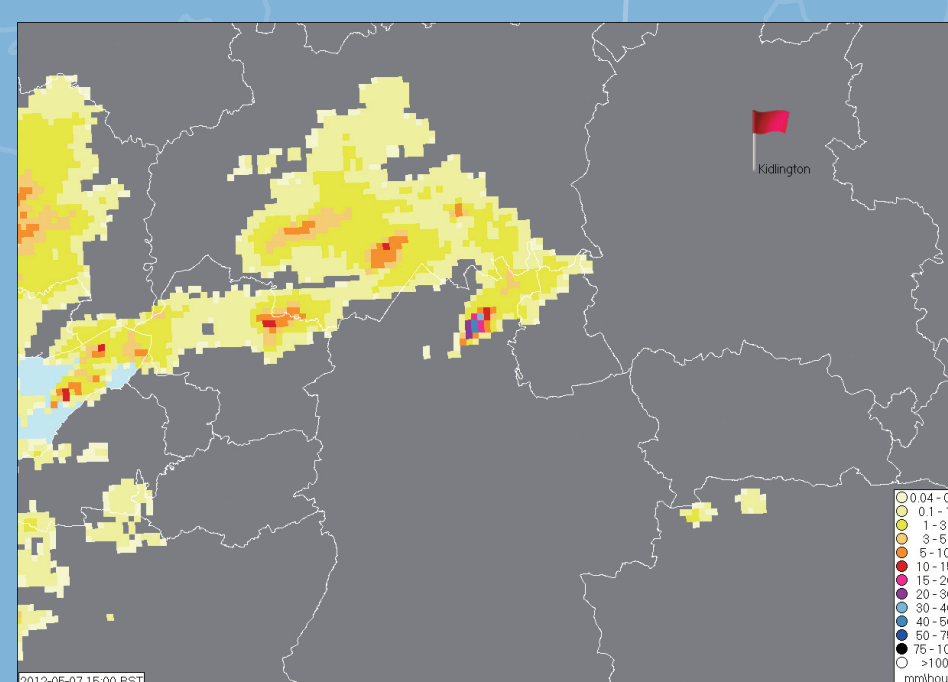
WRF at 17 UTC



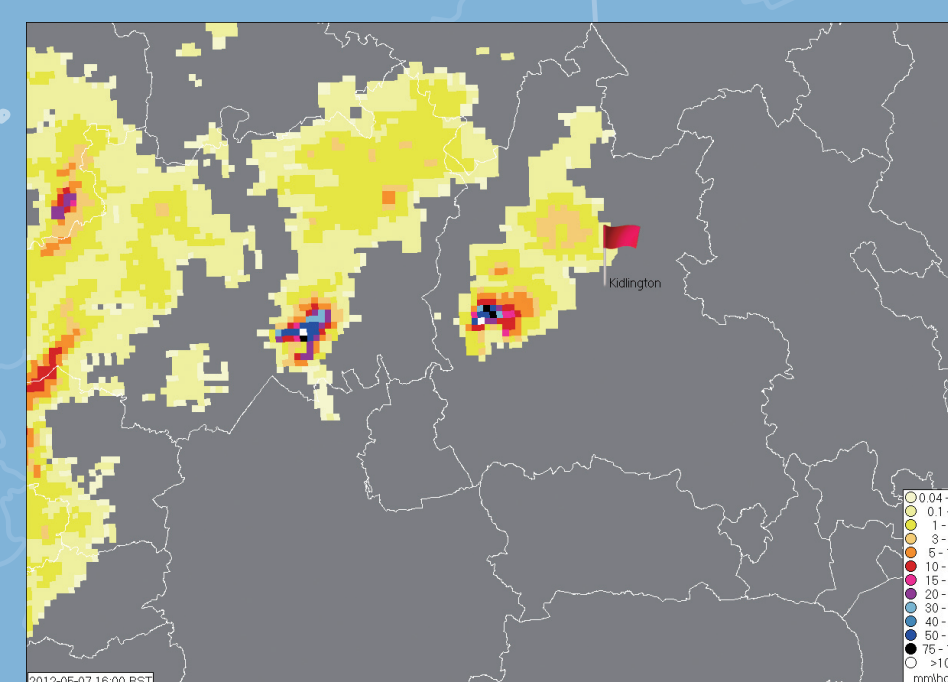
WRF at 12 UTC



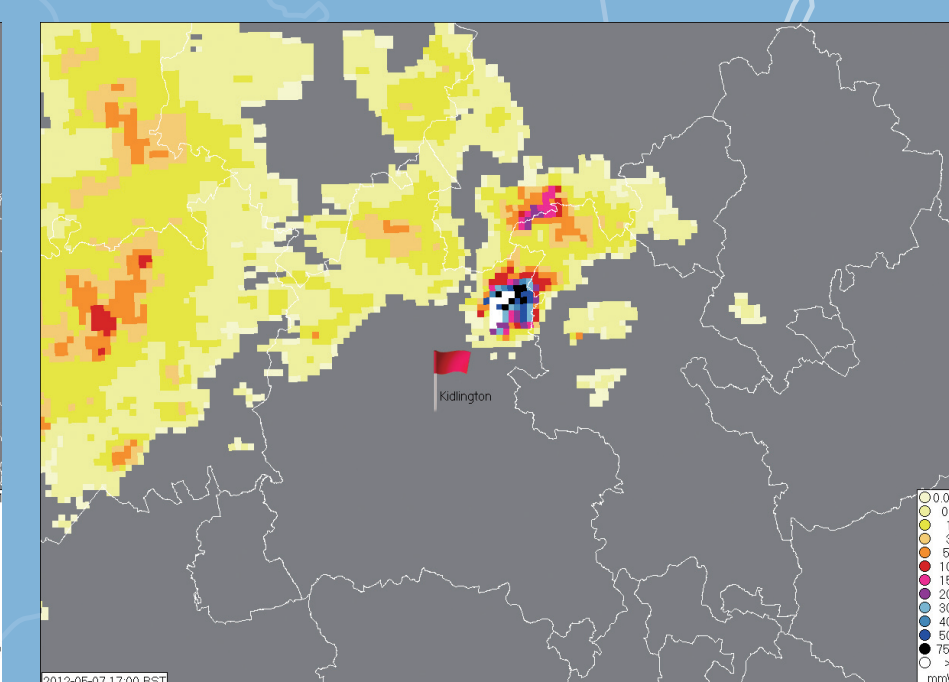
WRF at 13 UTC



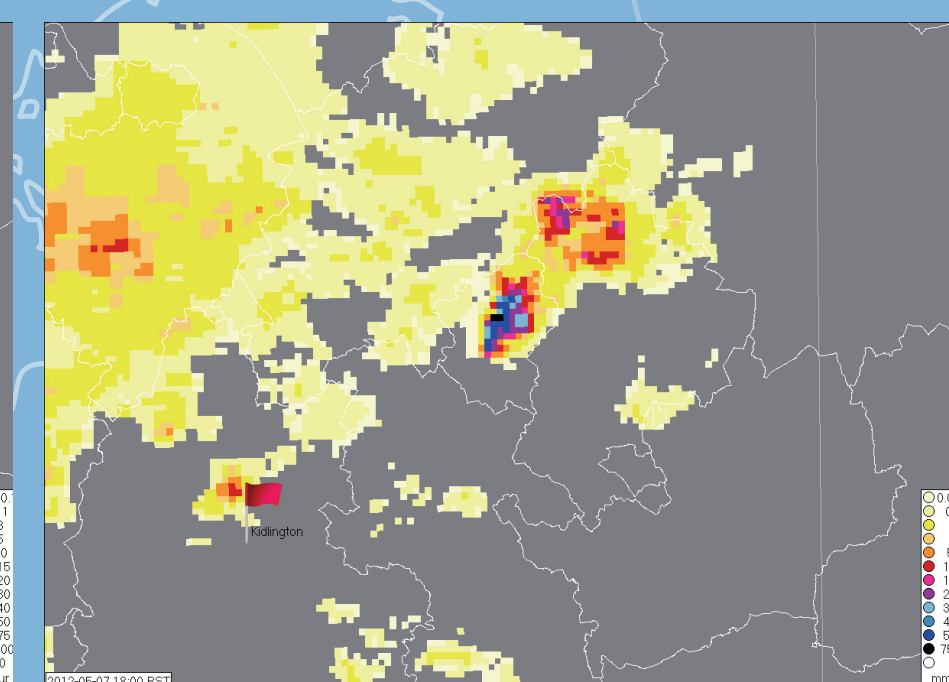
WRF at 14 UTC



WRF at 15 UTC



WRF at 16 UTC



WRF at 17 UTC

- WRF output of 3km resolution nest
- Red flag shows location of tornado
- Timing and location by WRF are accurate
- Clear inflow and outflow regions near the storm.

3) Conclusion

- Wind field and shape of storm show classic supercell characteristics.
- WRF was the only model to come up with this severity of the storm.
- Forecasters can use WRF to warn different authorities for the threat on extreme hazardous weather.
- These types of events are rare in the UK, nevertheless WRF did a good job representing

