

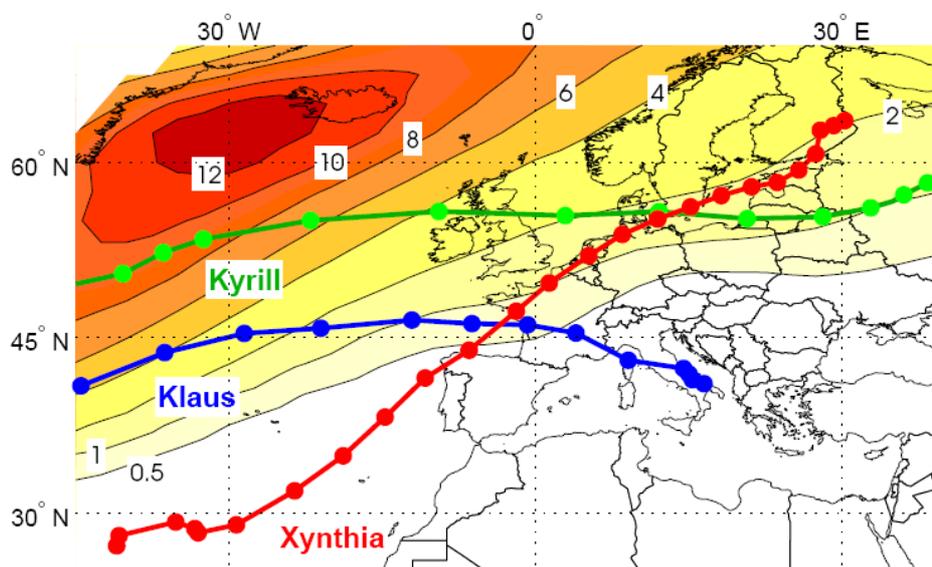
## European Winter Storms: Traditional Perils Posing New Challenges

Europe witnessed major damage from winter storms Klaus, Kyrill and Xynthia which exhibited uncommon characteristics. Klaus and Xynthia travelled eastwards on a lower latitude than usual along the edge of the dominant North Atlantic storm track, while Kyrill reached Eastern Europe with an uncommon intensity. In this briefing, Aon Benfield's Impact Forecasting team and the University of Cologne look into these notable windstorms.

### Climatology

Scientific research shows that the storm climate in Europe has changed considerably over the past 130 years, exhibiting decadal periods of high and low activity. The last decade was characterized by average or calm conditions, following a period of strong activity which peaked during the early nineties. The occurrence of recent storms like Klaus, Kyrill and Xynthia are therefore considered to be a part of the climate system's natural variability.

Research on winter storm activity points to a lower number of events in the future. However, it also indicates intense storms moving over the North and Baltic Seas towards Eastern Europe, following a similar path to windstorm Kyrill.



**Figure 1: Storm paths for Kyrill (green), Klaus (blue) and Xynthia (red), with dots indicating storm location at six hour intervals. These are compared to the track density of extreme winter storms for recent climate conditions. Isolines show the number of extreme winter storm activity days per year, taken as an average over the last 50 years.**

## Kyrill

In January 2007, Windstorm Kyrill, following a more usual path for winter storms, crossed over Great Britain, the North Sea and the Baltic Sea. This high intensity storm was felt not only in Western Europe and but also into Poland and the Baltic States – parts of Europe rarely affected by winter storm activity. It is uncommon for the winter systems to reach Central and Eastern European mainland with intensity similar to Kyrill.

**Insurance market loss = between EUR3.07 and EUR3.56 billion** (Source: Aon Benfield market study).

## Klaus

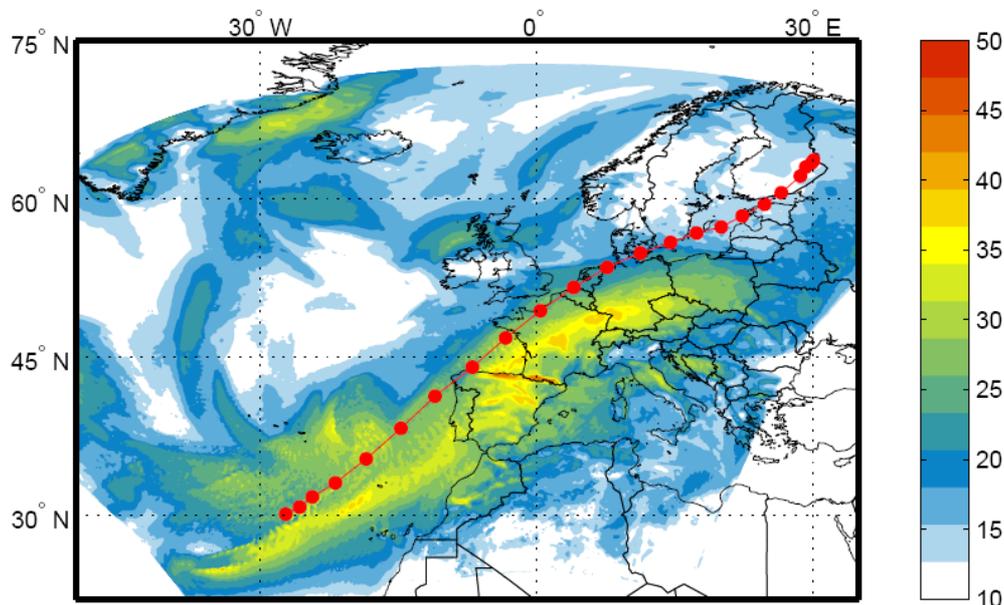
Windstorm Klaus developed near Bermuda on 21 January 2009. It tracked eastward and after a period of rapid intensification over the eastern Atlantic Ocean, reached Western Europe on 23 January. Damage was reported throughout southern France and northern Spain with 26 deaths attributed to the storm. Reported wind speeds exceeded 180 km/h (hurricane intensity winds) on stations of lower elevation over Northern Spain and Southern France.

**Insurance market loss = EUR1.57 billion** (Source: PERILS)

## Xynthia

Windstorm Xynthia developed over the subtropical Northern Atlantic Ocean on 26 February 2010, moved North-Eastward and strengthened, eventually affecting Portugal, Spain, France, the Benelux countries and Germany on 27 and 28 February. Xynthia was responsible for 59 fatalities in Europe. The area affected by Xynthia's extreme winds extended from the mid-Atlantic to the Czech Republic and Southern Poland, thus affecting most of Western Europe. Both Klaus and Xynthia reached Portugal and Spain, two countries that rarely suffer from such events.

**Insurance market loss = EUR1.3 billion** (Source: PERILS)



**Figure 2: Path of Windstorm Xynthia (red line) and associated storm footprint (the wind gusts pattern).** The figure presents the extent of the region affected by the storm. Dots indicate the location at six-hourly time steps. Colours show Xynthia's maximum wind gusts (m/s) as simulated by the Weather Research Forecasting (WRF) model, run by University of Cologne.

## The insurance industry response

Central and Eastern Europe's insurance market penetration continues to grow, resulting in a gradual increase in exposure. While the meteorology may remain mostly unchanged, losses in the near future might increase, thus heightening the appetite for understanding the risks to the region.

Existing catastrophe models only partially capture the climatological variability of European windstorms. The next generation of catastrophe models must address these challenges as model developers expand coverage into new European territories, responding to higher insurance market penetration in Central and Eastern Europe.

The collaboration between Impact Forecasting, Aon Benfield's catastrophe model development centre of excellence, and the University of Cologne is geared towards creating a pan-European windstorm model, due to launch in early 2012. Using the latest research and data means we can generate the most comprehensive loss estimations and allow detailed analysis of the impact of extreme windstorms on re/insurers' European portfolios. A better understanding of potential losses means re/insurers can make more informed decisions on their reinsurance purchases.

## References

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## About Impact Forecasting®

Impact Forecasting LLC is a catastrophe model development center of excellence within Aon Benfield whose seismologists, meteorologists, hydrologists, engineers, mathematicians, GIS experts, finance, risk management and insurance professionals analyze the financial implications of natural and man-made catastrophes around the world. Impact Forecasting's experts develop software tools and models that help clients understand underlying risks from hurricanes, tornadoes, earthquakes, floods, wildfires and terrorist attacks on property, casualty and crop insurers and reinsurers. Impact Forecasting is the only catastrophe model development firm integrated into a reinsurance intermediary. Learn more at [www.impactforecasting.com](http://www.impactforecasting.com).

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