



Münchener Rück
Munich Re Group

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Catastrophe figures for 2008 confirm that climate agreement is urgently needed

A large number of tropical cyclones and the earthquake in Sichuan made 2008 one of the most devastating years on record. Although there was a drop in the number of loss-producing events compared with the previous year (from 960 to 750), individual catastrophes pushed up the numbers of victims and the losses appreciably.

Throughout the world, more than 220,000 people died as a result of natural catastrophes this year. Overall losses totalled some US\$ 200bn (2007: US\$ 82bn) but were still below the record set in 2005 (US\$ 232bn in current values). Insured losses in 2008 rose to US\$ 45bn, about 50% higher than in the previous year.

Driven by high losses from weather-related natural catastrophes, 2008 was – on the basis of figures adjusted for inflation – the third most expensive year on record, exceeded only by the hurricane year of 2005 and by 1995, the year of the Kobe earthquake. Torsten Jeworrek, member of Munich Re's Board of Management: "This continues the long-term trend we have been observing. Climate change has already started and is very probably contributing to increasingly frequent weather extremes and ensuing natural catastrophes. These, in turn, generate greater and greater losses because the concentration of values in exposed areas, like regions on the coast, is also increasing further throughout the world." Munich Re is a world leader in terms of investigating risks from natural hazards of all kinds. "2008 has again shown how important it is for us to analyse risks like climate change in all their facets and to manage the business accordingly," said Jeworrek.

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Some of the main events in detail:

In 2008, Asia was again the continent affected by the worst human catastrophes. Cyclone Nargis is estimated to have claimed the lives of more than 135,000 people in Myanmar: 85,000 deaths have been officially

confirmed, whilst 54,000 people are still missing. With very high wind speeds, record rainfalls, and a storm surge, the tropical storm caused devastation primarily in the low-lying Irrawaddy Delta and in the old capital, Rangoon. Since large parts of the mangrove forests – a natural form of coastal protection – have disappeared in recent years, there was nothing to prevent storm surge travelling as far as 40 km inland. The country was inundated with water up to 3.5 metres deep, and more than a million of Myanmar's inhabitants were made homeless.

The earthquake that hit the Chinese province of Sichuan, a region classified as being highly exposed to earthquake, was a further human catastrophe. According to official statistics, around 70,000 people were killed, 18,000 are still missing, 374,000 were injured, and almost five million were made homeless. At the same time, the Sichuan quake – which occurred in May – also produced the largest single overall loss of 2008. The total figure of US\$ 85bn made it the second most expensive event of its kind after the Kobe earthquake (Japan, 1995).

Earlier in the year, China had already suffered enormous losses amounting to more than US\$ 21bn due to an unusual cold spell with huge volumes of ice and snow. These had a major impact on the infrastructure in 18 provinces: roads and railways were blocked and in some places destroyed, and the electricity supply collapsed.

In terms of insured losses, Hurricane Ike was the most expensive individual event in 2008. Whereas in the previous two years, the US mainland had largely been spared by heavy cyclones, the 2008 hurricane season generated substantial losses which also affected the insurance industry. Six tropical cyclones (Dolly, Edouard, Fay, Gustav, Hanna, and Ike) reached the US coast in close succession this year, the severest being Ike, which made landfall as a Category 2 hurricane near Galveston (Texas). The storm surge triggered by Ike submerged large sections of the Texas and Louisiana coast. As the storm progressed over the mainland, extreme precipitation caused more and more damage, resulting in an insured loss estimated at US\$ 15bn (not including the claims covered under the National Flood Insurance Program). The overall loss caused by Ike was US\$ 30bn. The year's second most expensive hurricane was Gustav, with an overall loss of US\$ 10bn and an insured loss of US\$ 5bn.

The number of tropical cyclones in the North Atlantic in 2008 was much higher than the long-term average and also higher than the average of the current warm phase since 1995, which is more pronounced as a result of climate change. A total of 16 tropical cyclones were counted during the year; the average for the warm phase so far is 14.7. Eight of these windstorms reached hurricane strength, five of them being classified as major hurricanes (Categories 3–5). In terms of both the total number of storms and the number of major hurricanes, 2008 is the fourth most severe hurricane season since reliable data have been available. The tornado season in the United States, which runs from April to September,

was also unusually severe. There were roughly 1,700 tornadoes in 2008, generating an aggregated loss of several billion US dollars.

According to provisional estimates published by the World Meteorological Organization (WMO), 2008 was the tenth warmest year since the beginning of routine temperature recording and the eighth warmest in the northern hemisphere. This means that the ten warmest years ever recorded have all occurred in the last 12 years. "It is now very probable that the progressive warming of the atmosphere is due to the greenhouse gases emitted by human activity. The logic is clear: when temperatures increase, there is more evaporation and the atmosphere has a greater capacity to absorb water vapour, with the result that its energy content is higher. The weather machine runs in top gear, bringing more intense severe weather events with corresponding effects in terms of losses. This relationship is already visible today in the increasing heavy precipitation events in many regions of the earth, the heat waves, and the hurricanes in the North Atlantic. The loss statistics for 2008 fit the pattern that the calculations of climate models lead us to expect," said Prof. Peter Höppe, Head of Munich Re's Geo Risks Research.

Compared with the devastation that natural catastrophes caused in Asia and America in 2008, the losses in Europe were relatively moderate. Nevertheless, there were also two events in Europe that generated billion-dollar losses for the insurance industry. At the beginning of March, an intense low-pressure system named Emma swept across large parts of central Europe with very high wind speeds, thunderstorms, and hail; in Germany, Denmark, Poland, the Czech Republic, Slovakia, Switzerland, and Austria, it caused an overall loss of US\$ 2bn, of which US\$ 1.5bn was insured.

Hilal, a low-pressure storm that crossed southwestern Germany (especially Baden-Württemberg) at the end of May and the beginning of June, caused major damage due to strong gusts, hailstorms, and flash floods. With an insured loss of US\$ 1.1bn, Hilal was the seventh most expensive natural catastrophe in the global statistics for the year.

Board member Dr. Torsten Jeworrek: "For us as a leading reinsurer, the natural catastrophe trends of recent years have resulted in three action strategies, which we are resolutely pursuing. Firstly, we accept risks in our core business only at risk-adequate prices, so that if the exposure situation changes, we adjust the pricing structure. Secondly, with our expertise we develop new business opportunities in the context of climate protection and adaptation measures. Thirdly, in the international debate, we – as a company – press for effective and binding rules on CO₂ emissions, so that climate change is curbed and future generations do not have to live with weather scenarios that are difficult to control." Munich Re performs scientific analyses on the effects of climate change and cooperates with many scientific institutes. In 2008, Munich Re launched a cooperation with Professor Lord Nicholas Stern and the London School of Economics (LSE), the aim being to advance research into the economic impact of climate change.

Munich Re actively supports ambitious climate protection goals. This approach also opens up enormous opportunities because of the new technologies that emerge with very large growth potential. As a risk carrier with innovative coverage concepts in the field of alternative sources of energy (wind, solar, geothermal), Munich Re promotes these technologies and thus secures additional business potentials for itself. Board member Dr. Torsten Jeworrek: "The next climate summit in Copenhagen must quite clearly fix the route for reducing greenhouse gases by at least 50% by 2050 with corresponding milestones. If we delay too long, it will be very costly for future generations."

Munich Re assigns natural catastrophes to one of six categories for assessment purposes. The annual list includes all events with more than ten fatalities and/or losses running into millions.

Service: As of January 2009, graphs and tables derived from current analyses of natural catastrophes will be available at our NatCatSERVICE download centre www.munichre.com/geo.

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The **Munich Re Group** operates worldwide, turning risk into value. In the financial year 2007, it achieved a profit of €3,937m, the highest since the company was founded in 1880, on premium income of approximately €37bn. The Group operates in all lines of business, with around 43,000 employees at over 50 locations throughout the world and is characterised by particularly pronounced diversification, client focus and earnings stability. With premium income of around €21.5bn from reinsurance alone, it is one of the world's leading reinsurers. Its primary insurance operations are mainly concentrated in the ERGO Insurance Group. With premium income of over €17bn, ERGO is one of the largest insurance groups in Europe and Germany. It is the market leader in Europe in health and legal expenses insurance, and 34 million clients in over 30 countries place their trust in the services and security it provides. The global investments of the Munich Re Group amounting to €176bn are managed by MEAG, which also makes its competence available to private and institutional investors outside the Group.

Disclaimer

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The ten largest natural catastrophes in 2008

Ranking by overall losses

| Date | Country/Region | Event | Fatalities | Overall losses US\$ m | Insured losses US\$ m |
|----------------|----------------|-------------------|------------|--------------------------|--------------------------|
| 12.5.08 | China | Earthquake | 70,000 | 85,000 | 300 |
| 6–14.9.2008 | Caribbean, USA | Hurricane Ike | 129 | 30,000 | 15,000 |
| 10.1–13.2.2008 | China | Winter damage | 129 | 21,100 | 1,600 |
| 21.8–3.9.2008 | Caribbean, USA | Hurricane Gustav | 100 | 10,000 | 5,000 |
| June 2008 | USA | Floods | 24 | 10,000 | 500 |
| 2–5.5.2008 | Myanmar | Cyclone Nargis | 84,500 | 4,000 | |
| May - June | China | Floods | 170 | 2,100 | |
| 13.–24.11.2008 | USA | Wildfires | | 2,000 | 600 |
| 1–2.3.2008 | Europe | Winter storm Emma | 14 | 2,000 | 1,500 |
| 22–26.5.2008 | USA | Tornadoes | 12 | 1,600 | 1,325 |

Ranking by insured losses

| Date | Country/Region | Event | Fatalities | Overall losses US\$ m | Insured losses US\$ m |
|----------------|----------------|-----------------------------|------------|--------------------------|--------------------------|
| 6–14.9.2008 | Caribbean, USA | Hurricane Ike | 129 | 30,000 | 15,000 |
| 21.8–3.9.2008 | Caribbean, USA | Hurricane Gustav | 100 | 10,000 | 5,000 |
| 10.1–13.2.2008 | China | Winter damage | 129 | 21,100 | 1,600 |
| 1–2.3.2008 | Europe | Winter storm Emma | 14 | 2,000 | 1,500 |
| 22–26.5.2008 | USA | Tornadoes | 12 | 1,600 | 1,325 |
| 29.5–1.6.2008 | USA | Severe storms, floods | | 1,500 | 1,100 |
| 29.5–2.6.2008 | Germany | Severe storms, flash floods | 3 | 1,300 | 1,100 |
| 5–6.2.2008 | USA | Tornadoes | 50 | 1,300 | 955 |
| 11–18.2.2008 | Australia | Floods | 2 | 1,000 | 890 |
| 9–11.4.2008 | USA | Severe storms, tornadoes | 3 | 1,100 | 800 |

Ranking by number of fatalities

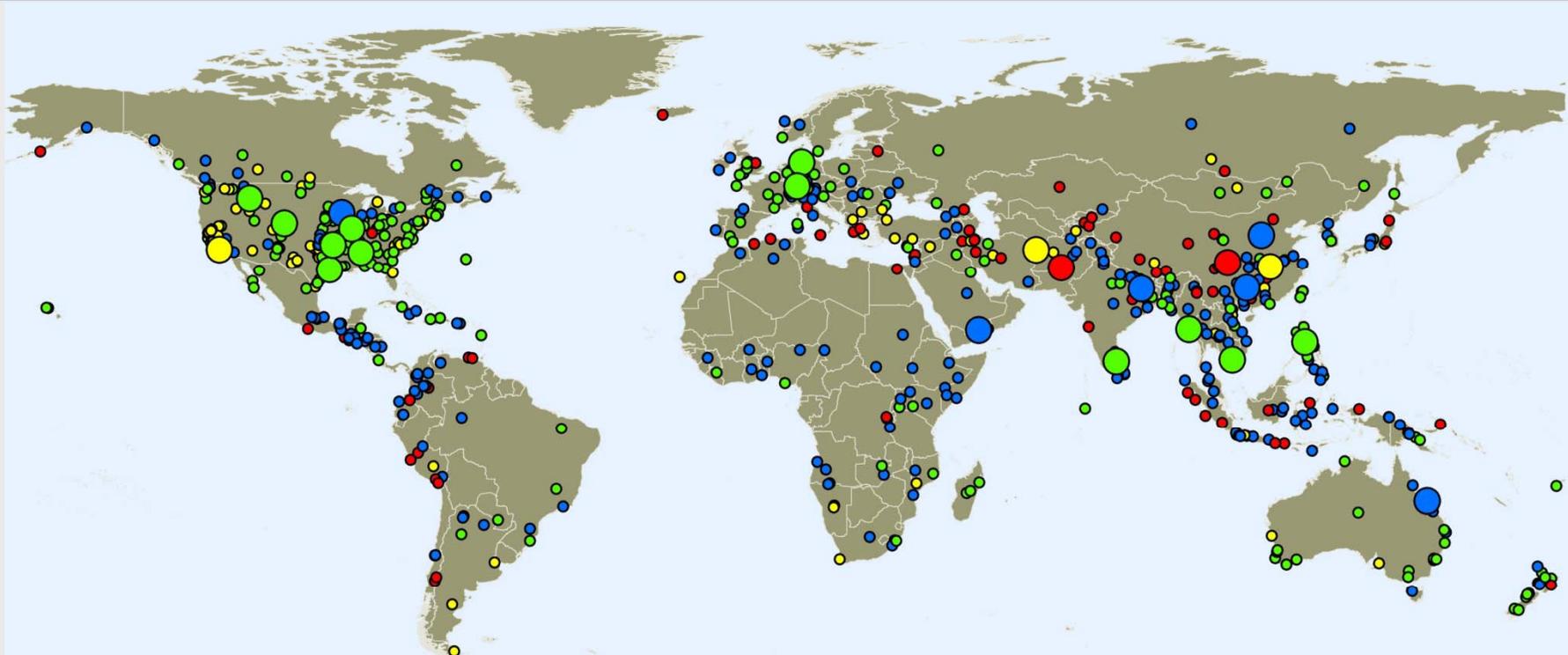
| Date | Country/Region | Event | Fatalities | Missing |
|-----------------|-------------------------------------|------------------------|------------|---------|
| 2–5.5.2008 | Myanmar | Cyclone Nargis | 84,500 | 50,000 |
| 12.5.2008 | China | Earthquake | 70,000 | 18,000 |
| January 2008 | Afghanistan, Kyrgyzstan, Tajikistan | Cold wave | 1,000 | |
| 15.8–11.9.2008 | India, Nepal, Bangladesh | Floods | 635 | |
| 18–25.6.2008 | China, Philippines | Typhoon Fengshen | 557 | 26 |
| 28/29.10.2008 | Pakistan | Earthquakes | 300 | |
| 8.9.08 | China | Rock-/Landslide | 277 | |
| August 2008 | China, Laos, Vietnam | Tropical storm Kammuri | 211 | 70 |
| 24–25.10.2008 | Yemen | Floods | 184 | 100 |
| 25.11–3.12.2008 | India, Sri Lanka | Cyclone Nisha | 180 | |

Natural disasters 2008

World map



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As at: December 2008

- 750 natural hazard losses
- Costliest/Deadliest events

- **Geophysical**
(earthquake, tsunamis, volcanic activity)
- **Meteorological** (storm)
- **Hydrological**
(flood, mass movement)
- **Climatological**
(extreme temperature, drought, wildfire)