

## **DISASTERS BULLETIN 3: January 1 – July 8, 2003**

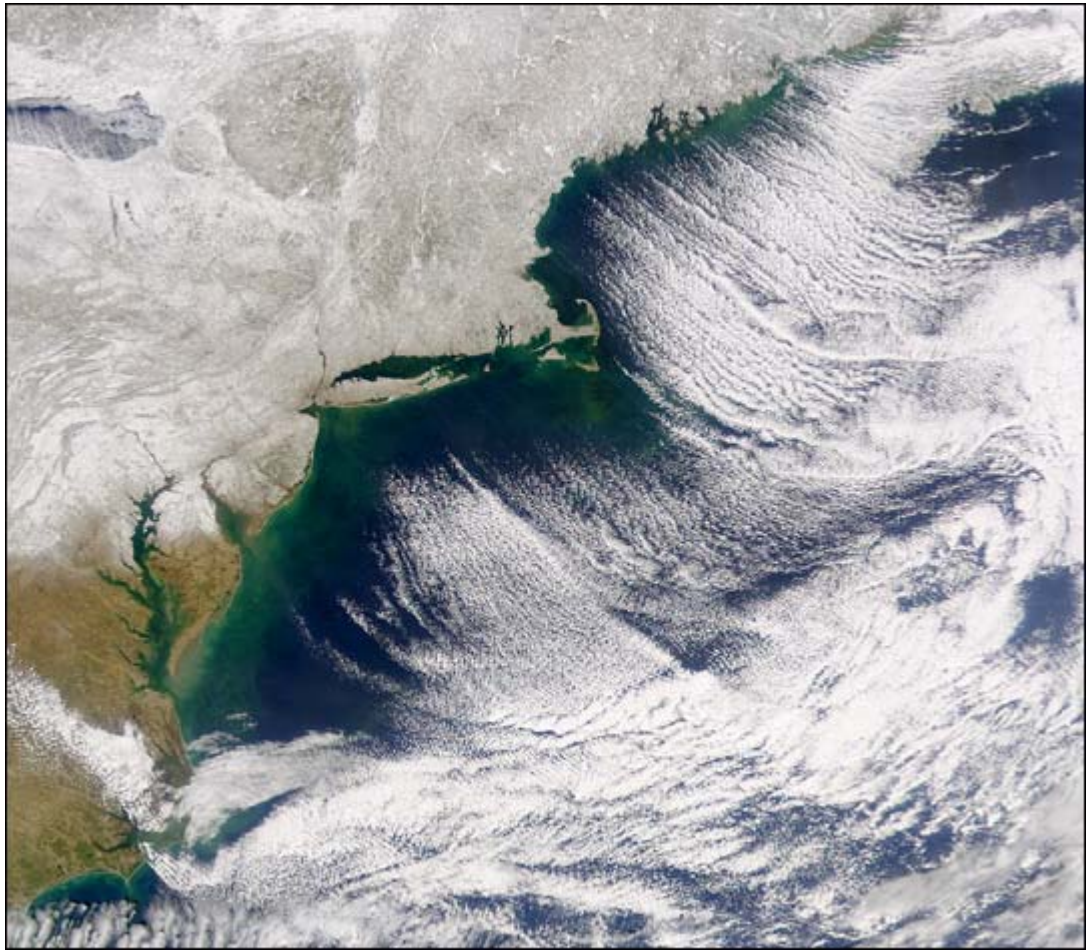
**Benfield Hazard Research Centre, University College London**

### **Summary for the period**

Following six months of quiet, the first half of 2003 experienced a reawakening of geological activity. A moderate earthquake in China killed 268 in February and another in Turkey took around 180 lives at the start of May. Just three weeks later, the year's most lethal natural catastrophe so far took over 2,200 lives, injured more than 10,000 and left 150,000 homeless as another quake struck Algeria close to the capital Algiers. Economic and insured losses over the period were once again dominated by weather-related events and especially by winter storms in the United States. A major loss was also triggered, however, by severe floods in Argentina, which are estimated to have cost the economy in excess of one billion US\$. Floods also proved to be ubiquitous in the developing world, causing serious problems in particular in Azerbaijan, the Horn of Africa, Indonesia, Peru and Sri Lanka. At the time of writing, flooding on a gigantic scale is also inundating eastern China, with over 45 million people affected and initial estimates of economic losses approaching one billion US\$. With further torrential rains on the way, this is a figure that is likely to rise significantly. Destructive tropical cyclones struck Fiji, New Caledonia, Indonesia, India, Madagascar and the Philippines, although death tolls were low. Following the Algerian quake, the most lethal event was a heat wave that affected much of India during May and early June, to which are attributed over 1,200 deaths. While catastrophe-related economic and insured losses in Europe were minimal, first quarter insured losses in the United States are estimated at 1.46 billion US\$, compared to 615 million US\$ for the same period in 2002. Losses are attributed to five events affecting half the states in the Union. Three of these were severe winter storms that blanketed fifteen states causing an estimated 1.1 billion US\$ in insured property damage, while the balance of first-quarter losses resulted from two wind/windstorm events. US Second-quarter insured losses will be dominated by the results of the battering received by the tornado-alley states during early May, for which total claims are expected to range from 1.55 to 2.2 billion US\$, the largest tornado loss on record.

### **Selected major events**

<b>Territory:</b>	United States
<b>Region:</b>	Connecticut, Delaware, Kentucky, Massachusetts, Maryland, North Carolina, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Tennessee, Virginia, Vermont and West Virginia.
<b>Date:</b>	February 14 - 18
<b>Event:</b>	Winter storm
<b>Impact:</b>	Over 30cm of snow fell across Massachusetts, much of rest of New England and New York. Insured losses are estimated at 161 million US\$ for Maryland, 130 million US\$ for New Jersey and 105 million US\$ each for New York and Pennsylvania. Total fatalities due to the storm were estimated at 37.
<b>Summary:</b>	One of the heaviest snowstorms on record brought chaos to the north-eastern states over the President's Day week-end. New York, Washington DC, and Boston were brought to a standstill as snow accumulated to depths in excess of 50cm. In Boston, total snowfall for February was 70cm – the largest accumulation for any storm since records began. The effects of the storm were not only confined to the north-east, and on the 16 <sup>th</sup> and 17 <sup>th</sup> snow lay on the ground from Kentucky to Connecticut. In the south-eastern states, sleet, ice and freezing rain caused serious disruption to travellers. In the following week torrential rain and melting snow triggered floods in Kentucky, Tennessee, and West Virginia.



North-east US snow cover. March 3<sup>rd</sup> 2003. (Courtesy NASA)

<b>Data sources:</b>	National Climatic Data Center <a href="http://lwf.ncdc.noaa.gov/oa/climate/research/snow02.html">http://lwf.ncdc.noaa.gov/oa/climate/research/snow02.html</a>
<b>Additional sources:</b>	NASA Earth Observatory <a href="http://earthobservatory.nasa.gov/">http://earthobservatory.nasa.gov/</a>  ISO <a href="http://www.iso.com/press_releases/">http://www.iso.com/press_releases/</a>
<b>Territory:</b>	United States
<b>Region:</b>	Iowa, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New York, Pennsylvania, Texas, Wisconsin
<b>Date:</b>	April 4 - 15
<b>Event:</b>	Late Winter storms
<b>Impact:</b>	Total insured losses are estimated at 1.2 billion US\$ due to a combination of ice, snow, freezing rain, wind, hail, tornadoes and flooding. Texas was

worst hit with wind speeds in excess of 128 km/h and baseball-sized hailstones resulting in damage leading to 285,000 claims totalling 885 million US\$. Travel was severely disrupted and over half a million homes in Michigan and New York State left without power.

**Summary:** A severe snowstorm was triggered on April 4th by the collision of warm, wet air from the Gulf of Mexico with cold air further north, forming frontal systems that dumped over 30cm of snow on Nebraska and Minnesota before moving steadily eastwards to affect New York, New Jersey and neighbouring east coast states. In the south, the storm brought torrential rain, hail and high winds to Mississippi. On the 15<sup>th</sup>, severe thunderstorms developed over Texas and Oklahoma, spawning a dozen tornadoes, giant hailstones and strong winds.

**Data sources:** NASA Earth Observatory  
<http://earthobservatory.nasa.gov/>

ISO  
[http://www.iso.com/press\\_releases/](http://www.iso.com/press_releases/)

**Additional sources:** National Climatic Data Centre  
<http://lwf.ncdc.noaa.gov/oa/ncdc.html>

**Territory:** Argentina

**Region:** North-east Argentina. The province of Santa Fe and the city of Santa Fe were worst affected. The provinces of Santiago del Estero and Entre Rios were also badly hit.

**Date:** late April – early May

**Event:** Flood

**Impact:** At the height of the flooding, 125,000 people were evacuated. Total fatalities are as yet unknown, with just 23 confirmed but 600 missing. 24,000 homes were damaged and another 4,000 completely destroyed, along with 30 schools. Two million hectares of farmland were destroyed and agricultural and ranching losses are estimated at 200 million US\$. Crop losses include 200,000 tonnes of sorghum and corn and 400,000 tonnes of soybean. Initial estimates of economic losses are of the order of 1.5 billion US\$.

**Summary:** A week of torrential rain in the central part of the country led to the Salado river in Santa Fe province bursting its banks. In Santa Fe city itself, floodwaters rose 2 m in three hours, drowning up to 60 percent of the city. The worst floods on record for the region affected 140,000 people and led to widespread disruption that continues at the time of writing.

**Data sources:** ReliefWeb  
<http://www.reliefweb.int/w/rwb.nsf>

**Additional sources:** NASA Earth Observatory  
<http://earthobservatory.nasa.gov/>

**Territory:** Turkey

**Region:** Bingol province (SE Turkey)

**Date:** May 1st

**Event:** Earthquake

**Impact:** An estimated 300 buildings were destroyed, with over 9,000 others suffering moderate to heavy damage. Four schools collapsed including a boarding school housing 195 children. The total death toll was 177, eighty-five of which were children buried beneath the aforementioned school. Economic losses remain to be determined. Insured losses are expected to be small.

**Summary:** A Richter Magnitude 6.4 earthquake struck the Bingol region of south-east Turkey during the early hours of the morning of May 1<sup>st</sup>. Poor building methods and materials and a lack of enforcement of anti-seismic building codes are blamed for the level of destruction and loss of life, although the shallow (10 km) depth of the quake and its timing – when most people would have been sleeping – will also have played a part. The quake occurred in a tectonically complex region near the eastern end of the East Anatolian Fault that separates the Turkey (Anatolian) and Arabian Plates.

**Data sources:** USGS Earthquake Hazards Program  
<http://earthquake.usgs.gov/eqinthenews/>

**Additional sources:** ReliefWeb  
<http://www.reliefweb.int/w/rwb.nsf>

Earthquake Engineering Research Institute  
<http://www.eeri.org/titlepage.html>

**Territory:** United States

**Region:** Central states including eastern Kansas, northern and south-west Missouri, parts of Tennessee, Arkansas, Nebraska, South Dakota, Oklahoma and Mississippi

**Date:** May 5th

**Event:** Tornadoes and severe thunder storms

**Impact:** In total, over 300 counties were affected in 19 states. Over 100 injured and 300 homes were destroyed in the Oklahoma City area and 400 homes destroyed in Green County, Missouri. Scores of buildings were destroyed elsewhere, accompanied by power outages and disruption to water supplies. Fatalities totalled 42. Insured losses are estimated at between 1.55 and 2.2 billion US\$. The upper end of the range would result in the event being the costliest tornado-related loss in US history, beating the previous record of 1.7 billion US\$ set in April 2001.

**Summary:** A total of 412 tornadoes touched down during the first ten days of May – over twice as many as the previous record number. Most destruction and loss of life occurred on May 5<sup>th</sup>. The previous day, cold, dry air mass from over the Rocky Mountains collided with a mass of moist, warm air moving north from the Gulf of Mexico, spawning a line of severe thunderstorms over south-east Kansas and Missouri. These moved rapidly eastwards generating 84 tornadoes as they went. The town of Pierce in south-west Missouri was severe damaged by a Category 3 tornado, with wind speeds averaging between 253 and 330 km/h. Another powerful tornado narrowly missed Oklahoma City.

**Data sources:** NOAA News Online  
<http://www.noaanews.noaa.gov/stories/s1136.htm>

**Additional sources:** National Satellite, Data, and Information Centre  
<http://www.ncdc.noaa.gov/oa/climate/research/2003/may/hazards.html>

NASA Earth Observatory  
<http://earthobservatory.nasa.gov/>

US National Weather Service, Central Region HQ  
<http://www.crh.noaa.gov/>

**Territory:** China

**Region:** The eastern provinces of Hubei, Guangxi, Jiangxi, Guizhou, Zhejiang, Hunan and Sichuan

**Date:** late-June – early July

**Event:** Floods

**Impact:** The floods are the worst on the Huai river since 1991. As of June 30<sup>th</sup>, nearly 45 million people had been affected of which over 28 million seriously. As well as damage to countless buildings, lifelines – such as roads, power cables and communication lines – have been either destroyed or seriously damaged, as have extensive irrigation schemes. Preliminary estimates put economic losses at 870 million US\$, but this figure is almost certain to rise. As of July 8<sup>th</sup>, thirteen fatalities have been reported and 552,000 people have been evacuated. Over two million hectares of crops have been damaged while 58,000 homes have been destroyed and another 180,000 damaged.

**Summary:** Violent storms and torrential rain since the last week of June have severely affected ten provinces along China's Huai river. Total rainfall in places has reached 500mm, with up to 250mm of rain falling in a single hour in Herfeng County (Hubei province). Currently, nearly two million people in over six thousand villages are stranded by a river that is flowing over a metre above danger level. At the time of writing further heavy rain is forecast and the situation is expected to worsen.

**Data sources:** ReliefWeb  
<http://www.reliefweb.int/w/rwb.nsf>

### Other notable and unusual events (selected)

Date	Country/region	Event	Fatalities	Economic losses (mil US\$)	Insured losses (mil US\$)
June - July	Bangladesh	Flood	> 100		
June 26	Bangladesh	Landslide	22		

June 10	Germany	Thunderstorms	12		
Late May – early June	India	Heat wave	1,210		
May 27	Philippines (Luzon)	Tropical storm	41	~ 3	
May 21	Northern Algeria	Earthquake	2,266	~ 100	
May 8	Madagascar	Cyclone	265		
Early – mid May	W. Kenya, E.Somalia & S.Ethiopia	Flood	160		
May	Sri Lanka	Flood and landslide	235	28	
April 22	India (Assam)	Cyclone	36		
April 20	Kyrgyzstan	Landslide	38		
Early April	Canada (Nova Scotia/Newfoundland)	Floods		~ 10	
End-March to early April	Indonesia (Flores & West Timor)	Flood and landslide	~ 30	3	
March 31	Bolivia (Tipuani)	Landslide	24		
Feb 24	China	Earthquake	268		
Feb 6	Congo	Tornado	164		
Jan 29	Indonesia	Landslide	18		
Jan 24	Fiji	Tropical storm	15	30	
Jan 22	Mexico (Colima & Jalisco)	Earthquake	30		
Jan	Australia (ACT)	Wildfires	5	> 125	125
Dec 2002 – Jan 2003	Bangladesh, India & Nepal	Cold wave	~1,500		