



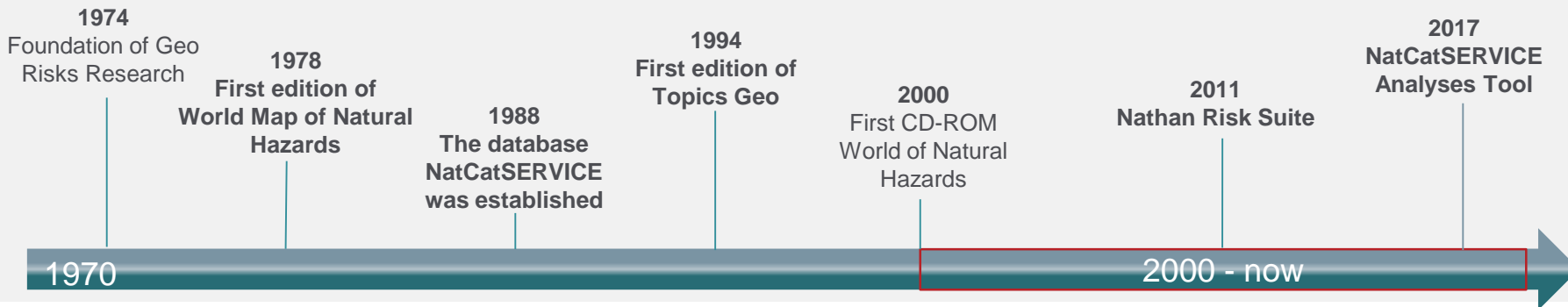
# Globale Schäden: Eine Bilanz der letzten Jahrzehnte

Petra Löw, Munich Re  
Leiterin NatCatSERVICE

Öffentliches Symposium Warnsignal Klima: Wetterextreme vom 11. bis 13.9.2018 in Hamburg

# Geo Services at Munich Re

40 years of expertise from paper maps to fully integrated mobile solutions



NATHAN Risk Suite



## One of the world's largest databases on natural catastrophes worldwide



## NatCatSERVICE

Natural catastrophe know-how for risk management and research

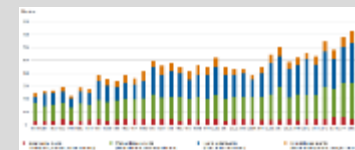
Many decades of acquired experience in researching, documenting, analyzing and evaluation of natural catastrophes have made the NatCatSERVICE one of the most valued data sources for information on natural loss events worldwide. This unique archive provides comprehensive, reliable and professional data on natural, economic and human losses caused by any kind of natural peril.

NOT IF, BUT HOW

## The Database

- Loss events from 1980 until today; for USA and selected countries in Europe: loss events since 1970
- Retrospectively, all great disasters since 1950
- In addition, ~2,600 major historical events starting from 79 AD with the eruption of Mt. Vesuvius
- **Currently ca. 41,000 data sets**

## Online Analysis Tool



<http://natcatservice.munichre.com>


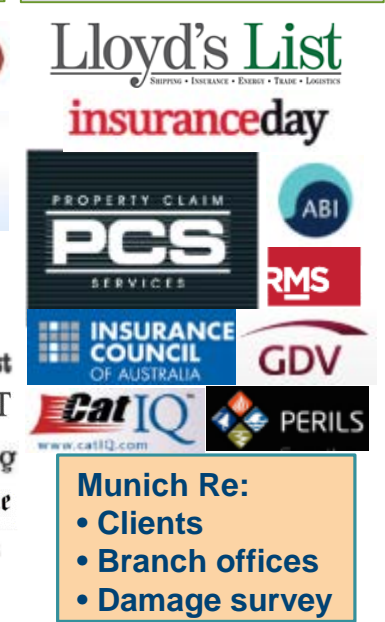
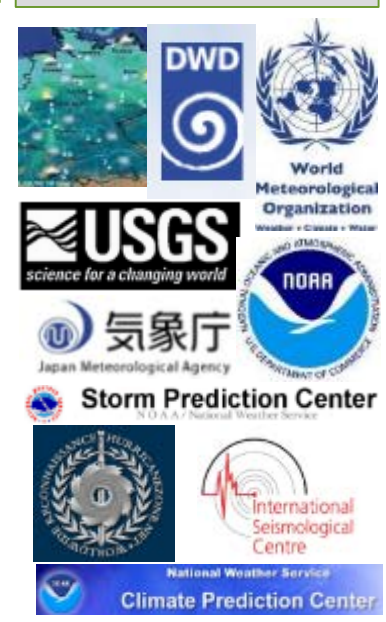


# Structure of NatCatSERVICE

## Field-of-work schematic

Data Mining & Survey	Loss Estimation	Loss Normalization	Analytics
<p>Sourcing of event information</p> <p>Geo-coding</p> <p>Quality control and revision</p>	<p>Insured loss information:</p> <ul style="list-style-type: none"> <li>- Internal / external sources</li> </ul> <p>Economic loss estimation:</p> <ul style="list-style-type: none"> <li>- Insurance penetration data</li> <li>- Home values / building &amp; construction cost data</li> <li>- Agricultural data</li> <li>- Infrastructure information</li> <li>- etc.</li> </ul> <p>Loss estimation procedures</p>	<p>Normalization procedures</p> <ul style="list-style-type: none"> <li>- CPI adjustment</li> <li>- GDP normalization</li> <li>- GCP normalization</li> </ul> <p>Provision and preparation of socio-economic proxy data</p> <p>CatClassification</p> <ul style="list-style-type: none"> <li>- Applying income group data on normalized loss to assign a CatClass to each event</li> </ul>	<p>Statistics &amp; charts</p> <p>Trends &amp; correlations</p> <p>Customized analyses</p> <p>Explanation of methodologies &amp; interpretation of results</p> <p>(Re-)Presentation of NCS</p> <ul style="list-style-type: none"> <li>- Publications, presentations, internet</li> <li>- Work projects, co-operations</li> </ul>

# NatCatSERVICE

## Examples of sources

International news agencies + local press	Insurance	Meteorological Seismological Services	Science	Governments, UN, EU, NGOs
	 <div style="border: 1px solid black; padding: 5px;"> <p><b>Munich Re:</b></p> <ul style="list-style-type: none"> <li>• Clients</li> <li>• Branch offices</li> <li>• Damage survey</li> </ul> </div>			



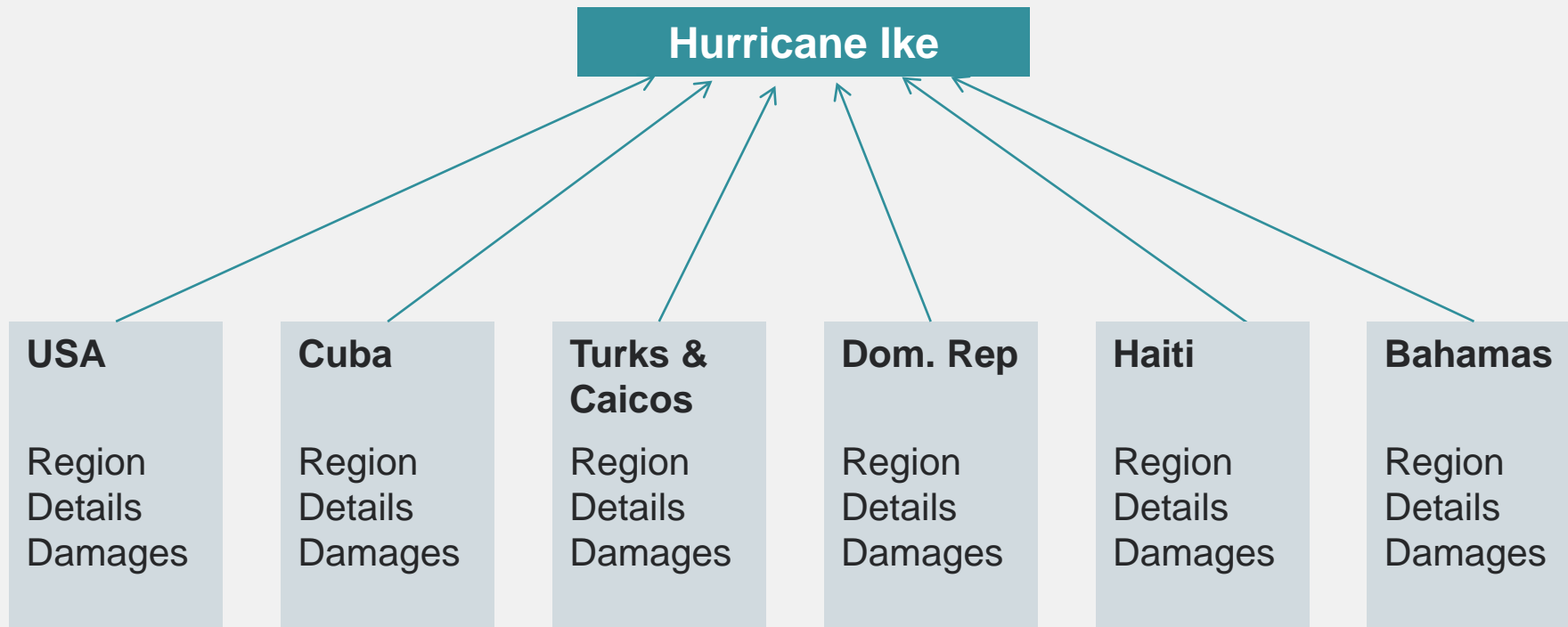
# NatCatSERVICE Database Structure – Peril Families (Structure following IRDR DATA project)

Family	Main event	Sub Peril			
Geophysical	Earthquake Volcanic eruption Mass movement dry	Earthquake (ground shaking) Fire following Tsunami	Winter storm (extra-trop. cyclone) Tempest / severe storm Hail storm Lightning Tornado Local windstorm (orographic storm) Sandstorm / dust storm Blizzard / snowstorm Storm surge	General flood Flash flood Glacial lake outburst	Heat wave Cold wave / frost Extreme winter conditions
Meteorological	Tropical storm Extra-tropical storm Convective storm Local windstorm	Volcanic eruption Ash cloud		Subsidence Avalanche Landslide (wet)	Wildfire Unspecified
Hydrological	Flood Mass movement wet	Subsidence Rockfall Landslide (dry)			Drought
Climatological	Extreme temperature Drought Wildfire				

See also:

[http://www.irdrinternational.org/wp-content/uploads/2014/04/IRDR\\_DATA-Project-Report-No.-1.pdf](http://www.irdrinternational.org/wp-content/uploads/2014/04/IRDR_DATA-Project-Report-No.-1.pdf)

# Multi-Region-Event



# NatCatSERVICE

## Loss estimation

### NatCatSERVICE identifies **five levels of information quality**:

1. Info on **insured losses** in industrial countries, compiled by institutions such as *PCS*, *Perils AG* or various *Insurance Associations*
2. Partial info on **insured losses** in developing markets / countries
3. Info on total **economic losses**, often from governments (no info on insured loss)
4. Partial info on **economic losses** (e.g. impact on agriculture, infrastructure etc.)
5. Only **description of event** (e.g. number of houses damaged / destroyed by flood, storm, earthquake etc.)



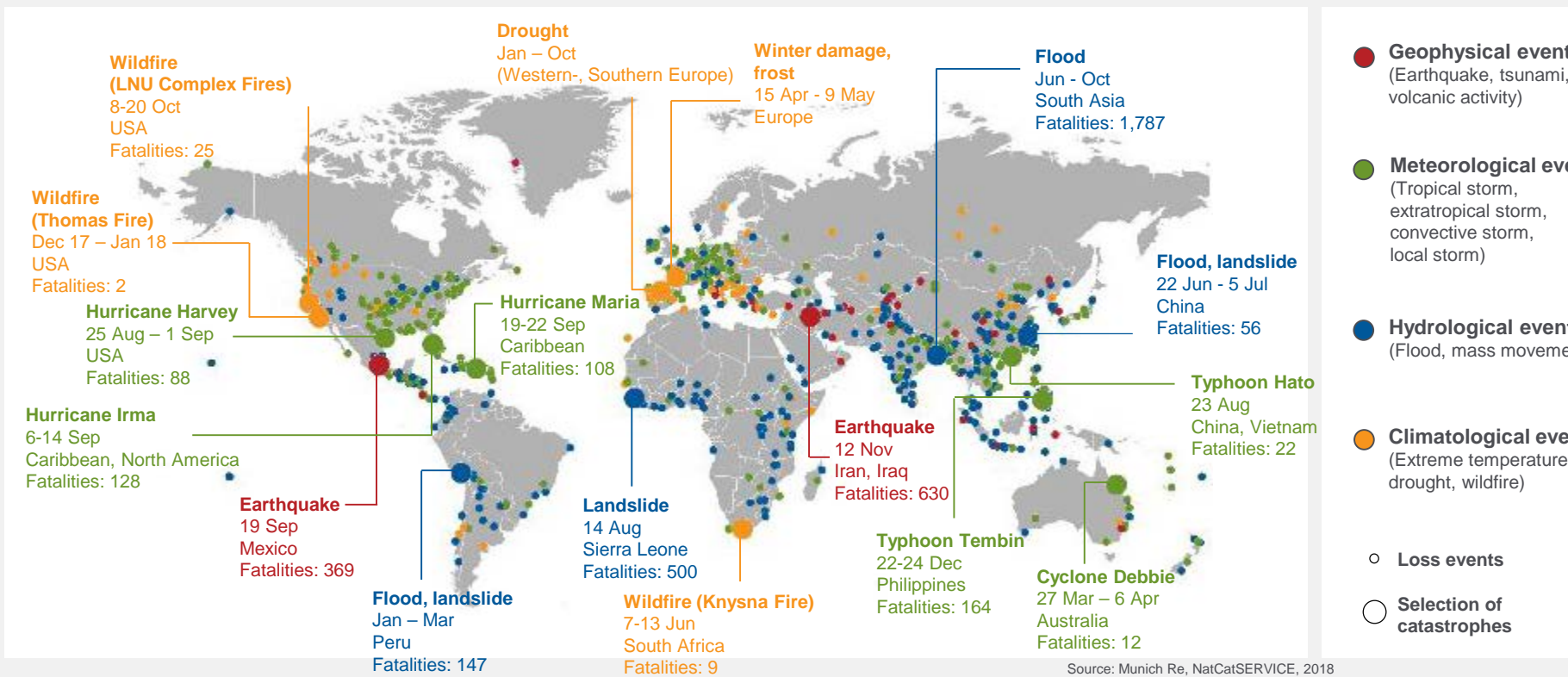
# Loss events worldwide 1980 – 2017

## Munich Re Catastrophe Classification 2016

Category	Cat-Class	Worldbank Income Groups				Number of fatalities
		High income	Upper middle income	Lower middle income	Low income	
		The threshold depends on the different stages of development				
<b>Catastrophe</b>	<b>4</b>	<b>≥ 3.000</b>	<b>≥ 1.000</b>	<b>≥ 300</b>	<b>≥ 100</b>	<b>≥ 1,000</b>
<b>Major loss event</b>	<b>3</b>	<b>≥ 300</b>	<b>≥ 100</b>	<b>≥ 30</b>	<b>≥ 10</b>	<b>100 - 999</b>
<b>Medium loss event</b>	<b>2</b>	<b>≥ 30</b>	<b>≥ 10</b>	<b>≥ 3</b>	<b>≥ 1</b>	<b>10 - 99</b>
<b>Small loss event</b>	<b>1</b>	<b>≥ 3</b>	<b>≥ 1</b>	<b>≥ 0.3</b>	<b>≥ 0.1</b>	<b>1 - 9</b>

# Loss events worldwide 2017

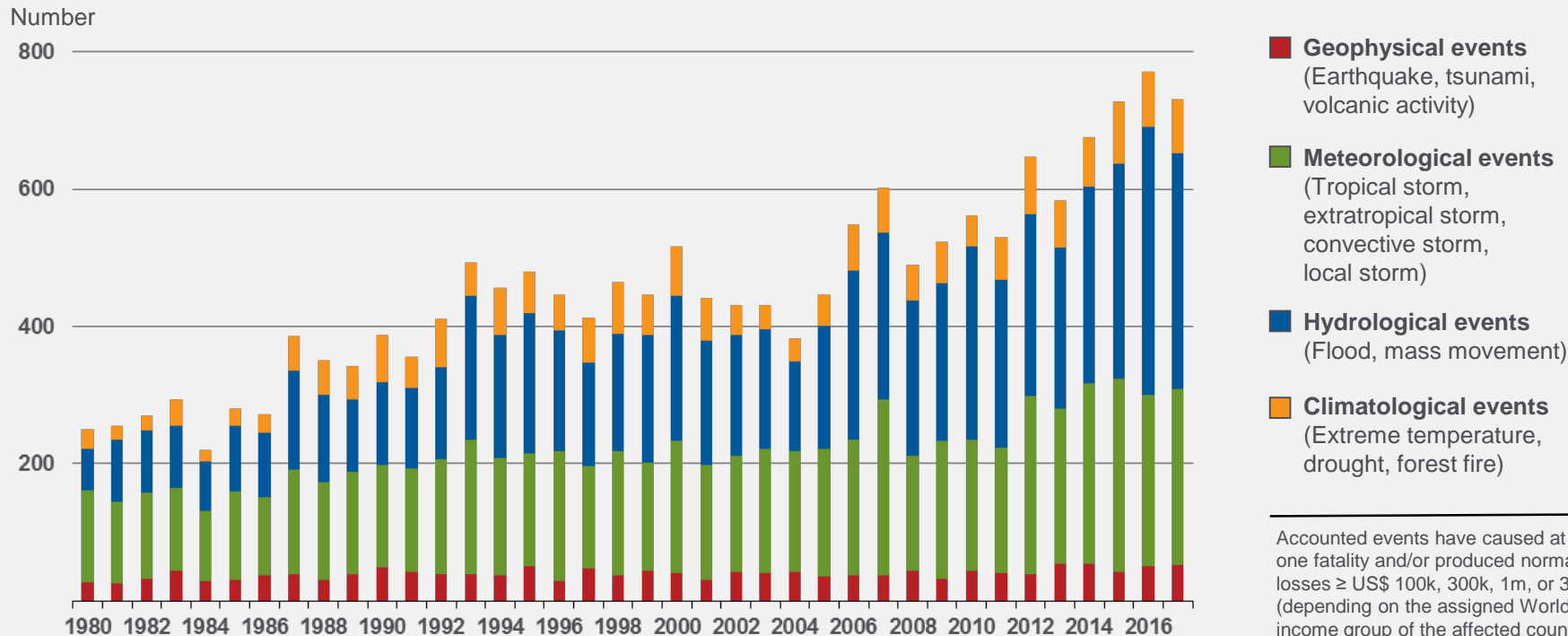
## Geographical overview



Source: Munich Re, NatCatSERVICE, 2018

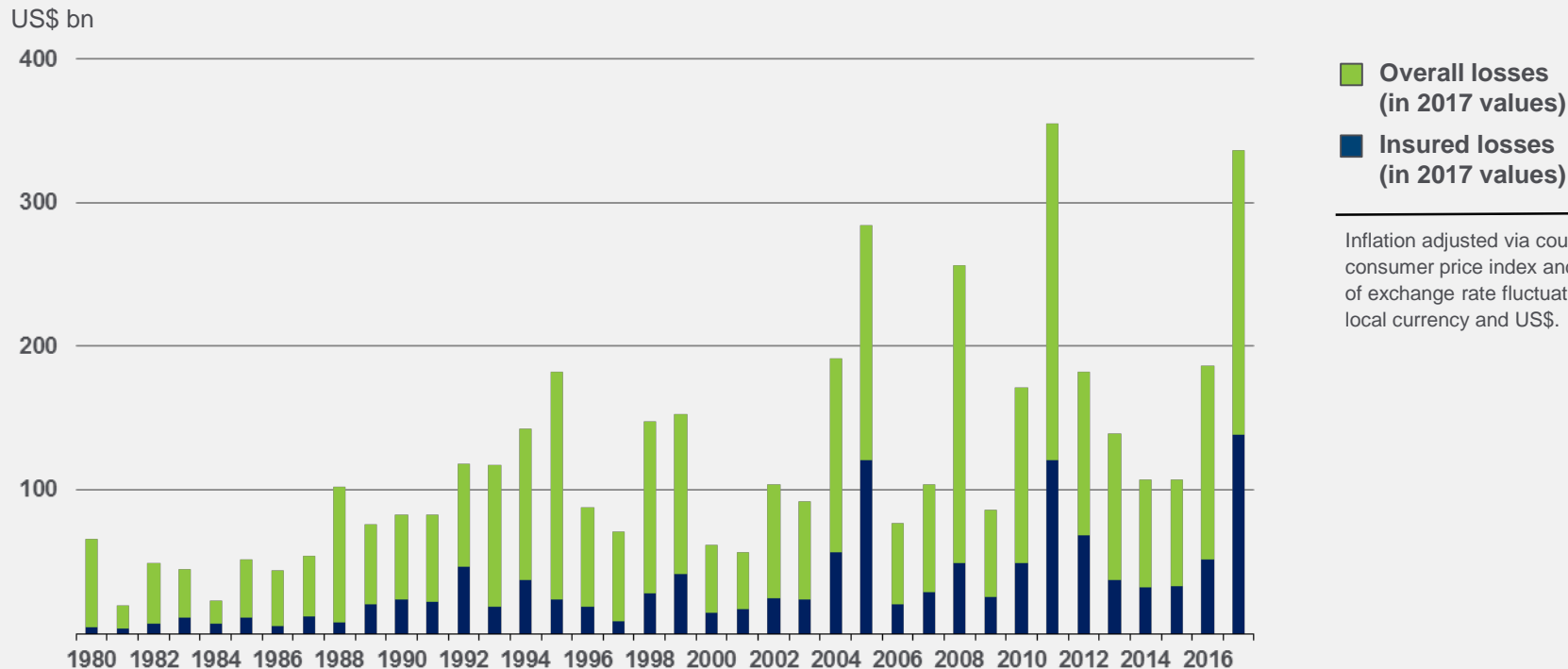
# Loss events worldwide 1980 – 2017

## Number of relevant events by peril



# Loss events worldwide 1980 – 2017

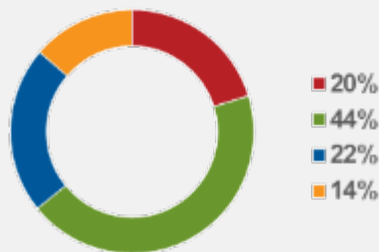
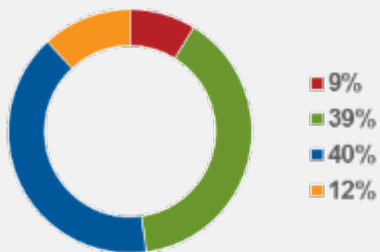
## Overall and insured losses



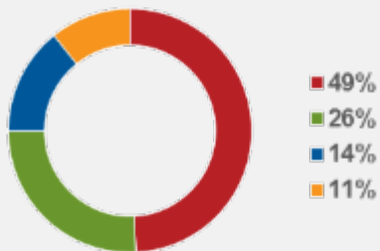
# Loss events worldwide 1980 – 2017

## Percentage distribution

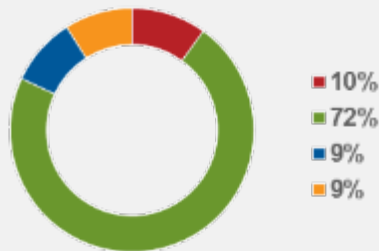
Number of relevant events: 17,300 Overall losses: US\$ 4,600bn



Fatalities: 1,720,000



Insured losses: US\$ 1,300bn



- **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)

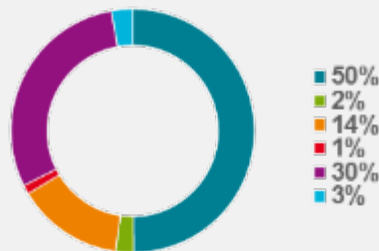
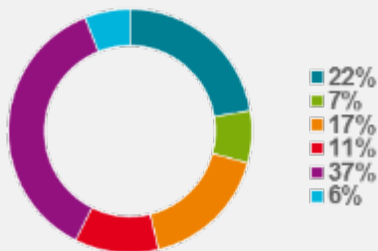
Accounted events have caused at least one fatality and/or produced normalized losses  $\geq$  US\$ 100k, 300k, 1m, or 3m (depending on the assigned World Bank income group of the affected country).

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 – 2017

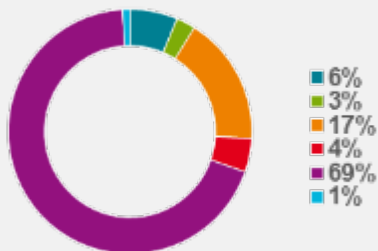
## Percentage distribution by continent

Number of relevant events: 15,800 Overall losses: US\$ 3,700bn

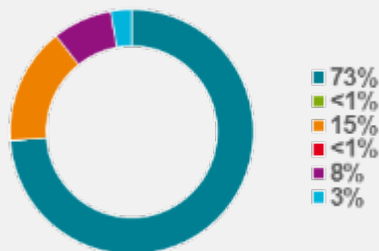


- North America, incl. Central America and Caribbean
- South America
- Europe
- Africa
- Asia
- Australia/Oceania

Fatalities: 880,000



Insured losses: US\$ 1,100bn



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\$.



# NatCatSERVICE Analysis tool is online

## Try now!

## NatCatSERVICE

**Natural catastrophe know-how for risk management and research**

Many decades of acquired experience in researching, documenting, analysing and evaluation of natural catastrophes have made the NatCatSERVICE one of the most valued data sources for information on natural loss events worldwide. This unique archive provides comprehensive, reliable and professional data on insured, economic and human losses caused by any kind of natural peril.

**NOT IF, BUT HOW**

Start Analysis

Share      

[natcatservice.munich.munichre.com](http://natcatservice.munich.munichre.com)  
and  
[natcatservice.munichre.com](http://natcatservice.munichre.com)





Image: Munich RE

Vielen Dank für Ihre Aufmerksamkeit!

Petra Löw

[ploew@munichre.com](mailto:ploew@munichre.com)