



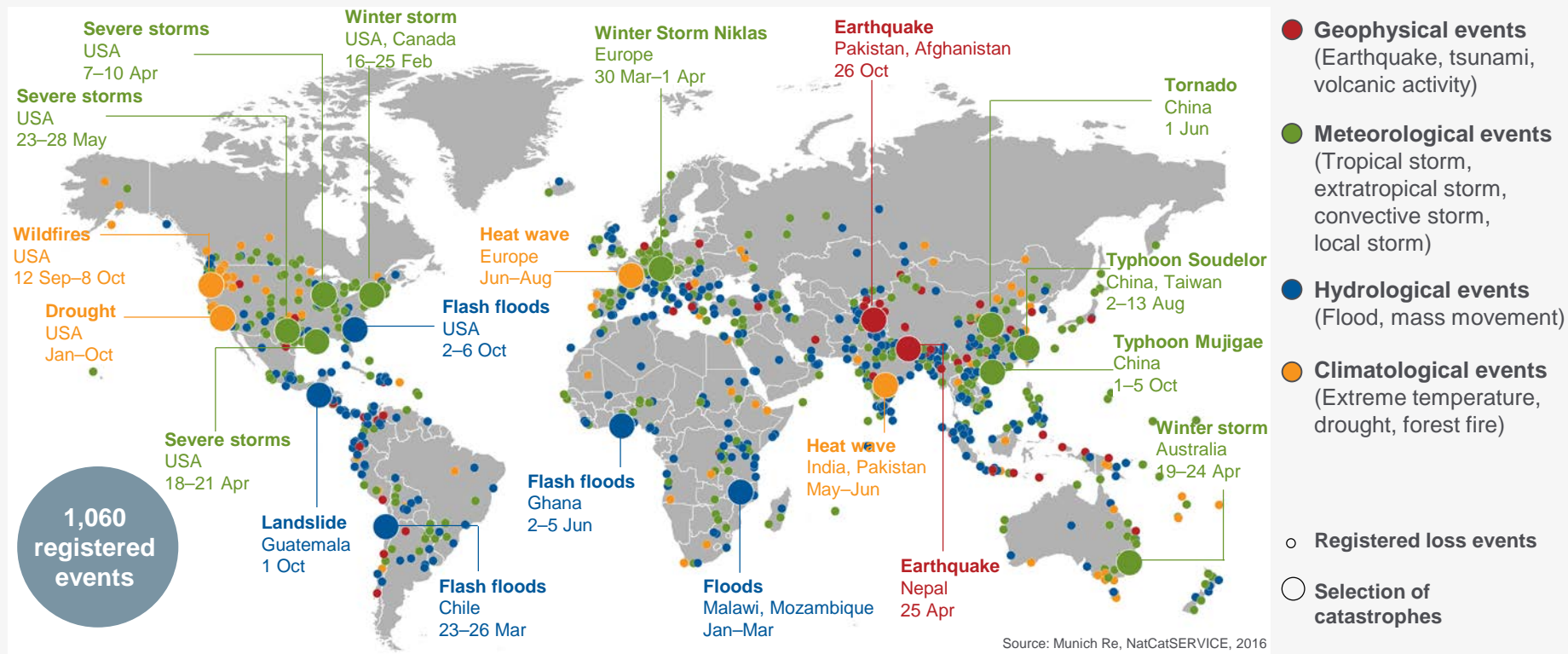
# NatCatSERVICE

Loss events worldwide 1980 – 2015

March 2016

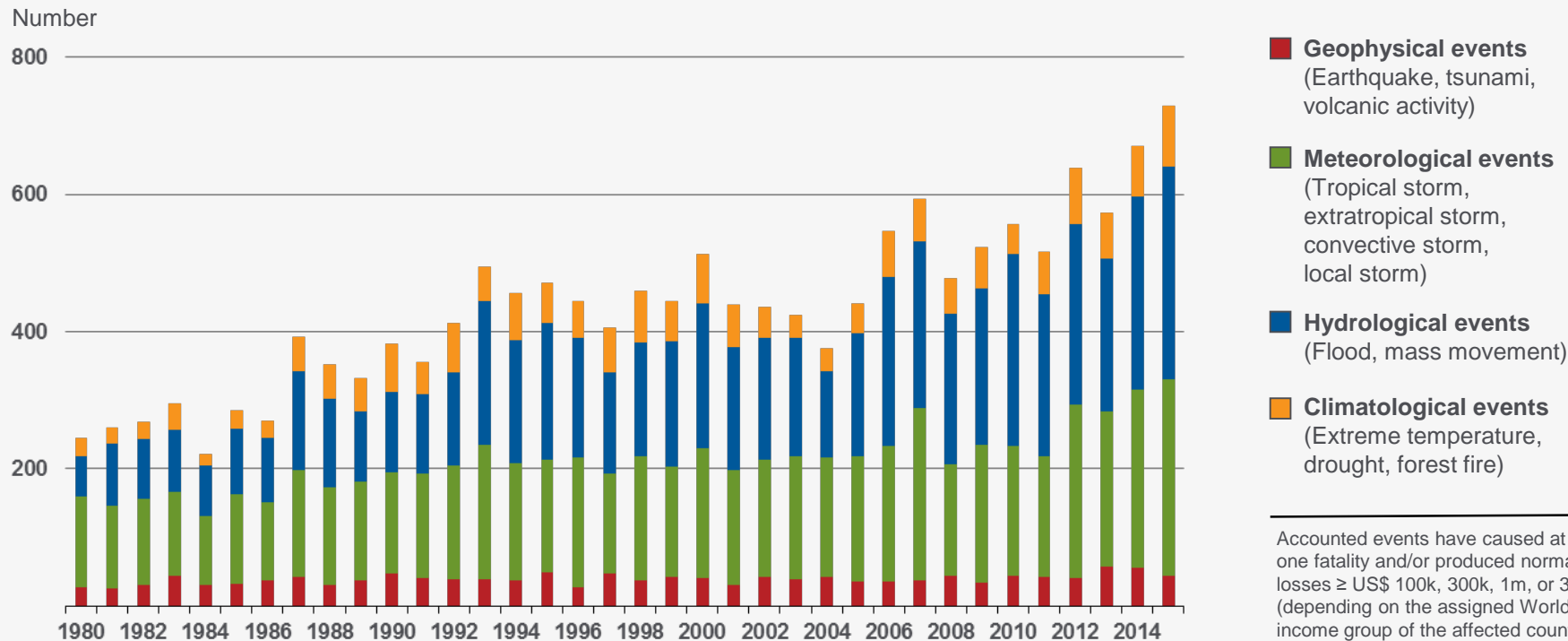
# Natural loss events worldwide 2015

## Geographical overview



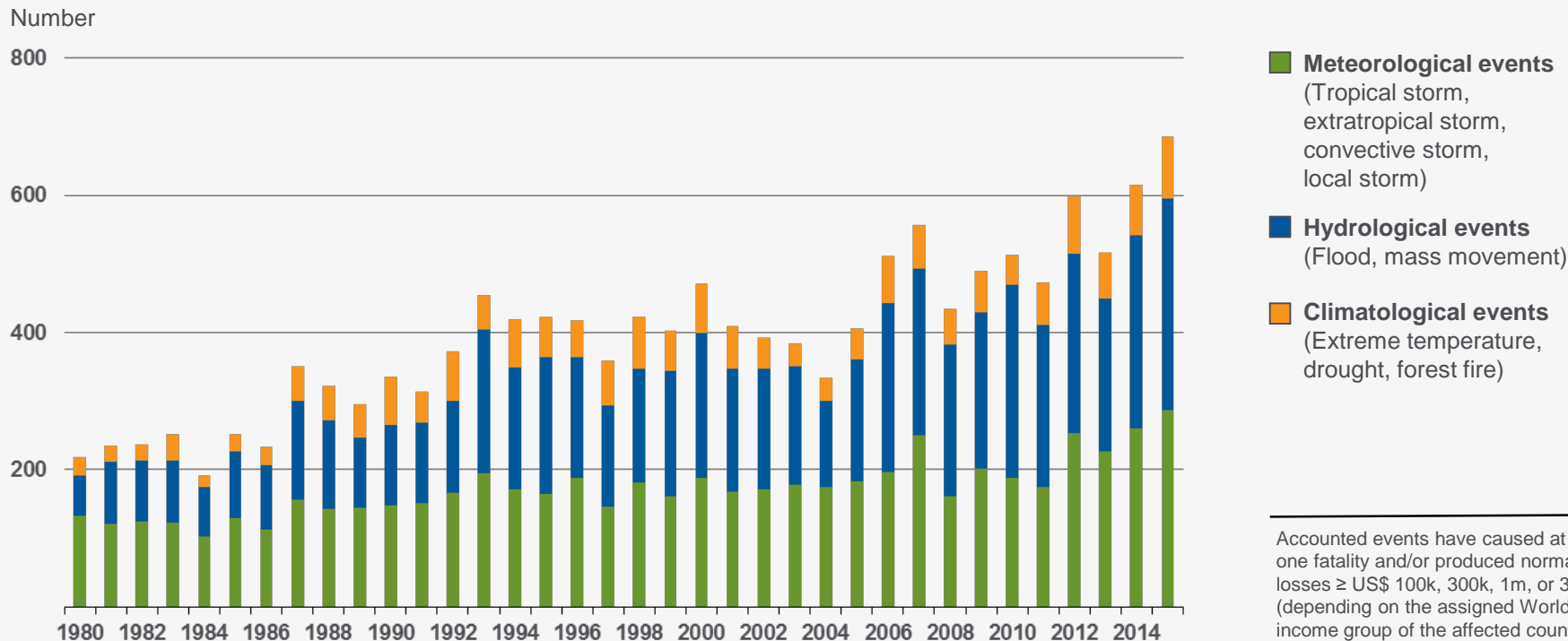
# Loss events worldwide 1980 – 2015

## Number of relevant events by peril



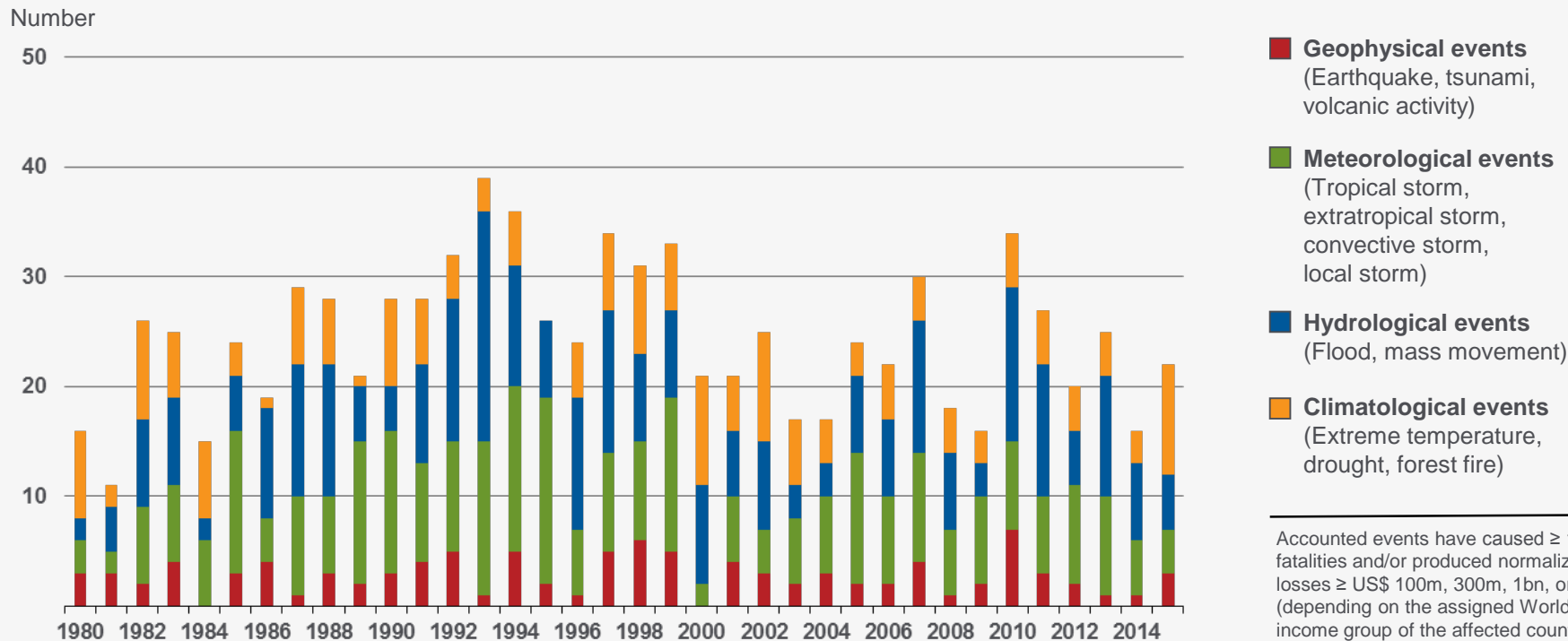
# Weather-related loss events worldwide 1980 – 2015

## Number of relevant events by peril



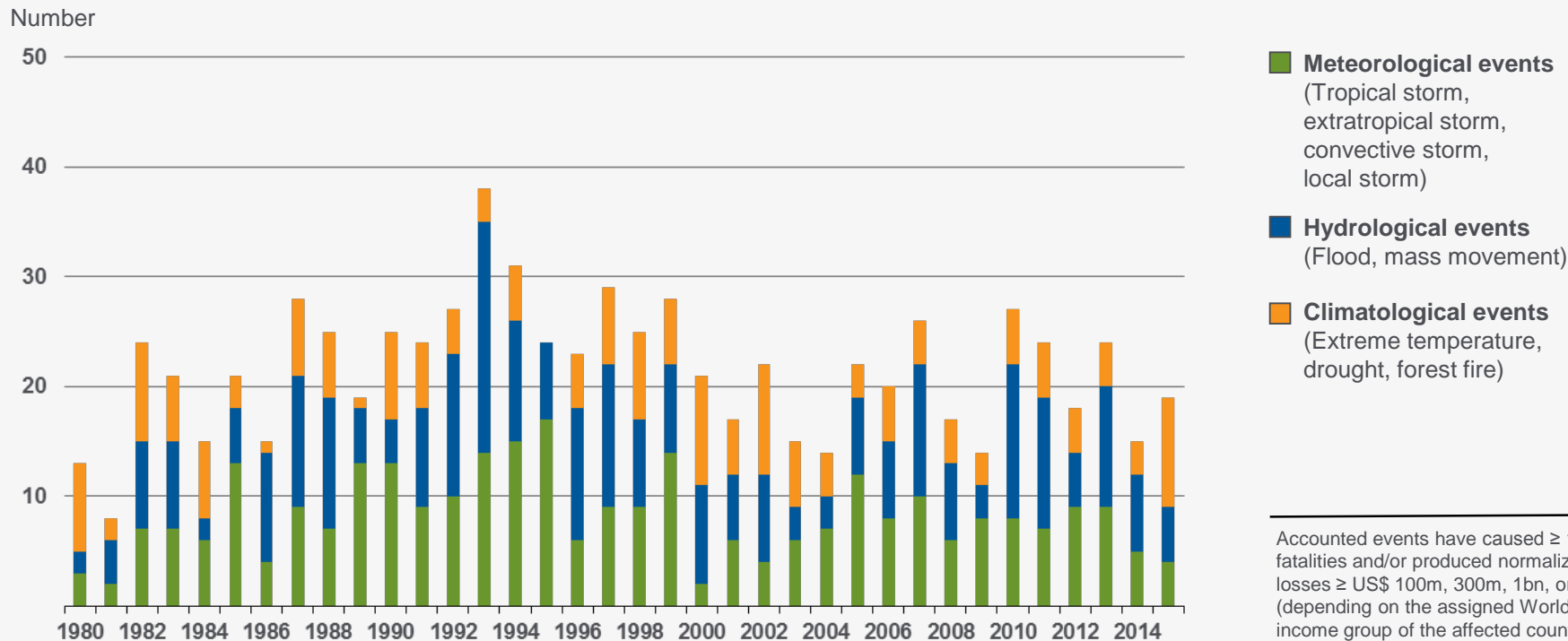
# Loss events worldwide 1980 – 2015

## Number of severe catastrophes by peril



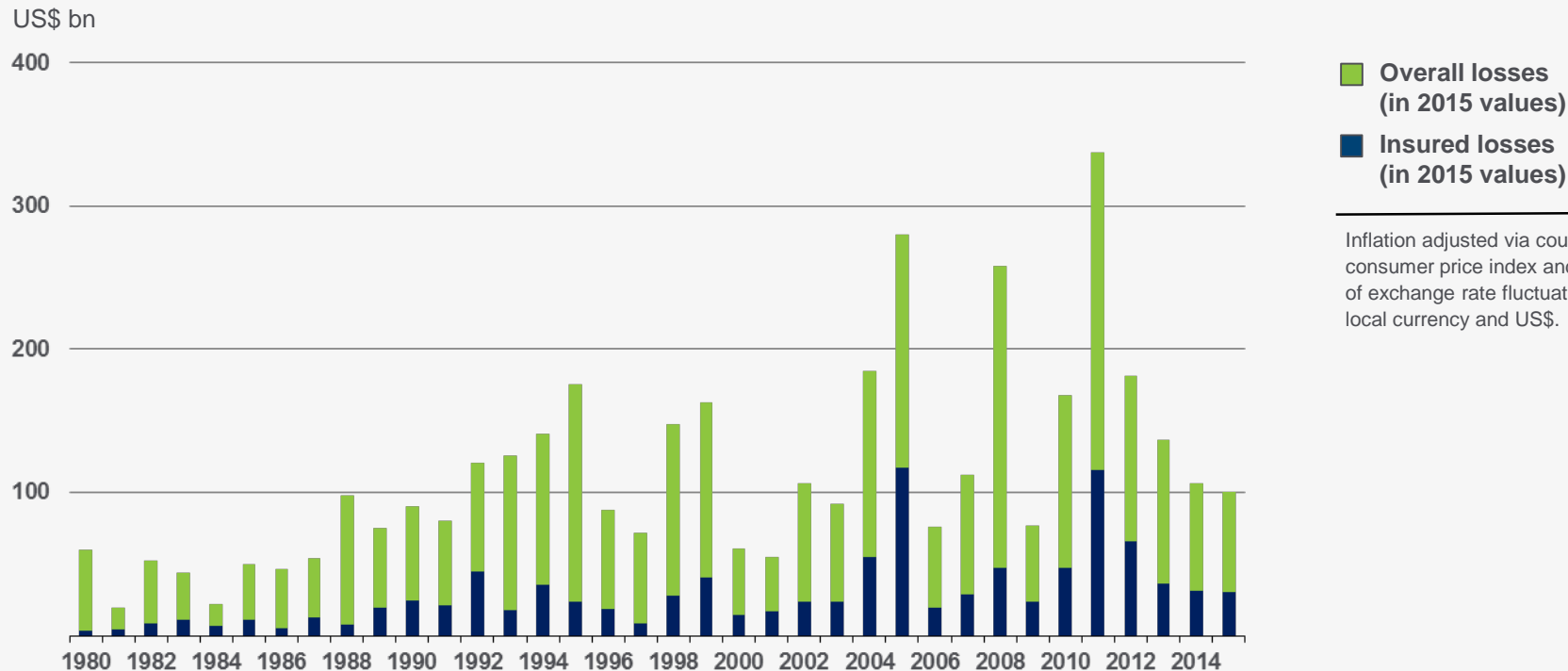
# Weather-related loss events worldwide 1980 – 2015

## Number of severe catastrophes by peril



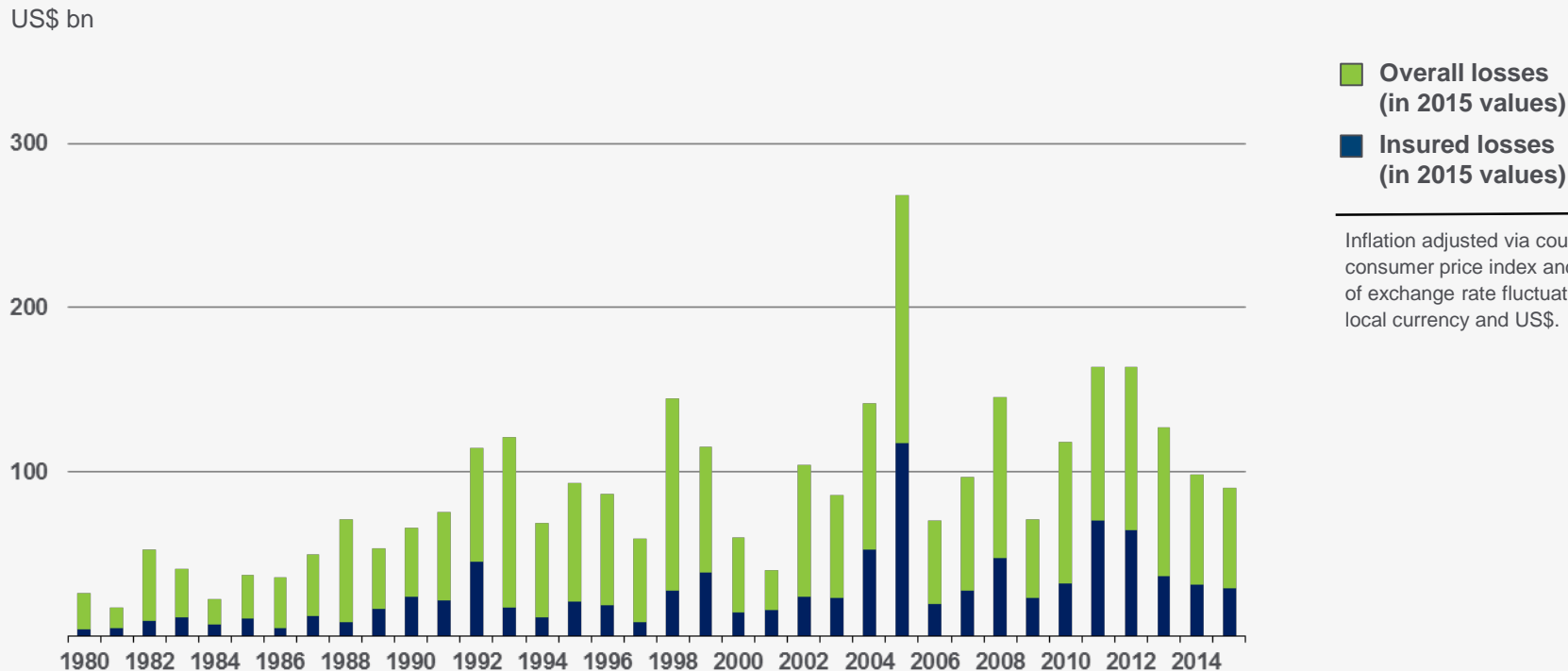
# Loss events worldwide 1980 – 2015

## Overall and insured losses



# Weather-related loss events worldwide 1980 – 2015

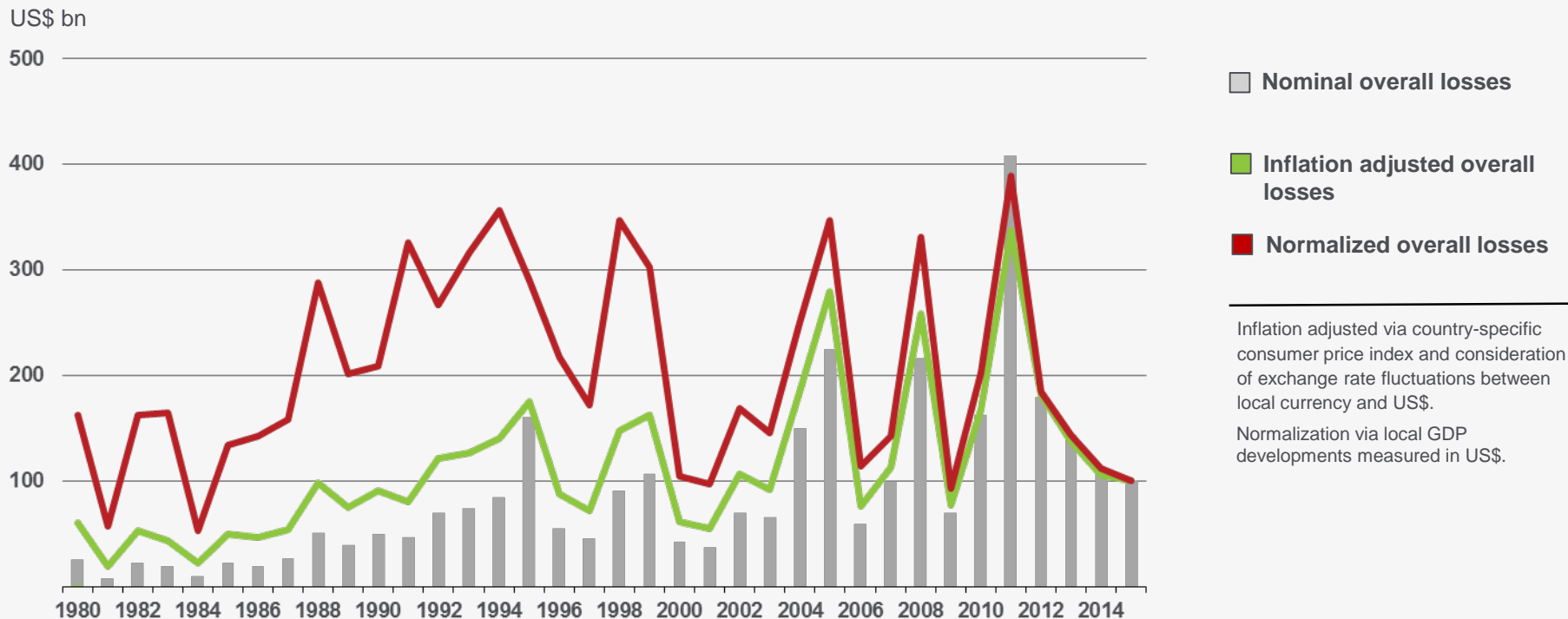
## Overall and insured losses





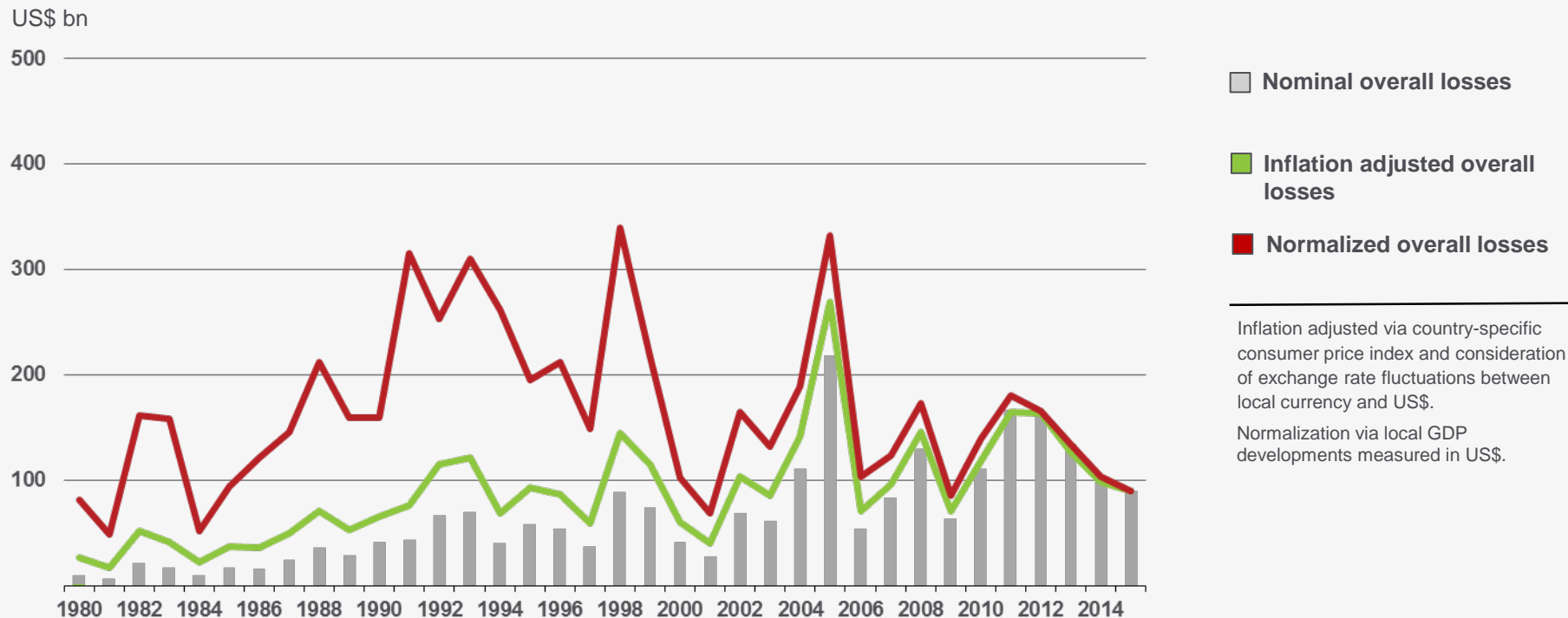
# Loss events worldwide 1980 – 2015

## Overall losses: nominal, inflation adjusted, and normalized



# Weather-related loss events worldwide 1980 – 2015

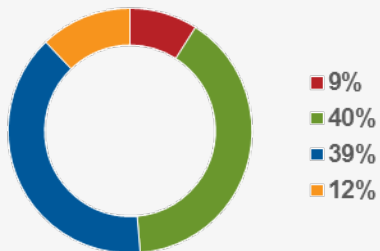
## Overall losses: nominal, inflation adjusted, and normalized



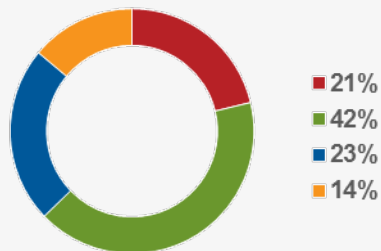
# Loss events worldwide 1980 – 2015

## Percentage distribution

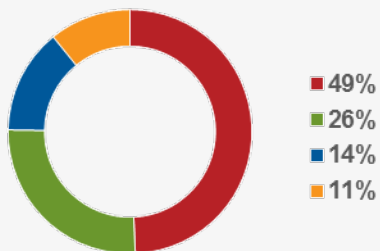
Number of relevant events: 15,700



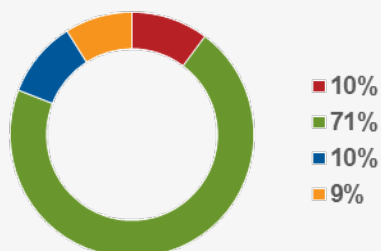
Overall losses: US\$ 4,050bn



Fatalities: 1,700,000



Insured losses: US\$ 1,050bn



- **Geophysical events**  
(Earthquake, tsunami, volcanic activity)
- **Meteorological events**  
(Tropical storm, extratropical storm, convective storm, local storm)
- **Hydrological events**  
(Flood, mass movement)
- **Climatological events**  
(Extreme temperature, drought, forest fire)

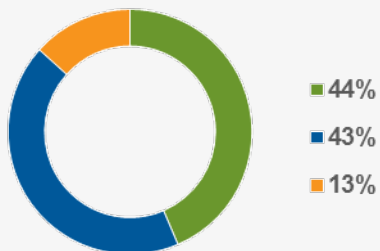
Accounted events have caused at least one fatality and/or produced normalized losses  $\geq$  US\$ 100k, 300k, 1m, or 3m (depending on the assigned World Bank income group of the affected country).

Inflation adjusted via country-specific consumer price index and consideration of exchange rate fluctuations between local currency and US\$.

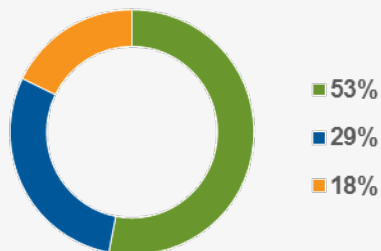
# Weather-related loss events worldwide 1980 – 2015

## Percentage distribution

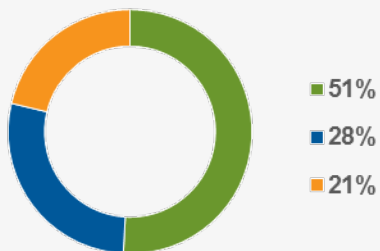
Number of relevant events: 14,300



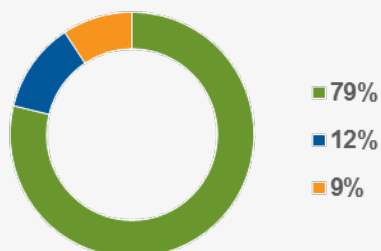
Overall losses: US\$ 3,200bn



Fatalities: 860,000



Insured losses: US\$ 940bn



- **Meteorological events**  
 (Tropical storm, extratropical storm, convective storm, local storm)
- **Hydrological events**  
 (Flood, mass movement)
- **Climatological events**  
 (Extreme temperature, drought, forest fire)

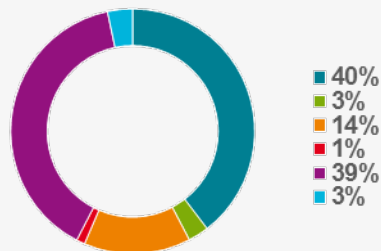
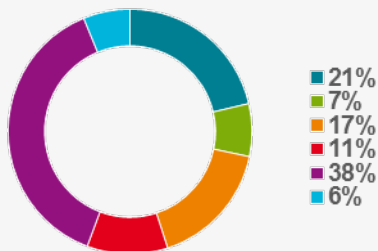
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# Loss events worldwide 1980 – 2015

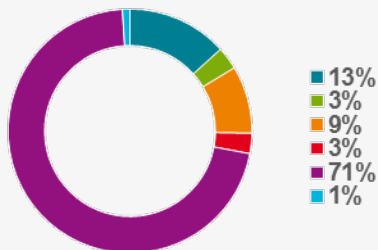
## Percentage distribution by continent

Number of relevant events: 15,700 Overall losses: US\$ 4,050bn

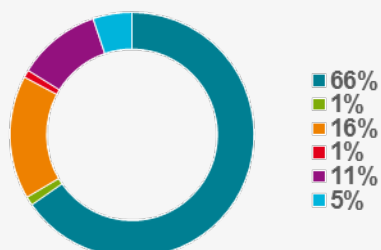


- North America, incl. Central America and Caribbean
- South America
- Europe
- Africa
- Asia
- Australia/Oceania

Fatalities: 1,700,000



Insured losses: US\$ 1,050bn



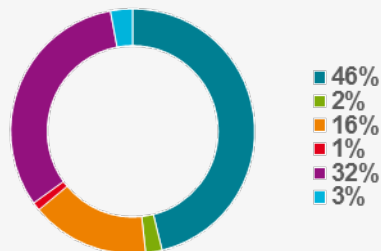
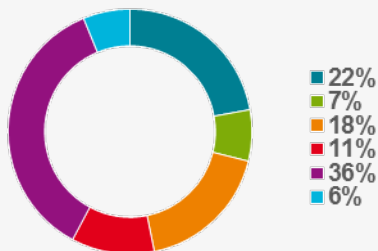
Accounted events have caused at least one fatality and/or produced normalized losses  $\geq$  US\$ 100k, 300k, 1m, or 3m (depending on the assigned World Bank income group of the affected country).

Inflation adjusted via country-specific consumer price index and consideration of exchange rate fluctuations between local currency and US\$.

# Weather-related loss events worldwide 1980 – 2015

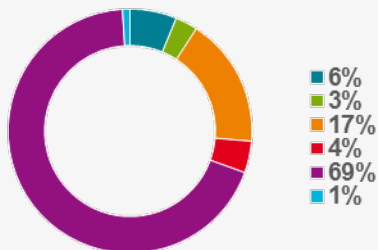
## Percentage distribution by continent

Number of relevant events: 14,300 Overall losses: US\$ 3,200bn

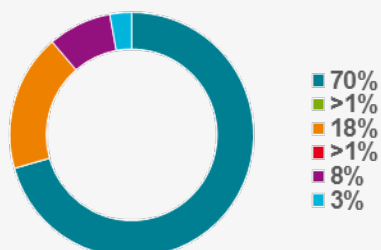


- North America, incl. Central America and Caribbean
- South America
- Europe
- Africa
- Asia
- Australia/Oceania

Fatalities: 860,000



Insured losses: US\$ 940bn



Accounted events have caused at least one fatality and/or produced normalized losses  $\geq$  US\$ 100k, 300k, 1m, or 3m (depending on the assigned World Bank income group of the affected country).

Inflation adjusted via country-specific consumer price index and consideration of exchange rate fluctuations between local currency and US\$.

# Significant loss events worldwide 1980 – 2015

## 10 costliest events ordered by overall losses

Date	Event	Affected area	Overall losses in US\$ m original values	Insured losses in US\$ m original values	Fatalities
11.3.2011	Earthquake, tsunami	Japan: Aomori, Chiba, Fukushima, Ibaraki, Iwate, Miyagi, Tochigi, Tokyo, Yamagata	<b>210,000</b>	40,000	15,880
25-30.8.2005	Hurricane Katrina, storm surge	United States: LA, MS, AL, FL	<b>125,000</b>	60,500	1,720
17.1.1995	Earthquake	Japan: Hyogo, Kobe, Osaka, Kyoto	<b>100,000</b>	3,000	6,430
12.5.2008	Earthquake	China: Sichuan, Mianyang, Beichuan, Wenchuan, Shifang, Chengdu, Guangyuan, Ngawa, Ya'an	<b>85,000</b>	300	84,000
23-31.10.2012	Hurricane Sandy, storm surge	Bahamas, Cuba, Dominican Republic, Haiti, Jamaica, Puerto Rico, United States, Canada	<b>68,500</b>	29,500	210
17.1.1994	Earthquake	United States: Northridge, Los Angeles, San Fernando Valley, Ventura	<b>44,000</b>	15,300	61
1.8-15.11.2011	Floods, landslides	Thailand: Phichit, Nakhon Sawan, Phra Nakhon Si Ayuttaya, Phthumthani, Nonthaburi, Bangkok	<b>43,000</b>	16,000	813
6-14.9.2008	Hurricane Ike	United States, Cuba, Haiti, Dominican Republic, Turks and Caicos Islands, Bahamas	<b>38,000</b>	18,500	170
27.2.2010	Earthquake, tsunami	Chile: Concepción, Metropolitana, Rancagua, Talca, Temuco, Valparaiso	<b>30,000</b>	8,000	520
23./24./27.10.2004	Earthquake	Japan: Honshu, Niigata, Ojiya, Tokyo, Nagaoka, Yamakoshi	<b>28,000</b>	760	46

Source: Munich Re, NatCatSERVICE, 2016

# Significant loss events worldwide 1980 – 2015

## 10 costliest events ordered by insured losses

Date	Event	Affected area	Overall losses in US\$ m original values	Insured losses in US\$ m original values	Fatalities
25-30.8.2005	Hurricane Katrina, storm surge	United States: LA, MS, AL, FL	125,000	<b>60,500</b>	1,720
11.3.2011	Earthquake, tsunami	Japan: Aomori, Chiba, Fukushima, Ibaraki, Iwate, Miyagi, Tochigi, Tokyo, Yamagata	210,000	<b>40,000</b>	15,880
23-31.10.2012	Hurricane Sandy, storm surge	Bahamas, Cuba, Dominican Republic, Haiti, Jamaica, Puerto Rico, United States, Canada	68,500	<b>29,500</b>	210
6-14.9.2008	Hurricane Ike	United States, Cuba, Haiti, Dominican Republic, Turks and Caicos Islands, Bahamas	38,000	<b>18,500</b>	170
23-27.8.1992	Hurricane Andrew	United States: FL, LA; Bahamas	26,500	<b>17,000</b>	62
22.2.2011	Earthquake	New Zealand: Canterbury, Christchurch, Lyttelton	24,000	<b>16,500</b>	185
1.8-15.11.2011	Floods, landslides	Thailand: Phichit, Nakhon Sawan, Phra Nakhon Si Ayuttaya, Phthumthani, Nonthaburi, Bangkok	43,000	<b>16,000</b>	813
17.1.1994	Earthquake	United States: Northridge, Los Angeles, San Fernando Valley, Ventura	44,000	<b>15,300</b>	61
19-24.10.2005	Hurricane Wilma	Bahamas, Cuba, Haiti, Jamaica, Mexico, United States	22,000	<b>12,500</b>	44
June - September 2012	Drought	United States: AR, CO, GA, IA, IL, IN, KS, KY, MO, MS, MT, NE, OH, OK, SD, TN, TX, WI, WY	25,000	<b>12,000</b>	

Source: Munich Re, NatCatSERVICE, 2016



# Significant loss events worldwide 1980 – 2015

## 10 deadliest events

Date	Event	Affected area	Overall losses in US\$ m original values	Insured losses in US\$ m original values	Fatalities
26.12.2004	Earthquake, tsunami	Sri Lanka, Indonesia, Thailand, India, Bangladesh, Myanmar, Maldives, Malaysia	10,000	1,000	<b>220,000</b>
12.1.2010	Earthquake	Haiti: Port-au-Prince, Petionville, Jacmel, Carrefour, Leogane, Petit Goave, Gressier	8,000	200	<b>159,000</b>
2-5.5.2008	Cyclone Nargis, storm surge	Myanmar: Ayeyawaddy, Yangon, Bugalay, Rangun, Irrawaddy, Bago, Karen, Mon, Laputta, Haing Kyi	4,000		<b>140,000</b>
29-30.4.1991	Tropical cyclone, storm surge	Bangladesh: Gulf of Bengal, Cox's Bazar, Chittagong, Bola, Noakhali districts	3,000	100	<b>139,000</b>
8.10.2005	Earthquake	Pakistan, India, Afghanistan	5,200	5	<b>88,000</b>
12.5.2008	Earthquake	China: Sichuan, Mianyang, Beichuan, Wenchuan, Shifang, Chengdu, Guangyuan, Ngawa, Ya'an	85,000	300	<b>84,000</b>
July - August 2003	Heat wave, drought	France, Germany, Italy, Portugal, Romania, Spain, United Kingdom	14,000	1,100	<b>70,000</b>
July - September 2010	Heat wave	Russia: Moscow region, Novgorod, Ryazan, Voronezh			<b>56,000</b>
20.6.1990	Earthquake	Iran: Caspian Sea, Gilan province, Manjil, Rudbar, Zanjan, Safid, Qazvin	7,100	100	<b>40,000</b>
26.12.2003	Earthquake	Islamic Republic of Iran: Bam	500	20	<b>26,200</b>

Source: Munich Re, NatCatSERVICE, 2016

# Explanation for the interpretation of loss data statistics

## Number statistics and loss thresholds

Number statistics are influenced by a constantly improved reporting of small-scale loss events over the time (*reporting bias*). There is a need to distinguish between **registered** and **relevant** loss events.

- **Registered loss events** are all events recorded by NatCatSERVICE. The range extends from *insignificant* to *catastrophic* loss events expressed in overall losses and/or fatalities. The reporting bias is particularly high for high frequency and low impact events.
- **Relevant loss events** exceed defined thresholds of *normalized* overall losses and/or fatalities. These events are considered in number statistics and trend analyses. Threshold values are:
  - Fatalities  $\geq 1$
  - Normalized overall loss  $\geq$  US\$ 100k, 300k, 1m, or 3m (depending on assigned World Bank income group of each affected country)
- **Type of data filtering is helpful for** reduction/elimination of reporting bias and for conclusions on changes in frequency of occurred loss events.

# Explanation for the interpretation of loss data statistics

## Inflation adjustment and normalization of NatCat loss data

### Three ways of presenting loss data:

- Nominal losses: values as they originally occurred
- Inflation adjusted losses: accounting for changes in monetary equivalent
- Normalized losses: accounting for growth of values and assets

**Inflation adjustment:** Loss value in local currency is *adjusted to inflation* via the country's consumer price index (CPI) under consideration of exchange rate fluctuations between the local currency and the US\$.

**Normalization:** Loss value in US\$ is *normalized* via the development of locally resolved ( $1^\circ \times 1^\circ$ ) nominal gross domestic product data in US\$ between year of occurrence and today.

### Inflation adjusted loss data is helpful for...

- How high would a historic loss value be in today's money?

### Normalized loss data is helpful for...

- What losses would a historic event cause when exposing today's values and assets?
- Conclusions on loss drivers like changes on the hazard side or effectivity of prevention measures