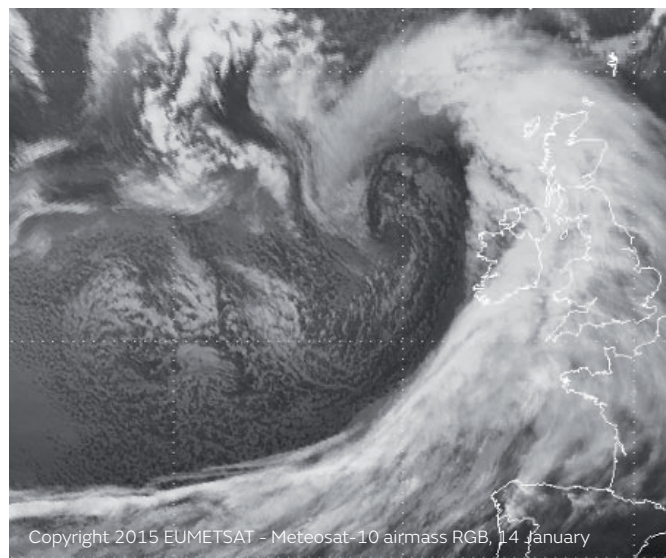


Euro Windstorm Historical Catalogue

More than 6,000 historical storm footprints at high resolution for research into insurance loss.

Recommendations based on catastrophe model outputs are constantly under scrutiny, both by internal teams and by regulators. The Euro Windstorm Historical Catalogue has been developed to assist insurers with their Own Risk and Solvency Assessments (ORSA) and wider Solvency II requirements. The dataset of 6,110 footprints and tracks from storms occurring between 1979 and 2014 describes the location of extreme wind events over the European region. Users can reconcile historical losses against individual storms as a check on catastrophe model output or use multiple storms as a factor in deriving vulnerability curves.



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Euro Windstorm Historical Catalogue

- 4-km resolution captures the effects of topography and land use, providing a detailed insight into loss.
- Large number of storms gives insight into event frequency.
- Wide domain covers 24 countries across Europe.
- Combination of model skill and observations gives confidence in the veracity of the event.
- Tracks show the path of the storm.
- Available as a complete catalogue or in subsets according to research requirement.

Most damaging windstorms in Europe are extra-tropical cyclones: synoptic-scale (~1000 km) low-pressure systems which grow from unstable frontal waves. These systems gain their energy from a strong north-south temperature gradient and a strongly baroclinic atmosphere. The north Atlantic Ocean provides these conditions, sustaining extra-tropical cyclones which travel eastwards towards Europe.

Model sources

Euro Windstorm footprints are generated using the Met Office Unified Model (UM) to downscale ERA-Interim data to 12 km and finally to 4 km. Horizontal 4-km resolution gives an improved representation of topography and land use. The ERA-Interim data set provides a stable and consistent description of the atmosphere from 1979 to the present day on which to base the footprints. The Euro4 domain covers 24 countries across Europe.

Methodology

Storm footprints indicate the maximum wind gust at 10 metres above ground at each grid point in the 72-hour window covering an event's peak intensity. A maximum gust is defined as the highest value of the 3-second running-average wind speed during the period.

Footprints are modelled using a combination of short-range forecasts from successive hindcast runs. The first few hours of each forecast (spin-up) are not used in order to benefit from the high resolution model, which needs time to evolve from its much coarser initial state. Also, forecasts beyond 30 hours are discarded due to diminished forecast skill over longer periods.

A storm event is defined as the 72 hours centred on the storm's peak intensity along the track, available for each storm event (the maximum wind speed at 925 hPa and within a 300-km radius of the location of the vorticity maximum). Storm footprints and tracks can be combined to indicate both the location and the extent of the event, as shown in Figure 2.

Representation

The Historical Windstorm Catalogue footprints and tracks are available in standard georeference format for integration into your applications. Static visualisations are also available in standard graphical format.

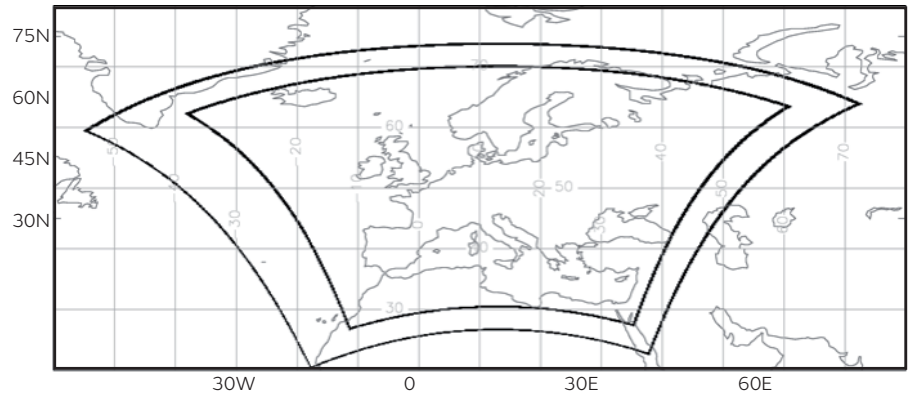
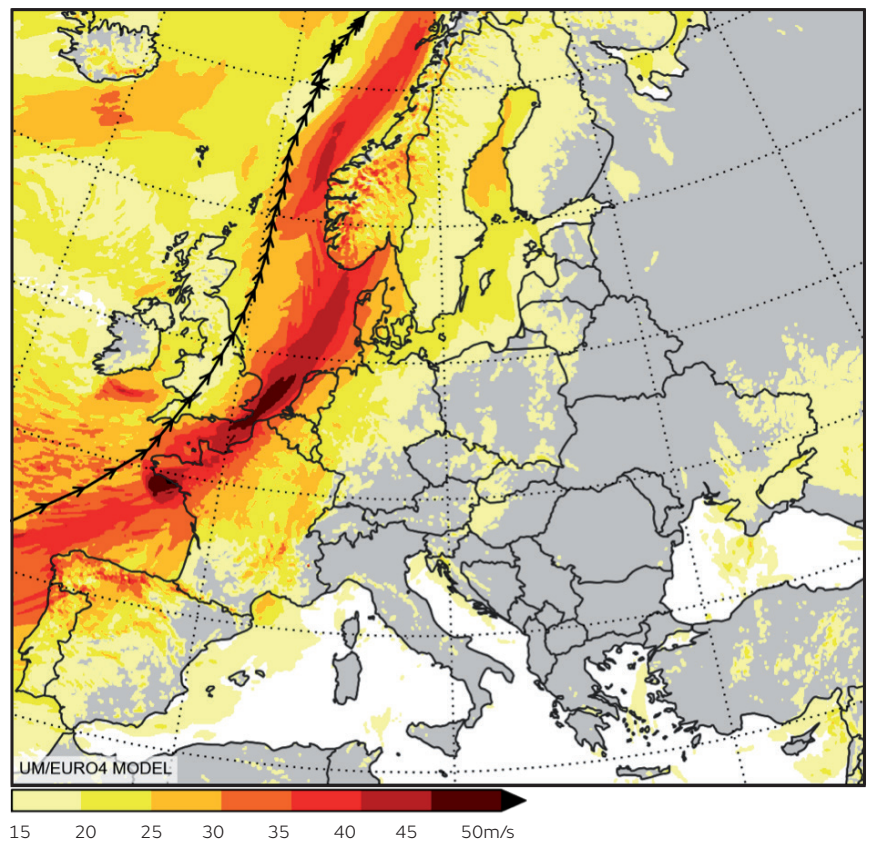


Figure 1: 12 km (outer) and 4 km (inner) domains

Windstorm footprint

Maximum gust from 14/10/1987 18:00 to 17/10/1987 18:00



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Figure 2: Map showing the maximum gust speed at every model grid point during the Great Storm, October 1987, and associated storm track

To find out more

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