

sigma 1/2018: Natural catastrophes and man-made disasters in 2017: a year of record-breaking losses

US highlights

North Atlantic hurricane season resulted in highest global insured loss total ever.

HIM caused combined insured losses of USD 92 billion.

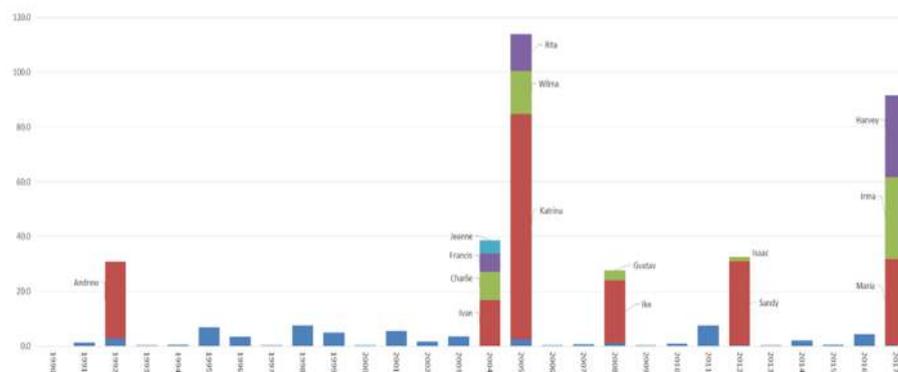
Figure 1: Insured losses from North Atlantic hurricanes 1990-2017 (USD bn), in 2017 prices

2017: a year of historic losses

At more than USD 144 billion, global insured losses from catastrophe events in 2017 were the highest ever on sigma records. The losses were mostly driven by the North Atlantic hurricane season. In particular, three major hurricanes (Saffir-Simpson category 3 and above) – Harvey, Irma and Maria (HIM) – hit the US and the Caribbean in quick succession, resulting in combined insured losses of USD 92 billion (economic losses: USD 217 billion) from wind, storm surge and precipitation-driven flood damage. With the vast geographic footprint HIM, multiple locations and lines of insurance business were impacted, and a full assessment of the losses is still pending.

Second costliest North Atlantic hurricane season ever

On account of HIM, last year was the second most expensive hurricane season in the North Atlantic, after 2005 when Hurricanes Katrina, Wilma and Rita resulted in combined insured losses of USD 112 billion. The figure below provides a history of insured losses from North Atlantic hurricanes since 1990.



Source: Swiss Re Institute

Hurricane Harvey brought unprecedented levels of rainfall ...

...and highlighted the vulnerability of Houston to heavy flooding.

After 12 years without a major hurricane making landfall, Hurricane Harvey made landfall over the southern Texas coast as a category 4 storm on 25 August 2017. While the winds weakened considerably after landfall, Harvey stalled along the Texas coast and unleashed unprecedented amounts of rain, the most ever to have come with a tropical cyclone in the US since reliable records began. The rain caused catastrophic inland flooding in some of the most populated areas of the Gulf Coast, including Houston. Insured losses were an estimated USD 30 billion with economic losses of at least USD 85 billion. Floodwaters displaced 30 000 people and damaged or destroyed nearly 200 000 homes and businesses. Also 500 000 vehicles were damaged.

Harvey was the third major inland flood event to hit the Houston metropolitan area in as many years. The regularity of flooding highlights the vulnerability of Houston to water inundation. The metropolitan area has expanded massively in the past 15 years, with the suburban sprawl extending onto flood plains that are prone to flash floods when precipitation is extreme. The ever-expanding area of paved areas means rainwater runs along the surface rather than being absorbed into the ground.

Yet, about 80% of homes in the city are uninsured against floods.

Around 80% of homes in Houston metropolitan area are uninsured against flood risk, pointing to a large protection gap. In the US, it is estimated that two-thirds of annual expected losses from flood events are uninsured. The Federal Emergency Management Agency provides flood coverage to homeowners through the National Flood Insurance Program (NFIP), while private flood insurance policies are only very niche and not widely available. To date most US households remain heavily exposed to flood risk, in total up to about USD 10 billion annually (the NFIP insures only up to USD 5 billion in total).

Hurricane Irma maintained a category 5 intensity for more than three days.

Harvey was only the first of a series of major hurricanes. Just a few days later came Hurricane Irma which made landfall in the US hitting parts of western Florida and South Carolina at category 3 after inflicting historic losses in the Caribbean. In the Caribbean region, after hovering at around category 2 to 3 intensity for a few days, Irma intensified rapidly over warmer sea surface temperatures. It attained the highest intensity of category 5 on September 4th, at which it stayed for more than three full days. Overall insured losses from Irma were estimated at USD 30 billion with USD 67 billion in economic losses.

Thereafter was Hurricane Maria, which crippled Puerto Rico's infrastructure.

Next came Hurricane Maria, which brought massive destruction to Puerto Rico and Dominica, after developing from category 1 intensity to category 5 within 24 hours. It was the strongest hurricane to hit Puerto Rico since 1920 and crippled the island's infrastructure including the water system, power grid, communication networks and energy facilities. Insured losses have been estimated to be USD 32 billion.

Large hurricane cluster like HIM events are rare but not unprecedented...

From an insurance loss perspective, HIM were not unprecedented events. Each of the hurricanes had their unique destructive forces, and the accumulated losses from the three storms were very high. But, while storms resulting in losses of such magnitude occur rarely, they have happened before (eg, in 2005). Nor did HIM represent a worst-case scenario: Swiss Re's modelling tools simulate hurricane scenarios where insured losses can be well in excess of USD 250 billion.

...and will likely happen more frequently in the future.

Observation of historical data indicates that hurricanes do not appear at random, but tend to cluster in groups. This is an important consideration not least because, irrespective of the absence of major storm landfall in the US during the last 12 years, the North Atlantic seems to still be in an active phase of hurricane activity. Climate model predictions of more frequent occurrence of various characteristics observed in HIM, and thereby likely also more storm clustering, are cause for concern. Similar to Hurricanes Katrina, Rita and Wilma in 2005, the HIM experience tested insurers' ability to absorb cumulative losses from multiple events. From a risk management perspective, these events highlight that aside from focusing on the severity of a single event, hurricane clustering has emerged as an as-important variable to consider in assessing future loss scenarios.

Insurers needs to consider hurricane frequency as much as severity in their modelling of loss scenarios.

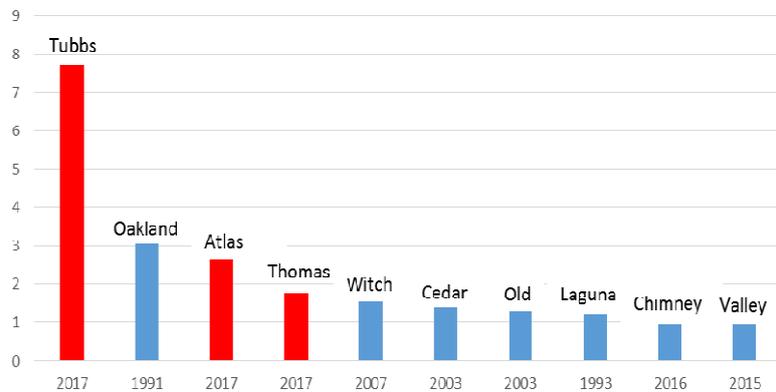
With respect to Harvey specifically, this storm highlighted the dangers that hurricanes can bring in the form of excessive rains and resulting flooding. With a warming climate, the frequency of events that combine heavy rains and winds will likely increase. So too will events with severe storm surge in view of rising sea levels. It is therefore important for the insurance industry to include such secondary risk factors in risk assessment and modelling.

Insured losses from wildfire events in the US were USD 13 billion last year, the highest ever...

California burning: growing exposures yield record US wildfire losses

Unusual late-season fire activity and multiple record-setting blazes led to extraordinary wildfires insured losses in the US last year. The October and December fire outbreaks in California cost the industry an unprecedented USD 13 billion in claims in the US, the highest ever recorded. The October Tubbs fire is the most destructive in terms of structures destroyed in the US and the costliest fire event ever in the world. The December Thomas fire in Ventura and Santa Barbara counties is the largest wildfire in California in terms of area impacted (114 000 hectares burned).

Figure 2: Top 10 insured losses from wildfires in the US (USD billion), in 2017 prices

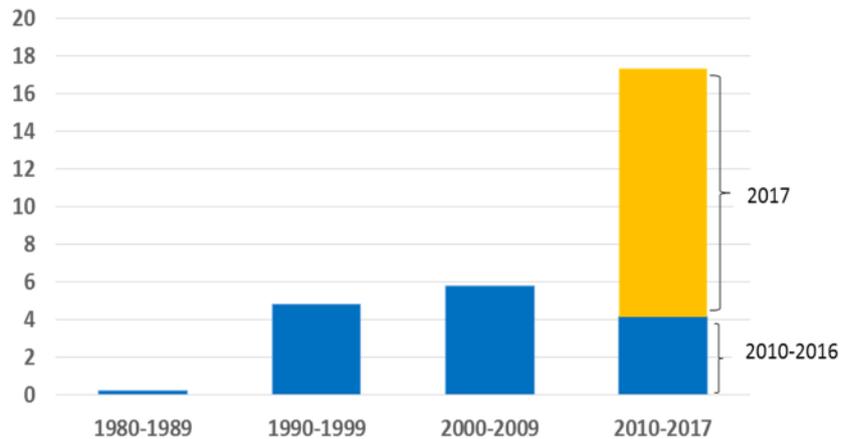


Source: Swiss Re Institute

...and almost half of all insured losses from fire outbreak events in the US since 1980!

To put the US wildfire season into perspective, insured losses in 2017 alone were more than three times those in the time period 2010-2016 and just short of half (47%) of all insured losses from all fire outbreaks since 1980.

Figure 3: Insured losses from wildfires in the US since 1980 (USD billion), in 2017 prices



Source: Swiss Re Institute

Environmental conditions in California proved perfect for last year's inferno.

Wildfires are an ever-present hazard in the forest and grassland regions of North America and are an essential part of the forest ecosystem. Most fires do not threaten communities, but can destroy vast expanses of timber resources. When they spread to urban settings, they can be deadly and destructive. The exact cause of many of the 2017 California fires remains unknown, but the state's climatic and hydrologic conditions provided the perfect setting for an inferno. After a multi-year drought from December 2011 through late 2016, the state received much-needed precipitation in the winter 2016/2017, with northern California having its wettest winter ever. The moisture allowed fast regrowth of dense vegetation throughout spring, providing ample fuel which dried out during what turned out to be California's hottest summer on record. Finally, strong autumn gusty winds (Santa Ana and El Diablo winds) brought warm and dry air.

Longer wildfire seasons and increasing exposures account for mounting fire-related losses.

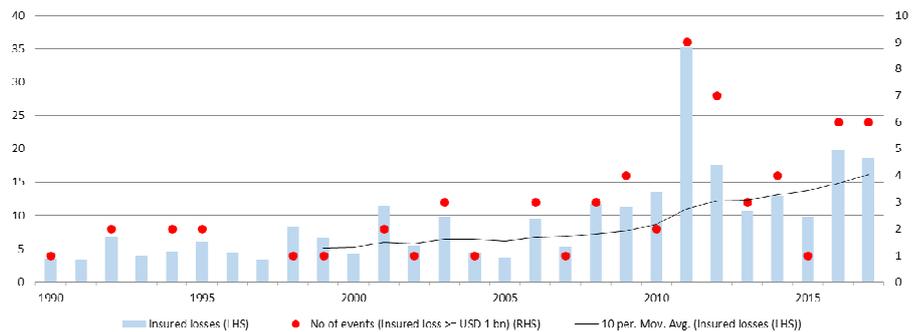
Generally speaking, longer wildfire seasons, increasing frequency of large wildfires (>400 hectares) combined with increasing exposure in the wildland-urban interface (WUI) are responsible for the extraordinary rise in the insured losses from fire. Since 1990, 60% of all new homes have been built in the WUI.

Insured losses from tornados and severe convective storms in the US were high too last year.

Thunderstorm losses above average

2017 was also a busy year in terms of tornado activity in the US. Insured losses from tornado outbreaks and thunderstorms (severe convective storms (SCS)) were estimated at USD 19 billion, similar to 2016 (USD 20 billion) but higher than the previous 10-year annual average of USD 15 billion. There were six thunderstorm events that each caused insured losses of USD 1 billion or more. The largest was a hailstorm in Denver, Colorado, in spring, resulting in insured losses of USD 2.5 billion. There were 32 thunderstorms in the US, less than in 2016 (37), but more than the average of the previous 10 years (26).

Figure4: Insured losses from SCS in the US since 1990 (USD billion), in 2017 prices



Source: Swiss Re Institute

Go the Swiss Re Institute website (www.institute.swissre.com) to read and download/order the full version of this sigma report.

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