Swiss Re

Storm over Europe

An underestimated risk

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Preface

Winter storms in Europe represent a major catastrophe loss potential for the insurance industry, as the events of December 1999 again clearly demonstrated. Since storm activity in Europe is subject to major fluctuations which stretch out across several years, the storm risk tends to be severely underestimated by many players in the insurance industry. After all, the last fifty years have shown that an insured storm loss in the order of some USD 7 billion can be expected to occur in Europe about once every ten years.

Overly optimistic risk assessments generate inadequate storm premiums which are insufficient to cover the expected losses in the longer term. As a result, reinsurers are no longer able to secure the margin they need for the risk capital they provide. European storm covers have thus lost much of their attractiveness for reinsurers. At the same time, the optimistic mood is leading insurers to purchase inadequate cover, which inevitably causes solvency problems for them in the wake of major events such as the storms in December 1999.

A detailed consideration of those events and a description of the European storm phenomenon in this publication is followed by a discussion of aspects relevant to insurance. Both the subject of storm series and the possible effects of climate change on storm activity are examined.

A sound model of the storm risk is indispensable for assessing the effects of the latest storm events on the insurance industry, and for establishing insurance and reinsurance pricing which is commensurate with the risks. Swiss Re has developed a probabilistic risk analysis to enable calculations of this description. The recent storm events confirm Swiss Re's assessment: as a natural hazard with enormous loss potential, winter storms in Europe must be taken a good deal more seriously than they have been in the past. For this reason, a set of proposals for providing sound cover for the storm risk in Europe concludes the publication.

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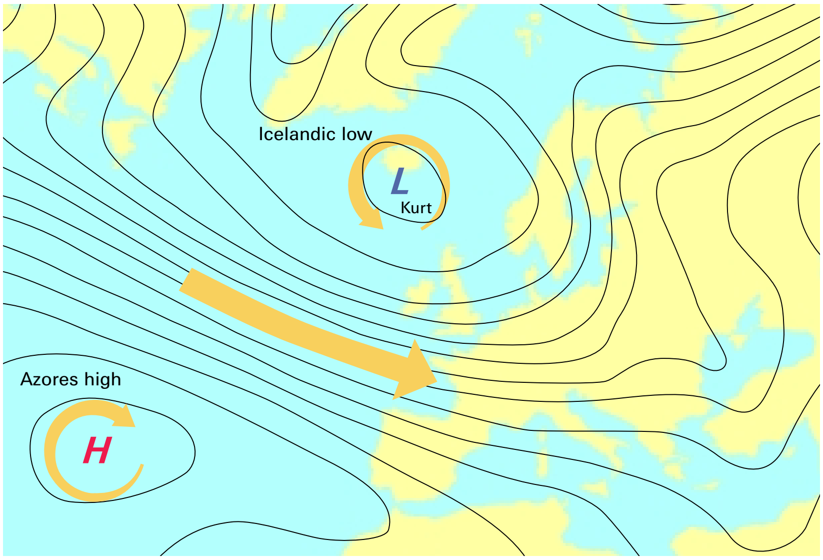
Winter storms *Lothar* and *Martin*

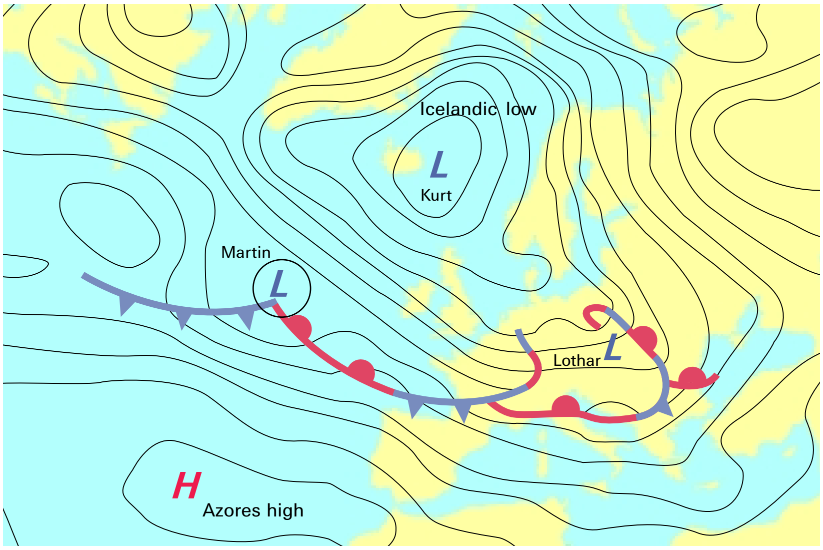
At the end of December 1999, the two most severe winter storms since 1990 raged across Europe, after Denmark had already been hard hit by Anatol on 3 December. On 26 December, *Lothar* crossed northern France, southern Germany and Switzerland within a few hours, leaving a path of destruction. The next day, *Martin* passed through further to the south, also causing heavy losses in central and southern France, northern Spain, Corsica and northern Italy.

The high speeds at which *Lothar* and *Martin* moved were attributable to unusually heavy westerly winds. *Lothar* attained its maximum intensity on the French Atlantic coast, maintaining its force a long way inland. Peak gust velocities reached 170 km/h in the heart of Paris and more than 180 km/h at Orly airport – twenty per cent above the maximum wind speed on record. Even before *Lothar* died out over Eastern Europe, another powerful storm, *Martin*, reached the west coast of France at the latitude of La Rochelle. While *Martin* crossed the country with somewhat weaker peak gusts about 200 km to the south of *Lothar,* speeds of some 160 km/h and 140 km/h were registered in Vichy and Carcassonne, respectively.

High altitude weather map, 26 December 1999
The map shows the pressure distribution at some 5 km above ground – the closer the lines of one pressure type are to one another, the higher the windspeed. The large pressure gradient between the Icelandic low pressure area *Kurt* and the Azores high pressure area generated a pronounced westerly wind (see arrow) combined with an intense high altitude current (the so-called jet stream), which spurred *Martin* and *Lothar* in their courses over Europe.



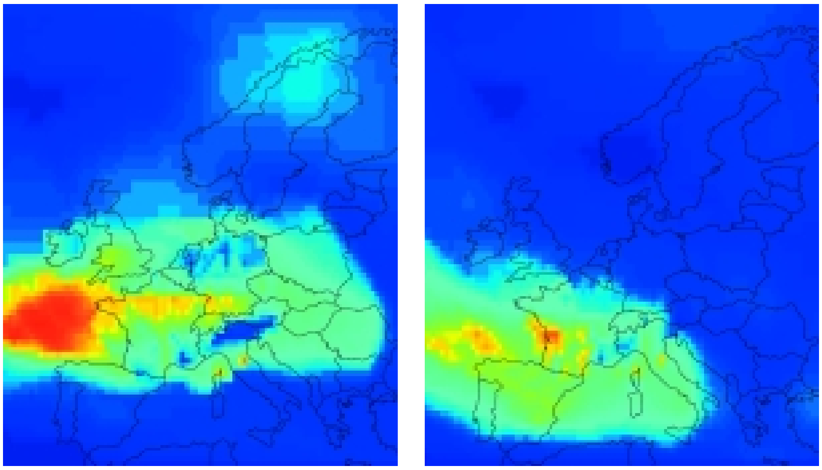
Surface weather map, 27 December 1999
The map shows *Lothar* as it loses momentum over eastern Europe, while *Martin* approaches from the Atlantic. A minor intermediate disturbance developed over France at the same time without, however, causing any damage. While *Kurt* caused the strong westerly winds, the actual losses were attributable to *Lothar* and *Martin*, which both originated at the polar front as so-called secondary cyclones.



Surface pressure distribution (black line), cold (blue) and warm fronts (red), occluded fronts (blue/red).

Peak gust velocities for *Lothar* and *Martin*
Based on Swiss Re's storm model, validated with measured values (wind velocity in metres per second)

0 10 20 30 40 50 60 m/s



Lothar

Martin

Loss extent

Particularly in France, but also in southern Germany and Switzerland, the losses triggered by *Lothar* and *Martin* were paralleled only by the storms of 1990. More than 80 people died, not counting the lives claimed in the course of clean-up work. 44 of these deaths occurred in France alone, while 17 were reported in Germany and 13 in Switzerland – collectively an exceptionally high death toll for a winter storm. The storms ravaged some 60 percent of the roofs in the Paris region and damaged more than 80 per cent of the buildings in surrounding towns, some of them substantially. Countless greenhouses were destroyed and several construction cranes were blown over.

Forests also sustained tremendous damage: in France, Germany and Switzerland, for example, the storms toppled several times the average annual timber yield. Power supply, which is not insured, was also affected more seriously than ever before: in France alone, *Lothar* blew over more than 120 large electricity pylons (the combined total with *Martin* exceeded 200), and more than three million households were left without electricity for days. In all, more than three million claims were filed with insurance companies in France, leading to claims settlements which exceeded the capacity of some insurers.

Storm losses in USD billions by country

	Lothar	Martin
France	4.7	2.3
Germany	0.7	
Switzerland	0.4	> 0.12

Lothar and *Martin* caused economic losses of some USD 12 billion and USD 6 billion, respectively. Of these amounts, USD 5.8 billion (*Lothar*) and USD 2.4 billion (*Martin*) were insured, while USD 3.8 billion (*Lothar*) and USD 1.6 billion (*Martin*) were covered by reinsurance. These sums are in the top range of losses caused by winter storms in Europe to date and can only be compared with those triggered by the series of winter storms in 1990 (*Daria, Herta, Vivian* and *Wiebke*).

Electricity pylons reduced to scrap metal
near Wahlenheim, eastern France.

The European storm phenomenon

Less solar radiation reaches the northern hemisphere in the winter months than in the summer due to the inclination of the earth's axis. By contrast, equatorial latitudes are exposed to intensive radiation throughout the year. As a result, the difference in temperatures between the North Pole and the equator is much more pronounced in winter than in summer, which is why *winter storms* is the term used to describe the intensive low pressure vortices which occur almost exclusively during the winter months (November to April).

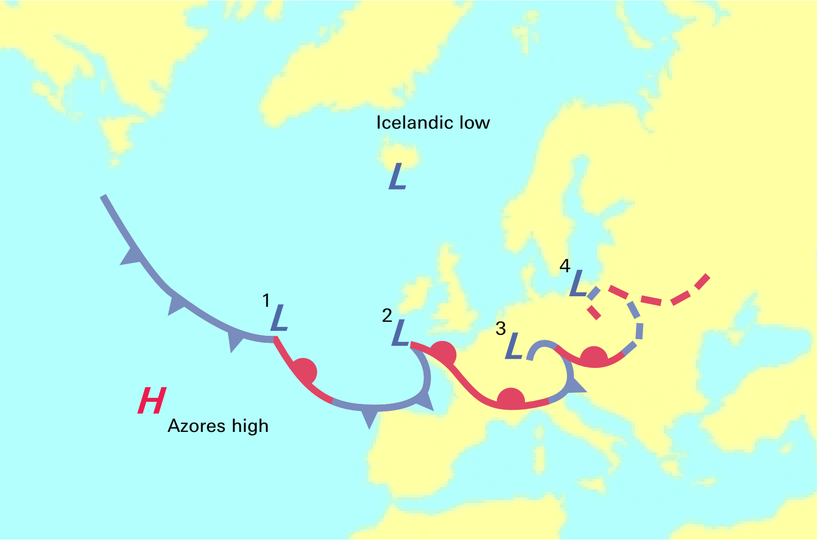
European winter storms are intensive, extra-tropical cyclones, ie powerful windstorms which develop at mid-latitudes – around 45° – according to specific patterns. Since the sun's rays hit the earth more or less vertically at the equator and only at a low angle in mid-latitudes, the earth is heated more at the equator, thus creating a difference in temperatures between the North Pole and the equator. Because the earth's axis is inclined, solar radiation at mid-latitudes is subject to a pronounced seasonal cycle. This in turn causes the difference in temperatures between the North Pole and the equator also to follow a distinct annual cycle in which temperature differences are smallest in summer and largest during winter.

Nature endeavours to balance out this difference in temperatures: at mid-latitudes, low pressure vortices mix the humid subtropical air masses with the cooler Arctic ones and thus eliminate the temperature difference locally. If these vortices reach a certain momentum, they are referred to as storms.

Most low pressure vortices develop along the 45th degree of latitude known as the polar front, which forms the temperature boundary between cold polar air and humid subtropical air. These low pressure vortices expand to become a low pressure system with air masses rotating anti-clockwise above the northern hemisphere around the centre.

Lifespan of extra-tropical cyclones in the mid-latitudes

1. Origin: a fast-growing disturbance develops on the polar front
2. Start of the maximum intensity phase: the low-pressure area has pronounced cold (blue) and warm fronts (red)
3. End of the maximum intensity phase: the cold front catches up with the warm front in the centre of the low-pressure area (blue/red); this is known as an occlusion
4. Final phase: the cyclone dissipates



The term *front* is generally understood to mean a boundary between different air masses. A cold front, which usually moves from west to east, is a boundary between air masses, with the colder air displacing the warmer air. By analogy, a warm front causes the warmer air to displace the colder air.

As this development continues, extensive cold and warm fronts take shape and the system reaches its most intense phase. While the largest quantities of precipitation are generated along a warm front, the strongest winds arise directly behind a cold front. The intensity of a storm passes its zenith at the moment when a swiftly advancing cold front catches up with a warm front at the centre of a low pressure system. This stage is known as an occlusion: the cold and warm air masses mix with one another, and the storm gradually loses its energy supply, thus bringing its life-cycle to an end.

The paths depressions move along are largely determined by the position of the Icelandic low and the Azores high. These pressure centres determine whether a low pressure system developing over the Atlantic will advance across Europe and cause storm damage, or whether it will reach the far north of Europe between Iceland and the British Isles before drifting off to the northeast. It can generally be assumed that, when the Icelandic low is well-developed, more low pressure systems – and hence more powerful winter storms – will head directly towards Europe.

Differences between extra-tropical and tropical cyclones

	Extra-tropical cyclones	Tropical cyclones
Location, origin	Along the polar front around the 45th degree of latitude	In the (sub)tropics over warm water (> 26º C)
Season, frequency	Approx. 180 low pressure areas crossing the North Atlantic per year, including 2–3 major winter storms	An average of about 9 hurricanes per year in the Atlantic and the Caribbean, 6 of which are more intense
Driving force	North-south temperature contrast; intensity may also increase over land	Condensation processes: intensity reduces very quickly over land
Extent, structure	1,000–2,000 km, complex structure, cold and warm front	500–1,000 km, symmetrical
Lifetime	2–5 days	Up to 10 days or more
Local storm duration	3–24 hours	2–6 hours
Max. wind speed	70–180 km/h (20–50m/s)	20–300 km/h (33–90 m/s)
Speed of movement	Up to 120 km/h (33 m/s)	60 km/h (17 m/s)
Associated hazards	Storm flood	Storm flood, tornadoes
Losses	Winds of uneven force causing losses over a large area, up to 1,000 km from the centre. Very many small to medium losses at most	Winds causing losses typically within a radius of no more than 200 km around the centre ("eye"). Small and large losses up to total loss

Storm series

A series of severe storms within a few days (storm series) is not as unusual as it might appear at first. A storm series may be encouraged to develop from the overall weather situation, or large-scale circulation, which often lasts several days. Weather situations of this kind are determined by intensive westerly airstreams and are characterised by a stationary Icelandic low (the so-called primary cyclone) and a sharply defined boundary (the so-called polar front) between humid, warm subtropical air and cold Arctic air. Individual low pressure vortices (known as secondary cyclones) form along this boundary, and it is from these that the storm depressions can develop. Windstorm losses are thus triggered by the secondary cyclone rather than by the large-scale circulation.

Lothar and *Martin* developed from a similar westerly wind weather situation as winter storms *Daria* and *Herta* (January 1990), *Vivian* and *Wiebke* (February 1990) and *Esther, Désirée, Fanny* and *Hetty* (January 1998). While Icelandic depression *Kurt* was responsible for the strong westerly airstream, the secondary cyclones *Lothar* and *Martin* arising on the polar front actually caused the devastating losses.

Is global warming to blame for *Lothar* and *Martin*?

The risk potential of global warming must not be underestimated.

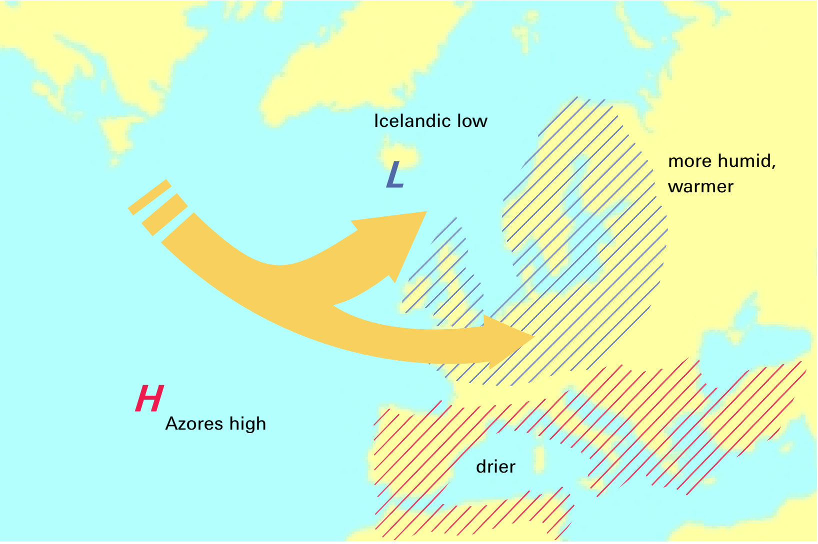
Climate change is often cited as the cause of the unusually high losses caused by *Lothar* and *Martin*. However, it would be too simple to argue that higher average annual temperatures implicitly lead to more frequent and violent storms over Europe and thus inevitably increase payments for storm losses. Rather, the close interaction among a variety of climatic and insurance-related aspects must be carefully analysed and assessed in each individual case when storm losses are being discussed.

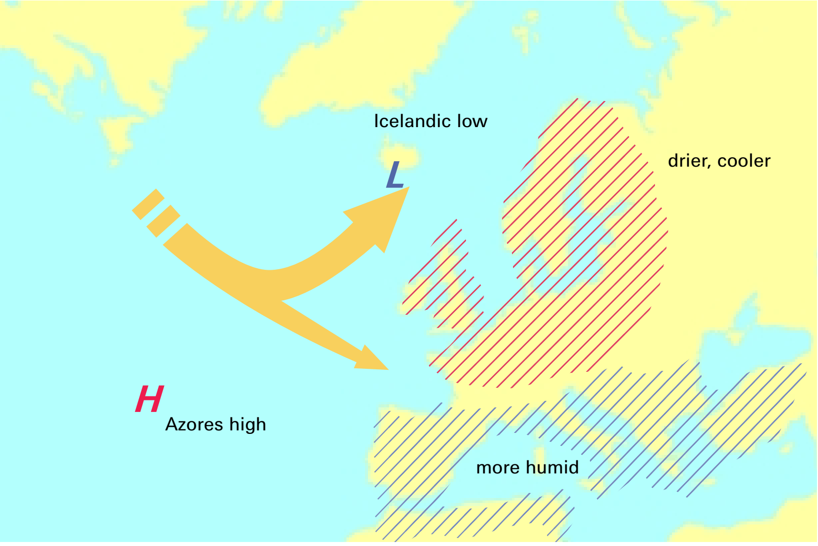
Climate change

Global warming is a fact. Direct measurements of the air layers both close to the earth and higher up in the atmosphere clearly indicate an increase in the average annual global temperature. At the turn of the 20th century, the rate was still about 0.6 degrees Celsius per century. This has accelerated since 1976, and the average annual temperature is now increasing at a rate of 2.0 degrees Celsius per century. Although the extent of warming by the year 2100 still remains highly uncertain, scientists now largely agree that the climate is in fact changing. Discussions are increasingly focusing on the consequences of global warming, including issues such as:

- the absolute magnitude of global warming (eg by the year 2100);
- the extent to which consequences of anthropogenic influences (such as CO_2 emissions) will eclipse a natural, long-term climatic development; and
- the way in which the climate will change locally (eg in northern France), and the effects this will have.

However, a rise in temperatures will not necessarily lead to more storms over Europe. Computer simulations and meteorological records indicate that although the frequency and intensity of storms over the Atlantic have increased slightly during recent decades, the storm paths tend to be further to the north.





Positive NAO index (above): The marked difference in air pressure between the Icelandic low and the Azores high intensifies the westerly airstreams (arrow) which carry strong winds – and a growing number of storms – and relatively moist Atlantic air masses a long way into Europe. As a result, weather conditions tend to be more humid in northern Europe and drier and cooler in the Mediterranean area. These conditions are reversed with a negative NAO index (below): the westerly airstreams are clearly less pronounced; they are blocked and diverted in a northerly direction.
Cold subartic air is then prevalent in most parts of Europe.

Natural climate variation

Climate change is a relatively slow and long-term process, and represents only one out of several factors to be considered when estimating potential storm development over the next 5–15 years. A change in the climate, such as a long-term increase or reduction in annual temperatures, is actually a highly dynamic process rather than a monotonous or uniform one. The climate fluctuates even without human intervention, and probably the best-known "climate swings" are the El Niño Southern Oscillation (ENSO) phenomenon and its North Atlantic counterpart, the North Atlantic Oscillation (NAO).

The NAO, which is described with a simple index, is especially important for the progression of storm paths over the Atlantic. High positive NAO index values tend to be linked to relatively mild, wind-intensive winters, while negative NAO index values are associated with relatively cold winters with rather less wind. However, although less likely, this does not mean that events such as *Lothar* will not strike in negative NAO years.

The NAO index fluctuates between positive and negative figures over irregular periods of about 5 to 25 years. A negative NAO index dominated until the 1960s; since then, the figures have become increasingly positive. A distinct warming of sea temperatures could be observed at the same time. Is this change – which tends to raise the likelihood of strong Atlantic west winds over Europe – directly linked to global warming? This question is currently a matter for scientific discussion. Unlike the effects of global warming, however, the influence of the NAO index on weather events in Europe can be proved beyond doubt. More attention therefore must be paid to this index, and especially to the way in which it develops in the future.

North Atlantic Oscillation (NAO)

The winter climate in Central Europe – especially the temperature regime and wind activity – is closely related to the air pressure conditions over the North Atlantic, the so-called North Atlantic Oscillation (NAO). The NAO index is used to describe the difference in air pressure between the Azores high (sub-tropics) and the Icelandic low (sub-polar region). If the Icelandic low is well-developed, corresponding to a positive NAO index, westerly air flowing from the Atlantic will be carried a long way into Europe. This leads to mild and windy winters. If the Icelandic low is weak and thus corresponds to a negative NAO index, cold subarctic air will dominate the weather. Westerly winds are blocked or deflected, and the winters are significantly colder and less windy.

Correlation between windstorm and climate change

At present, a direct correlation between storm losses and climate change cannot be substantiated on the basis of reliable data. However, this does not mean that global warming can be ruled out as a factor influencing loss development in the future – particularly if it is shown to affect the pattern of natural climatic variation. In this case, climate forecasts would play an increasingly important role in risk assessment and in setting premiums.

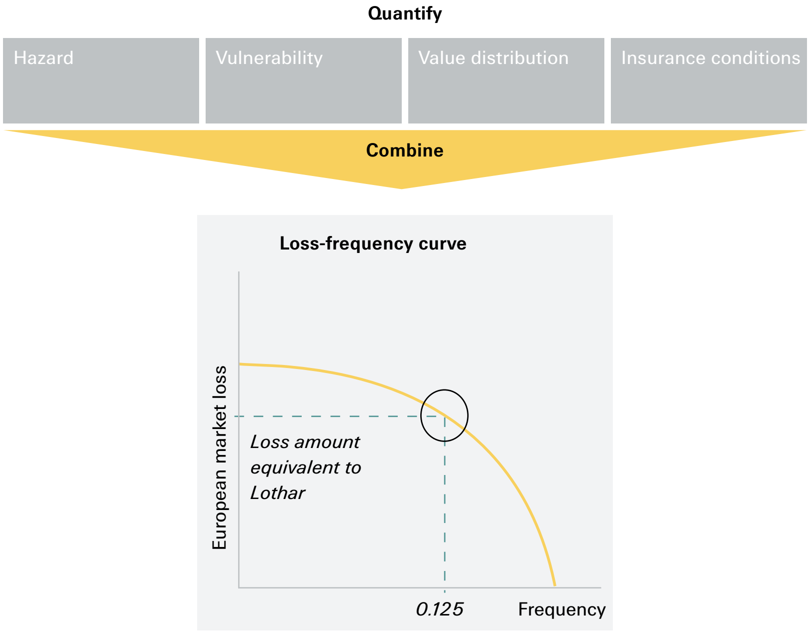
Currently, however, the overall loss amount is shown to depend on the path of a particular storm rather than on its absolute force. The intensity and frequency of storms are not the only decisive factors in assessing whether global warming will trigger more storm losses. The paths they take are equally important: whether a storm affects a region with a high concentration of values or passes over fairly thinly populated territory is a factor which bears a far greater influence on the loss experience than the absolute intensity of the storm as such. When assessing future storm paths, it is important to forecast climatic phenomena, such as the North Atlantic Oscillation, and the way they may change, and to incorporate these factors into a risk assessment.

Climate forecasting

At best, it is now possible to forecast the weather for the coming 10 days. The situation is different when it comes to the climate, to which the weather is subordinate. The atmospheric circulation patterns – and hence the climate – are primarily controlled by marine temperatures and ocean currents, which are relatively sluggish in their reactions. Sophisticated computer models are now able to reproduce correctly these interrelated aspects of the climate and calculate them for the future. The models determine the likelihood of a positive or negative NAO index value in the future, and indicate whether a trend towards more or less storm activity can be expected over Europe. Thanks to close co-operation with the relevant research institutes, these climate forecasts will allow Swiss Re to continuously adapt its risk models to existing conditions – bearing in mind risk adequacy – especially in the climate-sensitive European winter storms sector.

Swiss Re's windstorm risk model

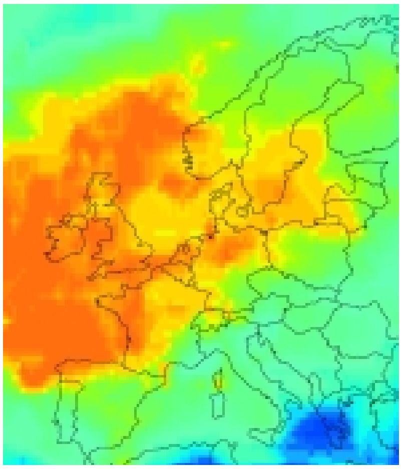
Given the nature of the hazard, any meaningful assessment of the windstorm risk must address the whole of northern Europe rather than confine itself to individual countries, and it must integrate a variety of complex factors. For a portfolio of European insurance policies, these key factors are: the actual hazard (ie storm paths, storm frequency and intensity), vulnerability (loss experience specific to buildings, to the utility of structures and to countries), the geographical distribution of all insured values, and existing insurance covers with their specific treaty conditions. In order to facilitate an assessment of the windstorm risk, a quantitative analysis must take account of all these factors and the underlying physical processes. It must include a mathematical and statistical assessment of historical events. A risk assessment therefore requires a model in which all the influences mentioned above are mapped with adequate accuracy.



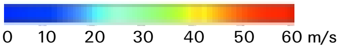
Risk concept Windstorm Europe
Swiss Re's probabilistic storm model *EuroWind* is applied, for example, to a representative European market portfolio. It offers the loss-frequency model to facilitates assessment of a return period for a loss in the order of *Lothar* for all of Europe. A frequency of 0.125 corresponds to a return period of 8 years.

Probabilistic model

Probabilistic models are used to determine the relationship between loss frequency and intensity. In the past, losses were assessed primarily by way of scenarios of selected large events which were generally based on historic storms. The drawback of this approach is that it does not supply any information about the expected return period. By contrast, probabilistic models are able to do so because their analyses are based on a vast number of events of differing severity within a clearly defined observation period. This allows an explicit calculation of the frequency (or return period) of each possible loss level. This approach ultimately generates an integrated view of the size and frequency of all possible events, represented by the loss-frequency curve.



Hazard map Wind Europe
The hazard map shows the peak gust velocity (in metres per second) to be expected locally about once every 50 years, based on all historic storms recorded in EuroWind (1947–1999/2000).



These requirements are met by *EuroWind,* a probabilistic model designed to assess the storm risk in Europe, which Swiss Re developed in co-operation with EQECat. *EuroWind* covers the UK, Ireland, France, Germany, Denmark, Sweden, Norway, Belgium, Luxembourg and the Netherlands, and it includes a wide selection of loss vulnerability curves specific to individual risks and countries. The calculations are based on the careful reconstruction of some 180 historic winter storms dating back to 1947, and also include the most recent events (*Anatol, Lothar* and *Martin*). More than 8,000 model storms have been generated from this data, in accordance with the observed relationship between storm frequency and intensity. Each of these storms is laid over the portfolio to be assessed in order to determine the relevant event loss using the vulnerability ratios specific to buildings, the utility of structures, and countries. The event losses and their frequency can be used to derive the average annual loss and the relationship between the size and frequency of losses. A probabilistic model thus facilitates the calculation of both the statistically expected average annual loss and the expected loss for any given return period on a portfolio. Risk assessments following this approach are thus far more reliable than others which use loss scenarios for individual events. *EuroWind* supplies a complete loss-frequency curve which generates a realistic risk assessment and thus allows pricing to be commensurate with the risk. Loss-frequency curves of this kind can also be used to estimate the return periods for individual historical events (*as-if* losses).

The parish church at Attalans (Switzerland) shows the whole spectrum of storm losses, from the small losses characteristic of windstorm (such as tiles) to the more unusual large losses (church spire).

Storm covers

As a rule, storm losses are automatically included under allied perils in property insurance. Even so, to consider storms an accessory risk would be a grave misjudgement given their high occurrence frequency and enormous catastrophe loss potential.

Lothar and *Martin* again confirmed that insured storm losses in the billions are not infrequent. Although *Lothar* – with USD 4.7 billion in France and USD 0.4 billion in Switzerland – exceeded the peak losses caused by the 1990 storm series many times over, the loss extent throughout Europe came as no surprise. Three storms with insured losses per event of at least USD 4 billion have already been registered since 1987, with *Lothar* and *Daria* heading the series at USD 5.8 billion (adjusted to current prices).

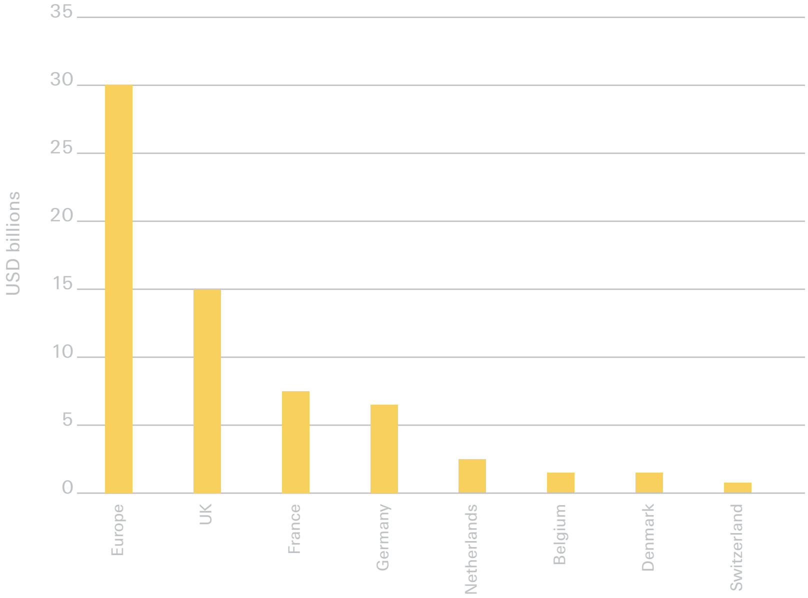
Most significant historical events with insured losses
(calculated for all of Europe with EuroWind)

Date	Name	Area affected	Main area	Insured loss (in USD billions)	Return period in years
2./3.1.1976	Capella	UK, NL, B, D	UK	1.2	> 5
16.10.1987	87J	UK, F, NL	English Channel	4.3	5
25.1.1990	Daria	Europe	F, D, UK	5.8	8–10
3./4.2.1990	Herta	F, D	Paris region	1.1	< 5
26.2.1990	Vivian	UK, F, NL, B, D	North Sea coast	3.4	< 5
28.2.1990	Wiebke	D, CH, A	Southern Germany	1	< 5
21.1.1995			Northern Europe	1	< 5
3./4.12.1999	Anatol	DK, D, UK, SW	DK	1.5	< 5
26.12.1999	Lothar	F, D, CH	Paris region	5.8	8–10 (F: 70)
27.12.1999	Martin	F, CH	Bordeaux region	2.4	< 5

Apart from the fact that the geographical situation exposes vast areas of Europe to an increased storm risk, the tremendous concentration of values is the main reason for the immense loss potential prevalent in the European insurance markets. Since, in Europe, these factors correlate with one another, the extent of the insured loss can attain a magnitude matched only by earthquakes and hurricanes in the US and Japan. Examinations of *as-if* losses over the last 50 years show that storm events involving losses of more than USD 1 billion and a return period of 2–3 years must be expected more frequently than has generally been assumed throughout Europe. Swiss Re expects losses of *Lothar's* magnitude to occur every 8–10 years. Insurers and reinsurers who base their risk management only on the most recent loss experience vastly underestimate the storm risk, since insured storm losses in the order of USD 30 billion are entirely realistic for Europe, and they occur on average once every 100 years.

Market	100-year economic loss in USD billions	Insurance density	Insured market loss (in USD billions)	Reinsured amount (in USD billions)
Europe	35	85%	30	20
UK	16	95%	15	9.5
France	8	90%	7	4
Germany	7	95%	6.5	4
Netherlands	3.0	90%	2.5	1.2
Denmark			1.5	
Belgium	1.7	90%	1.5	1
Switzerland			1	

Insured losses, as they are to be expected on average every 100 years.



In the aftermath of large-scale storms such as *Lothar* and *Martin*, insurers are burdened with countless single losses. *Lothar* confronted French insurance companies with some three million claims. In this situation, the lasting economic viability of all parties involved can be secured only by ensuring a fair and efficient distribution of the loss burden among reinsurers, insurers and the individual property owners alike.

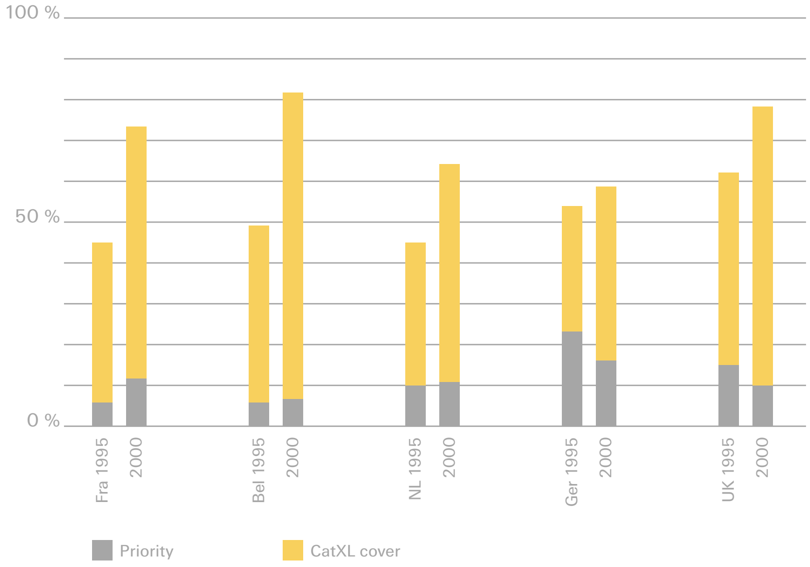
Deductibles must be applied when breaking down the loss burden, as the policyholders should be involved to a far greater extent than they have been in the past. The insurers' intention behind this measure is to reduce administrative work rather than to cut the benefits to be paid out. The average loss burden after winter storm *Lothar* was just USD 1,500, a sum which is not likely to spell ruin for most policyholders.

Appropriate deductibles help to exclude minor damage and motivate the policyholder to prevent or mitigate losses. Today, however, most deductibles are far too low to bear any significant effect, averaging only some 100 dollars in many European markets.

The effect of such modest deductibles is unsatisfactory in two respects. First, they barely reduce the loss amount or the number of affected policies and thus fail to reduce the administrative effort involved. Second, small deductibles actually entail a considerable moral hazard: the policyholder may be tempted to inflate a minor loss by the agreed deductible amount in order to have the insurer reimburse the full loss amount, small though it may be. Moreover, insurers and reinsurers in particular should take account of any deductible agreed in the original policy when calculating the premium and estimating maximum loss potentials. The underwriting risk for the insurance industry may well become even greater if the sheer number of claims prevents compliance monitoring, and the deductibles are not or only partly implemented on the market.

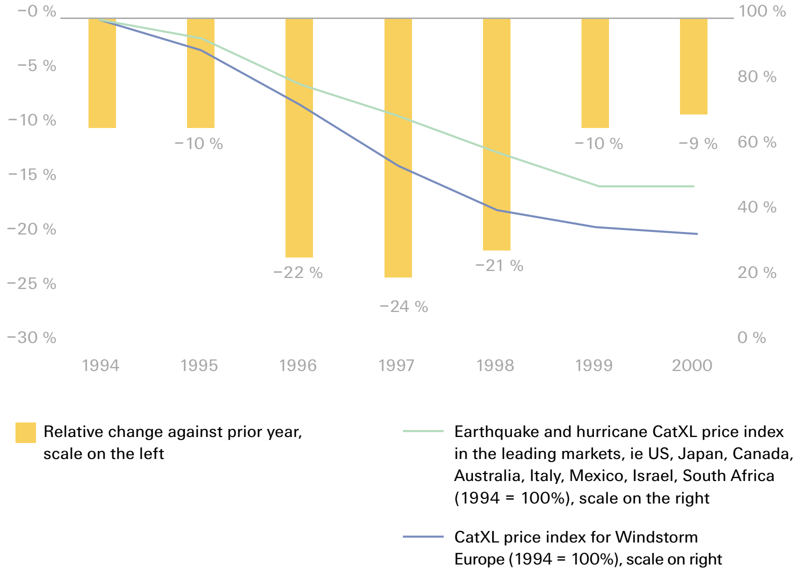
For example, an effective deductible would have to be about one percent of the sum insured. While this amount ensures a real participation in the loss, it does not threaten to ruin the property owner. The number of losses and claims filed would be cut by about 50%. The available resources would be at the disposal of those most severely affected and would not need to be spent on loss administration. Still, despite the importance of the measure, deductibles of this magnitude are very difficult to implement under present market conditions.

Like earthquakes and floods, storms have an enormous cumulative catastrophe loss potential and trigger substantial demand for reinsurance. Surveys conducted by Swiss Re show that the reinsurance capacity purchased in the European storm markets is exceeded only by earthquake and hurricane cover in the US – even though most European insurers are hardly covered for a once-in-a-century storm loss. In France, for example, the reinsurance cover of many insurers was not sufficient to absorb the losses arising from *Lothar*. Some French insurers ran into solvency problems due to this factor and their individual capitalisation.



A comparison of the extent and position of non-proportional CatXL programmes in the leading European storm markets (as a percentage of the corresponding hundred-year storm losses).

Development of the average CatXL premium levels (risk-adjusted) in five European storm markets (F, B, NL, D, UK) since 1994, with price index.



The often overly optimistic assessment of the storm risk in the insurance and reinsurance markets received additional momentum after 1990 through the temporary absence of major storm losses. This inaccurate risk perception and the general glut of reinsurance capacity have caused prices in storm reinsurance to erode drastically since 1994. While prices in all natural catastrophe markets crumbled during this period, the deterioration in prices for non-proportional European storm covers – CatXLs – was clearly the most severe. Prices in the major earthquake and hurricane markets have halved since 1994, whereas in Europe they have plunged to virtually a third of their previous levels, leaving price structures at an entirely inadequate level from an underwriting perspective. In all the European storm markets, premiums are now far from sufficient to cover loss payments in the long run. Since reinsurers are no longer able to achieve the margin they need for the risk capital they provide, non-proportional European storm cover has lost much of its attractiveness for them. Analyses conducted by Swiss Re clearly show that, on average, prices for European storm covers should clearly be at twice the current level.

CatXL and the event clause

Due to the major loss potential involved in natural catastrophes and the limited capacity available, reinsurance should be largely composed of non-proportional reinsurance treaties – known as CatXLs – which cover event losses within contractually specified limits. Event covers require a precise event definition. The name of the atmospheric disturbance, usually given by a meteorological agency, should be used for identification. This will ensure that all losses arising from an uninterrupted chain of causes basically belong to the same event. Hours' clauses should be given only secondary importance. For example, although *Lothar* and *Martin* swept across Europe within just 30 hours, they were two clearly separate events, as described above from the meteorological viewpoint. Difficulties in allocating losses inevitably arise if several storm events overlap. Nevertheless, it would be wrong to group independent events together into one single loss event.

The present lack of earning power in natural catastrophe reinsurance gives cause for concern and – with regard to the reinsurers' creditworthiness – is not in the interest of the insurers, either. At all events, price structures in the insurance and reinsurance markets must adequately reflect the risks if they are to ensure a sound and systematic risk transfer. Accordingly, storm risks must be granted an appropriate share of the original premium, and the reinsurance premium must be commensurate with the risk. This approach alone will ensure that insurers will not be faced with a premium upsurge in the wake of a major event.

Typical forest damage in the Vosges
(Saales, eastern France)

Title:
Storm over Europe
An underestimated risk

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Publisher:
Swiss Re Publishing

Editing and production:
Swiss Re Language Services
RK, Corporate Communications
Reinsurance & Risk division

Graphic design:
Galizinski Gestaltung, Zurich

Photographs:
H. R. Bramatz, Zurich: cover;
Keystone Press AG, Zurich: pp 9, 18;
Press agency L. Dukas, Zurich: p 27

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