

GUY CARPENTER

Hazard Review of the Year 2002



January 30, 2003

Introduction

According to the latest reports issued by both Munich Re¹ and Swiss Re² there were approximately 19,000 people worldwide who were killed by both 'natural' and 'human-made' catastrophes in 2002.

Furthermore, the total economic and financial losses associated with these events, of which there were approximately 300, have been estimated to reach US\$ 40 billion¹ of which the insurance industry is liable for approximately US\$ 12 billion^{1&2}. The economic losses from 'natural' catastrophes in 2002 increased by 57% above the previous year, predominantly as a result of one of the worst flooding events to affect a large area of Central Europe in August.

'Natural' Catastrophes Summary

'Natural' catastrophe losses in 2002 have been estimated to reach a total figure of US\$ 10 billion¹. According to reports the losses associated with the 'natural' events have made more of an impact with property insurers than 'human-made' or 'technological' events, as indeed they have done every consecutive year since 1990 – with the exception of the losses of September 2001. The major events included the major Central European floods of August, which had an estimated total insured loss of US\$ 3 billion these were the central topic of an in-depth Instrat CAT-i White Paper³. Other events included a series of tornadoes that occurred in April across 17 states of the United States causing a total insured loss of approximately US\$ 1.5 billion¹. In September Tropical Storm Isidore caused a total market loss of US\$ 470 million⁴. In November, another series of tornadoes cost a further US\$ 460⁴ million in insured losses. Hurricane Lili also swept the Caribbean and parts of the United States Southeast, resulting in US\$ 700 million in insured losses⁵. Both Tropical Storm Isidore and Hurricane Lili are examined within another Guy Carpenter White Paper entitled 'Tropical Cyclone Review 2002'. In early September, Typhoon Rusa destroyed 650 ships and boats in South Korea, and severely damaged the country's fish farms. Insured losses from Rusa totalled US\$170 million. In September heavy rainfall caused severe flooding to occur in the south east of France particularly in the Gard, Hérault and Vaucluse départements. The total insured loss from this event was Euros 440 million⁶.

¹ Munich Re – Natural Cat Loss Press Release 30th December 2002

² Swiss Re – Sigma Study News Release 19th December 2002

³ Guy Carpenter Instrat – Central Europe Floods 2002 White Paper October 2002

⁴ ISO Press Release 2002

⁵ Swiss Re – Sigma Study News Release 19th December 2002

⁶ Swiss Re – Sigma Study News Release 19th December 2002

'Human-made' Catastrophes Summary

Human-made and technological catastrophes in 2002 have accounted for insured losses of US\$ 2 billion that were mainly due to major fires, aviation and space disasters.

The US\$ 12 billion total insured loss worldwide for catastrophe losses equates roughly to the average since 1970. The losses of 2002 are, however, significantly lower than those made throughout the years since 1990, when, according to Swiss Re⁷, annual losses averaged US\$ 21.5 billion. However, they also caution that this should not be taken as a sign that losses are on the downturn.

Major 'Natural' Catastrophe Insured Losses 2002

Insured (US\$ Bn)	Loss	Total Loss	Date	Event	Country
1.5	-		27/04/2002	Tornadoes	United States
3.0		20	06/08/2002	Floods	Central Europe
0.17			22/08/2002	Typhoon/Flood	South Korea
0.47			08/09/2002	Floods	France
0.4			14/09/2002	Tropical Storm Isidore	United States
0.7		2.0	21/09/2002	Hurricane Lili	United States
0.5			09/11/2002	Tornadoes	United States

Deadliest Catastrophes 2002⁸

Fatalities	Date	Event	Country
1,500	01/01/2002	Epidemic	Burkina Faso
1,050	09/05/2002	Heatwave	Madhya Pradesh
1,000	25/03/2002	Earthquake	Afghanistan
1,000	27/01/2002	Explosion	Nigeria
800	08/06/2002	Flood	China

⁷ Swiss Re – Sigma Study News Release 19th December 2002

⁸ The OFDA/CRED International Disaster Database – University of Louvain

According to the OFDA/CRED International Disaster Database the most deadly catastrophe of the year occurred in Burkina Faso due to an epidemic of meningitis. A heatwave that occurred across a large area of Madhya Pradesh and Andhra Pradesh, India in May killed approximately 1,050 individuals. Floods that occurred across a large area of Shanxi, Sichuan, Hubei and Fujian provinces of China killed approximately 800 individuals.

Event Summary

Vanuatu Earthquake January 3rd 2002

The year began with a series of earthquakes around Vanuatu, a group of 83 islands in the South West Pacific. The islands were hit on January 3rd by a quake measuring 7.3 Ms. It was followed by several aftershocks, two of which measured 6.4 Ms and 6.7 Ms.

The earthquakes set off landslides, damaged buildings and caused people to run from their homes in the capital, Port Vila. Huge boulders rolled down hillsides and into Port Vila's harbour, cutting off access to its docks. The bridge linking the capital to the north of the main island of Efate was also destroyed, and some government buildings damaged. Several people were hospitalised with injuries from falling debris, but there were no reports of fatalities. New Zealand gave NZ\$ 100,000 in aid to assist with building repairs.

United States Winter Storms – January to February 2002

A series of winter storms that occurred throughout January and February caused US\$ 265 million in insured losses in seven states from Oklahoma to Ohio, according to Insurance Services Office Inc.⁹. In one of the mildest winters in recent years, Texas accounted for the highest insured loss with US\$105 million in damage due to storms that occurred in January. Kansas had an insured loss of US\$ 90 million, followed by Missouri with US\$ 70 million in claims, New York with US\$ 60 million in damage and Ohio with US \$50 million in claims as a result of winter storms.

Severe Weather across the United Kingdom 28th January to 4th February 2002

Severe weather hit the UK on 28th January 2002. Most damage in the UK was focused on southern Scotland, north-east England and northern parts of Northern Ireland with strong gusts being reported in coastal regions. There were reports of roof and masonry damage with most intense damage experienced between Dundee, Glasgow, Edinburgh and Durham.

⁹ ISO Press Release 2002

Power cuts were experienced by 90,000 in Scotland, 20,000 in Newcastle-upon-Tyne and 7000 in Northern Ireland.

Between 1st February and 3rd February, there was further widespread disruption to power lines, road, railways and ferry services across the country.

There were 12 fatalities that occurred between the 28th January and 4th February 2002 and rescue forces coped with numerous cases of capsized lorries, fallen trees, ships in need of salvage operations and injuries from violent gusts of up to 85 mph.

Estimates of the insured losses resulting from the storm are in the region of Euros 140 million.

Storms in Sydney, Australia 16th to 17th February 2002

Parts of Sydney were declared natural disaster areas after a severe electrical storm caused widespread damage and cut power to thousands of homes across the city and the New South Wales Central Coast. The storm, which was accompanied by winds of up to 65 mph, hail and torrential rain, developed in the Southern highlands and cut a path through 36 heavily populated areas and blacked out 100,000 homes before moving north through Hornsby and the Central Coast. The hardest hit towns were Liverpool, Fairfield, Holroyd, Parramatta, Blacktown, Baulkham Hills and Campbelltown. Trees were brought down across roads, roofs were blown off houses and cars were trapped on a major highway. Roofs were blown off houses at Bonnyrigg Heights in the western area of Sydney and motorists were trapped on sections of the Cumberland Highway by flash flooding.

Taipei, Taiwan Earthquake 31st March 2002

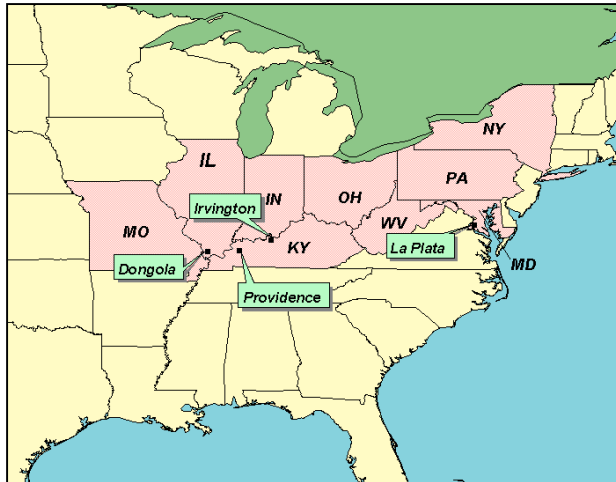
A 7.1 Ms earthquake occurred approximately 65 miles south east of Taipei, Taiwan at a depth of 33 km, there were five reported fatalities and more than 200 injuries according to the United States Geological Survey. Several buildings collapsed, and telecom and power services broke down in some areas. The five fatalities occurred at the site of the Taipei financial centre a 100 storey building that was undergoing construction at the time that the earthquake struck.

Several underground water and gas pipes were ruptured around Taipei and several small fires were reported as a result of the gas pipe failure. The central subway of Taipei was also closed briefly.

The earthquake, which reportedly lasted for a whole minute and could be felt islandwide, also caused office buildings in Taipei to sway for a few minutes.

United States – Series of Tornadoes 27th April 2002

Five people were killed and many were injured after a series of more than 15 tornadoes were spawned on 27th April by a series of powerful spring thunderstorms that drenched states from Kentucky in the south to New York in the north, and from Missouri in the west to Maryland in the east.



In one of the worst-hit towns, La Plata, Maryland, about 20 miles (32 km) south of Washington, two people died and more than 70 were injured as a twister touched down, ripping roofs off homes and stores, destroying some houses, tearing down power lines and toppling trees.

Authorities imposed an overnight curfew on the small town of 6,500 people as emergency crews searched homes for trapped residents amid splintered homes, overturned cars and downed power lines.

Areas of downtown La Plata experienced severe damage after a tornado cut a 12 mile long swathe through the area. Further storms struck western Kentucky, killing one man, injuring at least 30 people and destroying 146 homes, according to state emergency reports.

One woman was killed in a tornado which touched down in Dongola, Illinois, after a series of severe storms rolled through the southern tip of the state. Several residential properties were damaged, trees were uprooted and power lines were downed in the rural communities of Glatia and Cypress, also in southern Illinois.

In Tennessee, a tornado cut a 10 mile path through the Murfreesboro area, about 30 miles south east of Nashville, injuring 18 people and damaging 62 homes and buildings. Winds in parts of Tennessee reached 140 mph.

The total insured losses pertaining to these tornadoes was approximately US\$ 1.5 billion¹⁰. Insurers' losses from the tornado that affected La Plata alone totalled nearly US\$ 25 million in claims¹¹.

¹⁰ Swiss Re Sigma Study – News Release 19th December 2002

¹¹ ISO Press Release – May 2002

European Storms 7th to 8th June 2002

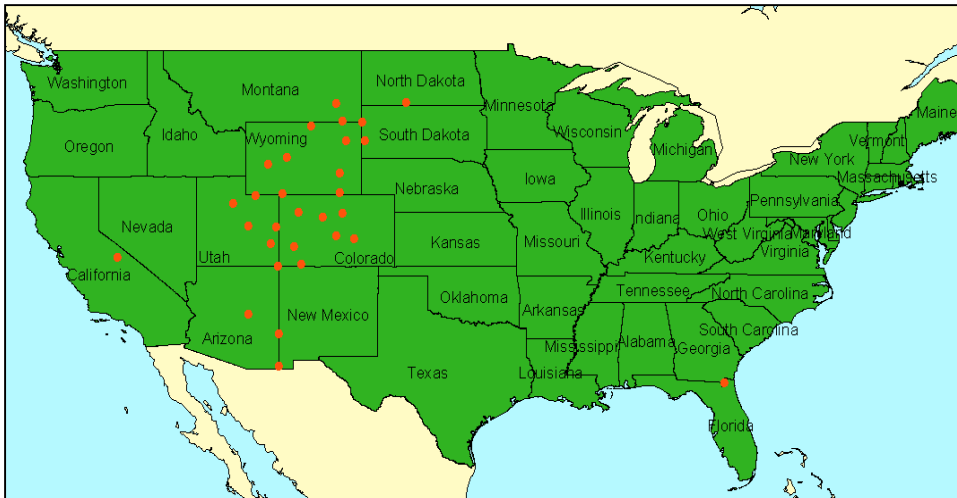
Fierce thunderstorms swept across a large area of Europe on 7th June, killing eight people and leaving flooded roads, some damaged houses and downed bridges from France to Poland. Regional officials in north-eastern Italy declared a state of emergency, while the Austrian military was deployed to deal with the flooding aftermath. In Germany, at least three people died in storm-battered Bavaria. An 81-year-old woman died when flood waters poured into her Dierdorf cellar, while two men drowned in a parking garage. In south-eastern France, floods and mudslides collapsed two houses and carried several cars away. About 100 residents of Saint-Geoire-en-Valdaine in the mountainous Isere region were forced to spend the night in a local gymnasium. A woman in her 80s was found dead in the rubble of a home partly destroyed by the storms, police said. There were a further 3 fatalities as a result of severe weather in Poland.

Flooding also hit Venice, Italy where waters surged to nearly four feet, setting a record high for June and making footbridges impossible to use. A state of emergency was declared in parts of Friuli, in north-eastern Italy, while rains washed out a bridge over the Cervo river in nearby Biella. Austrian firefighters and other emergency workers were placed on high alert across the province of Lower Austria as swollen rivers broke their banks. High waters flooded several regional highways, forcing their temporary closures. Austrian army troops were mobilized and more than 1,700 fire brigade boats fought the flood damage. In Switzerland, rail and road traffic was badly disrupted in the central cantons of Lucerne and Schwyz, and agriculture fields, fruit orchards and vines were damaged.

Various Locations - United States Forest Fires - June 2002

Throughout June there were a series of severe forest fires that occurred across a large area of the United States' Mid-West region. The fires occurred across the states of Colorado, Arizona, Utah, Wyoming, New Mexico, Montana. Smaller fires occurred in South Dakota, California and Georgia.

One of the largest fires spread across 90,000-acres near the southern suburbs of Denver. This fire was to be the biggest in Colorado's history. Many of the fires burned out of control and firefighters initially made little progress against what they termed a 'weather-driven' fire. The weather preceding the fires had been very hot and dry with an associated lack of rainfall.



State	Approximate Location/s
Arizona	Carrizo, Rodeo and Chediski
Colorado	Bear, Spring Creek, Hayman, Missionary Ridge, Fountain Gulch
Georgia	Blackjack Bay
Montana	Line Creek
New Mexico	Parachute Adam, Walnut, Tejon
South Dakota	Grizzly Gulch
Utah	Mustand, Price Canyon, Springville, Black Canyon, East Fork, Rattle
Wyoming	South Fork, She Bear Mountain, Cow Camp, Daley, Reese Mountain, Watt, Pownell, Hensel.
California	Birch

The insured loss that resulted from the Rodeo-Chediski fire alone was approximately US\$ 120 million according to reports from ISO. This fire alone generated over 6,000 claims for damage to residential and commercial property and vehicles. The fire destroyed an estimated 300 residential properties.

Floods in Shaanxi Province, China - June

Flooding and mudslides killed at least 178 people in China and wrecked bridges and power stations after torrential rains occurred throughout June.

152 people were reported dead with a further 266 declared missing in Shaanxi province. Whilst at least 24 people were reported dead in the neighbouring province of Sichuan. Nearly 10,000 people were made homeless as a result.

Heavy rains and thunderstorms swept through western China over a period of 5 days at the beginning of June.



Province	Counties	Cities	Rivers
Shaanxi	Foping, Ningshan, Changan, Yangxian, Shiquan, Hingshan	Xian	Hanjiang, Ziwu, Xun
Sichuan	Chongqing	Suining, Hanzhong, Nanchong	Yangtse, Jialinjiang

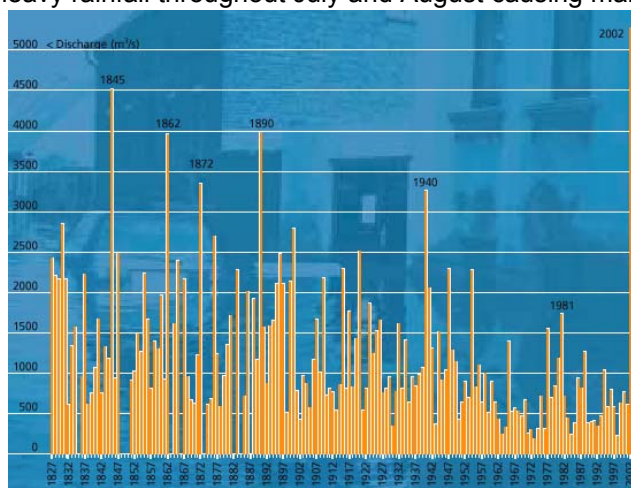
The Chinese military were called in to assist with emergency rescue work after 80,000 homes were destroyed or badly damaged as a result of the floods. Approximately 13 bridges and 30 kilometres (20 miles) of highways and railway lines were completely destroyed as were 29 hydroelectric power stations according to emergency relief organisations. Rains experienced in the north west region of Xinjiang were persistent enough to destroy 500 homes and over 1,600 hectares (4,000 acres) of cropland. These floods were China's deadliest of 2002, although Government sources stated that they had spent billions of dollars on flood prevention since 1998, when 4,150 people died in floods that devastated the central and north eastern parts of the country. Other measures that have also been taken to battle the disaster include the banning of tree felling and the formation of special army units to combat flooding on major rivers.

As a result of the heavy rainfall and floods there was a total economic loss of US\$ 400 million.

Central Europe Floods – August 2002

In line with several forecasts of climate research, numerous severe storms in 2002 resulted in precipitation records being set in many parts of the world causing regional and supra-regional flooding.

In many regions of Europe there was heavy rainfall throughout July and August causing many rivers to burst their banks triggering flash floods. On 12 August in Dresden, for example, 158 litres of rain per square metre fell in just 24 hours, more than twice the amount ever recorded there previously (77 litres per square metre). In the Czech Republic there were massive efforts required to protect the city of Prague from the flood waters of the Vltava River.



The total economic losses that arose from the floods were in the region of 55 billion Euros whilst the total insured loss amounted to 3 Billion Euros making it the largest insured loss of 2002.

Reinsurance Losses:

Company	Million Euros	Source of Information
Munich Re	500	Munich Re
Swiss Re	170	Swiss Re
Partner Re	110 – 120	Partner Re
Hannover Re	50	Hannover Re
General & Cologne Re	50	General & Cologne Re
Converium	50	Converium
Scor	40 – 50	Scor
XL Capital	50	XL Capital

These floods are covered in greater depth in our White Paper entitled 'Central Europe Flood Report 2002' that can be downloaded from the Guy Carpenter web site: www.guycarp.com.

Sicily Earthquake – 6th September

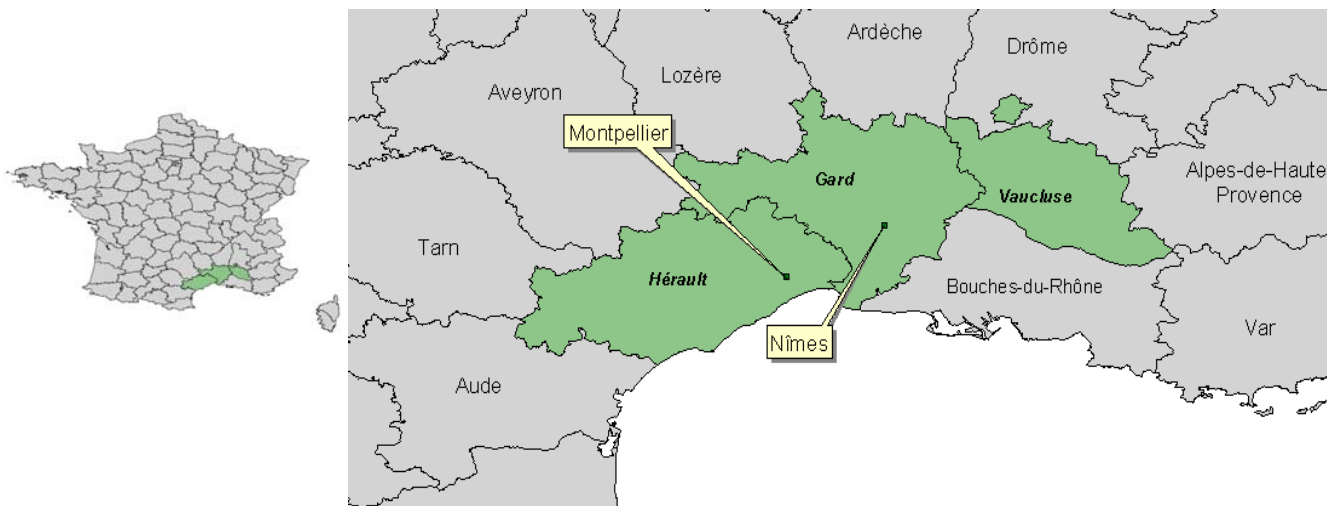
On 6th September Sicily was hit by a 6.1 Ms earthquake, the strongest quake to hit Sicily in 20 years. The quake, which had its epicentre about 40 kilometres (about 25 miles) north east of

Palermo, in the Tyrrhenian Sea, was followed by more than 70 aftershocks. Reports stated that there was a total of US\$ 500 million in economic loss.

Among those buildings to experience damage was the 9th century Palazzo dei Normanni, the seat of the Sicilian parliament, and the baroque church of St. Ann's. Damage was also experienced in the Valley of Temples, a complex of classic Greek temples about 55 miles south of Palermo.

Floods in France - 8th September 2002

Torrential rain also caused further problems in Europe one month later when flash floods occurred in south eastern France causing severe damage to the Gard, Hérault and Vaucluse départements. There were 23 fatalities as a result of the floods.



It was reported that almost 40% of the vines in Gard and 10% in Vaucluse, a total of 40,000 hectares (100,000 acres), were damaged in the floods, according to the regional agriculture officials. Authorities also stated that 500 bulls and specially bred horses, from the famous Camargue plane south of Nîmes, had drowned.

Prime Minister Jean-Pierre Raffarin pledged 10 million Euros of state aid to the affected regions and the European Union also provided funds. The French government declared a state of natural disaster in the region.

One week after the incident the French 'Federation of Insurance Companies' estimated a total insured loss of 150 million Euros. This loss soon increased as claims were filed in the months

that followed the floods with the result that the final total was in the region of 470 million Euros¹².

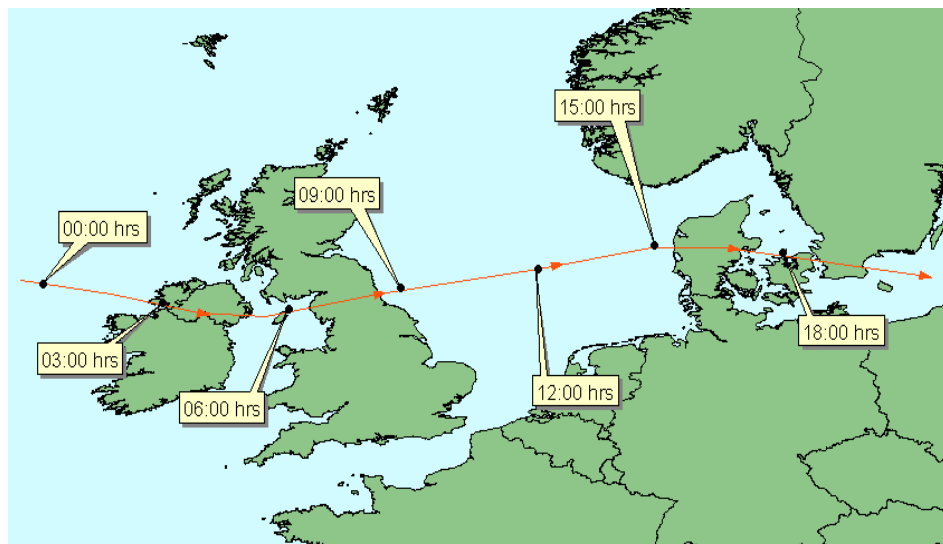
Windstorms in United States – September 2002

Two separate windstorm events in September; one that affected both Arizona and Utah and another that occurred in the Ohio Valley (Indiana, Kentucky and Ohio) caused US\$ 215 million in insured damage.

Indiana was hit by a late-season tornado on September 20th, destroying homes and cars and leaving thousands of people without power.

State Farm estimated that they would receive at least 20,000 claims for homeowners coverage and about 5,000 claims for automobile coverage as a result of this tornado. Amongst those who had catastrophe mobile claims units on site were State Farm, Nationwide and American Family Insurance who were able to assist policyholders in the affected area. It was estimated that each claim paid was approximately US\$ 5,000 although there were several individual larger losses¹³.

Windstorm Jeanette, NW Europe – 27th October 2002



Track of windstorm Jeanette

¹² Swiss Re 2003 Press Release

¹³ Best's Insurance News, 23 September 2002

Storm 'Jeanette' tracked across NW Europe on the 27th October traversing northern England, the North Sea, Denmark and finally on in to Sweden. Strong winds of over 70 mph were experienced inland, and in coastal regions winds of over 90 mph were reported.

The strong winds were accompanied by heavy downpours of rainfall in the UK where flooding resulted in several evacuations in Scotland. Flood warnings were issued for various rivers across much of Scotland, and northern and eastern parts of England. Insured losses were estimated to be in the range of 0.8 to 1.2 billion Euro, principally in the United Kingdom, the Netherlands, and Germany¹⁴.

The worst wind related damage was experienced across Wales, the English Midlands and into the Netherlands, western Germany. At least 33 people were killed across Europe. In the U.K., around 1 million people lost power, with 65,000 still without power. Seven people were killed, and flights from all the London and Midlands airports were cancelled. Many railway services were also cancelled as a result of a combination of downed trees and debris on the lines, and damage to overhead power lines. A passenger ferry ran into a warship in Portsmouth Harbour. Damage caused by the stormy weather in the UK was estimated to cost up to £50 million (US\$ 75 million), according to the Association of British Insurers. The British Insurance Brokers' Association (BIBA) estimated that claims could reach £200 million (\$300 million).

In the Netherlands, four people were killed. Amsterdam's Schipol airport was closed, and damage caused to the main railway station.

The strong winds caused damage from Frankfurt to Hamburg in Germany. There were eleven fatalities as a result of the storm, rail services were severely disrupted as well as flights, and fallen trees were widespread. Nordrhein-Westphalen was particularly affected as half the deaths were recorded in this state and Cologne cathedral was damaged by the high winds. Allianz estimated that it would pay out around 80 million Euros (US\$ 78 million). According to reports there were four fatalities in France and a further two in Belgium in storm related incidents.

Earthquake in central Italy - 31st October 2002

A total of 29 people were killed as a result of an earthquake that struck the town of Campobasso 70 miles north east of Naples, Italy. An entire classroom of children were killed when their school collapsed as a result of the tremors. A day after the first earthquake struck, several more tremors shook the town.

National Institute of Geophysics and Vulcanology, said the strongest of the aftershocks had a preliminary reading of 5.3, nearly as powerful as the first shake that measured 5.4 Ms. In the aftermath of the event attention shifted to why the school, built about 50 years ago, collapsed in a quake whose magnitude should not have been strong enough to topple buildings built to modern earthquake standards.

Tornadoes in Eastern USA – November 10th to 11th 2002

Insurers paid homeowners and businesses US\$ 460 million for property losses from the tornadoes, strong winds and hail that struck seven states on November 9th and 10th¹⁵.

As many as 88 tornadoes were reported to have ripped through a wide area of Alabama, Georgia, Kentucky, Mississippi, Ohio, Pennsylvania and Tennessee, causing extensive damage to property and vehicles. For example, a third of Carbon Hill Township, Alabama, was destroyed, as were many buildings in Columbus, Mississippi.

Insured losses were greatest in Tennessee at US\$ 160 million, followed by Ohio at US\$ 125 million and Alabama at US\$ 95 million. Insurers received approximately 86,000 claims from residential and commercial policyholders.

Bushfires in New South Wales, Australia – December 2002

About three thousand fire-fighters tackled more than 70 bushfires in New South Wales state, Australia throughout December.

About 20 houses were destroyed in the vicinity of Sydney but only one death was reported. The worst affected area was the north-western suburb of Glenorie, where about 15 houses burned down. Many roads were closed, and train services and power supplies were disrupted. Around 800 people were spending Thursday night in emergency shelters because their homes were threatened. Many individuals living in the affected area had to spend time in emergency shelters as their homes were threatened. Property damage was estimated at AUS\$ 10 million.

The New South Wales government donated AUS \$1 million to set up a bushfire relief fund to ensure that the victims receive a one-off AUS \$10,000 payment if their home is completely destroyed.

¹⁴ Risk Management Solutions Press Release 2002

¹⁵ Insurance Services Office New Press Release

The Australian Prime Minister stated that; "We do this because we can't act as an insurer at last resort, we can't pick up the cost of all losses in a fire, if the government, the state or the federal government, were to do that people would simply not insure, so the \$10,000 grant we give to people who lose their houses, no questions asked, just hand it over, is no substitute for comprehensive household and contents insurance."

One in four houses across Australia are not insured, and three in four tenants do not have contents insurance. Home owners seeking insurance when the fires began were told they would not be paid for fire damage occurring immediately after taking out a new policy.

After the fires many insurance companies were reassessing household premiums with the result that home insurance policyholders could expect premium loadings for high-risk houses along with discounts for those who adopt fire precaution methods. Aided by the recent decision by state and local governments to draw maps of bushfire danger zones, insurance companies will in the future be able to pinpoint suburbs even houses that are at the greatest risk. Local media reports claimed that Australia's largest general insurer, NRMA Insurance, had stated that it would be able to rate every house in the state for bushfire risk within the next year. These ratings could be used to load premiums or to charge a risk excess.

United States Snowstorms – 4th to 7th December 2002

Insurers are expected to pay homeowners and businesses US\$ 360 million for insured-property losses that occurred as a result of the winter storms on December 4th that affected North Carolina, South Carolina, New York, Pennsylvania and Virginia.¹⁶

The first major snowstorm of the season, that drove up from the Carolinas to New York state, began on December 4th in the south and moved across the north east on December 5th, left more than 1 million people in both North and South Carolinas without power as heavy ice ripped power lines and tree limbs to the ground. According to several news reports the same storm dropped more snow on New York City in one day than fell in all of winter 2001 combined. Eleven states were affected by the weather, with schools and businesses closing, airline flights cancelled or delayed and roads snarled as driving conditions deteriorated. According to reports issued at the time 30 people died as a result of the storms – predominantly in traffic related accidents.

Insured losses for the snow and ice storm were greatest in North Carolina at US\$ 230 million, followed by South Carolina at US\$ 60 million, New York at US\$ 40 million, Pennsylvania at

¹⁶ Insurance Services Office Press Release December 2002

US\$ 20 million and Virginia at US\$ 10 million. It was anticipated that insurers would receive more than 155,000 claims from both residential and commercial policyholders¹⁷.

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¹⁷ Insurance Service Office Press Release January 2003