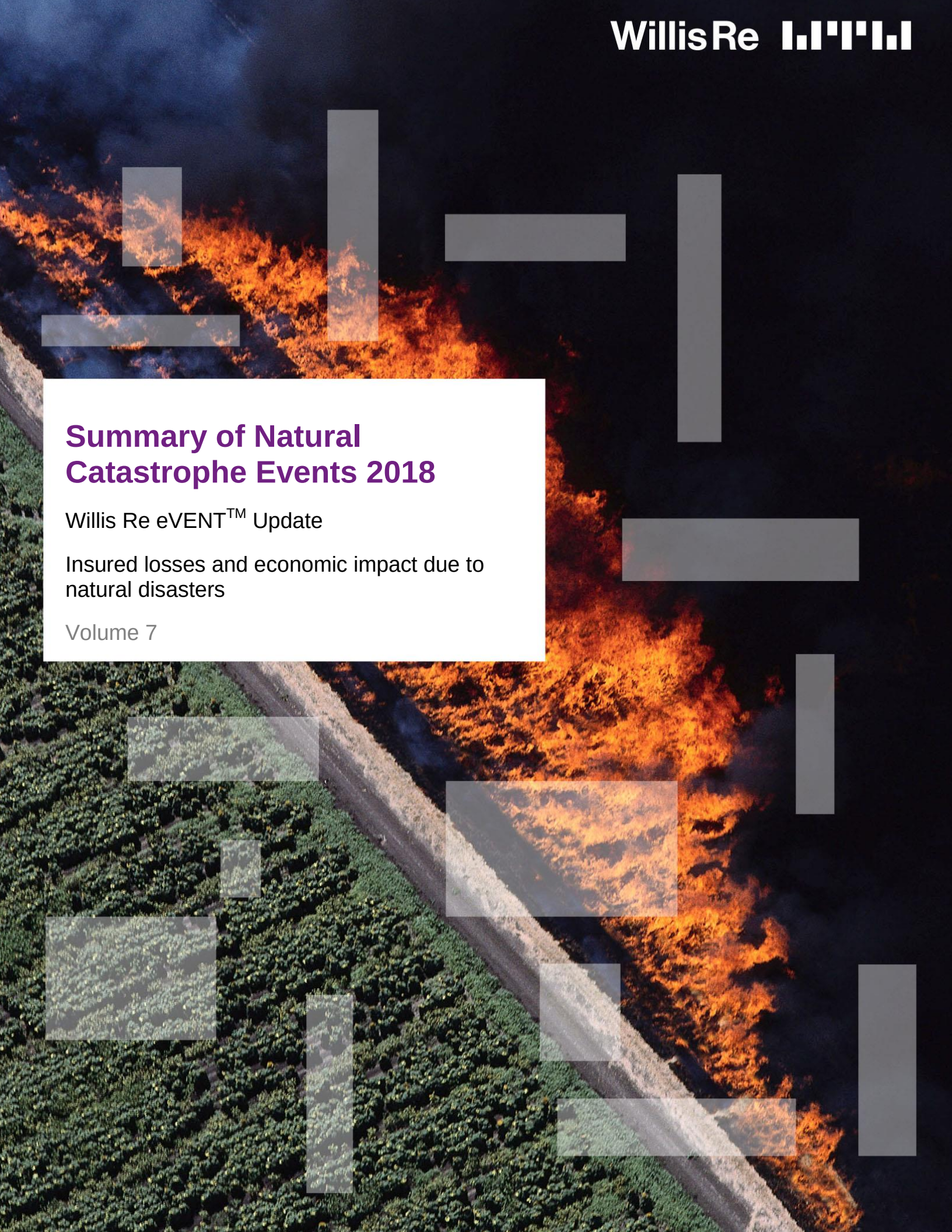

Summary of Natural Catastrophe Events 2018

Willis Re eVENT™ Update

Insured losses and economic impact due to natural disasters

Volume 7

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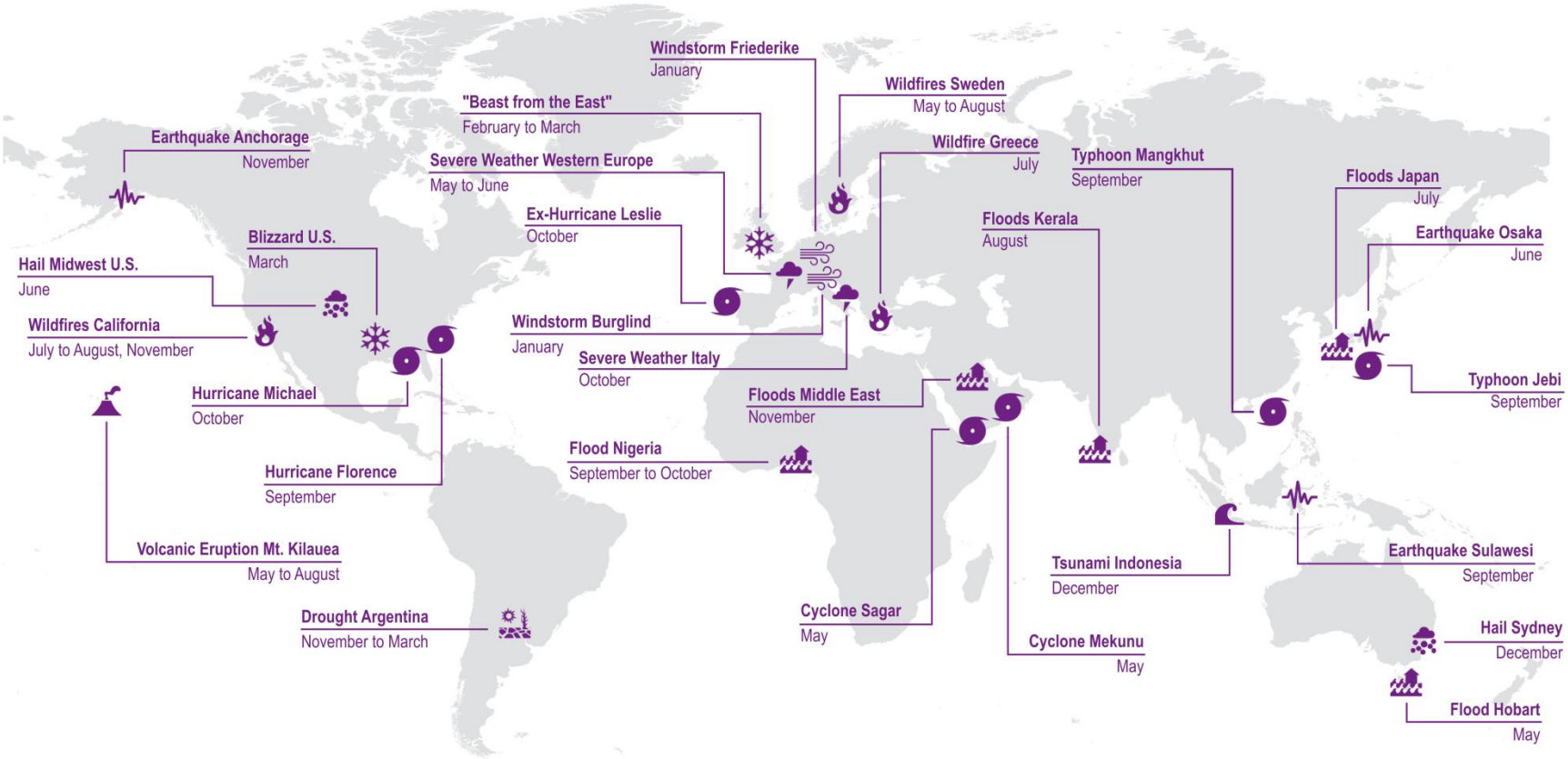
Major natural catastrophes in 2018 per region based on insured losses



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January 2019

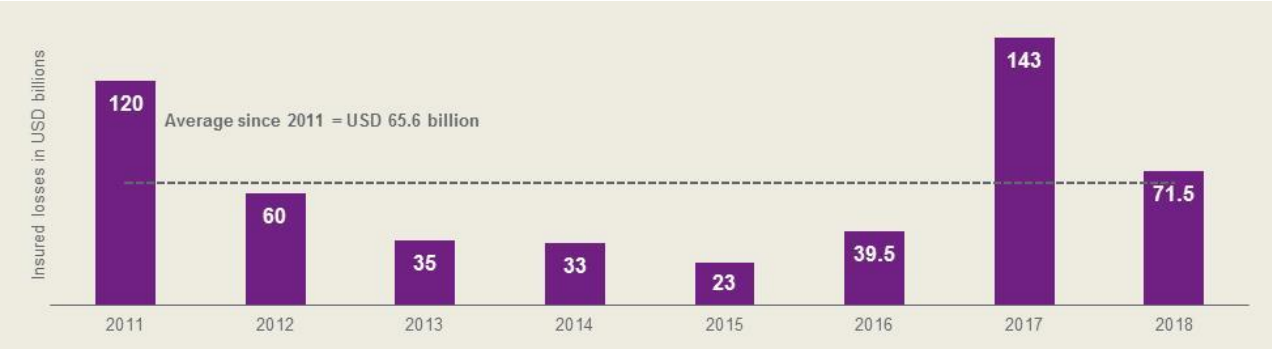
Introduction

This report summarizes economic and insured losses from the most relevant natural catastrophe events that occurred during 2018. The loss values presented herein include those reported by Willis Re, catastrophe model vendors, reinsurance companies and third-party organizations. Loss estimates are presented in USD, for which rates of exchange at December 1, 2018, have been used.

Our insured loss estimates from major **natural catastrophes in 2018 of about USD 71.5 billion** are one of the highest since the 2011 annual market losses of USD 120 billion. However, the insured losses in 2018 are slightly less than half of those from 2017, and are marginally above the average annual losses over the last eight years (see table below). Contrasting the previous peak years where one or a couple of natural disasters represented a large percentage of the insured losses during that given year (e.g., HIM hurricanes in the North Atlantic in 2017, Superstorm Sandy impacting New York in 2012, or the Tohoku, Japan, Earthquake in 2011), for 2018 there is no such major event(s) concentrating a large proportion of the losses. So what is observed for 2018 are losses coming from minor and medium-sized loss events.

In the U.S., the largest single insured loss came by the end of the hurricane season when Hurricane Michael impacted Florida, Georgia and the Carolinas between October 10 and 12, producing circa USD 6 to 10 billion of insured losses. In addition, the wildfires in Carr, Mendocino, Camp and Woolsey, CA, produced a combined loss of about USD 15 billion. **In Japan,** Tropical Cyclone Jebi in early September caused USD 8.5 billion of insured losses, representing the largest loss from a tropical cyclone in Japan. In spite of this, Jebi hit Japan with an intensity very much expected from a scientific point of view and at a location well embedded into commercial risk vendor models. **Europe** saw lower insured losses from natural disasters during 2018 than in recent previous years, with Winter Storm Friederike (called David in France) being the largest event. It impacted mainly Germany, the Netherlands and Belgium, with insured losses circa USD 2 billion. **In the Middle East,** Tropical Cyclone Mekunu, the hurricane with the highest intensity to hit Oman on record, caused over USD 400 million of insured losses, while in **Latin America and the Caribbean,** the highlight of 2018 is the occurrence of no single major insured loss from natural disasters.

The aforementioned events, along with others having lower insured losses, are described in detail in the second part of this report, listed in chronological order, while a summary of events is provided in the tables at the end of the document, organized by peril/region affected in chronological order.



Insured losses from natural catastrophes since 2011 (Willis Re estimates)

1. In focus

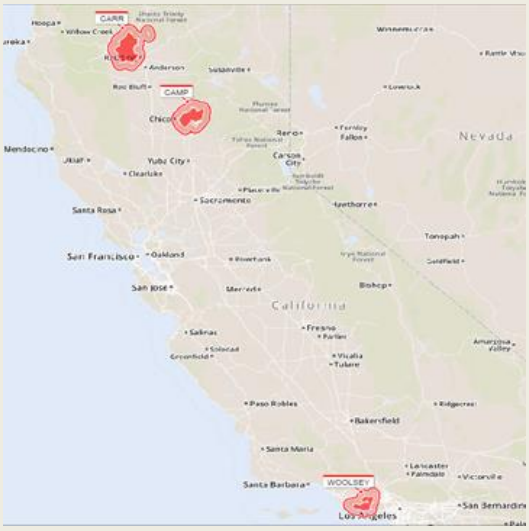
New for 2018, In focus highlights some of the key themes for the year framed in the context of past observations and historical losses. The traditional detailed description of natural events follows in the next section.

California: A year of wildfires

In the summer and fall of 2018, the U.S. suffered a series of catastrophic wildfires. These events have broken state records and resulted in significant insured losses. In particular, the Camp Fire became the deadliest and most destructive wildfire in California on record.

There have been **four major American wildfires in 2018:**

- Carr Fire in Shasta County, Northern California
- Mendocino Fire in Northern California
- Woolsey Fire in Southern California, near Los Angeles
- Camp Fire in Northern California, near Paradise



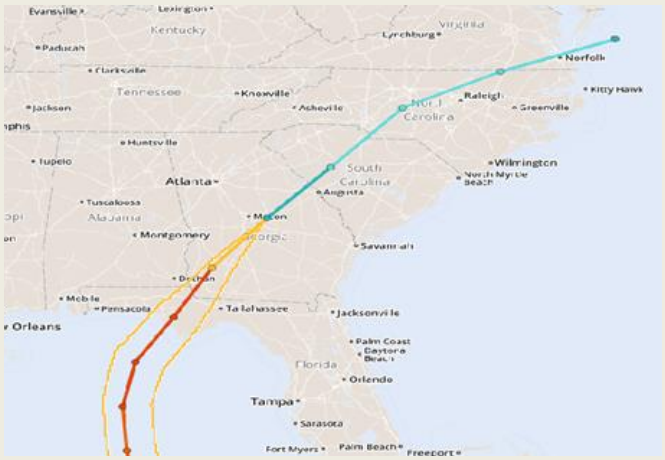
Aerial Extent of the Carr, Camp and Woolsey wildfires, via SpatialKey

The Carr, Mendocino, Woolsey and Camp wildfires have contributed significantly to the overall insured losses across the U.S., with an estimated combined insured loss of **USD 15.0 – 17.0 billion.**

Many different factors contributed to the 2018 California wildfire season becoming the worst on record, including an increased amount of natural fuel and compounding atmospheric conditions linked to global warming, according to the University of California, Berkley Center for Catastrophic Risk Management. The rating agency, Fitch, believes the wildfires will have a modest impact on year-end P&C results.

Hurricane Michael: Could losses have been larger?

Michael, the thirteenth named Atlantic storm of 2018, made landfall in the Florida Panhandle as a Category 4 storm. Michael was the third most intense storm to make landfall in the U.S. on record, behind the 1935 Labor Day Hurricane and Hurricane Camille of 1969, producing the year's largest hurricane insured loss with estimates between **USD 6 and 10 billion.** The storm's damage path was very narrow; however, had the wind field extent mirrored last year's Hurricane Irma, the insurance industry would have seen a much larger loss.



Hurricane Michael's track, via SpatialKey

The **Willis Re damage reconnaissance team** assessed Michael's damage in the October 2018 **Willis Re Damage Survey** to a collection of properties and determined that the **wind speed in the surveyed cities was above the 1-in-700-year return period.**

Most damage was limited to the Florida Panhandle and southern Georgia, sparing both North and South Carolina from further loss after Hurricane Florence made landfall there earlier in September.

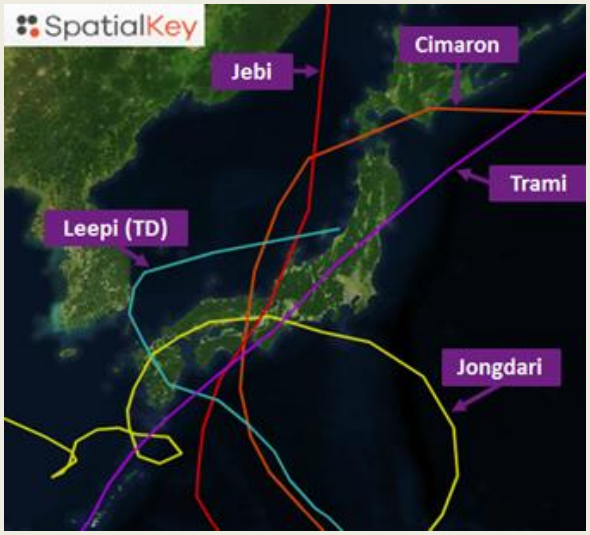
Michael was the region's first Category 4 hurricane on record, and building codes were not designed to protect against such an intense storm — highlighting the importance of continued examination of hurricane risk and risk mitigation in the region.

An active but not unexpected year of natural catastrophes in Japan

In the summer of 2018, Japan suffered a series of back-to-back natural disasters including typhoons, a flood and earthquakes. Many of these events resulted in significant insured losses, primarily driven by atmospheric perils. In particular, Typhoon Jebi is the strongest storm, by wind speed, to have affected Japan in the past 25 years.

Japan has seen **five landfalling wind events this year, out of which four were above Category 1** on the equivalent Saffir-Simpson hurricane wind scale:

- Two Category 3 typhoons: Jebi and Trami
- Two Category 2 typhoons: Jongdari and Cimaron
- Tropical Depression Leepi: made landfall with negligible losses



Storm tracks of the five landfalling wind events in 2018 over Japan, via SpatialKey

Typhoons Jebi, Trami, Cimaron and Jongdari have contributed significantly to the overall insured losses across the Asia Pacific region, with an estimated combined insured loss of about **USD 10.5 billion** (GIAJ included as source of the losses).

Despite these high losses, 2018 **tropical cyclone activity in Japan is within expectations** from a landfall location, frequency and severity perspective, with only one landfalling typhoon above the yearly average.

Other major events to impact the country were the earthquakes in Osaka and Hokkaido, and the extreme floods in July. Although many natural catastrophes have occurred across Asia Pacific in 2018, Japan remains the most impacted in terms of insured losses.

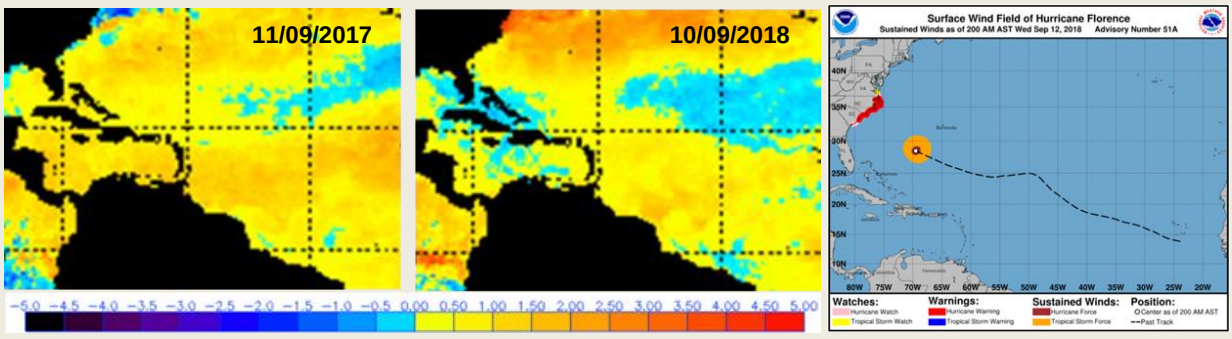
Latin America and the Caribbean: 2018 losses not a patch on 2017

The Caribbean and Latin America have seen notably lower impacts from natural catastrophes in 2018 compared with losses from the HIM hurricanes and the devastating Mexico earthquakes in 2017.

Multiple factors appear to have driven this year's modest hurricane losses in the region. For one, 2018 has been a year of abundant dry air in areas of the Caribbean and tropical Atlantic: Because hurricane formation requires moisture in the atmosphere, the ability of tropical waves to produce persistent stormy weather has been hindered throughout the 2018 Atlantic hurricane season.

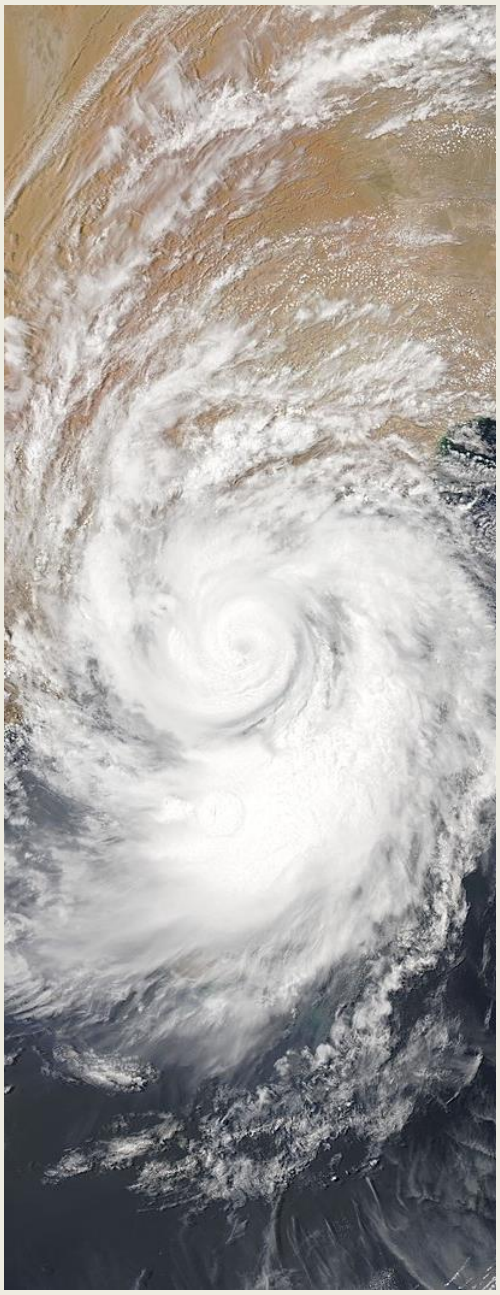
Relatively cold sea-surface temperatures in the Caribbean basin, between 0.5 and 1 degree Celsius cooler than 2017, have also played a crucial role in 2018's relative quiescence. Cooler waters deter the development of tropical storms and hurricanes, which are reliant on the evaporation of warm seawater. Hurricane development also reduced atmospheric wind shear, and 2018's wind shear has been stronger than average for the Gulf of Mexico, the Caribbean and the tropical Atlantic (source: NOAA).

In September, Hurricane Florence, which made landfall in the U.S., swept through the Atlantic basin taking a steep northwesterly turn guided by the prevailing atmospheric and ocean conditions at the time, not causing any significant impact in the Caribbean.



Sea-surface temperatures in the Atlantic basin around the times of Hurricane Irma/Maria (left) and Hurricane Florence (middle). Hurricane Florence's path through the Atlantic basin (right) (source: NOAA)

The strongest tropical cyclone to hit the Arabian Peninsula



Cyclone Mekunu approaching Salalah, Oman on May 25 (source: MODIS, NASA)

2018 saw the Arabian Peninsula experience its most intense tropical cyclone on record. Cyclone Mekunu made landfall on May 25 near Salalah, Oman's third-largest city. With peak one-minute sustained wind speeds of 185 km/h, the Category 3 storm (on the Saffir-Simpson scale) caused widespread damage in parts of southern Oman and Yemen.

Not only was Mekunu the most intense cyclone recorded on the Arabian Peninsula, it was also the first hurricane-equivalent storm to hit Oman's southern Dhofar Governorate since May 1959.

Like the storm of 1959, much of the damage caused by Mekunu resulted from the vast precipitation accompanying its movement over the Arabian Peninsula. In five days, Mekunu had deposited over 600 mm of rainfall in Salalah, the equivalent of over four times the annual average.

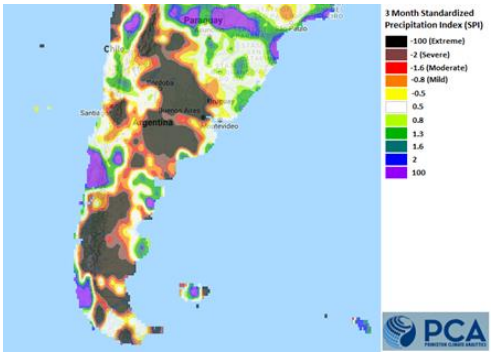
Data from the Capital Market Authority of Oman puts the resulting insured impact from Mekunu at **USD 403 million**, a loss not unprecedented in the region's history despite the record-setting event. Cyclone Gonu of 2007 (which, until Mekunu, held the record for the strongest storm to strike the Arabian Peninsula), is still considered Oman's most costly natural disaster after it affected **USD 650 million** in insured losses (EM-DAT).

Mekunu was accompanied by a total of six other tropical cyclones in the North Indian Ocean in 2018, making it the **most active season since 1992.** And, while the total impact is still being fully realized, this year highlights some crucial considerations for cyclone risk in the region — primarily the **potential for record-breaking wind and rainfall intensities,** as well as the possibility of successive storms bringing damage to already hard-hit areas.

The occurrence of damaging and deadly landfalls like Cyclone Mekunu stresses the need for **adequate loss quantification methodologies, better preparedness and adequate risk-transfer mechanisms** to support the communities and economies within the region.

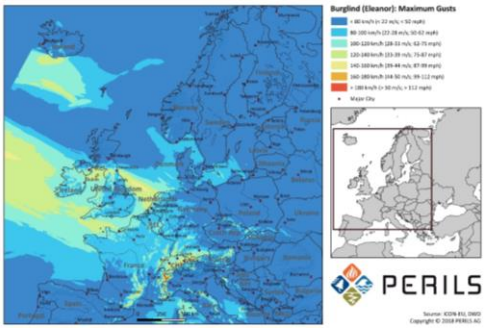
2. Major natural catastrophes in 2018

DR South America	November 2017 to March 2018
Argentina, Uruguay **Economic losses (in USD millions)** ▪ **3,400 in Argentina, 500 in Uruguay** (Insurance Journal) **Fatalities: Unknown**	▪ During the southern hemisphere summer of 2017/2018, southern South America experienced a severe lack of rainfall leading to the worst drought in decades across parts of Argentina and Uruguay. ▪ La Niña conditions contributed toward the below average precipitation. ▪ Argentina's soy production is estimated to decline 31% and corn by 20% compared to the prior growing season (U.S. Foreign Agricultural Service). ▪ Food prices have been impacted, with corn and soybean prices in the U.S. seeing 14% and 8% increases, respectively. ▪ The global price of food, measured by the U.N.'s FAO Food Price Index, increased by roughly 1% between January and February 2018 as a result of the drought. ▪ Argentina's GDP this year is predicted to decrease by 0.7% (VOA News).



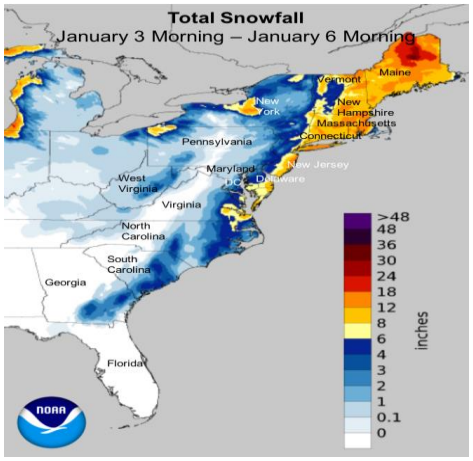
Drought conditions across South America on March 26 (source: PCA)

WS Burglind/Eleanor	January 2 to 3, 2018
Austria, Belgium, France, Germany, Ireland, Netherlands, Switzerland, U.K. **Insured losses (in USD millions)** ▪ **1,245–1,811** (AIR) ▪ **1,020** (Munich Re) ▪ **856** (PERILS) **Economic losses (in USD millions)** ▪ **1,090** (Munich Re) **Fatalities: 9**	▪ Burglind formed as a secondary low of depression system Alja, ultimately reaching a minimum central pressure of 966 hPa. ▪ Peak gust values of 201 km/h in Guetsch, Switzerland, 196 km/h in Cap Corse, France, 175 km/h in Zugspitze, Germany and 161 km/h in Great Dun Fell, U.K. ▪ 9 recorded fatalities: 3 in Switzerland during forest clean-up work; 6 in France. ▪ Flight cancellations affected airports in Zurich, Frankfurt, Paris, Basel-Mulhouse, London and Amsterdam. ▪ Widespread power disruption to >400,000 households and businesses, of which over 200,000 were in France. ▪ Localized flooding in Germany and Ireland; roof damage in Austria, France, U.K.; widespread tree windfall.



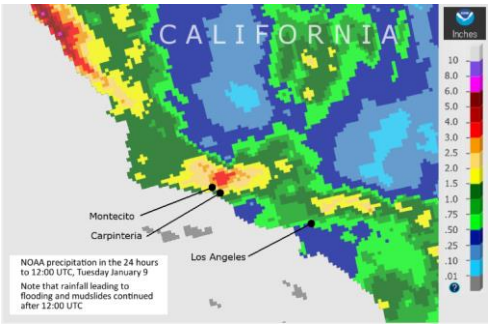
Low pressure system Burglind (Eleanor) on January 3 (source: PERILS)

BL U.S.	January 3 to 6, 2018
Northeast and Eastern U.S. **Insured losses (in USD millions)** ▪ **<1,000** (PCS) **Fatalities: 22**	▪ A low-pressure system combined with below-average temperatures allowed for a wintry mix along the southeast coast. ▪ Snow, sleet and freezing rain impacted Florida and spread northward through Georgia and the Carolinas, and significant coastal flooding occurred in Maine and New Hampshire. ▪ >100 damaged by flood. ▪ Close to 200,000 properties were affected by power outages.



Winter storm report on January 6 (source: PCS, NOAA)

ST U.S.	January 8 to 10, 2018
California, U.S. **Insured losses (in USD millions)** ▪ **<1,000** (PCS) **Fatalities: 17**	▪ Wind, heavy rain and mountain snow hammered California, leading to flooding and mudslides across parts of the state. ▪ Wind gusts up to 117 km/h and rainfall up to 25.4 cm were reported. ▪ Close to 500 homes and businesses were damaged or destroyed due to flooding, wind and water intrusion. ▪ Flooding and fallen trees also caused losses to vehicles. ▪ Many roads were closed or blocked due to mudslides.



NOAA precipitation on January 8. Dark purple indicates highest rainfall amounts (source: NOAA)

WS Friederike (David)	January 17 to 18, 2018

Belgium, France, Germany, U.K., Netherlands, Central Europe, Italy

Insured losses (in USD millions)

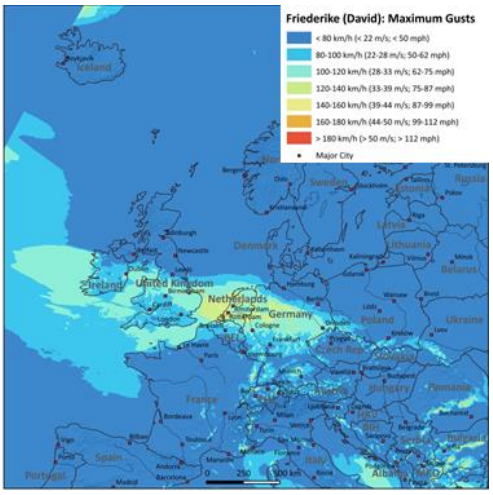
- **2,100** (Swiss Re)
- **2,100** (Munich Re)
- **1,896** (PERILS)
- **1,471–2,942** (AIR)
- **1,132–1,358** in Germany (Willis Re)
- **1,132** in Germany (GDV)
- **792–1,132** (CoreLogic)

Economic losses (in USD millions)

- **2,700** (Swiss Re, Munich Re)

Fatalities: 13

- A strong Atlantic extra-tropical cyclone, named Friederike in Germany and David in France, crossed northwest Europe, significantly impacting Germany, the Netherlands and Belgium.
- Gusts of up to 140 km/h were recorded in the Dutch port of Hoek van Holland; the German states of North Rhine-Westphalia and Lower Saxony were also affected by the strongest winds (RMS).
- 13 fatalities, including 8 in Germany, 3 in the Netherlands, 1 in Belgium and 1 in Italy.
- Widespread minor damage was reported across Germany and the Netherlands, with some instances of structural damage.
- Notable roof damage occurred at Amsterdam Schiphol airport, which resulted in 2 of 3 departure halls closing. In total, >500 flights were canceled across the affected regions (RMS).
- >250,000 power outages.



Maximum wind gusts from Winter Storm Friederike (David) (source: PERILS)

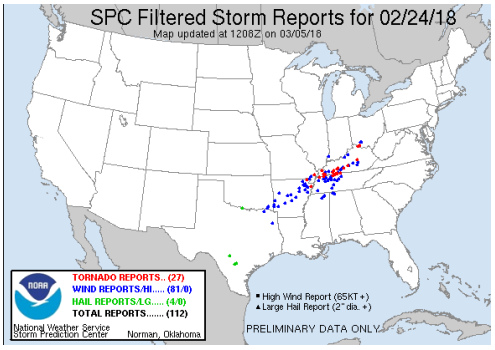
ST Midwest U.S.	February 24 to 26, 2018

Midwest U.S.

Insured losses (in USD millions)

- **<1,000** (PCS)

- An outbreak of heavy rain and snow moved through the Southern and Central Plains resulting in flash flooding.
- Over 400 properties were damaged by flood and more than 40 suffered wind damage.
- An EF-2 and EF-1 scale tornado, with maximum winds of 215 km/h touched down in Tennessee, Kentucky and Arkansas, damaging several homes and buildings.



Thunderstorm report on February 24 (source: SPC, NOAA)

“Beast From the East” and Storm Emma	February 25 to March 5, 2018

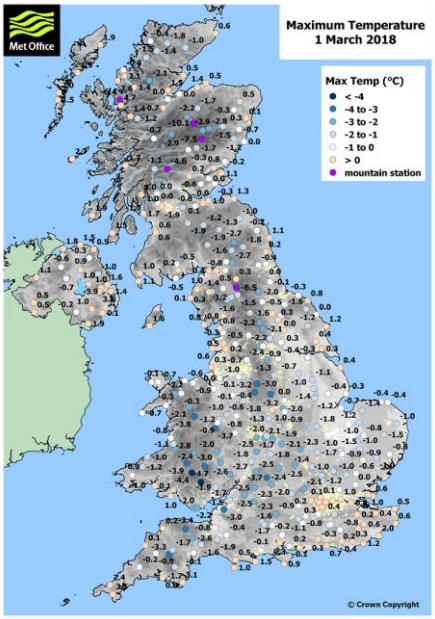
France, Portugal, Spain, U.K., Ireland

Insured losses (in USD millions)

- **638–765** (Insurance Day)

Fatalities: 77 (Munich Re)

- The initial event, later to become the “Beast From the East”, was an arctic outbreak from a disordered polar vortex.
- The event was characterized by an anticyclone (named Hartmut) centered on Scandinavia, ultimately developing into an anticyclonic storm.
- Peak gust value of 187 km/h was recorded in Ovre Dividal National Park, Norway.
- Hartmut and Winter Storm Emma (minimum central pressure of 963 hPa) collided from March 1, leading to a peak gust value of 228 km/h on Mount Aigoual, France.
- 49 cm of snow was deposited in Drumalbin, U.K.
- 94 recorded fatalities, including 17 in the U.K., predominantly from the cold wave.
- Flight cancellations at Glasgow airport; widespread travel disruption in Ireland and U.K.



Maximum temperature in the U.K. on March 1 (source: U.K. Met Office).

BL U.S.	March 1 to 3, 2018

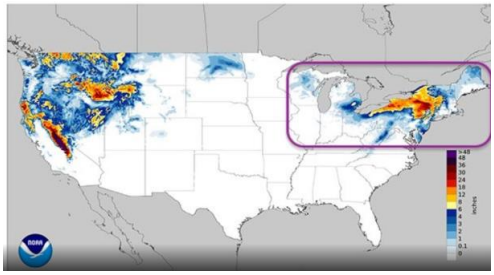
Eastern U.S.

Insured losses (in USD millions)

- **>1,000** (PCS)

Fatalities: 9

- A strong winter storm carried winds and coastal flooding into the Northeast U.S. causing widespread property damage and power outages in Alabama, Tennessee, Texas and Kentucky.
- Gusts of 150 km/h were reported in MA and NH, while gusts up to 145 km/h were experienced in Boston.
- Onshore winds caused coastal flooding in New England, especially in Boston.
- Parts of New York and Pennsylvania saw between 25 and 50 cm of snow.
- 9 fatalities resulted from the severe weather.
- Millions lost power in the mid-Atlantic, Northeast, and Great Lakes regions.



Total storm rainfall on March 3. Dark red indicates highest snowfall amounts (source: NOAA)

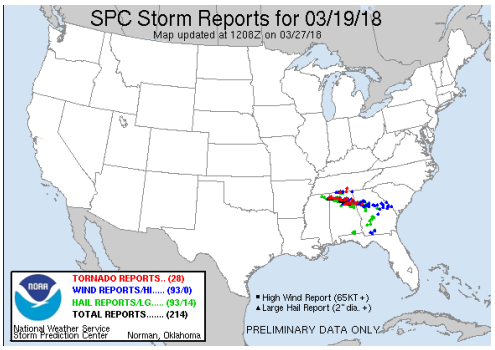
ST U.S.	March 18 to 21, 2018

Southern U.S.

Insured losses (in USD millions)
- **>1,000** (PCS)

Fatalities: 0

- Severe thunderstorms developed in the southern plains and eastern Gulf Coast, producing large hail and damaging winds, including tornados as well as flash floods.
- Hail up to 51 mm in diameter fell in Daytona Beach, Florida; Bastrop County Texas; Beaufort County, South Carolina; Tishomingo County, Mississippi; and Terrebonne Parish, Louisiana.
- A round of severe storms that included tornadoes swept through several towns in the south and left behind a trail of destruction and at least 3 injured persons.
- Significant damage was recorded to homes, roofs, mobile homes, a nursing home and vehicles, due to the hail.



Thunderstorm report on March 19 (source: SPC, NOAA)

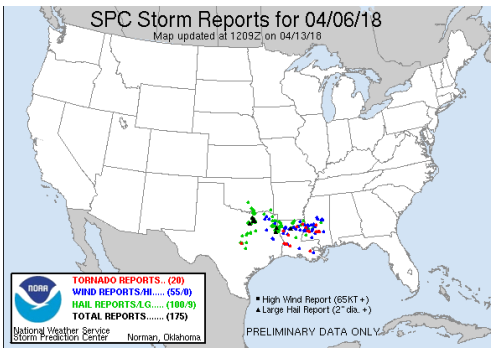
ST Southern U.S.	April 6 to 7, 2018

Southern U.S.

Insured losses (in USD millions)
- **<1,000** (PCS)

Fatalities: 0

- A band of strong thunderstorms moved across Texas and into the Southern U.S., bringing hail and tornados.
- Hail up to 70 mm in diameter was reported throughout Texas.
- Hailstones caused significant damage to cars, as well as roof, siding, window and skylight damage to buildings.



Thunderstorm report on April 6 (source: SPC, NOAA)

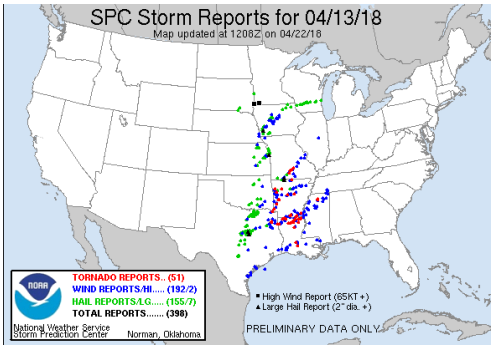
ST Midwest U.S.	April 13 to 17, 2018

Midwest and Southern U.S.

Insured losses (in USD millions)
- **<1,000** (PCS)

Fatalities: 3

- Thunderstorms swept across the Midwest and into the Southern U.S., carrying freezing rain, snow and tornados.
- An EF-2 tornado touched down in Greensboro, North Carolina, with a maximum path width of 450 m and maximum wind speed of 217 km/h, bringing widespread destruction.
- 20 homes were destroyed, 80 were severely damaged, and up to 300 others sustained lesser damage.
- Around 75,000 homes and businesses lost power due to the tornado.



Thunderstorm report on April 13 (source: SPC, NOAA)

ST Midwest U.S.	April 28 to May 5, 2018

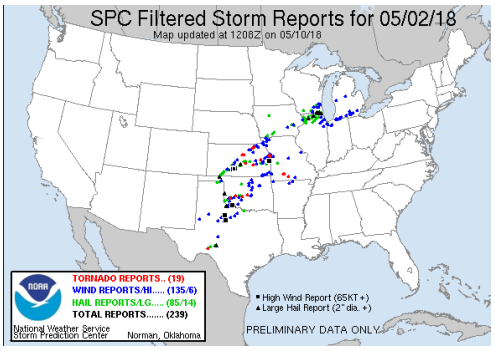
Midwest U.S.

Insured losses (in USD millions)

- **>1,000** (PCS)

Fatalities: 0

- Several days of severe storms produced tornadoes, strong winds, hail and flooding across the Central and Midwest U.S. causing damage to properties.
- Approximately 400 National Weather Service (NWS) reports of severe weather were issued over the event time span.
- An EF-3 tornado with estimated winds of 224 km/h tracked for more than 23.4 km in Kansas.
- Hail up to 100 mm in diameter fell in northern Kansas.
- Significant roof damage from high winds and toppled trees was the major driver of property damage.



Thunderstorm report on May 2 (source: SPC, NOAA)

ST Western Europe	May to June, 2018

11 countries affected including: Austria, Belgium, France, Germany, Netherlands, Switzerland

Insured losses (in USD millions)

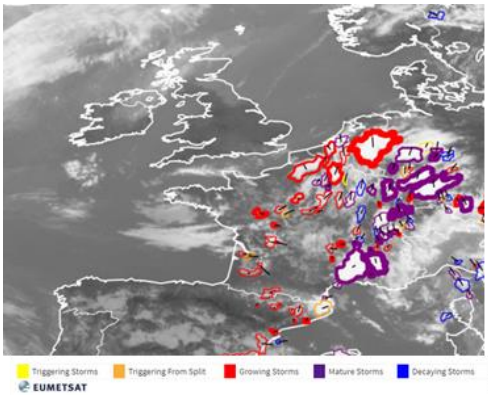
- **1,000** (Munich Re)

Economic losses (in USD millions)

- **1,700** (Munich Re)

Fatalities: >5

- Throughout late May and into mid-June, a series of severe, slow-moving thunderstorms developed across central Europe, affecting Belgium, France and Germany most significantly.
- The thunderstorms generated intense and localized wind, hail and flood damage.
- During the storms on May 22, up to 50 cm of hail accumulated in Kaisersesch, Germany. In northwest Paris, some areas observed 50 to 70 mm of rainfall within one hour (FloodList).
- Further violent thunderstorms occurred from May 31 to June 1, which also affected Austria where flash flooding was reported in Grafenschachen and Loipersdorf (FloodList).
- Storms continued to develop into mid-June. On June 12, Lausanne, Switzerland, recorded nearly 79 mm of rain in 24 hours causing flooding (FloodList).
- >5 fatalities.
- Damage from the storms mainly arose from floodwaters and some hail activity, with property and motor claims being reported.
- Significant travel disruption occurred in the affected areas due to flooded roads, downed trees and power outages.



Infrared satellite image at 15:00 UTC on May 22 showing thunderstorm development (source: EUMETSAT via Metcheck)

FL Hobart, Australia — May 10 to 11, 2018

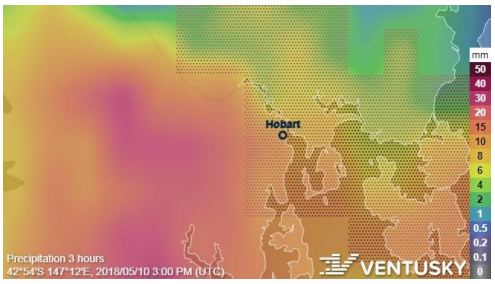
Hobart, Australia

Insured losses (In USD millions)

- **73** (Insurance Council of Australia)

Fatalities: 0

- Intense thunderstorms in the Australian state of Tasmania on May 10 and 11 led to flash flooding across the region, with the state capital of Hobart severely impacted.
- 24-hour rain accumulations reached 129 mm in the early hours of May 11 (FloodList).
- The suburbs of Kingston, Sandy Bay and Blackmans Bay were most significantly affected (ICA).
- There were no reported fatalities; however, a number of people were rescued after becoming trapped in floodwaters.
- Properties were inundated with water and cars were washed down the streets.
- There were also reports of roof wind damage and downed trees (The Guardian).
- At the peak of the storms, 14,000 homes were without power (FloodList).
- Transport was severely affected with major roads blocked by floodwaters and debris (FloodList).



Three-hour rainfall accumulation at 02:00 local time on May 11 (source: Ventusky)

WS U.S. — May 12 to May 16, 2018

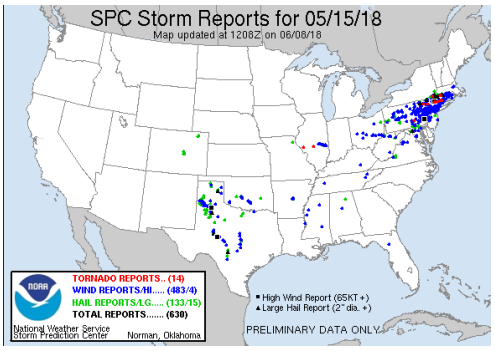
Northeast, Midwest, Southern U.S.

Insured losses (in USD millions)

- **>1,000** (PCS)

Fatalities: 5

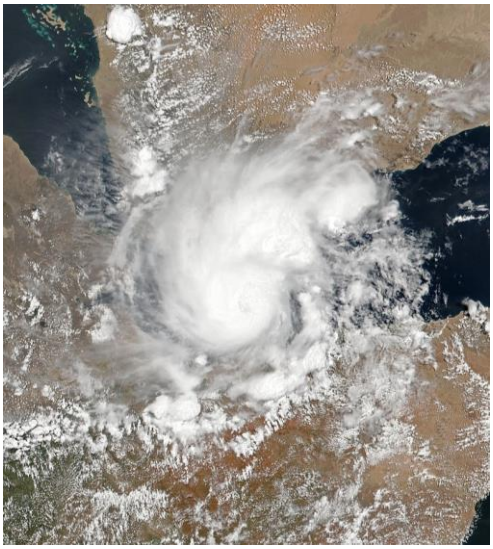
- Severe storms shuffled across the Northeast, the Midwest, the South, as well as Colorado in the U.S., causing widespread damage, power outages and travel disruption.
- Wind gusts of up to 130 km/h were reported with wind damage seen in 19 states.
- Significant roof damage was seen from wind gusts and hail as well as trees falling on houses, power lines and roads.
- A flash flood emergency was also reported in Maryland after streets and basements were flooded.
- Hundreds of properties experienced wind, hail and/or flood damage.



Thunderstorm report on May 15 (source: SPC, NOAA)

TC Sagar	May 21, 2018
Somalia, Djibouti, Yemen, Ethiopia **Max. Cyclonic Storm** **Economic losses (in USD millions)** ▪ **30 in Djibouti** (UNICEF) **Fatalities: 57** (plus a further 32 from secondary landslides)	▪ Cyclone Sagar, the first named cyclone of the 2018 North Indian Ocean cyclone season, made landfall in Somalia on May 21, becoming the most intense tropical cyclone to hit the country since records began (JTWC). ▪ Having formed on May 16, the storm intensified and traversed west through the Gulf of Aden before making the westernmost landfall ever recorded in the North Indian Ocean (Wunderground). ▪ Sagar impacted Yemen, Somalia, Djibouti and Ethiopia on its rare course through the Gulf of Aden. ▪ In Somalia, 1-minute sustained peak wind speeds of 97 km/h were observed (JTWC). Sagar also brought to Somalia the equivalent of 1 year's worth of rainfall, resulting in deadly flash-floods (OCHA). ▪ 55 fatalities in Somalia and 2 in Djibouti. Rainfall from Sagar also caused landslides in Ethiopia responsible for the deaths of 32 people (Ethiopian GCAO). ▪ Approximately 170,000 people are thought to have been affected in Somalia and a further 25,000 in Djibouti. ▪ Agriculture in northern Somalia was severely impacted, with estimated 277 ha of arable land destroyed and thousands of livestock killed (NADFOR). ▪ Flooding in Djibouti damaged about 10,000 houses, with total costs to infrastructure in the country estimated at USD 30 million (UNICEF).

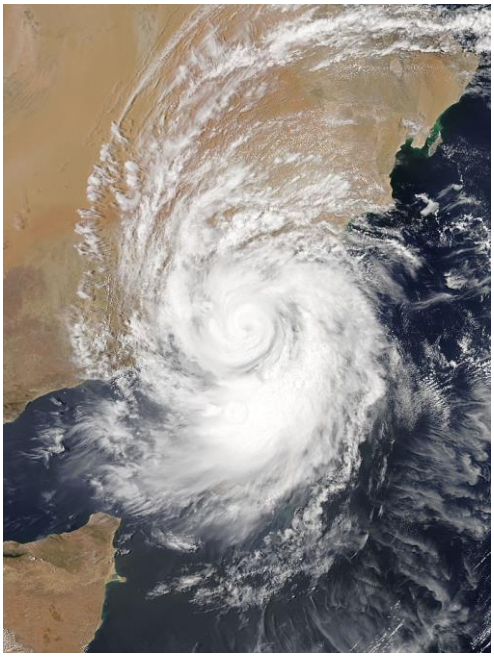
Track and intensity of Cyclone Sagar (source: JTWC via WikiProject Tropical cyclones/Tracks)



MODIS satellite image of Cyclone Sagar over the Gulf of Aden on May 18 (source: NASA Earth Observatory)

TC Mekunu	May 25 to 26, 2018
Yemen, Oman **Max. and landfall Category 3** **Insured losses (in USD millions)** ▪ **403** (Capital Market Authority Oman via Reinsurance News) **Fatalities: 30** (EM-DAT)	▪ Cyclone Mekunu made landfall on May 25 near Salalah, Oman's third-largest city. ▪ Boasting peak 1-minute sustained wind speeds of up to 185 km/h, the Category 3 storm was the most intense to hit the Arabian Peninsula on record (IMD). ▪ In 5 days Mekunu deposited approximately 617 mm of rainfall in Salalah, the equivalent of over 4 times the annual average (MRMWR). ▪ 24 fatalities in Yemen and 6 fatalities in Oman (EM-DAT). ▪ A state of emergency was declared on the Yemeni island of Socotra after 40 people were reported missing. 1,000 households were evacuated and floodwaters inundated the roads connecting Socotra airport (OCHA). Two ships capsized in Al-Gaydah (IFRC). ▪ On Yemeni mainland, the Al Mahrah and Hadhramaut governorates were worst affected, with widespread power outages. ▪ In Salalah, sustained winds of 97 km/h damaged houses, cars and boats. ▪ Storm rains flooded normally very dry regions such as at the desert area of Rub' al Khali, which saw its first lakes in 20 years (NASA Earth Observatory). ▪ Data from the Capital Market Authority in Oman confirmed that 20 insurance firms had received 1,123 claims, with losses totaling over USD 403 million (via Reinsurance News). Property and Engineering claims make up USD 243 million and USD 79 million, respectively. ▪ Mekunu made landfall in Oman less than a week after Cyclone Sagar had caused damage in Somalia and Yemen.

Track and intensity of Cyclone Mekunu (source: JTWC via WikiProject Tropical cyclones/Tracks)



MODIS satellite image of Cyclone Mekunu approaching Salalah, Oman on May 25 (source: NASA Earth Observatory)

Subtropical Storm Alberto	May 28 to May 31, 2018

Florida, Southern U.S.

Tropical Storm at landfall

Insured losses (in USD millions)

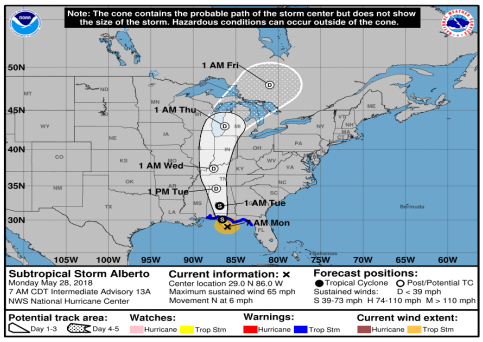
- **<100** (PCS US)

Economic losses (in USD millions)

- **1,300** (Enki)

Fatalities: 2

- Subtropical Storm Alberto brought strong winds, storm surge and flash flooding to the Southeast U.S., mainly affecting Florida and Alabama.
- The storm formed off the Yucatan Peninsula and traveled northward into the eastern Gulf of Mexico.
- Alberto made landfall in Laguna Beach, Florida, on May 28, with maximum sustained winds of 75 km/h, equivalent to tropical storm strength winds on the Saffir-Simpson Hurricane Wind Scale.
- The storm was downgraded to a subtropical depression later the same day, as it continued to move inland into Tennessee and the Midwest.
- Alberto's winds were relatively light, but the system tapped into an abundant moisture structure, bringing heavy rains across the regions.
- Storm surge from Alberto caused water levels to rise 0.3–0.9 m above normal tide levels north of Tampa Bay and westward to the Mississippi River Delta.
- Flash flooding was reported in Myrtle Beach, South Carolina, and Wilmington North Carolina.
- Two journalists were killed by a falling tree while covering the storm in North Carolina.

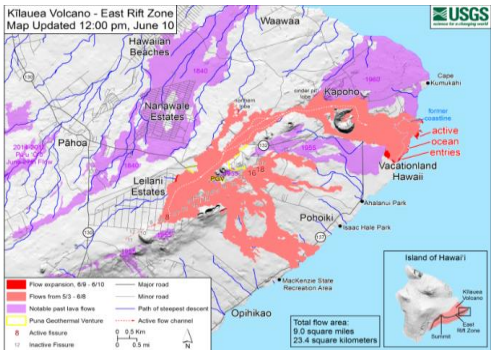


Subtropical Storm Alberto path as of May 28 (source: NOAA)

WF Sweden	May to August, 2018
Sweden **Insured Losses (in USD millions)** ▪ **>87** (Svensk Försäkring via Insurance Insider) **Economic Losses (in USD millions)** ▪ **>100** (Swedish Forest Agency via Insurance Journal) **Fatalities: 0**	▪ From May to August 2018, a series of wildfires ignited throughout Sweden, ranging from north of the Arctic Circle to the southern county of Scania. ▪ The areas worse affected were Gävleborg and Jämtland. ▪ During their peak in July 23, the fires covered an area of 250 km^2 (Swedish Forest Agency). ▪ May and July, respectively, were the warmest months in Sweden on record making conditions susceptible to wildfire (NASA Earth Observatory). ▪ While many of the affected areas were sparsely populated, hundreds of people were evacuated from their homes over the course of the wildfires. ▪ Rainfall in late July, aided by intense firefighting efforts, led to the wildfires being brought under control by early August.

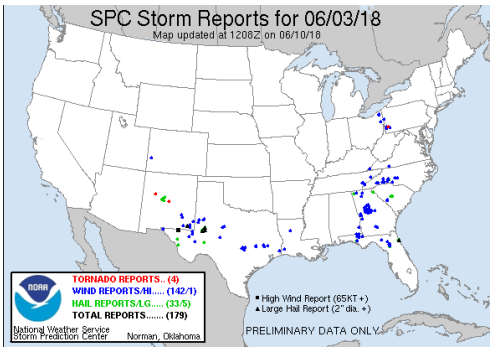
MODIS satellite image of wildfires near Ljusdal on July 17 (source: NASA Earth Observatory)

VE Mount Kilauea	May 3 to August 23, 2018
Big Island, Hawaii **Insured losses (in USD millions)** ▪ **<1,000** (PCS) **Economic losses (in USD millions)** ▪ **1,300** (Enki) **Fatalities: 0**	▪ Mt. Kilauea, located on the Big Island of Hawaii, erupted on May 3. ▪ The Pu'u 'O'o crater floor collapsed on May 1, causing earthquakes and magma to drain into a new vent system along the East Rift Zone. ▪ On May 4, a moment magnitude (Mw) 6.9 earthquake struck offshore Hawaii's Big Island, the strongest to occur on the island in 43 years, but no reports of major damage to buildings or infrastructure were reported from the shaking. ▪ The volcanic activity triggered lava flows and earthquakes and was the most destructive in the U.S. since the eruption of Mount St. Helens in 1980. ▪ >600 buildings are reported to have been destroyed and major power plants were forced to shut down and evacuated. ▪ The lava flows were estimated to cover about 2,300 ha.



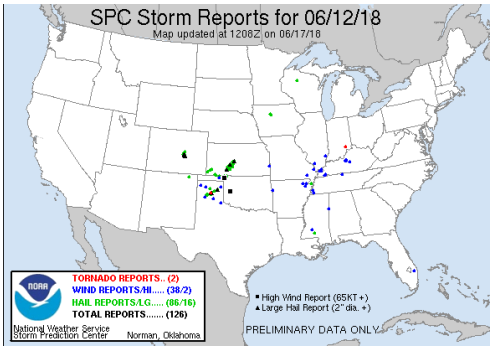
Mount Kilauea East Rift Zone (source: USGS)

HL Southwest U.S.	June 3 to 6, 2018
Southwest U.S. **Insured losses (in USD millions)** ▪ **<1,000** (PCS) **Fatalities: 0**	▪ Unstable weather patterns aided in developing severe thunderstorms across western Texas and parts of central New Mexico. ▪ Large hail up to 64–76 mm diameter was seen in Loving, New Mexico, and the Dallas-Fort Worth area of Texas, with wind gusts up to 119 km/h in Eunice as well as several reports of a tornado. ▪ There were reports of significant damage to roofs and siding on residential and commercial buildings as well as major vehicle damage. ▪ An American Airlines passenger jet experienced serious damage to the aircraft including a crushed nose cone, shattered windshield panels and cockpit side window.



Thunderstorm report on June 3 (source: SPC, NOAA)

HL Midwest U.S.	June 12 to 13, 2018
Midwest U.S. **Insured losses (in USD millions)** ▪ **<1,000** (PCS) **Fatalities: 0**	▪ Severe hailstorms struck eastern Colorado causing widespread damage. ▪ Baseball-sized hail stones up to 76 mm were reported in the metro Colorado Springs area. ▪ Major damage was inflicted on roofs and siding of residential and commercial buildings as well as extensive vehicle damage. ▪ The storm cut power to about 5,300 people and briefly interrupted the municipal water supply.



Thunderstorm report on June 12 (source: SPC, NOAA)

EQ Osaka — June 18, 2018

Japan

Magnitude 5.3

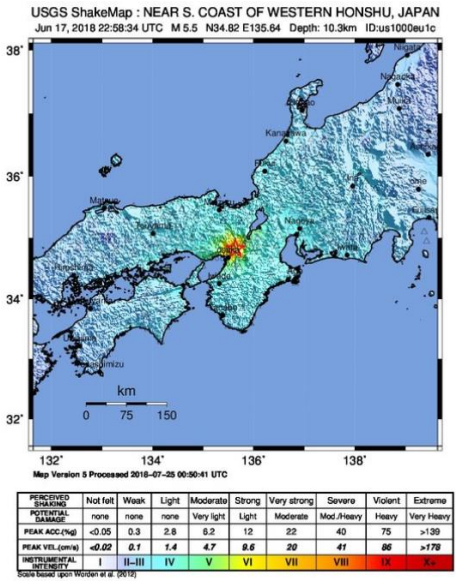
Max. Intensity:
VIII – Severe (MMI)

Insured losses
(in USD millions)

- **27–124** (AIR)
- **195** (RMS)
- **910** (GIAJ, in claims paid as of Dec 11)

Fatalities: 5

- On June 18 at 07:58, Japan local time (22:58 UTC, previous day), a Mw 5.3 earthquake struck the city of Osaka, Japan (USGS).
- Its epicenter was approximately 25 km northeast from the coast of Osaka Bay, at a shallow depth of 15.4 km.
- The earthquake is thought to have resulted from activity along 3 fault zones: Arima-Takatsuki, Ikoma and Uemachi. The areas around Osaka may be subject to increased likelihood of major earthquakes due to this recent event (Headquarters for Earthquake Research Promotion).
- A total of 766 structures were found by government surveys to have sustained partial damage. >120 schools in Osaka prefecture were also damaged.
- 82 flights were canceled.
- 450 people remained in public shelters a week after the earthquake.
- 170,000 homes were affected by electricity outages and 112,000 by loss of gas during the day.
- Shinkansen and other train services were suspended for the day.



Intensity map of the affected area (source: USGS)

HL Midwest U.S. — June 18 to 20, 2018

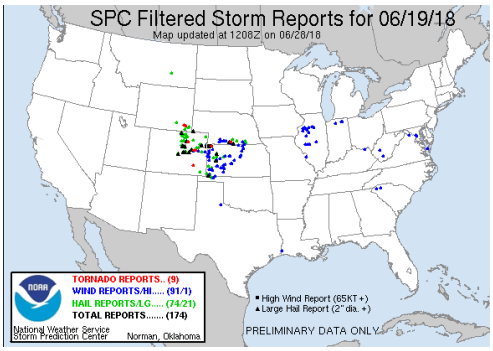
Midwest U.S.

Insured losses
(in USD millions)

- **>1,000** (PCS)

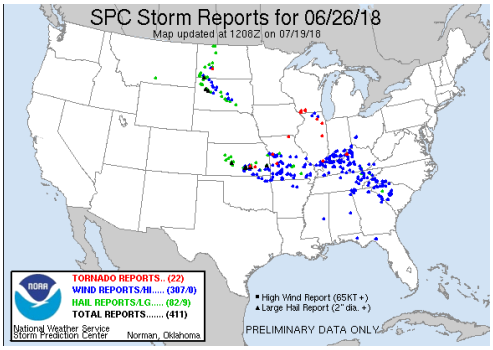
Fatalities: 0

- Powerful storm systems pushed through northern Colorado producing large hail and strong winds.
- Hail up to 76 mm damaged cars and homes in the Boulder area before wreaking havoc on Morgan County.
- Wind gusts up to 114 km/h were reported at Fort Morgan Airport.
- The storm also affected several parts of Utah as hail and rain poured down across northern parts of the state.
- Extensive damage to residential and commercial buildings was reported.



Thunderstorm report on June 19 (source: SPC, NOAA)

ST Midwest U.S.	June 24 to 26, 2018
Midwest U.S. **Insured losses (in USD millions)** ▪ **<1,000** (PCS) **Fatalities: 0**	▪ Severe convective storms broke out across the Midwest and caused significant property damage in south-central Kansas. ▪ Most reported damage was caused by a tornado in the city of Eureka, Kansas. ▪ Large hail up to 70 mm and wind gusts of 161 km/h were also reported in Kansas. ▪ Most of Eureka was reported to have suffered damage, with the majority coming to homes and small businesses and being described as "heavy structural damage" by officials. ▪ Some properties were reported to have suffered complete structural failure. ▪ 5 people were reported injured from the storm. ▪ Straight-line winds from the storm downed trees across the Midwest and Southwest, causing property damage.

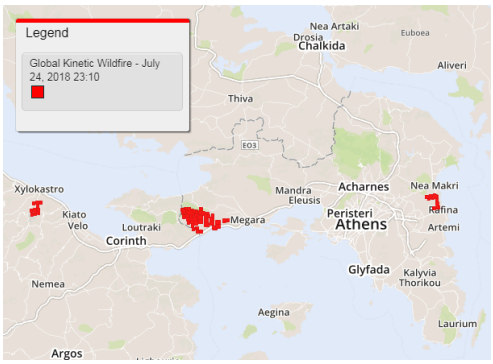


Thunderstorm report on June 26 (source: SPC, NOAA)

WF Spring Fire Colorado	June 27 to July 11, 2018
Colorado, U.S. **Insured losses (in USD millions)** ▪ **<100** (PCS) **Fatalities: 0**	▪ The Spring Creek fire started on June 27, and was determined to be human caused. ▪ The fire consumed over 43,700 ha and caused significant property damage. ▪ The fire is the third-largest wildfire in Colorado's history. ▪ >100 structures were reported to be completely destroyed.

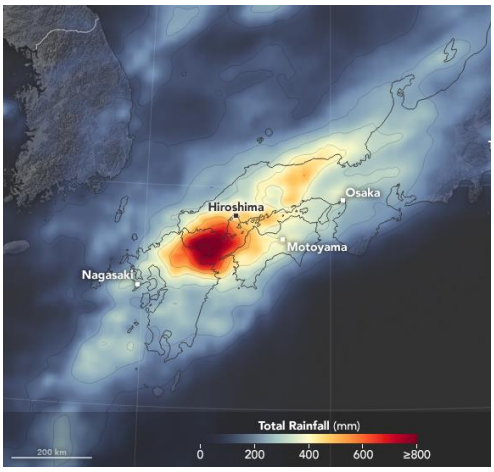
Fire weather outlook for June 29 (source: NOAA)

WF Greece	July, 2018
Attica, Greece **Insured losses (in USD millions)** ▪ **38.1** (Greece Association of Insurance Companies) **Fatalities: 99**	▪ The July 2018 Greece wildfires were the second-deadliest wildfire event of the 21st century, globally. ▪ Starting on July 23, a series of 3 wildfires ignited across central-southern mainland Greece in the Attica region. The wildfires were focused around Zemeno, Kineta and Rafina. ▪ The cause of the wildfires is unknown; however, local officials suspect arson and a damaged utility cable could have played a role. ▪ A summer heatwave, in addition to an abnormally dry winter, made conditions susceptible for wildfire. Strong wind gusts of up to 97 km/h exacerbated the fires (RMS). ▪ 99 fatalities, >172 injured, with the majority associated with the Rafina wildfire. ▪ >700 residents were evacuated, mainly from coastal settlements around Rafina. ▪ Approximately 2,500 homes destroyed, with a further 4,000 severely damaged (RMS). ▪ Some flights were disrupted at Athens airport on July 23 due to smoke causing poor visibility, with the Athens-Corinth motorway also being closed (RMS).



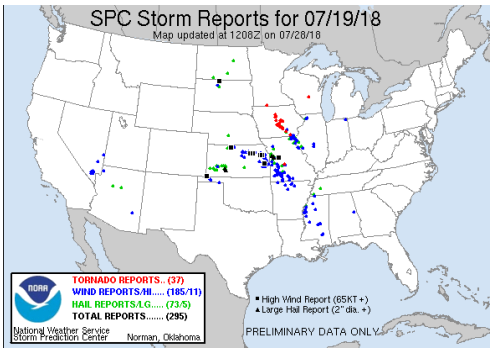
Wildfire footprint at 23:10 on July 24 (source: Global Kinetic Wildfire via SpatialKey)

FL Japan	July 3 to 9, 2018
Japan **Insured losses (in USD millions)** ▪ **1,675** (GIAJ, in claims paid as of Dec 11) ▪ **2,501–3,725** (AIR) **Fatalities: >225**	▪ The July 2018 Japan floods were the most deadly weather disaster in Japan since 1982. ▪ Heavy rainfall from a low pressure system driven by the remnants of Typhoon Prapiroon caused extensive flooding across Japan between July 3 and 9. ▪ During the most intense rainfall, the 3-hour rainfall rate peaked at 26.3 cm in Kochi prefecture, the highest since records began in 1976 (DW). ▪ Southwestern Japan bore the brunt of the flooding, with 31 prefectures affected in total. ▪ Landslides and mudslides occurred across many of the saturated slopes causing large-scale structural damage to property. ▪ In Mabi, Okayama prefecture, the levees of the Odagawa were breached, causing flooding of up to 4.8 m depth in residential areas (Reuters). ▪ >225 fatalities were reported as a result of rain-related incidents across Japan. ▪ >8 million people were placed under evacuation orders during the course of the flooding (FloodList). ▪ >46,000 buildings were reported as being damaged across the affected regions (FDMA). ▪ The commercial sector was also heavily affected with Mazda Motor, Teijin and Asahi Shuzo suspending operations for a period (RMS). ▪ The July 2018 flooding highlighted the need for greater flood prevention and awareness throughout Japan. 21 reservoirs overflowed during the flooding, yet only 4 were previously designated as priority area for disaster mitigation. Furthermore, many residents were not aware of the flood risk their properties faced due to flood hazard maps being released only relatively recently (Japan Times).



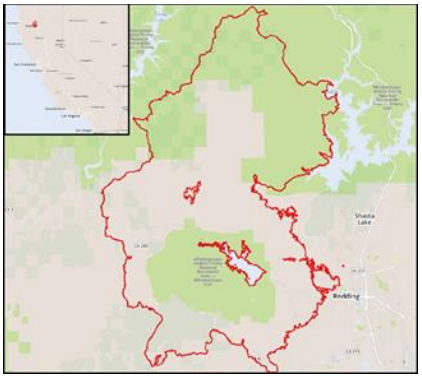
Rainfall accumulation from 03:00 local time on July 2 to 03:00 on July 9 (source: NASA Earth Observatory)

ST Midwest, South U.S.	July 19 to 22, 2018
Midwest and Southern U.S. **Insured losses (in USD millions)** ▪ **>1,000** (PCS) **Fatalities: 0**	▪ Severe storms in Minnesota and Iowa brought at least 5 tornadoes causing damage to buildings, power lines and vehicles. ▪ The Iowa towns of Marshalltown, Pella, and Bondurant were the worst affected areas. ▪ Large hail and wind gusts of 105 km/h were reported. ▪ Roofs were removed from buildings and vehicles were overturned. ▪ A factory in Pella was completely destroyed, with a second plant receiving significant structural damage. ▪ A tornado destroyed or severely damaged an estimated 12 houses in Bondurant. ▪ 17 people were reported to have been injured.



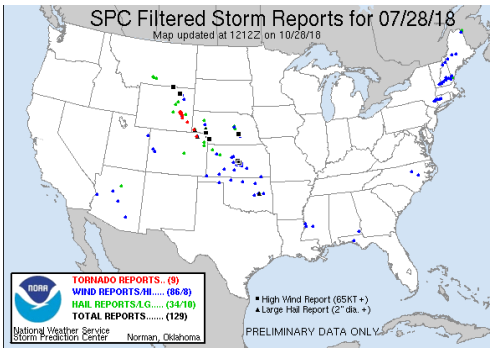
Thunderstorm report on July 19 (source: SPC, NOAA)

WF Northern California	July 23 to August 15, 2018
Northern California, U.S. **Insured losses (in USD millions)** ▪ **>1,000** (PCS) **Fatalities: 15**	▪ A number of wildfires in Northern California, including the destructive Carr and Mendocino Fire, developed at the end of July and were fueled by high winds, low humidity and very dry conditions. ▪ The Carr Fire was the result of a spark from a car. ▪ The fire destroyed 1,884 structures and burned nearly 280,000 ha. ▪ The Carr Fire became the most destructive fire in Shasta County history. ▪ 2,198 structures reported being damaged or destroyed from the 3 fires.



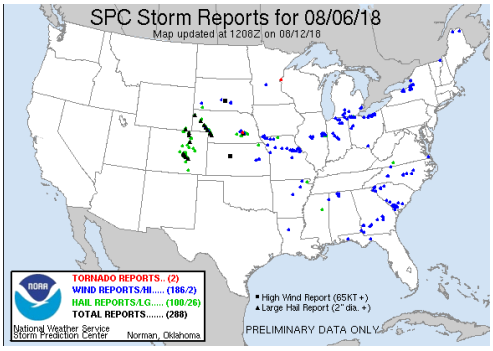
Carr Fire (source: Willis Re via SpatialKey)

ST Midwest U.S.	July 26 to 29, 2018
Midwest U.S. **Insured losses (in USD millions)** ▪ **<1,000** (PCS) **Fatalities: 0**	▪ A cluster of severe storms developed over the upper Rockies and stretched from Idaho into the central plains. ▪ Winds exceeding 148 km/h brought widespread damage to trees, power lines and exterior buildings across Wyoming and Colorado. ▪ Hail up to 89 mm was reported throughout the region, producing property damage. ▪ Several tornadoes were reported, including one in Arapahoe County, Colorado, that caused an injury and ripped a roof off a home. ▪ Heavy rains flowed from these storms, and a flash flood warning was issued for Cheyenne, Wyoming. ▪ The storms moved slowly through the region and resulted in multiple days of severe weather and widespread hail.



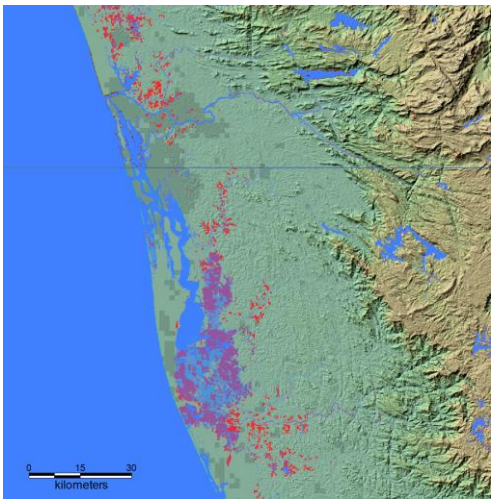
Thunderstorm report on July 28 (source: SPC, NOAA)

HL Midwest U.S.	August 6 to 7, 2018
Midwest U.S. **Insured losses (in USD millions)** ▪ **<1,000** (PCS) **Fatalities: 0**	▪ Severe storms rolled through Colorado, Nebraska and Wyoming, producing damage from hail, winds and flooding. ▪ Large hail up to 4 inches (101 mm) was reported as the main driver of damage affecting the Colorado Springs area. ▪ Up to 400 vehicles at the Cheyenne Mountain Zoo experienced extensive hail damage. ▪ Heavy rainfall was reported to have caused localized flooding in the area. ▪ At least 14 people were injured and thousands lost power in the region.



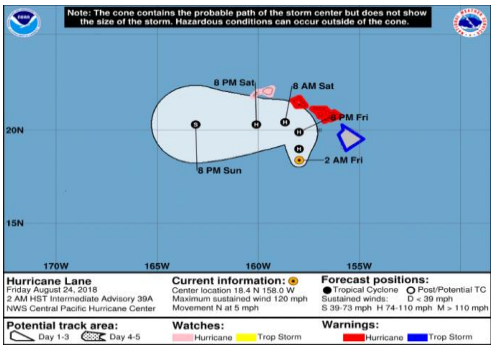
Thunderstorm report on August 6 (source: SPC, NOAA)

FL Kerala	August 8 to 16, 2018
India **Insured losses (In USD millions)** ▪ **330** (Willis Re) **Economic losses (In USD millions)** ▪ **3,000** (Willis Re) ▪ **3,593** (World Bank via Times of India) **Fatalities: >480**	▪ The August 2018 floods were the most damaging to Kerala in the last century. ▪ Between August 8 and 16, heavy rainfall during an active southwest monsoon season led to extensive flooding across Kerala in southwest India. ▪ Average rainfall across the state for the period was 350 mm, 255% above expected (RMS). ▪ Flooding impacted all districts of Kerala, with Idukki, Thrissur, Chengannur, Ernakulam and Kuttand worst affected. ▪ Widespread mudslides and landslides occurred, particularly in the northern hilly districts where the situation was exacerbated by the opening of dams and reservoirs. ▪ >480 fatalities were reported due to rain-related incidents (The Indian Express). ▪ >1 million people were estimated to be displaced due to the flooding (BBC). ▪ Thousands of homes and >10,000 km of roads were destroyed or damaged by the floodwaters (RMS). ▪ Cochin International Airport, the largest in the state, was forced to close for 14 days after floodwaters inundated runways and damaged equipment (Times of India). ▪ Significant agricultural losses occurred in the district of Idukki, where financial losses from damage to tea plantations alone was estimated at USD 129 million, though the vast majority of this was not insured (Business Today).



Maximum observed flooding area from Copernicus Sentinel-1 SAR data. Areas in red and purple show present flooding with areas in blue displaying the reference normal water extent (source: European Space Agency via NASA Earth Science Disasters Program)

HU Lane	August 23 to 28, 2018
Hawaii, U.S. **Insured losses (in USD millions)** ▪ **<100** (US, PCS) **Fatalities: 1**	▪ Hurricane Lane barely missed landfall on Hawaii as it avoided bringing catastrophic hurricane force winds to the island. ▪ The storm reached Category 3 strength before downgrading to a tropical storm as it slid underneath the Hawaiian Islands. ▪ Continuous rainfall associated with the outer rain bands of Lane impacted Hawaii for several days. ▪ 1,295 mm accumulated rainfall was recorded between August 22 and 26. ▪ The record-breaking rainfall led to flash flooding, mudslides and landslides, which caused damage to structures and vehicles, mainly on Hawaii's Big Island. ▪ >200 structures were damaged on the eastern side of the Big Island. ▪ Wildfires driven by the strong gusts associated with Hurricane Lane damaged several dozen structures and vehicles in West Maui.



Hurricane Lane's path as of August 24 (source: NOAA)

TC Jebi	August 27 to September 5, 2018

Japan

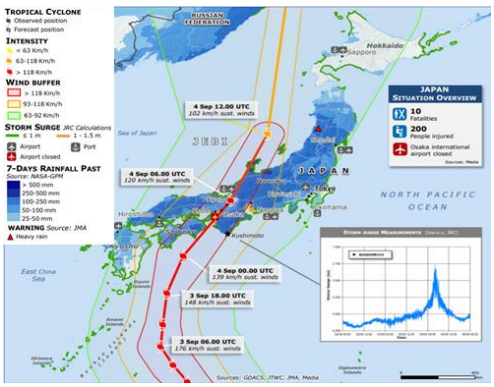
Max. Category 5
Category 3 at landfall

Insured losses (in USD millions)

- **8,500** (Willis Re)
- **6,585** (GIAJ, in claims paid as of Dec 11)
- **7,261–10,248** (AIR)
- **3,011–5,490** (RMS)

Fatalities: >11

- Typhoon Jebi was the strongest storm to hit Japan's mainland in 25 years.
- Having formed in the Pacific on August 27, Jebi reached Category 5 within 3 days and dissipated on September 5.
- At just after 11:00, Japan local time (03:00 UTC), on September 4, Jebi made landfall as a Category 3 typhoon on the island of Shikoku, then made a second landfall near Kobe City a few hours later.
- Wind gusts up to 200 km/h were recorded in the cities of Kobe, Osaka and Kyoto.
- Osaka registered a record storm tide of 3.29 m.
- In Kyoto, a record of over 100 mm rainfall fell in one hour. In other areas, up to 500 mm of total rain was observed.
- >11 fatalities, 400 injured and evacuation advisories for more than a million people.
- Jebi caused significant damage to infrastructure as well as major business interruption, particularly to manufacturing and tourism industries. Shipping and transport were also severely affected.
- 1,138 buildings were damaged across 32 prefectures.
- Many crops were destroyed prior to their harvest, adding to the devastation caused by Typhoon Cimaron.
- Overnight on September 4, >1.6 million households remained without power in Osaka, Kyoto, and 4 nearby prefectures.
- The closure of Kansai International Airport in Osaka for 10 days due to flooding resulted in >700 domestic and international flight cancellations.
- Bullet train services and schools were suspended for one day.
- Significant drop in Osaka's tourism economy, with a fall in restaurant and retail sales of up to 80% in the days following the event.



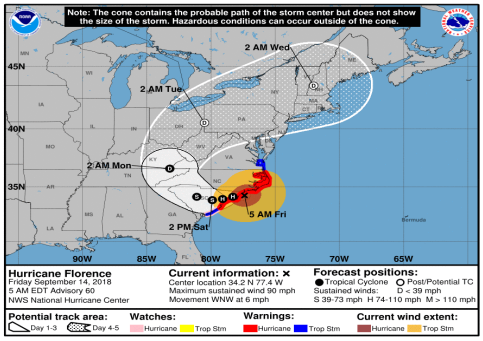
Wind speeds and track of Typhoon Jebi over Japan (source: ERCC via GDACS)

FL Nigeria	September to October, 2018
Nigeria **Economic losses (in USD millions)** ▪ **>1.13** (ERCC) **Fatalities: >299** (GDACS, ERCC)	▪ Total flooded area of 67,392 ha. ▪ Thousands of residents displaced. ▪ Nigerian National Emergency Management Agency (NEMA) declared a state of emergency across 15 states.

Flooded area in Lokoja, Nigeria as of September 20 (source: Copernicus via Tropical Tidbits)

HU Florence	September 13 to 19, 2018
North Carolina, South Carolina, Virginia **Max. Category 4** **Category 1 at landfall** **Insured losses (in USD billions)** ▪ **2.8–5** (US, RMS) ▪ **1.7–4.6** (US, AIR) ▪ **2.5** (US, KCC) ▪ **>1.0** (US, PCS) **Economic losses (in USD billions)** ▪ **6–11** (RMS) ▪ **17–22** (Moody's Analytics) **Fatalities: 53**	▪ Hurricane Florence caused catastrophic and record-breaking rainfall across the Southeast U.S. ▪ Florence formed as a tropical storm on September 1. It slowly strengthened as it moved westward to the U.S., reaching its peak strength at Category 4 intensity on September 5. ▪ The storm eventually weakened to a Category 1 intensity as it approached the Carolina coastline; making landfall near Wrightsville Beach, North Carolina, at 11:15 UTC on September 14. ▪ During the next 48 hours post-landfall, Florence moved slowly inland across the Carolinas causing hurricane-force wind gusts, significant storm surge, and widespread intense and prolonged rainfall. ▪ The Carolinas experienced up to 914 mm of rain, causing catastrophic and life-threatening flooding. Florence set records for the highest tropical cyclone rainfall in both North Carolina and South Carolina. ▪ Multiple tornadoes were reported in the central and eastern Carolinas. ▪ 30 confirmed direct and 23 indirect fatalities in the U.S. ▪ Hundreds of thousands of customers throughout the Carolinas lost power for multiple days.

Wind speed and path of Hurricane Florence (source: NASA, NHC)



Hurricane Florence's path as of September 14 (source: NOAA)

TC Mangkhut	September 7 to 17, 2018

China, Philippines

Max. Category 5
Category 4 (Philippines), 2 (China) at landfall

Insured losses (in USD millions)

- **1,000-2,000 in China** (AIR)

Economic losses (in USD millions)

- **648 in Philippines** (NDRRMC)

Fatalities: 83

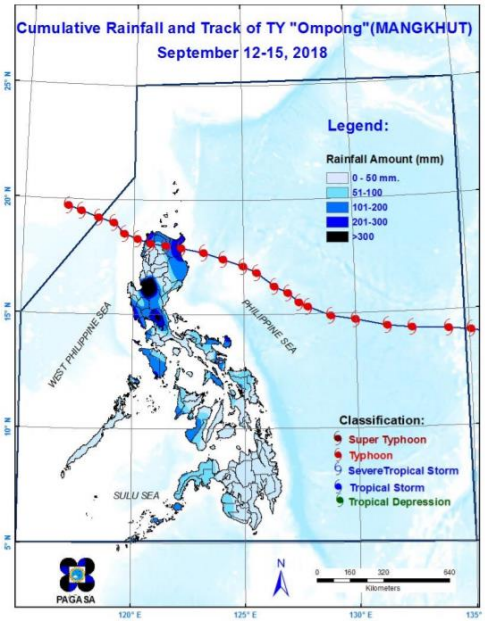
- Typhoon Mangkhut formed in the Northwest Pacific on September 7 and developed into equivalent of a Category 1 hurricane on September 9 before tracking toward Guam.
- Mangkhut made landfall over Cagayan in Philippines at 18:00 UTC on September 14 as a Category 4 typhoon. It then made a second landfall over Guangdong Province, China on September 16 at 09:00 UTC.
- Record-breaking storm surge of 2.35 m at Quarry Bay and 3.38 m at Tai Po Kau was recorded in Hong Kong (RMS).

Philippines

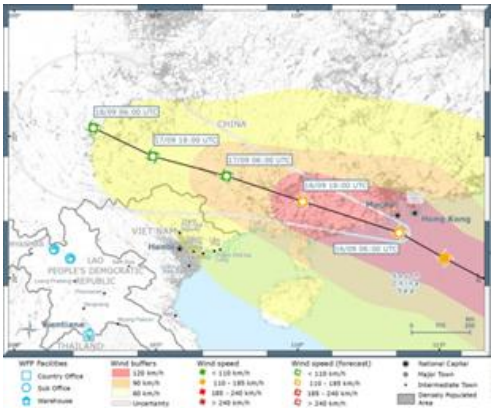
- 210,361 houses were damaged, 325 road sections and 8 bridges were affected.
- 283 domestic and international flights canceled. 198 regions were affected by power outages.
- Classes were suspended in 968 municipalities.
- About 3 million people were affected in the worst-hit parts of the Philippines, and another 11 million further south faced flooding.
- As of September 17, 192,840 people were sheltering in nearly 2,000 evacuation centers.

China

- Up to 2.4 million people were reportedly evacuated from Guangdong.
- >5,500 structures were impacted across southern China, with 1,200 destroyed across 5 provinces.
- Yangjiang was the worst-impacted city in Guangdong.
- >500 residential and high-rise buildings were severely damaged in Hong Kong (RMS).
- As of November 23, parts of Hong Kong remained without water or electricity.

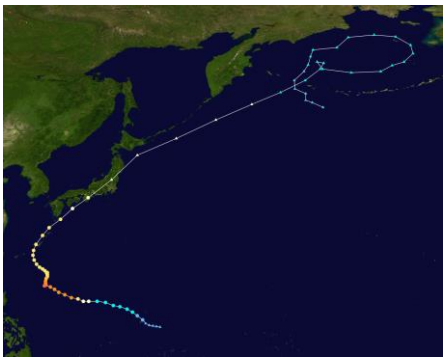


Cumulative rainfall and track of Typhoon Mangkhut in the Philippines (source: PAGASA)

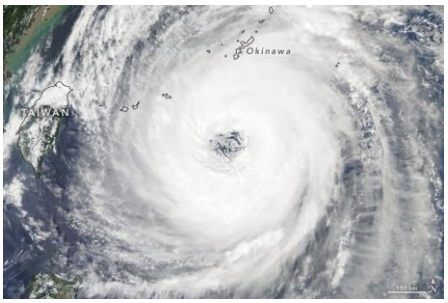


Wind speeds and track of Typhoon Mangkhut at landfall in China (source: World Food Programme)

TC Trami	September 20 to October 1, 2018
Japan **Max. Category 5** **Category 2/3 at landfall** **Insured losses** **(In USD millions)** ▪ **2,000** (Munich Re) ▪ **634–4,069** (AIR) ▪ **2,094** (GIAJ, in claims paid as of Dec 11) **Economic losses** **(In USD millions)** ▪ **2,600** (Munich Re) **Fatalities: 4**	▪ Typhoon Trami made landfall near Tanabe City, Wakayama prefecture, Japan, on September 30 as a borderline Category 2/3 typhoon. ▪ Having initially formed on September 20, the storm strengthened as it moved westward, peaking on September 24 as a Category 5 super typhoon. ▪ After moving northeastward, the storm slowly deteriorated, making landfall as a borderline Category 2/3. ▪ Prior to landfalling in mainland Japan, Okinawa Island was impacted, with sustained winds of 166 km/h (gusts at over 212 km/h) recorded at Kadena Air Base (RMS). ▪ 24-hour rainfall totals, ending September 30, reached 400 mm in some parts of Miyazaki, Kochi and Ehime prefectures. ▪ Typhoon Trami led to 4 fatalities and >200 people were injured (Anadolu Agency). ▪ Over 6,000 buildings were reported damaged across 33 prefectures, with the worst affected regions including Kagoshima, Tokyo and Shizuoka. Most of the damage arose from the strong winds; however, significant flood damage was also reported in Kagoshima and Miyazaki prefectures (FDMA, RMS). ▪ Power outages affected more than one million people due to downed power lines and trees (AccuWeather). ▪ Widespread travel disruption occurred with thousands of flights canceled and rail services disrupted (RMS). ▪ Typhoon Trami was the eighth named storm of the 2018 season to directly impact Japan following Typhoon Jebi less than a month earlier, which was the strongest to hit mainland Japan in 25 years (CNN).



Track and intensity of Typhoon Trami (source: NASA, NOAA)



Typhoon Trami approaching Okinawa on September 28 (source: NASA Earth Observatory)

EQ Sulawesi	September 28, 2018

Indonesia

Magnitude 7.5

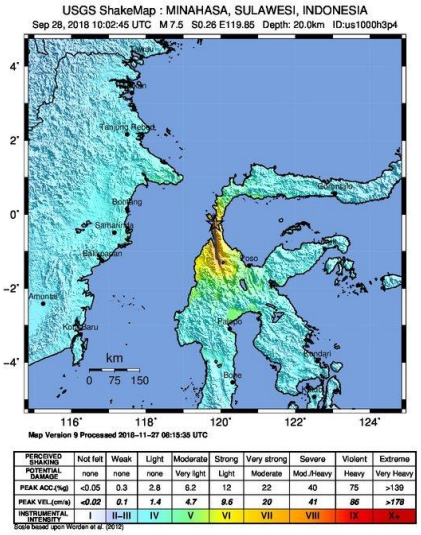
Max. Intensity:
IX – Violent (MMI)

Economic losses (in USD millions)

- **966** (BNPB)

Fatalities: 2,256

- On September 28 at 18:02 local time, a Mw 7.5 earthquake occurred in Sulawesi, Indonesia, as a result of a slip along the Palu-Koro strike slip fault.
- Its epicenter was located 70 km north of Palu at a depth of 20km (USGS).
- There were 4 foreshocks >Mw 4.9 over several hours preceding the main earthquake as well as 40 aftershocks >Mw 4.4 within 5 days following the earthquake (USGS).
- The earthquake triggered a tsunami with estimated wave heights of up to 6 m.
- Tsunamis are not typically associated with strike slip faulting due to the lack of vertical displacement. Recent studies suggest that the tsunami resulted from a large submarine landslide in Palu Bay triggered by the quake.
- There were 2,256 fatalities, making it the deadliest earthquake to strike the country since the 2006 Yogyakarta earthquake, which killed over 5,700 people.
- It is also the deadliest earthquake of 2018, surpassing the Mw 6.9 earthquake that struck Lombok a few months earlier causing over 400 fatalities.
- Over 12,500 people were injured, 223,000 internally displaced, 1,309 missing and 1.5 million people in Central Sulawesi were affected.
- Over 68,000 houses were damaged. There was critical damage to Palu's hospital, closure of the airport and the collapse of many large structures including hotels and bridges.
- The earthquake also caused liquefaction, subsidence and landslides, which contributed significantly toward the fatalities and damage.
- Economic losses are just shy of USD 1 billion; however, insured losses are limited due to low insurance penetration.



Intensity (MMI) map of affected area (source: USGS)

HU Michael	October 10 to 12, 2018

Alabama, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia

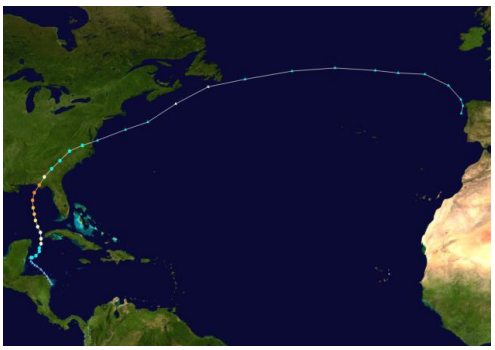
Max. Category 4
Category 4, 3, 2 at landfall

Insured losses (in USD billions)
- **6.8–10** (RMS)
- **6–10** (AIR)
- **8** (KCC)

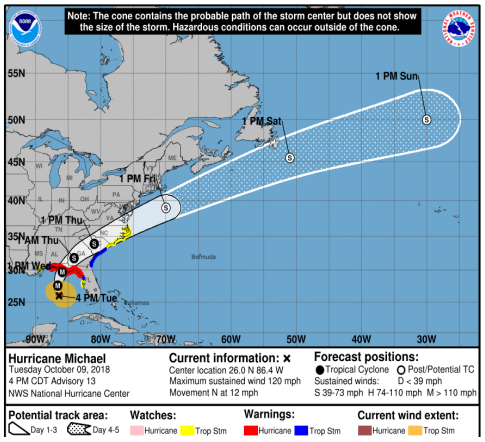
Economic losses (in USD billions)
- **25** (Enki)

Fatalities: 60

- Hurricane Michael was the thirteenth named storm of the 2018 North Atlantic hurricane season and was fueled by uncharacteristically high sea surface temperatures in the Gulf of Mexico.
- Michael formed as a broad area of low pressure over the southwestern Caribbean Sea and slowly morphed into a tropical storm as it drifted toward the Yucatan Peninsula. The storm began to rapidly intensify as it passed through the Yucatán Channel into the warm waters of the Gulf of Mexico.
- Michael collided with western Cuba as a tropical storm causing flash floods and mudslides. Rapid strengthening continued as it neared landfall along the Florida Panhandle.
- Michael made landfall at 17:15 UTC on October 10 near Mexico Beach as a Category 4 hurricane with maximum sustained winds of 250 km/h.
- After bringing disastrous wind and storm surge to the Florida coastline the storm promptly moved through Florida into Georgia, maintaining hurricane intensity over land for more than 11 hours before weakening to a tropical storm.
- Michael tracked into Georgia as a Category 3 hurricane, making it the first Category 3 storm in Georgia on record.
- Michael was the most intense hurricane to make landfall in the continental U.S. since Hurricane Andrew in 1992.
- Most wind damage was limited to the Florida Panhandle and southern Georgia; since Michael was a rapidly moving storm, precipitation accumulation was much less than for Florence.
- Storm surges between 8 and 10 feet along the Florida coast.
- Hundreds of thousands of residents had to evacuate up and down the Gulf Coast.
- Significant damage to single-family and manufactured homes' roofs, hotels, hospitals and schools, as well as heavy damage to piers and boats that were tossed into each other.
- Michael also affected parts of Central America including Honduras, Nicaragua and El Salvador.
- Drenching rains and winds of up to 129 km/h were reported in western Cuba and on Mexico's Yucatan Peninsula.



Wind speed and path of Hurricane Michael (source: NASA, NHC)



HU Leslie	October 13 to 16, 2018

France, Italy, Portugal

Max. Category 1

Insured losses (in USD millions)

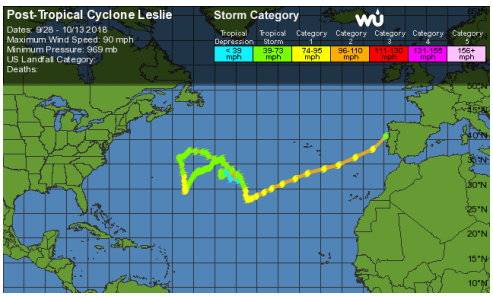
- **277** (Portuguese Association of Insurers and French Federation of Insurance)

Economic losses (in USD millions)

- **>440** (Portuguese Association of Insurers)

Fatalities: 16 (SAPO in Portugal, AFP in France)

- Ex-hurricane Leslie was the strongest cyclone of tropical origin to hit the Iberian Peninsula since 1842.
- First monitored on September 19 as a non-tropical low pressure system southwest of the Azores, Leslie oscillated between being a subtropical and extra-tropical storm over several weeks, reaching peak hurricane intensity on October 12.
- Leslie transitioned into an extra-tropical cyclone late on October 13, before making landfall three hours later in Figueira da Foz, with wind speeds up to 113 km/h.
- The remnants of Leslie reached France by October 15.
- Leslie resulted in Madeira Island's first tropical storm warning on record.
- 16 fatalities: 14 in France from flash flooding, 2 in Portugal and 28 injuries.
- 324,000 houses lost power and >1,000 trees were uprooted.

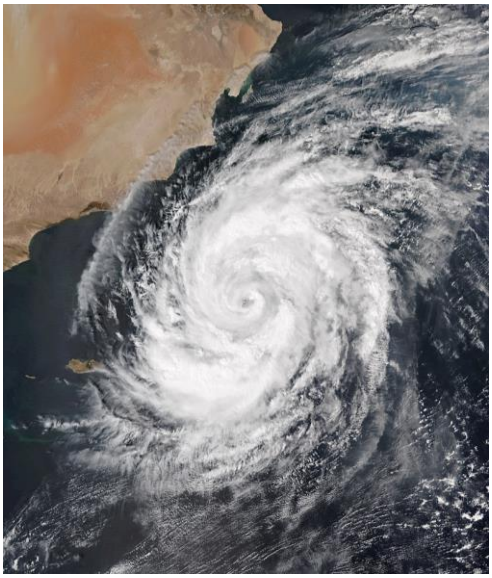


Track and intensity of Ex-hurricane Leslie (source: Wunderground)

Satellite image of Ex-hurricane Leslie (source: NOAA)

TC Luban	October 14 to 15, 2018
Yemen, Oman, Somalia **Max. Category 1 Cyclonic Storm at landfall** **Economic losses (in USD millions)** ▪ **2.55 in Al Mahrah Governorate, Yemen** (Yemen Prime Minister via Debriefer) **Fatalities: 25**	▪ The third tropical cyclone to hit the Arabian Peninsula, Cyclone Luban, made landfall on October 14 in eastern Yemen. ▪ Prior to landfall, Luban reached the equivalent of Category 1 hurricane status with peak 1-minute sustained wind speeds of 137 km/h (JTWC). ▪ Developing initially on October 6, in the central Arabian Sea, Luban followed a steady northwest trajectory until making landfall 30 km south of Al Gaydah with 72 km/h wind speeds (IMD). ▪ Oman, Dalkout and Salalah registered 145 mm and 138 mm of precipitation in 24 hours, respectively, leading to flash flooding (MRMWR). ▪ 25 fatalities in Yemen. ▪ 8,000 people were made homeless in Yemen (Yemen Prime Minister via Associated Press). ▪ Among the worst affected areas was the Al Mahrah Governorate, in which 70% to 90% of infrastructure was damaged (OCHA). The Governorate assigned USD 2.55 million to repairing public utilities and restoring basic services. ▪ Agriculture was also affected with thousands of livestock washed away. ▪ The occurrence of Luban in the Arabian Sea, and another storm Titli in the Bay of Bengal, marks the first time in recorded history that two storms were active at the same time in these basins.

Track and intensity of Cyclone Luban (source: JTWC via WikiProject Tropical cyclones/Tracks)



Cyclone Luban northeast of Socotra on October 10 (source: NOAA)

EQ Greece	October 26, 2018

Zakynthos, Greece

Magnitude 6.8

Max. Intensity: VII – Very Strong (MMI)

Insured losses (in USD millions)

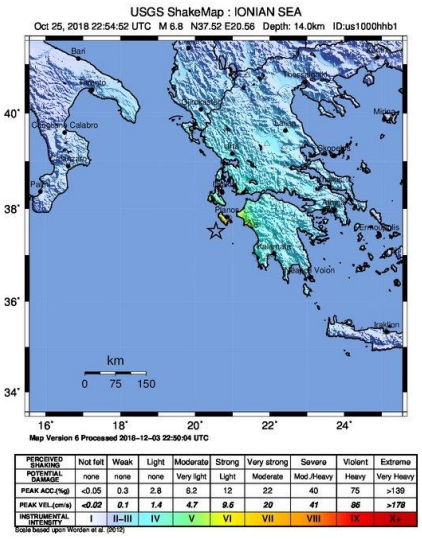
- **2.3–9.1** (Willis Re at October 2018)

Economic losses (in USD millions)

- **1–10** (with 35% probability, USGS)

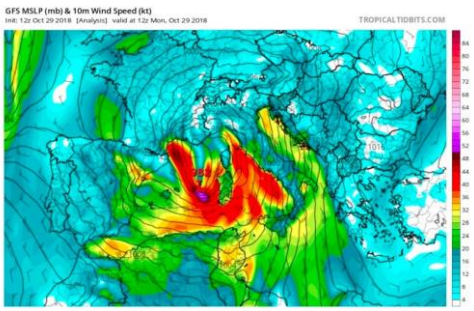
Fatalities: 0

- On October 26 at 01:54 (local time), a Mw 6.8 earthquake occurred in the Ionian Sea, its epicenter located 28 km southwest of Zakynthos, Greece (USGS).
- The earthquake resulted from oblique thrust faulting at 14 km depth, producing shaking of up to MMI VII (very strong) across most of Zakynthos Island (USGS), with shaking also reported as far away as Italy and Albania.
- The main earthquake was followed by multiple aftershocks, the largest of which was a Mw 5.6 on the same day.
- A small tsunami of approximately 20 cm was generated by the earthquake.
- Despite the magnitude of the event, there were no reported casualties, with 3 people suffering minor injuries.
- Zakynthos Island was most significantly affected, with power being lost immediately after the quake. 120 buildings were later classified as uninhabitable and the town itself was found to have shifted laterally by 5 cm (Greek Reporter).
- A 15th century monastery on the nearby island of Strofades was also damaged (Reuters).
- Islands in the Ionian Sea observe stringent building codes following an earthquake sequence in 1953, which caused approximately 450 deaths; this may account for the present day building stock quality.
- The event took place in one of Greece's most seismically active regions, where there is thought to be potential for a Mw 7.1 earthquake within a human lifetime (Temblor).



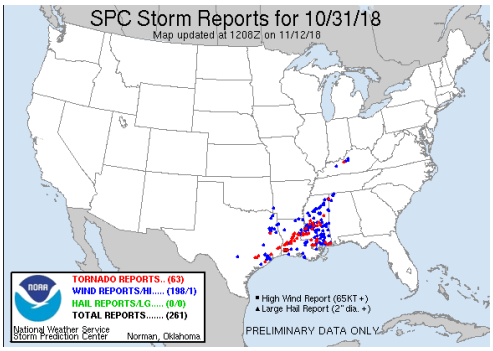
Intensity (MMI) map of affected area (source: USGS)

Severe Weather Italy	October 27 to 30, 2018
Italy, Austria, Croatia, Switzerland **Insured losses (in USD millions)** ▪ **>627** (Willis Re at January 2019) **Economic losses (in USD millions)** ▪ **>3,400 in Veneto, Italy** (Italian Government) **Fatalities: 30** (Italian Government)	▪ On October 27, a strong surface low pressure system (982 mb) located in the western Mediterranean coupled with seasonal high tides, resulting in severe localized flooding in Veneto, Sicily and regions of northeast Italy. ▪ The maximum recorded water level in Venice was 156 cm above sea level. ▪ Countrywide, the flooded area totaled more than 3878 ha. ▪ Water in the rivers of Livenza, Piave, Tagliamento and Adige rose rapidly causing flash floods, mudflows and landslides. ▪ Strong winds were also observed, with peak gusts of 202 km/h on Montecristo, Italy. ▪ 30 fatalities. ▪ Around 14 million trees were uprooted. ▪ As a precaution, many people were evacuated both in Veneto and Friuli Venezia Giulia.



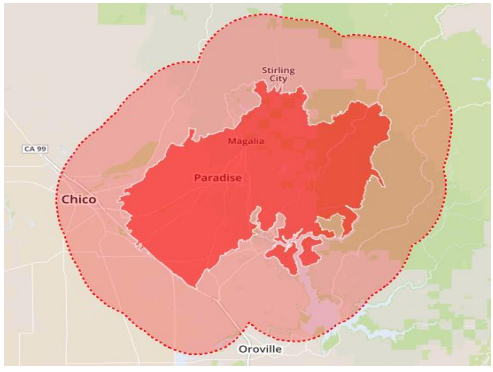
Surface winds across southern Europe on October 29 (source: tropicaltidbits.com)

TO Southwest, Southeast U.S.	October 31 to November 1, 2018
Midwest U.S. **Insured losses (in USD millions)** ▪ **>1,000** (PCS) **Fatalities: 2**	▪ A cluster of severe convective storms produced 12 tornadoes across Texas, Alabama, Louisiana, Mississippi and Kentucky. ▪ Three EF-2 tornadoes occurred during the outbreak, including one in Grant and LaSalle Parishes in Louisiana and in Natchez, Mississippi, damaging over 100 structures. ▪ Damage included roof damage, tree fall, mobile home destruction and school property damage. ▪ >100,000 homes and businesses experienced prolonged power outages. ▪ 2 fatalities. ▪ Homes and businesses weakened by Hurricane Michael were particularly susceptible to damage from these storm outbreaks.



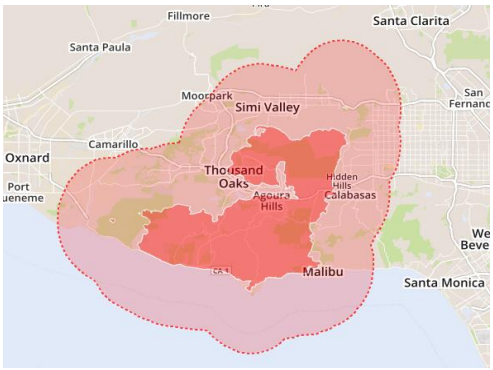
Thunderstorm report on October 31 (source: SPC, NOAA)

WF Northern California	November 8 to 25, 2018
Camp Wildfire **Insured losses (in USD billions)** ▪ **7.5–10** (RMS) ▪ **6–9** (AIR) **Fatalities: 85**	▪ The Camp Fire surpassed all previous records, becoming the deadliest and most destructive wildfire in California on record. ▪ It was the result of a vegetation fire that ignited on November 8 near Camp Creek Road in Butte County. ▪ The fire spread quickly due to low humidity, strong winds and dry fuels. ▪ The Camp Fire destroyed 14,500 structures and burned 62,052 ha in Butte County, California. ▪ This event surpassed the Griffith Park Fire in Los Angeles (1933) as the deadliest wildfire in California state history. ▪ The town of Paradise was essentially wiped off the map, as almost every structure was completely destroyed. ▪ An estimated 52,000 residents had to be evacuated during the fire.



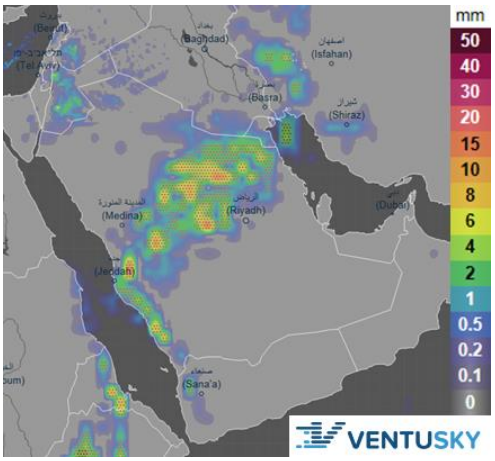
Camp Fire footprint (source: SpatialKey)

WF Southern California	November 8 to 21, 2018
Woolsey Fire **Insured losses (in USD billions)** ▪ **1.5–3** (RMS) **Fatalities: 3**	▪ The Woolsey Fire was a destructive wildfire that burned in Los Angeles and Ventura County. ▪ The fire ignited on November 8 near Simi Valley and proceeded to destroy 1,452 structures and damage an additional 337. ▪ The Woolsey fire became the eighth most destructive fire in California state history. ▪ Gusting winds up to 80 km/h carried the fire and caused difficulty in containing it. ▪ >39,700 ha were burned and an additional 1,800 ha by the Hill Fire, which occurred 7 km northwest of the Woolsey Fire. ▪ 3 fatalities and 3 firefighters injured. ▪ At least 40,000 people went without power for an extended period of time.



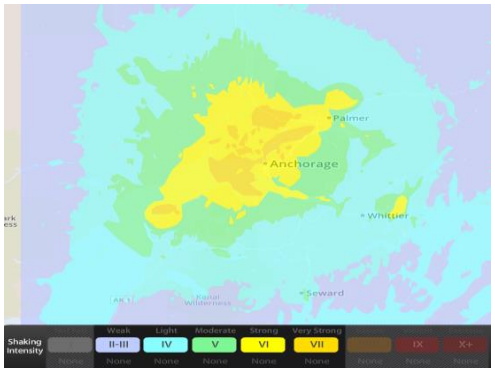
Woolsey Fire footprint (source: SpatialKey)

FL Middle East	November 9 to 15, 2018
Jordan, Kuwait, Saudi Arabia **Economic losses (in USD millions)** ▪ **>328 in Kuwait** (Kuwaiti Officials via Al Seyassah) **Fatalities: 44**	▪ Between November 9 and 15, parts of the Middle East experienced heavy precipitation leading to flash flooding, with Jordan, Kuwait and Saudi Arabia being worst affected. ▪ Kuwait City's International Airport recorded over 95 mm of rain, far exceeding the 19 mm rainfall expected for November (KCMC). ▪ Strong winds with gusts up to 115 km/h were also recorded in Salmiyah to the east of Kuwait City (Al Jazeera). ▪ 13 fatalities in Jordan, 1 in Kuwait, over 30 in Saudi Arabia. A further 400 were injured in Kuwait. ▪ Around 4,000 tourists visiting the ancient site of Petra in Jordan were forced to evacuate after floodwaters rose up to 4 m. ▪ Several areas in Kuwait were also inundated, flooding bridges and main roads and damaging buildings. ▪ Kuwait City's International Airport suspended flights for half a day, while state corporations, banks and Kuwait's stock market also temporarily suspended work (Reuters). ▪ Officials in Kuwait estimated damage of KWD 100 million (~USD 328 million) (via Al Seyassah). ▪ In Saudi Arabia, the Civil Defence evacuated nearly 4,000 people. Jeddah was one of the worst affected areas. In Al Jouf, temporary accommodation was arranged for 2,000 people displaced by the floods (Civil Defence via The National). ▪ 2 weeks prior, 21 people died in Jordan as a result of flash flooding near the Dead Sea.



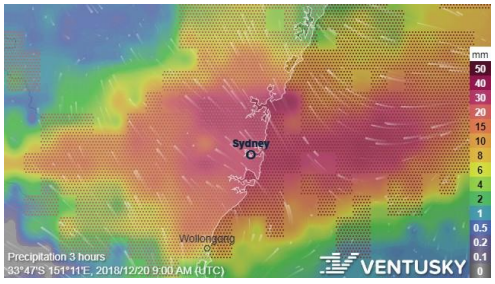
Accumulated precipitation on the Arabian Peninsula between 15:00 and 18:00 (UTC) on November 9 (source: Ventusky)

EQ Alaska	November 30, 2018
Alaska, U.S. **Magnitude 7.0** **Insured losses (in USD millions)** ▪ **<100** (PCS) **Fatalities: 0**	▪ A Mw 7.0 earthquake shook southern Alaska, including Anchorage, the largest city, causing infrastructure damage and property damage to residential and commercial structures. ▪ The initial rupture occurred at a depth of 40.9 km and was followed by a series of aftershocks, the largest of which was Mw 5.7. ▪ There was widespread damage to roads and transport infrastructure. The largest impact was to building contents. ▪ Widespread water and gas leakages were reported. ▪ 2 people were life-threateningly injured, but no fatalities were recorded.

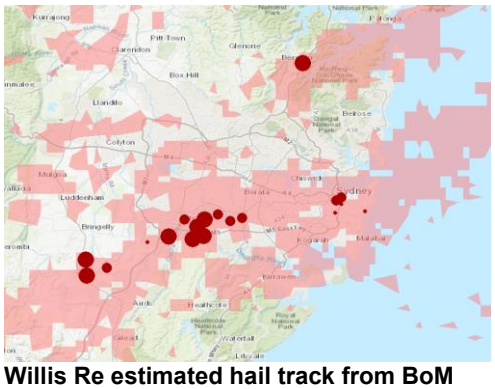


Shaking Intensity MMI scale (source: USGS via SpatialKey)

HL Sydney	December 20, 2018
Sydney, Australia **Insured losses (In USD millions)** ▪ **492** (Insurance Council of Australia via Twitter) **Fatalities: 0**	▪ Severe thunderstorms impacted Sydney during the afternoon and early evening of December 20. ▪ Hailstones of up to 80 mm in diameter were reported within the suburbs of Moorebank, Casula and Berowra, with widespread reports of hailstones of >40 mm elsewhere. Wind gusts of up to 140 km/h were also reported (RMS). ▪ Significant hail damage was reported to property and vehicles, with accounts of roofs, windows and windscreens being damaged (RMS). ▪ There were no reported fatalities or injuries. ▪ >17,000 households were left without power during the storm (RMS). ▪ Transport was disrupted, with some major roads flooded, light rail lines suspended and around 60 flights canceled at Sydney Airport during the peak of the storm (Sydney Morning Herald). ▪ The Insurance Council of Australia shortly declared the event a catastrophe and stated it would be the most costly event of the year for Australian insurers (ICA) (Financial Review). ▪ By the afternoon of December 21, the ICA had received >25,000 claims totaling USD 88.9 million (Financial Review).



Three-hour rainfall accumulation at 20:00 local time on May 20, showing intense thunderstorm activity (source: Ventusky)



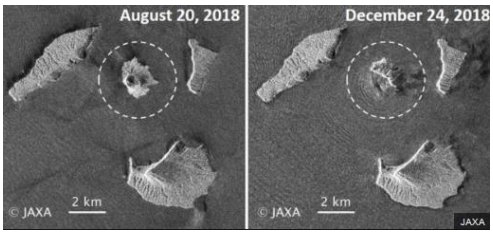
Willis Re estimated hail track from BoM radar data. Circle size relates to hail size. Many reports of >1cm hail across shaded regions

VE and TS Indonesia	December, 22 2018

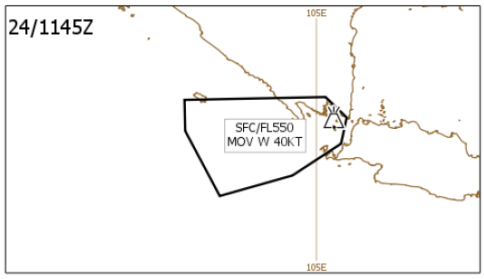
Sunda Strait

Fatalities: 437

- On December 22 at 21:30 local time, the Indonesian volcano Anak Krakatau erupted causing a local tsunami.
- The eruption caused partial collapse of the volcano's southwestern flank underwater. This resulted in a submarine landslide, consequently triggering a tsunami.
- The tsunami wave was approximately 1 m high and traveled up to 20 m inland.
- The worst affected locations were beaches along the coastal regions in Pandeglang, West Java and Sumatra.
- According to the latest reports from BNPB there were 437 fatalities, 14,059 people injured, 33,719 displaced and 16 missing.
- At least 2,752 houses, 92 hotels and villas, and 510 boats were damaged.
- Rescue efforts were challenging due to heavy rain and flooding.
- Anak Krakatau sits in the Sunda Strait between West Java and South Sumatra in the caldera, which formed as a result of the 1883 eruption of Krakatau.
- It has been active almost every day since June, 2018. Volcanic activity is still ongoing mainly in the form of Strombolian eruptions, creating ongoing concerns of additional submarine landslides.
- The ash cloud has been reported to reach altitudes of 55,000 ft, and the plume is traveling west into the Indian Ocean.
- All flights have been diverted to avoid the ash cloud.
- The volcano lost more than two-thirds of its height and volume during the week of the eruption, much of this is likely to be attributed to the collapse of the flank. This equates to 150–170 million cubic meters of material.



Satellite Imagery showing before and after the flank collapse (source: Japanese Alos-2 Radar Satellite)



Volcanic Ash Advisory on the 24th December (source: Australian Bureau of Meteorology)

3. Other natural catastrophe events by peril and location

Events highlighted in the following tables represent those with detailed information presented in the first part of the report.

Windstorm

Name	Date	Location	Losses (USD millions)	Fatalities
Ingmar (Carmen)	Jan 1	France	Insured: <226 (PERILS)	Unknown
Burglind (Eleanor)	**Jan 3**	**Austria, Belgium, France, Germany, Ireland, Luxembourg, Netherlands, Switzerland, U.K.**	**Insured: 1,020 (Munich Re), 856 (PERILS)**	**9**
Friederike (David)	**Jan 17 to 18**	**Belgium, France, Germany, Great Britain, Netherlands, Italy, Central Europe**	**Economic: 2,700 (Swiss Re), 2,700 (Munich Re)** **Insured: 2,100 (Swiss Re), 2,100 (Munich Re), 1,896 (PERILS)**	**11**
Georgina (Helene)	Jan 23 to Jan 24	Ireland, Norway, U.K.	Insured: <226 (PERILS)	>7
Dorcas-Elena (Ali-Bronagh & Knud)	Sep 19 to 20	Ireland, Norway, U.K.	Insured: <226 (PERILS)	2
Fabienne	Sep 23	Germany, Austria, Switzerland	Insured: <226 (PERILS)	1
Zorbas	Sep 26 to Oct 2	Greece, Turkey	Economic: Significant	7
Kuisma	Sep 27	Finland	Economic: Not significant	0
Callum	Oct 12	Ireland, U.K.	Economic: Not significant	2
Ex-Hurricane Leslie	**Oct 13 to 16**	**France, Portugal, Spain**	**Insured: 277 (Portuguese Institute of Insurers & French Federation of Insurance),** **Economic: >440 (Portuguese Institute of Insurers)**	**16**
Penelope	Nov 29 to 30	Greece, Turkey	Economic: Significant	1

Blizzard/Cold Front

Name	Date	Location	Losses (USD millions)	Fatalities
U.S. Winter Storm	**Jan 3 to 6**	**Northeastern and Eastern U.S.**	**Insured: <1,000 (PCS)** **Economic: 1,100 (NOAA)**	**22**
Morocco Cold Wave	Jan 5 to 9	Morocco		0
"Beast From the East"	**Feb 25 to Mar 5**	**Europe**	**Insured: 638 to 765 (Insurance Day)**	**77**
U.S. Winter Storm	**March 1 to 3**	**Eastern U.S.**	**Insured: >1,000 (PCS)** **Economic: 2,200 (NOAA)**	**9**
U.S. Winter Storm	Dec 7 to 10	Southeastern U.S.	Insured: Unknown	Unknown

Severe Thunderstorm (Tornado/Hail/Straight Wind)

Name	Date	Location	Losses (USD millions)	Fatalities
National Severe Weather	Jan 4 to 7	New Zealand	Insured: 23 (Insurance Council of New Zealand)	1
U.S. Severe Weather	**Jan 8 to 10**	**California U.S.**	**Insured: <1,000 (PCS)**	**17**
U.S. Severe Weather	**Feb 24 to 26**	**Midwest U.S.**	**Insured: <1,000 (PCS)**	**Unknown**
Madagascar Storm	Mar 15	Madagascar	Economic: Not significant	>17
U.S. Severe Weather	**March 18 to 21**	**Southern U.S.**	**Insured: >1,000 (PCS)** **Economic: 1,400 (NOAA)**	**9**
U.S. Severe Weather	**Apr 6 to 7**	**Southern U.S.**	**Insured: <1,000 (PCS)** **Economic: 1,800 (NOAA)**	**0**
Severe weather including tornadoes	Apr 10 to 11	New Zealand	Insured: 51 (Insurance Council of New Zealand)	Unknown
U.S. Severe Weather	**Apr 13 to 17**	**Midwest & Southern U.S.**	**Insured: <1,000 (PCS)** **Economic: 1,300 (NOAA)**	**3**
Nationwide severe weather including flooding	Apr 27 to 29	New Zealand	Insured: 14 (Insurance Council of New Zealand)	Unknown
U.S. Severe Weather	**Apr 28 to May 5**	**Midwest U.S.**	**Insured: >1,000 (PCS)** **Economic: 1,000 (NOAA)**	**0**
Central/Western Europe Severe Weather	Apr 29 to 30	Central/Western Europe	Economic: Significant	5
Central/Western Europe Severe Weather	**May to Jun**	**Central/Western Europe**	**Economic: 1,500 (Munich Re)** **Insured: 900 (Munich Re)**	**>5**
Iran Hailstorm	May 3	NW Iran	Economic: **>4**	0
U.S. Severe Storm	**May 12 to 16**	**Northeast, Midwest, Southern U.S.**	**Insured: >1,000 (PCS)** **Economic: 1,400 (NOAA)**	**5**
U.S. Severe Weather	**June 3 to 6**	**Southwest U.S.**	**Insured: <1,000 (PCS)** **Economic: 1,000 (NOAA)**	**0**
U.S. Severe Weather	**June 12 to 13**	**Midwest**	**Insured: <1,000 (PCS)**	**0**
U.S. Severe Weather	**June 18 to 20**	**Midwest U.S.**	**Insured: >1,000 (PCS)** **Economic: 2,100 (NOAA)**	**0**
U.S. Severe Weather	**June 24 to 26**	**Midwest U.S.**	**Insured: <1,000 (PCS)**	**0**
U.S. Severe Weather	June 29 to July 1	Midwest U.S.	Insured: <1,000 (PCS)	0
Western Europe Storm	Jul 3 to 5	France, Germany, Italy	Economic: Not significant	0
U.S. Severe Weather	**Jul 19 to 22**	**Midwest, Southern U.S.**	**Insured: >1,000 (PCS)**	**Unknown**
U.S. Severe Weather	Jul 21 to 26	Northeast U.S.	Insured: <1,000 (PCS)	0
U.S. Severe Weather	**Jul 26 to 29**	**Midwest, Southern U.S.**	**Insured: <1,000 (PCS)**	**Unknown**
U.S. Severe Weather	Jul 30 to 31	Southwest U.S.	Insured: <1,000 (PCS)	0
U.S. Severe Weather	**Aug 6 to 7**	**Midwest U.S.**	**Insured: <1,000 (PCS)**	**Unknown**
New Plymouth - Whakatane Tornados	Aug 20	New Zealand	Insured: 2 (Insurance Council of New Zealand)	Unknown
Central Europe Severe Weather	Aug 23 to 25	Central Europe	Economic: Not significant	0
U.S. Severe Weather	Sep 20 to 21	Midwest U.S.	Insured: <1,000 (PCS)	0
U.S. Severe Weather	**Oct 31 to Nov 1**	**Midwest U.S.**	**Insured: >1,000 (PCS)**	**2**

U.S. Severe Weather	Nov 14 to 16	Northeast U.S.	Insured: <1,000 (PCS)	0
U.S. Severe Weather	Nov 29 to Dec 2	Midwest, Southwest U.S.	Insured: Unknown	Unknown
Sydney Hailstorm	**Dec 20**	**Sydney, Australia**	**Insured: 492 (Insurance Council of Australia via Twitter)**	**0**

Tropical Cyclone — Atlantic Ocean

Name	Date	Location	Category*	Losses (USD millions)	Fatalities
Alberto	**May 28 to 31**	**Florida and Southeast U.S.**	**TS Max Intensity TS on Landfall**	**Insured: <100 (PCS) Economic: 1,300 (Enki)**	**2**
Hurricane Beryl	Jul 4 to 15	Lesser Antilles, Hispaniola, Puerto Rico, Cuba, The Bahamas, Bermuda, Atlantic Canada	1	Economic: Not significant (NOAA)	0
Lane	**Aug 23 to 28**	**Hawaii U.S.**	**5 Max Intensity 3 when it was closest to Hawaii (didn't make landfall)**	**Insured: <100 (PCS)**	**1**
Gordon	Sep 3 to 7	Southeast U.S.	TS	Insured: <100 (PCS)	4
Hurricane Isaac	Sep 7 to 15	West Africa, Lesser Antilles, Haiti, Jamaica, Cayman Islands, Cuba	1	Unknown	Unknown
Florence	**Sep 13 to 19**	**Southeast U.S.**	**4 Max Intensity 1 on Landfall**	**Insured: 1.7–4.6 billion (AIR, KCC, PCS, RMS) Economic: 17–22 (Moody's)**	**53**
Michael	**Oct 10 to 12**	**Southeast U.S.**	**4 Max Intensity 4, 3, 2 on Landfall**	**Insured: 6.0–10 billion (AIR, KCC, PCS, RMS) Economic: 25 (Enki)**	**60**

**Saffir-Simpson Hurricane scale*

Tropical Cyclone — Eastern Pacific

Name	Date	Location	Category*	Losses (USD millions)	Fatalities
Tropical Storm Ileana	Aug 5 to 10	Western Mexico, Baja California Sur	Tropical Storm	Economic: Not significant (NOAA)	4
Tropical Storm Tara	Oct 14 to 17	Southwestern Mexico	Tropical Storm	Economic: Not significant (NOAA)	0
Hurricane Sergio	Sep 29 to Oct 15	Baja California Peninsula, Northwestern Mexico, Southwestern U.S., Texas	4	Economic: Low	2
Tropical Storm Vicente	Oct 19 to 23	Honduras, El Salvador, Guatemala, Southwestern Mexico	Tropical Storm	Economic: Not significant	14
Hurricane Willa	Oct 20 to 24	Central America, Mexico	5	Economic: Not significant A.M. Best states Mexican insures can comfortably absorb the losses (Insurance Journal)	6

**Saffir-Simpson Hurricane scale*

Tropical Cyclone — Northwestern Pacific

Name	Date	Location	Category*	Losses (USD millions)	Fatalities
Bolaven (Agaton)	Jan 1	Philippines	TS	Economic: **11** (ESCAP/WMO Typhoon Committee)	2
Sanba (Basyang)	Feb 13	Philippines	TS	Unknown	9
Ewiniar	Jun 7	China	1	Economic: **746** (ESCAP/WMO Typhoon Committee)	5
Prapiroon (Florita)	Jul 3	Japan	1	Insured**:** Please see Japan Floods	Unknown
Maria (Gardo)	Jul 11	China	5	Economic: **598** (ESCAP/WMO Typhoon Committee)	0
Son-Tinh (Henry)	Jul 17 to 19	China and Vietnam	TS	Economic: **35** (ESCAP/WMO Typhoon Committee)	>21
Ampil (Inday)	Jul 22	China	TS	Economic: **234** (ESCAP/WMO Typhoon Committee)	Unknown
Jongdari	Jul 23 to Aug 4	Japan and China	2 Max Intensity 1 on landfall in Japan TD on landfall in China	Economic: 60 for China (ESCAP/WMO)	0
Shanshan	Aug 8	Japan	2	Unknown	Unknown
Leepi	Aug 11	Japan	1	Insured: Insignificant	Unknown
Yagi (Karding)	Aug 12	China	TS	Economic: **361** (ESCAP/WMO Typhoon Committee)	Unknown
Bebinca	Aug 15	China	TS	Economic: **332** (ESCAP/WMO	Unknown

				Typhoon Committee)	
Rumbia	Aug 17	China	TS	Economic: **5,307** (ESCAP/WMO Typhoon Committee)	53
Cimaron	Aug 23	Japan	3 Max Intensity 1 on landfall	Insured: Unknown	Unknown
Jebi (Maymay)	**Aug 27 to Sep 5**	**Japan**	**5 Max Intensity** **2 on landfall**	**Insured:** **8,500 Willis Re** **6,585 (General Insurance Association of Japan, in claims paid as of Dec 11)**	**>11**
Soulik	Sep 4	Japan	3	Unknown	Unknown
Barijat (Neneng)	Sep 13	China	TS	Economic: **7** (ESCAP/WMO Typhoon Committee)	Unknown
Mangkhut (Ompong)	**Sep 7 to 17**	**Philippines and China**	**5 Max Intensity** **4 on landfall in Philippines** **2 on landfall in China**	**Economic: 648 — Philippines (National Disaster Risk Reduction and Management Council)** **Insured: 1,000 - 2, 000 — China (AIR)**	**83**
Trami (Paeng)	**Sep 20 to Oct 1**	**Japan**	**5 Max Intensity** **2/3 on landfall**	**Economic: 2,600 (Munich Re)** **Insured: 2.094 (General Insurance Association of Japan , in claims paid as of Dec 11)**	**4**
Kong-Rey (Queenie)	Oct 6	South Korea	5	Unknown	>2
Yutu (Rosita)	Oct 25	Philippines	5	Unknown	1

**Saffir-Simpson Hurricane scale*

Tropical Cyclone — Southern Pacific and Oceania

Name	Date	Location	Category*	Losses (USD millions)	Fatalities
Fehi	Feb 1	New Zealand	TS	Insured: 32 (Insurance Council of New Zealand)	2
Kelvin	Feb 18	Australia	2	Not significant	Unknown
Ex-Gita	Feb 20	New Zealand	4	Insured: 24 (Insurance Council of New Zealand)	Unknown
Hola	Mar 7	New Zealand	4	Not significant	3
Marcus	Mar 17	Australia	5	Insured: 45 (Insurance Council of Australia)	0

Tropical Cyclone — Indian Ocean

Name	Date	Location	Category*	Losses (USD millions)	Fatalities
Ava	Jan 5 to 8	Madagascar	2	Economic: **130** (Risk Reduction Africa)	73
Berguitta	Jan 15 to 21	Mauritius, Reunion	3	Economic: Not significant	36
Dumazile	Mar 2 to 7	Madagascar	3	Unknown	0
Eliakim	Mar 14 to 20	Madagascar	Tropical storm	Economic: Not significant	21
Fakir	Apr 26	Reunion	1	Economic: Not significant	>2
Sagar	**May 21**	**Djibouti, Ethiopia, Somalia, Yemen**	**Cyclonic Storm**	**Economic: >30 (UNICEF)**	**89**
Mekunu	**May 25 to 26**	**Yemen, Oman**	**3 Max Intensity 3 on landfall**	**Insured: 403 (Capital Market Authority Oman)**	**30**
Titli	Oct 9	India	2	Economic: **400**	77
Luban	**Oct 14 to 15**	**Yemen, Oman, Somalia**	**1 Max Intensity Cyclonic Storm on landfall**	**Economic: 2.55 (Official Public Committee in Yemen)**	**25**
Gaja	Nov 16 to 18	India	2	Unknown	63

**Saffir-Simpson Hurricane scale*

Flood

Name	Date	Location	Losses (USD millions)	Fatalities
France Flood	Jan 20 to Feb 1	France	Insured: <226 (French Insurance Federation)	Unknown
Bolivia, Argentina Floods	Jan 29 to Feb 08	Bolivia, Argentina	Unknown	6
Brazil Floods	Feb 15 to 21	Barra da Tijuca, Rio de Janeiro	Economic: Not significant	4
Levant Flood	Feb 16 to18	Turkey, Iran, Iraq, Lebanon, Syria	Economic: Not significant	3
East Africa Flood	Mar to May	Democratic Republic of Congo, Kenya, Rwanda, Uganda	Economic: **>215** (Kenyan & Rwandan governments)	Unknown
Kenya Flood	Mar 3 to 15	Kenya	Economic: **>460** (Kenyan Government)	9
North and Central Queensland Floods	Mar 6 to 10	Australia	Insured: 12 (Insurance Council of Australia)	0
Brazil Floods	March 20 to 21	Mirante de Santana, Sao Paulo	Unknown	3
Balkans Flooding	Mar 25 to Apr 5	Greece, Turkey, Bulgaria	Economic: Not significant	Unknown
Israel Flood	April 15 to 23	South Israel	Economic: Not significant	12

Rwanda Flood	Apr 24	Rwanda	Economic: Not significant	>19
Kenya Flood	Apr 30	Kenya	Economic: Not significant	>100
Ankara Flood	May 5	Ankara, Turkey	Economic: Not significant	0
Hobart Storm and Flood	**May 10 to 11**	**Hobart, Australia**	**Insured: 73 (Insurance Council of Australia)**	**0**
Afghanistan Flood	May 9 to 22	Afghanistan	Economic: Not significant	72
Tajikistan Flood	May 17 to 26	South Tajikistan	Economic: Not significant	>6
Ethiopia Flood	May 25	Ethiopia	Economic: Not significant	>32
Hawke's Bay flooding	Jun 3 to 4	New Zealand	Insured: 3 (Insurance Council of New Zealand)	Unknown
Kenya Flood	Jun 7	Kenya	Economic: Not significant	>186
Hawke's Bay flooding	Jun 11 to 12	New Zealand	Insured: 3 (Insurance Council of New Zealand)	Unknown
East Africa Flood	Jun 20	Cote d'Ivoire, Ghana	Economic: Not significant	>25
Bulgaria/Romania Floods	Jun 28 to 29	Bulgaria, Romania	Economic: Not significant	4
Japan Floods	**Jul 3 to 8**	**Japan**	**Insured: 1,675 (General Insurance Association of Japan, in claims paid as of Dec 11)**	**225**
Bay of Plenty flooding	Jul 14 to 15	New Zealand	Insured: 2 (Insurance Council of New Zealand)	Unknown
Afghanistan Flood	Mid July	Afghanistan, Panjshir	Economic: Not significant	>10
Tatra Mountains Flooding	Jul 18 to 19	Slovakia/Poland	Economic: Significant	0
Kerala Floods	**Aug 8 to 16**	**India**	**Insured: 330 (Willis Re)** **Economic: 3,000 (Willis Re)**	**483**
Italy Flood	Aug 21	Italy	Economic: Not significant	>11
Afghanistan Flood	Aug 24	Afghanistan, Kunar	Economic: Not significant	11
Nigeria Flood	**Sep 1 to Oct 31**	**Nigeria**	**Economic: 0.9 (ERCC)**	**299**
Mexico Floods	Sep 18 to 23	Michoacán and Sinaloa, Mexico	Economic: Low (ACAPS)	10
Algeria Flood	Sep 19	NE Algeria	Economic: Not significant	>3
Tunisia Flood	Sep 22	NE Tunisia	Economic: **13.6** (Asia Insurance Review)	6
Iran Flood	Oct 5 to 6	Northern Iran	Economic: Not significant	9
Central America Floods	Oct 5 to 18	Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua	Economic: Low (Relief Web)	Costa Rica: 1, El Salvador: 6, Honduras: 9 Nicaragua: 5
Skjåk Flood	Oct 12 to 15	Skjåk, Norway	Insured: 9 (Finans Norge)	0
France Flood	Oct 15	France	Economic: Not significant	14
Trinidad and Tobago Floods	Oct 18 to 19	Tunapuna, Sangre Grande, Couva Tabaquite Talparo, Mayaro Rio Claro, Chaguanas Borough	Economic: Low (Relief Web)	0
Bududa Flood	Oct 19	Uganda	Economic: Not significant	60

Saudi Arabia Flood	Oct 19	Saudi Arabia	Economic: Not significant	14
Jordan Flood	Oct 23 to 26	Jordan Dead Sea, West Jordan	Economic: Not significant	21
Venice Flood	Oct 27 to 30	Austria, Croatia, Italy, Croatia	Economic: **>3,400** (Governor of Venice)	>30
Paraguay Floods	Oct 29 to Dec	Asunción and San Ignacio	Economic: Not significant	0
Middle East Flood	**Nov 9 to 15**	**Jordan, Kuwait, Saudi Arabia, Iraq**	**Economic: >328 in Kuwait (Kuwaiti Officials via Al Seyassah)**	**44**
Iraq Floods	Nov 22 to 25	Iraq	Economic: Not significant	21
Bodrum Flood	Nov 29	Bodrum, Turkey	Economic: Not significant	0

Earthquake

Name	Local Time	Location	Magnitude (Mw)	Losses (USD millions)	Fatalities
Jan 14	04:18	38km SSW of Acari, Peru	7.1	Economic: **98% probability of losses between 0–1** (USGS)	14
Jan 31	10:37	Afghanistan	6.2	Economic: Not significant	1
Feb 16	16:39	3km S of San Pedro Jicayan, Mexico	7.2	Economic: **38% probability of losses between 10–100** (USGS)	0
Feb 26	3:44	Papua New Guinea	7.5	Economic: **100–1,000** (with 37% probability, USGS)	Unknown
Mar 26	05:14	Indonesia (Saumlaki)	6.4	Economic: Not significant	0
Mar 30	02:24	Tajikistan, Roghun	5.7	Economic: Not significant	0
Apr 24	03:34	Adiyaman, Turkey	5.4	Economic: Not significant	0
May 9	14:11	Tajikistan, Ishkashim	6.2	Economic: Not significant	0
Jun 18	**07:58**	**Japan (Osaka)**	**5.3**	**Insured: 910 (General Insurance Association of Japan, in claims paid as of Dec 11)**	**5**
July 15	05:27	Yemen, 137km SE of Sayhut	6.0	Economic: Not significant	0
	16:39	Yemen, 159km SE Sayhut	6.0	Economic: Not significant	0
July 22	13:37	Iran, Kermanshah	5.8	Economic: Not significant	0
July 23	00:09	Iran, Kerman	5.6	Economic: Not significant	0
July 29	06:47	Indonesia (Lombok)	6.4	Economic: **1–10** (with 43% probability, USGS)	20
Aug 5	19:46	Indonesia (Lombok)	6.9	Economic: **352** (National Agency for Disaster Management)	>476
Aug 17	23:35	Indonesia (Nggilat)	6.5	Economic: Not significant	0
Aug 19	22:56	Indonesia (Lombok)	6.9	Economic: Not significant	14
Aug 21	05:31	24km ENE of Rio Caribe, Venezuela	7.3	Economic: **34% probability of losses between 10–100** (USGS)	0
Aug 26	01:43	Iran, Kermanshah	6.0	Economic: Not significant	2
Sep 6	03:07	Japan (Hokkaido)	6.6	Insured: 298 (General Insurance	41

				Association of Japan, in claims paid as of Dec 11), 132 (AIR) Economic: **1,000** (Asia Insurance Review)	
Sep 7	09:53	Iran, Bam	5.6	Economic: Not significant	0
Sep 28	**18:02**	**Indonesia (Sulawesi)**	**7.5**	**Economic: 966 (BNPB)**	**2,256**
Oct 6	19:11	21km WNW of Ti Port-de-Paix, Haiti	5.9	Economic: **65% probability of losses between 0–1** (USGS)	18
Oct 26	**01:54**	**Zakynthos, Greece**	**6.8**	**Insured: 2.3–9.1 (Willis Re)** **Economic: 1–10 (with 35% probability, USGS)**	**0**
Oct 28	03:38	Romania	5.5	Economic: Not significant	0
Nov 25	**20:07**	**Iran, Kermanshah**	**6.3**	**Economic: 1–10 (with 38% probability, USGS)**	**1**
Nov 30	**08:29**	**Alaska U.S.**	**7.0**	**Insured: <100 (PCS)**	**0**
Dec 1	22:27	Indonesia (Saumlaki)	6.4	Economic: Not significant	0
Dec 26	03:19	Italy, Catania	5.0	Economic: **1–10** (with 35% probability, USGS)	0

Wildfire

Name	Date	Location	Acres Burnt	Losses (USD millions)	Fatalities
New South Wales and Victoria Bushfires	**Mar 18 to 19**	**New South Wales and Victoria, Australia**	**>100,400**	**Insured: 60.3 (Insurance Insider)**	**0**
Swedish Wildfires	**May to Aug**	**Sweden**	**>61,776**	**Economic: >100 (Swedish Forest Agency via Insurance Journal)** **Insured: >87 (Svensk Försäkring via Insurance Insider)**	**0**
Saddleworth	Jun 24	U.K.	>9,000	Economic: Not significant	Unknown
Colorado Wildfire	**June 27 to July 11**	**Colorado, U.S.**	**>108,000**	**Insured: <100 (PCS)**	**0**
Carr, Mendocino California Wildfires	**July 23 to Aug 14**	**Northern California, U.S.**	**>690,000**	**Insured: >1,000 (PCS)**	**15**
Greece Wildfires	**Jul 23 to 26**	**Attica, Greece**	**Unknown**	**Insured: 38.1 (Greece Association of Insurance Companies)**	**99**
Algarve	Aug 1 to 15	Portugal	Unknown	Economic: Not significant	Unknown
Camp California Wildfires	**November**	**Northern California, U.S.**	**>153,336**	**Insured: 6.0–10.0 billion (AIR / PCS / RMS)**	**85**
Woolsey California Wildfires	**November**	**Southern California, U.S.**	**>96,949**	**Insured: 1.5–4.0 billion (PCS / RMS)**	**2**

Drought

Name	Date	Location	Losses (USD millions)	Fatalities
Argentina, Uruguay	**Jan 1 to Mar 31**	**Argentina, Uruguay**	**Economic: 3900 (The Watchers)** **Argentina: 3400 and Uruguay: 500 (Insurance Journal)**	**Unknown**
Afghanistan	April to Present	North and West Afghanistan	Unknown	Unknown
Pakistan	May	Karachi, Pakistan	Unknown	>65
Central America	Jul 1 to 31	El Salvador, Guatemala, Honduras and Nicaragua	El Salvador: 37 (IRFC)	Unknown
Cape Town	*Ongoing*	South Africa	Economic: **495** (South Africa government)	Unknown

Landslide

Name	Date	Cause	Location	Losses (USD millions)	Fatalities
Brazil Landslide	Nov 10	Very heavy rainfall	Niterói, Rio de Janeiro, Brazil	Economic: Not significant (Floodlist)	10 (Floodlist)
Ecuador Landslides	Nov 24	Very heavy rainfall	Limon Indanza Canton, Ecuador	Economic: Not significant (Floodlist)	9 (ReliefWeb)

Volcanic Eruption

Name	Date	Local Time	Location	Losses (USD millions)	Fatalities
Mount Kilauea	**May 3 to Aug 23**	**-**	**Mount Kilauea**	**Economic: 1,300 (Enki)** **Insured: <1,000 (PCS)**	**0**
Volcán de Fuego Eruption	Jun 3	12:00	44 km SW from Guatemala City	Agricultural Economic Losses: 13 (Relief Web)	190 (Reuters)
Anak Krakatau	**Dec 22**	**21:30**	**Sunda Strait, Indonesia**	**Unknown**	**437 (due to associated tsunami)**
Mount Etna	Dec 24	12:00	Catania, Italy	Unknown	0

Abbreviations

Symbols								
	BL	Blizzard		HU	Hurricane		ST	Severe Thunderstorm
	DR	Drought		LS	Landslide		TS	Tsunami
	EQ	Earthquake		ME	Meteoroid		VE	Volcanic Eruption
	EX	Explosion		StS	Storm Surge		WF	Wildfire
	FL	Flood		TC	Tropical Cyclone		WS	Windstorm
	HL	Hail		TO	Tornado			

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