Gallagher Re

Gallagher Re Natural Catastrophe Events report 2021

A summary of insured losses and economic impact due to natural disasters

Volume 10

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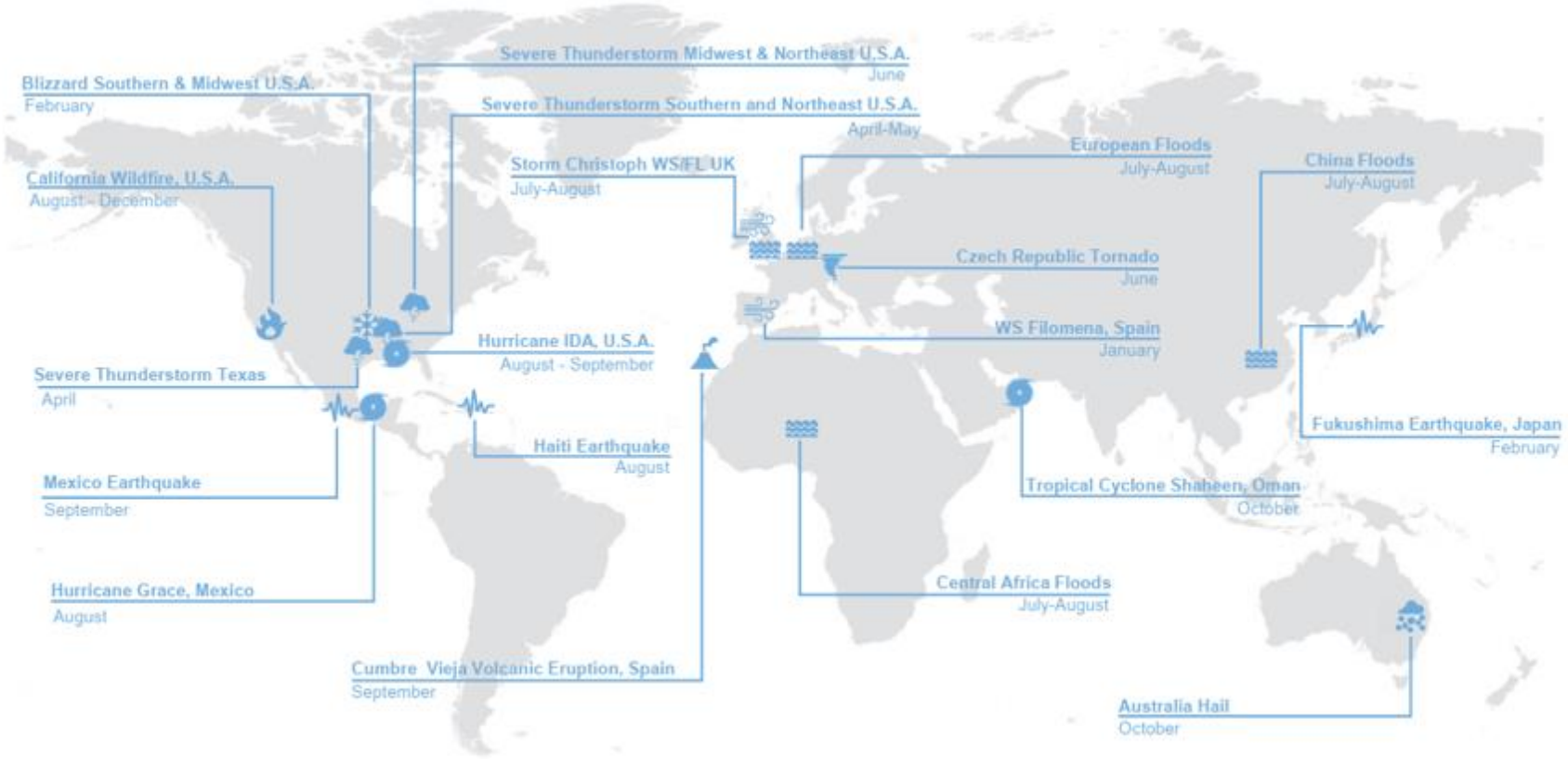
Major natural catastrophes in 2021 per region based on insured losses



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Introduction

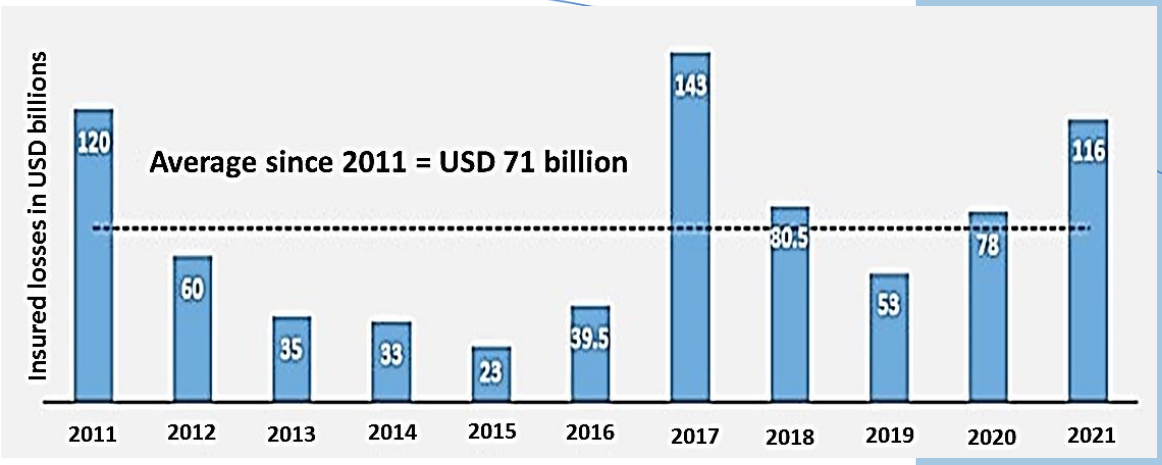
This report summarizes economic and insured losses from the most relevant natural catastrophe events that occurred during 2021. The loss values presented herein include those reported by Gallagher Re, catastrophe model vendors, reinsurance companies and third-party organizations. Loss estimates are presented in U.S. dollars (USD), for which rates of exchange at 1st December 2021, have been used.

Our insured loss estimates from major **natural catastrophes in 2021 of about USD 116 billion** are the third largest since 2011, after the annual market losses of USD 143 billion in 2017, and the USD 120 billion in 2011. The 2021 losses are 63% larger than the average over the past 10 years (see figure below). The largest losses of the year came from Tropical Cyclones with 35% of the overall losses, followed by Severe Thunderstorm with 25% of the annual loss. In terms of insured losses by region, North America had 68% of the total, followed by EMEA (Europe, Middle East and Africa) with 23% of the global loss. It is important to highlight that these estimates do not include losses to the industry coming from either COVID-19 or man-made insured losses.

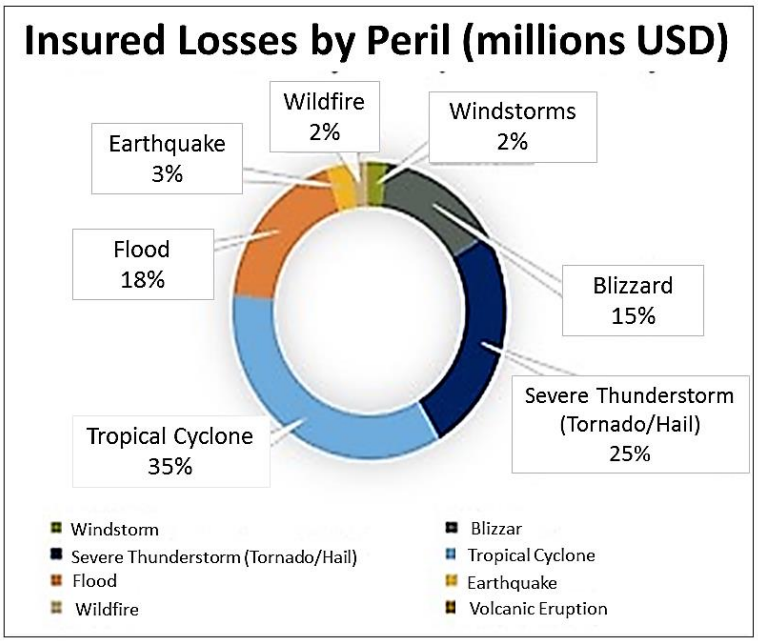
Our insured loss estimates from major natural catastrophes in 2021 of about USD 116 billion are the third largest since 2011.

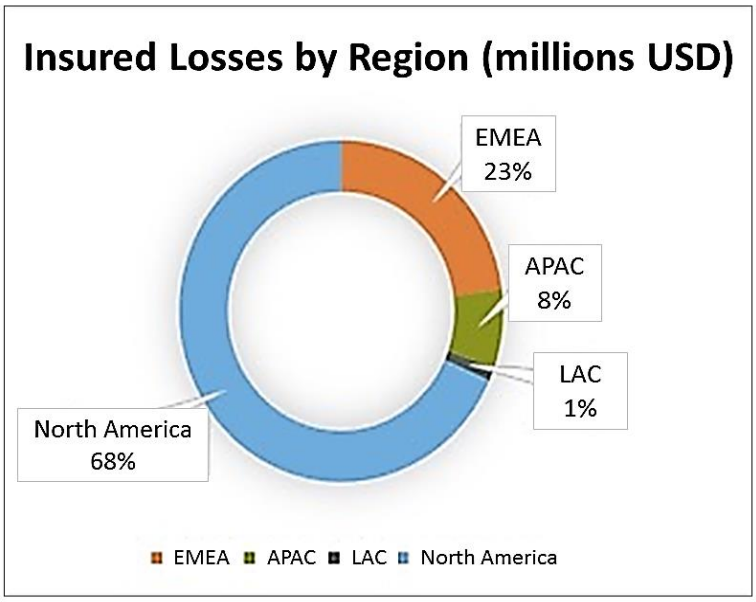
In the U.S. the largest insured losses from a single event came from Hurricane Ida in August with approximately USD 37 billion in all property insured losses (including offshore, NFIP, and write-your-own flood insurance program). Additionally, a series of unusual events such as Winter Storms affecting the South in February, and Severe Convective Storms in the Midwest in December impacted North America (details in the In Focus section). **In Europe,** the largest loss-causing event came in mid-July when Storm Bernd affected mainly Germany and Belgium producing more than USD 13 billion in insured losses. A point worth noting is that the impact from Bernd came as a consequence of the storm remaining in the region longer than expected (see the In Focus section). **In Asia,** in contrast with the tropical cyclone losses observed in Japan during 2018/19, the 2021 season (similar to 2020) saw no single typhoon making landfall in Japan. The events drawing the most attention in Asia were the thunderstorms that affected the Province of Henan in China, while in **Latin America and the Caribbean,** the highlight of the year was the absence of significant individual events causing large insured losses.

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 (Gallagher Re estimates)





Distribution of 2021 insured losses by peril and by region. Tropical Cyclone losses and events in North America were the most impactful in 2021 (Gallagher Re). EMEA: Europe, Middle East and Africa; APAC: Asia Pacific; LAC: Latin America and the Caribbean.

1. In focus

The US in 2021 – An extraordinary year for extreme weather

In the US, 2021 industry losses were driven by unusual events, including: intense winter storms affecting the South in February, hurricane driven inland flooding affecting the Northeast in early September, severe convective storms affecting the Midwest and Ohio River Valley in December, and a prolonged wildfire season with an end of year wildfire affecting the Mountain West.

Potentially caused by a strong negative Artic Oscillation (AC) during the first half of February, unusually cold weather and a series of winter storms affected much of the contiguous US. From February 12th to 20th, the cold-air outbreak brought freezing temperatures, snow and ice from the northern plains across the central US and down to southern Texas *(Figure 1).* Freezing temperatures and heavy snowfall were reported in states that do not typically see extended periods of cold weather, including, Texas, Oklahoma, Arkansas, Missouri, Louisiana and Mississippi. The state of Texas suffered a major power loss affecting more than 10 million homes and businesses for several days. This exacerbated claims in Texas due to burst pipes, which could not be heated without power. Freezing rain and sleet impacted Kentucky and Tennessee, and later the frozen precipitation moved into the MidAtlantic states. The overall economic losses for these events are estimated to be between USD 24 to 27 billion (NOAA) and the overall insured losses are estimated to be near USD 15 billion.

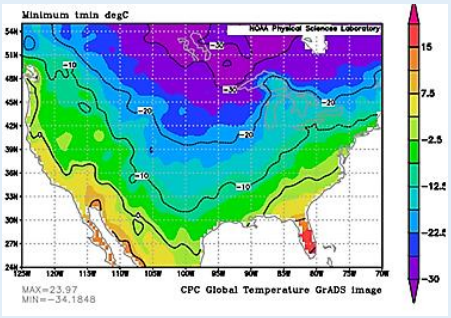


Figure1: Minimum temperature from February 12 to 20 (Source: CPC, NOAA)

The *2021 Atlantic hurricane season* was the third most active on record, with 21 named storms, including seven hurricanes of which four were major hurricanes. It was the first instance on record of two consecutive hurricane seasons exhausting the list of 21 storm names (NOAA). And it marks the sixth consecutive above normal Atlantic hurricane season. The year's most significant insured loss event for US regions is Hurricane Ida, with insured losses expected to exceed USD 37 billion. Ida is the fifth costliest hurricane to have impacted the US landmass, with economic losses estimated to be greater than USD 60 billion (NOAA). Ida made landfall as a Category 4 hurricane near Port Fourchon, Louisiana (*Figure 2*) on 29th August with maximum sustained winds of 150 mph and a minimum central pressure of 930 mb.

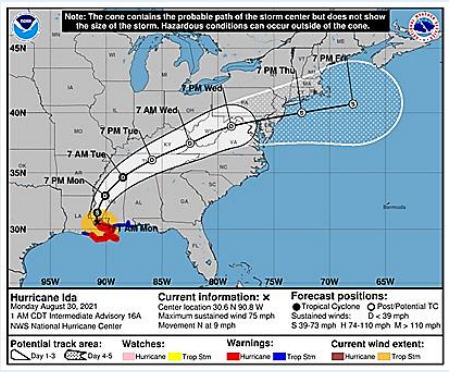


Figure 2: Hurricane Ida's path as of August 30 (Source: NOAA)

Hurricane Ida caused a huge economic loss, due to strong winds and flooding along its track. The widespread and intense rainfall affected highly populated areas from Philadelphia to New York, leading to major flash flooding. Newark and New Jersey recorded approximately 8.4 inches of rainfall per day and New York city recorded approximately 3 inches of rainfall per hour. Flash flood warnings were issued in portions of Kentucky, Louisiana, Massachusetts, Rhodes Island, Tennessee, New York and West Virginia. A major disaster emergency was declared in New York City and neighboring counties, due to hurricane induced rainfall and flash flooding.

Storm Bernd: Largest European Flood Loss on Record

Flooding from Storm Bernd generated large flood losses in central/western Europe, predominately in Germany, Belgium and the Netherlands, with the German Insurance Association (GDV) estimating insured losses of 8.2bn EUR in Germany. The scale of the losses led to reinsurance programs being affected to various extents, and impacted market dynamics at the 1/1/22 renewals at regional levels. Gallagher Re has investigated some of the key characteristics of the event, as discussed herein.

Why was Bernd so damaging?

In Germany, the most affected areas around Erft and Ahr rivers were in very narrow valleys with steep slopes, creating a funnel effect and magnifying the impact of the extreme rainfall. **The fast flowing, debris-laden water caused significant damage to properties** and contamination from debris within the flood-wave led to increased clean-up costs. Furthermore, the impact upon local infrastructure, with bridges and roads destroyed, amplified the overall losses.

Figure 1: Flood debris in Schuld, Germany (Source: AFP)

The main flooding impacts occurred on secondary watercourses, where limited flood defences were in place and hence defence structures generally did not play a large role in protecting properties. However, reservoir dams (like "Steinbachtalsperre") did withstand the rising floodwaters.

How does Bernd compare to historical floods?

Germany has seen major floods in the recent past, with major events in 2002/2013 and flash flooding events in 2014/2016. Like Bernd, the 2013 floods occurred as a result of a stalled weather system, whereas in 2002 multiple weather systems moving from the Mediterranean led to flooding. Whilst the 2013 floods primarily affected the Elbe and Danube, Bernd flooding impacts were observed mainly along smaller river courses, in addition to occurring over a shorter period of time compared to 2013. A common feature of the 2002, 2013 and 2021 events was that soils were saturated in the preceding months to the event, leading to enhanced run-off during the floods. Figure 2 compares the rainfall extent of historical floods. Climate Change may have some influence on the frequency and severity of flood events, with one consequence of climate change potentially being the weakening of the jet stream, which caused the 2013 and 2021 storms to stall leading to more accumulated precipitation.

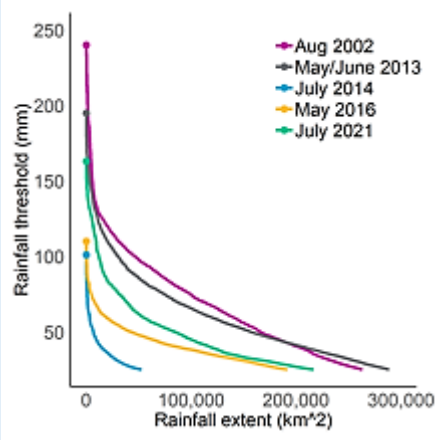


Figure 2: Rainfall extent of historical flooding events. 2002 and 2013 had more severe rainfall with maxima that exceeded Bernd by 20-50% (Source: Gallagher Re)

Are 'Bernd-like' events captured in vendor models?

We assessed the main vendor models to find events that had the key characteristics of Bernd in Germany; namely heavy localised rainfall causing extensive flooding away from the main rivers. We found events that had these characteristics and caused Bernd size market losses, within the vendor models. Other features such as existing soil saturation and the impact of topography are also captured within the models. The inclusion and modelling of impacts such as flow velocity, contamination and debris flows varies between the traditional vendor models.

The 2021 China Henan Floods

Extreme daily rainfall caused by a near-stationary set of thunderstorms affected the Province of Henan, China between the 19th and 21st July 2021 (see Figure 1). This caused flooding, primarily in the city of Zhengzhou, but also in the cities of Gongyi, Luoyang, Jiaozuo, Dengfeng and Ruzhou.

Climate Processes: China's usual monsoon season, known as the **Mei Yu season**, provided moisture for two tropical cyclones which made landfall in late July 2021 – **Severe Tropical Storm Cempaka**, and **Typhoon Infa**. This moist air was funneled from the Mei Yu front towards the foothills of the **Taihang Mountains**. Cooling and Condensation of this moist air resulted in a large area of intense thunderstorms forming near the city of Zhengzhou.

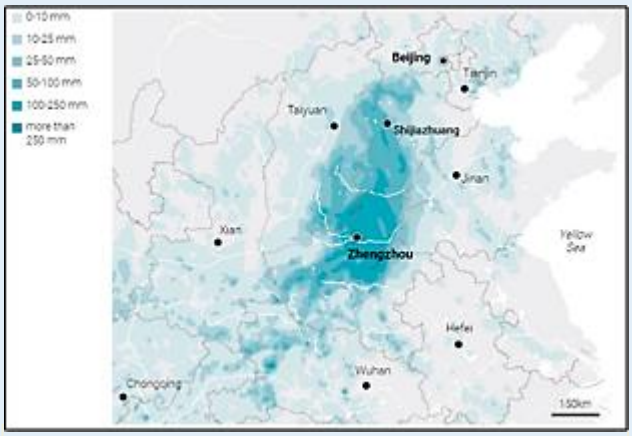


Figure 1: 24-hour rainfall accumulation from 06:00 UTC between 20th & 21st July 2021 (Source: South China Morning Post)

In the 24 hours between 21:00 UTC 19th and 20th July Zhengzhou received *644.6 mm* of rainfall, which is greater than the average annual precipitation of *640.9 mm*. On 20th July this event also broke the record for the highest one-hour rainfall amount across the whole of China, with *201.9 mm/hr* falling between 08:00 & 09:00 UTC. This is compared to the previous record of *168.3 mm/hr.*

In the Provincial capital of Zhengzhou, shown in Figure 2, there was widespread flooding of the subway system. In the city of Luoyang, a 20-meter breach occurred along the Yihetan Dam, forcing the military to perform a controlled blast to release the flood waters. To date it is estimated that the event has caused 302 fatalities and insured losses of more than USD 1.92 billion. These losses followed the 2020 floods which affected Guangxi, Guizhou, Sichuan, Hubei and Chingqing.

Figure 2: Aerial view of the flooded main urban area in Zhengzhou, Henan province. (Source: Getty Images)

Figure 3: Satellite image of Floodwaters in Henan, China, on July 26th, 2021. (Source MODIS; NASA Aqua)

Latin America and the Caribbean: A relatively benign year impacted by compound peril events

In Latin America and the Caribbean, the impact of natural catastrophes has been relatively low, which is reflected in low insured loss totals. The 2021 North Atlantic Hurricane season was the third most active in history, yet the impact on the region was not very significant when compared to the United States. Compound perils have been a feature of 2021, as Hurricane Elsa caused flooding after the volcanic eruption in St. Vincent. Similarly, Tropical Depression Grace brought heavy rain and flooding in the aftermath of Haiti's August earthquake.

Figure 1: Hurricane Grace's path as of 18th August (Source: NOAA NHC)

Although the 2021 North Atlantic Hurricane season was very active, the impact of tropical cyclones on Latin America and the Caribbean has been less severe compared to last year, which had major hurricanes Eta and Iota developing late in the season and making landfall in Central America. Hurricane Grace, a Category 3 storm, developed during August and was the most damaging storm for the region. Grace made two landfalls in Mexico: as a Category 1 storm in the Yucatán peninsula, before rapidly intensifying in the southern Gulf of Mexico to Category 3 hurricane, making landfall in Veracruz. Heavy rainfall and high winds caused flooding and power outages across the Caribbean, with the most severe damage in Mexico. Additionally, Mexico was impacted by six landfalling tropical cyclones from the eastern Pacific, the strongest of which was Hurricane Rick, which made landfall as a Category 2 storm in Michoacán.

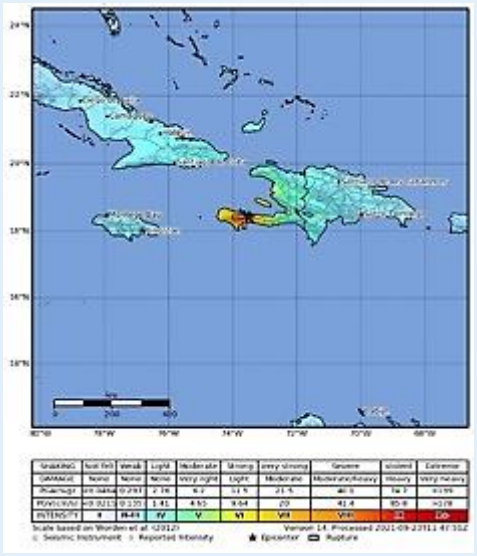


Figure 2: Shaking Intensity (MMI) footprint for Haiti earthquake (Source: USGS)

The most damaging event for the region occurred on 14th August when a 7.2Mw earthquake struck Haiti, causing over 2,000 fatalities (Relief Web). This was compounded by Tropical Depression Grace which brought heavy rainfall on 16th August causing flooding and landslides, which, in turn, hampered the ongoing relief effort. Insured losses were estimated to be around 250 million USD (KCC), despite economic losses reaching approximately 1.6 billion USD (IDB). This further highlights the protection gap faced by less economically developed countries in the region.

Figure 3: La Soufrière Volcano as of 9th April (Source: NASA)

2021 saw the first significant volcanic eruption in the region since Volcán de Fuego in Guatemala erupted in 2015. La Soufrière volcano, on the Caribbean island of Saint Vincent, erupted explosively on 9th April and periodic eruptions continued until 22nd April. Ashfall caused damage to crops and livestock, plus disruption to water and power supplies. Roughly 16,000 people had to be evacuated (UNOCHA), and economic losses are estimated to range between 230-330 million USD (UNDP). Similar to the earthquake in Haiti, the effects of the eruption were compounded by heavy rains from storms including Hurricane Elsa. This caused flooding and landslides, and re-mobilised volcanic ash as lahars on the island.

Japan 2020-2021 Tropical Cyclone Season

The average annual Japan landfalling typhoon frequency is around 3 (using 1991-2020 average). 2021 saw no typhoons making landfall in Japan. The activity seen between 2018-2021 is within expectation and does not suggest a change in activity level compared to the past.

The tropical cyclone (TC) season in the Western North Pacific basin (WNP) for 2021 started with slightly above average activity until July, after which the number of events remained below average.

In Japan there have only been three minor landfalling Tropical Storms (TS) this year: ***TS Nepartak*** in July, ***TS Lupit*** in August and ***Typhoon Chanthu*** in September. All three had weakened to below Category 1 Saffir Simpson Hurricane Scale (SSHS) equivalent and are not considered to be significant landfalls.

Figure 1: Landfalling and bypassing TCs around Japan from 2020 (dark blue) and 2021 (light blue)

2020 was similar, with no significant storms making landfall in Japan. However, unlike 2021, the number of TCs forming was closer to the WNP basin activity average. The number of landfalls in Japan does not directly correlate to overall TC formation frequency.

This contrast was best observed with the 2018-19 seasons when several significant and large typhoons made landfall.

Meteorological factors affecting landfalls

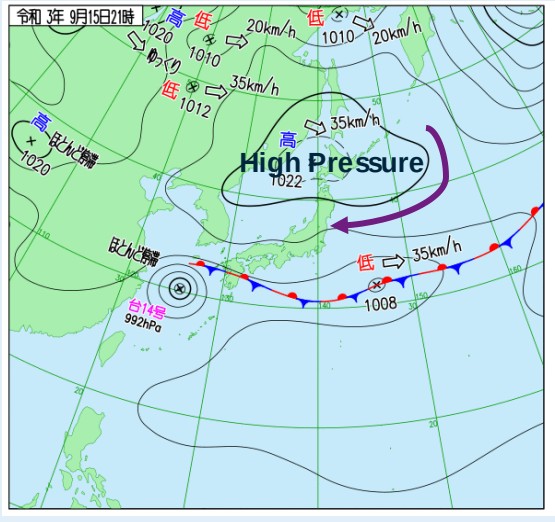


Figure 2: Meteorological map for 15th September 2021, showing a high-pressure system to the north of Japan, steering the TC south away from Japan (Source: JMA)

In 2020, the Japan Meteorological Agency (JMA) described the lack of landfalls as *"ultimately coincidental"* due to a variety of factors, including high sea surface temperatures in the Indian Ocean. This factor contributed to neutralising the convection currents in the Philippine Sea, where the majority of TCs develop [1]. This in turn led to fewer storms developing. From August onwards, there were **high pressure systems in the North Pacific which blocked storms from tracking into Japan**. These systems stagnate over the area, unmoving, and re-route surface air flow around them, preventing TCs from approaching Japan and therefore reducing landfall (See Figure 2). A similar situation appears to have occurred in 2021.

Secondary Perils: Informed decision-making through risk quantification

At Gallagher Re we have the tools and understanding to use analytics to facilitate discussions and ultimately improve resilience to secondary perils. Below we detail several cases of our analytical capabilities with regards to these.

Severe Convective Storms index: In response to market concern over Severe Convective Storms within the Southern European region, Gallagher Re developed the Severe Convective Storm index (SCSi). Utilising remote sensing data, the SCSi is used to assess the changing frequency and location of Severe Convective Storms over the past 40+ years. The applications of the index are broad, ranging from improving resilience through underwriting assistance to validating the performance of aggregate covers based on trends in exposure and claims. Regular reports on events are released throughout the season and at year's end to keep clients and carriers informed on the ever-changing seasonal progression.

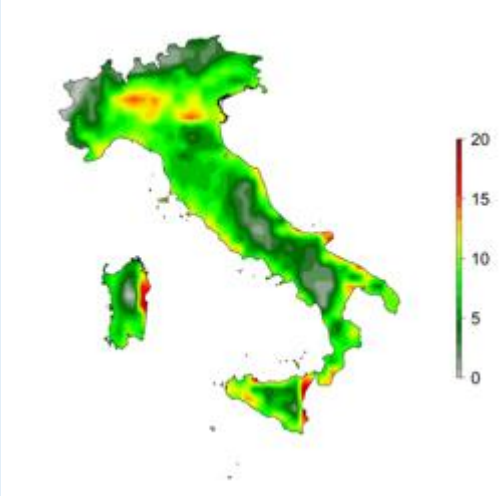


Figure 1: Gallagher Re's Severe Convective Storm index over Italy in 2021

Subsidence Model: France has experienced an increase in the frequency and intensity of subsidence events since the beginning of this century. The last three years, 2018 to 2020, have been particular in terms of subsidence risk, with more than 1 billion euros in average losses per year. In response to this, Gallagher Re has built a new subsidence model to enable our clients to understand their portfolio's exposure to subsidence risk. By building our own View of Risk, Gallagher Re can provide varying support, from reserving and underwriting, to reinsurance, and helping our clients to protect earnings volatility. A first estimation for the number and cost of claims at commune level is obtained in early September of each year.

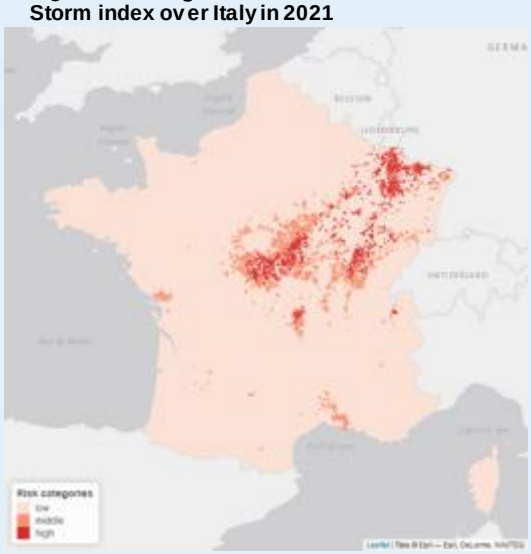


Figure 2: 2019 subsidence risk map over France developed by Gallagher Re.

Primary and Secondary Peril Correlation: Often primary and secondary perils can be combined into single covers. Such arrangements require an understanding of the dynamic of interaction between the perils to fully quantify the risk. Using our in-house model research and evaluation expertise Gallagher Re can assess the existence and extent of correlation between commonly grouped events. An example study was conducted in France, where the correlation between SCS events and other perils were studied. The study found a range in correlation magnitudes between SCS events and straight-line wind, heavy rain and extratropical cyclone.

Model Development: Where no models exist Gallagher Re has the in-house expertise to develop market-leading models. Recently Gallagher Re has pioneered the first **flood model for the MENA region** helping our clients to derive actionable insights for a previously unmodelled peril and enabling risk quantification in all key property lines of business.

For more information about how this or any of the other offerings outlined above may be used or adapted to suit your needs please contact your Gallagher Re advocate.

2. Major natural catastrophes in 2021

WS Filomena

8-10 January 2021

Spain

Insured losses
(in USD millions)

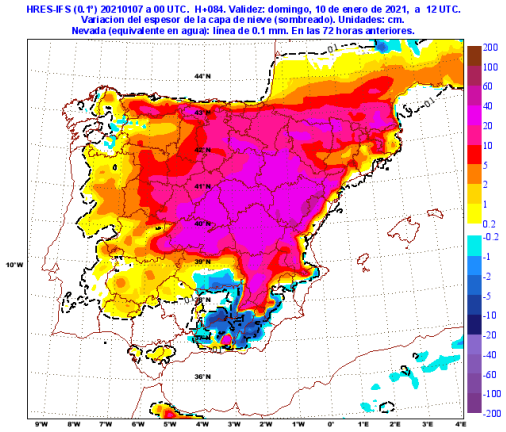
- Total: 832
- Private Insurers: 259 (UNESPA)
- State Compensation Fund: 573 (Ministerio del Interior)

Fatalities

- 4 (Spanish Government Official)

Timeline and Meteorology

- 5th January – The low-pressure area is located just to the West of the Azores. The Spanish Meteorological Agency (AEMET) name the storm, Filomena. Spain was subjected to cold polar air for several days (AEMET).
- 8th – 10th January – The extratropical cyclone meets with the polar flow, bringing exceptionally heavy snow to central, eastern, and northern Spain (AEMET).
- 10th – 17th January – The cyclone passed, and the anticyclonic conditions re-formed over Spain. The anticyclone, combined with the effect of snow on the ground, produced a 7-day severe cold spell.
- These extreme conditions could be attributed to a Sudden Stratospheric Warming event, which disrupted the jet-stream. (AEMET; Met Office).



Snow accumulation for 7-10th January (AEMET image)

Impact

- 30-50cm of snow fell in central, northern, and eastern Spain for 8-10th January (AEMET). Heaviest snowfall in Madrid since 1971 (AEMET).
- Mean daytime temperatures for 1st – 17th January were 3.8°C below the 1981-2010 baseline, and several record low temperatures were set. In the mountainous eastern city of Teruel, -21.0°C was recorded (AEMET).
- 7 of Spain's 17 autonomous communities were recognized as eligible for state-funded insurance compensation. 573 million USD granted by Spanish government for 6,643 claims (Ministerio del Interior).
- 113 million USD of damage to the agricultural industry in central Spain (European Parliament)

Minimum temperature recorded on 12th January (AEMET image)

WS/FL Christoph	18-20 January 2021

UK

Insured losses (combined for all countries)
(in USD millions)

- 106-159 (PwC)

Fatalities

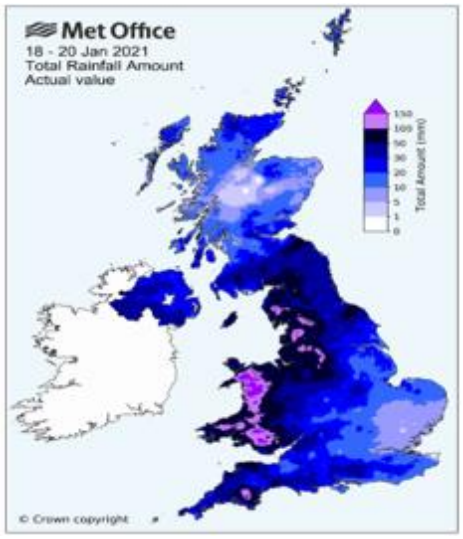
- Unknown

Timeline and Meteorology

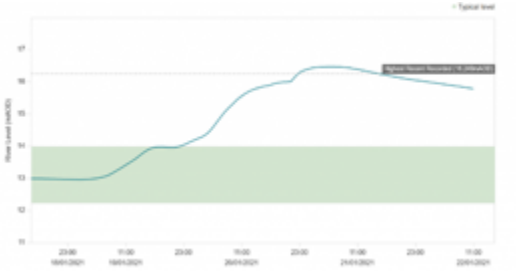
- 18th January – Christoph is recognized as a low-pressure system and named by the Met Office. Amber alerts are issued (Met Office).
- 18 - 20th January – 50 to 100mm of rain falls across Wales and north-west England. 100mm falls in parts of Wales, south-west England, the Lake District, and the Pennines. As much as 200mm falls in localised areas (Met Office).
- 20-21st January – Flooding affects basins in Wales, northwest England and Yorkshire, (300 flood warnings had been issued by the Environment Agency in the days prior) (RMS).

Impact

- The River Dee reached its highest ever recorded level, 16.46m on Jan 21 (Floodlist).
- Estimated 5800 properties were affected by floodwater in total (RMS).
- Approximately 3000 inhabitants had to be evacuated from homes in Greater Manchester (RMS).
- A bridge over the River Clwyd in Denbighshire was swept away by floodwater (Met Office).
- Train lines were affected by floods between Liverpool, Manchester, York and Darlington (RMS).
- The Environment Agency reported that 38'000 properties had been saved by flood defences (Environment Agency)



Actual rainfall values during Storm Christoph (Met Office image)



River Dee hydrograph during Storm Christoph (Floodlist image)

BL Southern U.S.A. 12-15 February 2021

Southern & Western U.S.A.

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

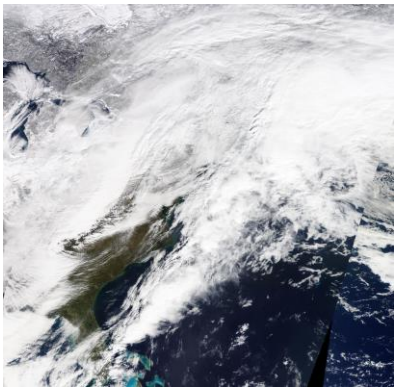
Timeline and Meteorology

- On Feb 12th, a large upper-level trough brought heavy precipitation to the Pacific Northwest.
- Ahead of the system, scattered rain/snow impacted parts of OR and WA throughout the day.
- As a surface low moved over the Pacific Northwest on the 13th, heavy snowfall impacted northwestern Washington, with areas further south along the OR coastline receiving heavy rainfall.
- Snowfall tapered off for Colorado during the evening hours on the 14th, with accumulations reaching 4-6" at lower elevations, and 12-18+ at higher elevations.
- The upper-level trough began to dip over Texas and the southern Plains late on the 12th into the 13th.
- Four to eight inches of snowfall impacted many areas across the north/central region Texas, with some areas seeing higher amounts.
- The winter precipitation from this storm system moved out of Texas during the evening hours on February 15th and later was followed by another system generating similar winter weather conditions.

Impact

- Texas was most impacted by this event with huge supply chain disruption of various products.
- Emergency were declared in all 254 counties of Texas, 9 counties in Northwestern Oregon and Clark County in Washington.
- Close to 500,000 properties were affected by power outages.
- According to media reports, there have been reports of damage to residential structures as well as downed trees and powerlines across various areas of the state.

Winter storm reported on February 13 (source: SPC, NOAA)



Satellite image of the large winter storm on February 16, 2021. (source: NASA EOSDIS Worldview)

Japan Earthquake | 13 February 2021

Offshore Fukushima

Insured Loss Estimate

(in USD millions)

- 2,134 (GIAJ + Zenkyoren)
- 2,630 (CRESTA Estimate)

Fatalities

2 (FDMA)

Timeline and Summary

- 13th February - At 14:07 UTC (23:07 local time), a magnitude Mw7.1 earthquake struck offshore of Fukushima, Japan, approximately 44.7 mi (72.0 km) east-northeast of Namie at a depth of 27.3 mi (44.0 km) (USGS).
- The earthquake was felt across eastern Honshu, Hokkaido and the Greater Tokyo Area (RMS).
- No tsunami warnings were issued by authorities, although a maximum tsunami height of 0.2 m (0.65 ft) was observed at Ishinomaki Port, Miyagi (RMS).
- The Japan Meteorological Society considered the earthquake to be an aftershock of the March 2011 Mw9.0 Tohoku earthquake (RMS).
- More than 19 million people experienced 'Moderate' shaking on the Modified Mercalli Index (MMI) scale, and over 2 million people experienced 'Very Strong' shaking (RMS).

Impact

- More than 950,000 homes in the Tohoku and Kanto regions of eastern Honshu did not have access to power and many power plants throughout the country went offline (RMS).
- Several thousand homes within Miyagi and Fukushima prefectures were temporarily left without water supply, and there were reports of damage to infrastructure throughout the impacted prefectures (RMS).
- The Fire and Disaster Management Agency (FDMA) estimated that 36,299 buildings suffered some form of damage (FDMA).
- One of the most impacted cities was Sōma, in which the photograph in figure to the right was taken.
- Within the city, a 100 m (330 ft) section of the fishing port was vertically displaced by up to 10 cm (3.9 in), with liquefaction resulting in sand ejection from fissures in asphalt near the wharf (The Japan News).
- In Sendai and Shiogima, two fires broke out as a result of the earthquake. Both were extinguished by the fire department with no known injuries (FDMA).

ShakeMap from USGS for the Mw7.1 earthquake that struck offshore from Fukushima in February 2021 (Source: USGS).

Rockfall following Mw7.1 earthquake intrudes road in the city of Sōma, Japan (Source: Associated Press).

BL Southern & Midwest U.S.A.

16-20 February 2021

Southern & Midwest U.S.A.

Insured losses
(in USD millions)

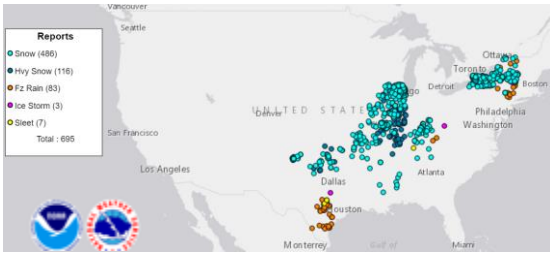
- **>1,000** (PCS)

Timeline and Meteorology

- On February 16th, after very cold temperatures remained in place over Texas and the southern Plains, a slow-moving, upper-level trough moved eastward over Texas.
- Scattered snowfall moved into northeastern Texas, Oklahoma, and Arkansas, eventually became more widespread overnight.
- The heaviest snowfall fell in parts of northeastern Texas, central-southern Arkansas and northwestern Mississippi.
- Freezing rain and sleet impacted Kentucky and Tennessee, and later the frozen precipitation moved into the Mid Atlantic states.
- Extremely cold temperatures continued across Texas, Louisiana and the southern states.
- Widespread winter precipitation continued across the eastern states and widespread snowfall and freezing rain impacted the Mid-Atlantic, with heavy snow falling in parts of New York.

Impact

- Heavy snowfall blinded motorists as many vehicles crashed in a slow chain reaction on an icy Interstate road in Lonoke, Arkansas.
- Total snow accumulations from the storm ranged from 6 to 10 inches in the state of New York.
- Snow and ice accumulations impacted roadways primarily in West and Middle Tennessee resulting in hazardous travel conditions in state of Tennessee.
- Emergency was declared several counties of Oklahoma and Texas.
- Freezing temperatures along with lack of power caused severe damage to homes throughout Texas.
- Close to 600,000 properties were affected by power outages



Winter storm reported on February 16 (source: SPC, NOAA)

A developing storm in the Southern and Eastern United States on February 16 **(source: WPC)**

WS Klaus-Luis	10-13 March 2021

France, Belgium, UK, Ireland, Germany, Netherlands, Luxembourg

Insured losses
(in USD millions)

- 192 (PERILS)

Fatalities

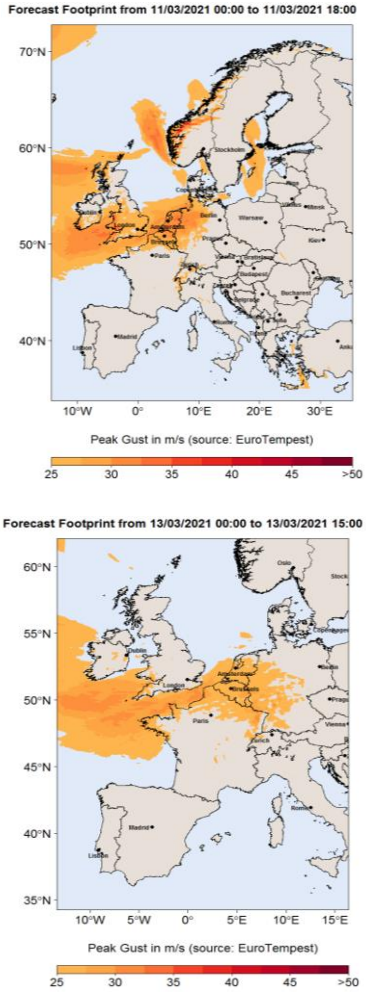
- 2 (PERILS)

Timeline and Meteorology

- Klaus-Luis has been combined as one individual event as the two low pressure systems affected northwest Europe consecutively within a 72h period (PERILS).
- Late February – Jet Stream began to strengthen and pushed a series of low-pressure systems across the Atlantic (Met Office).
- 10th March – The Met Office issued a yellow warning for wind and the low-pressure area "Klaus" brought wind gusts exceeding 100 Km/h to Ireland and the UK. The storm moved east and on 11th March, France, Belgium, Netherlands and Germany were exposed to strong winds (PERILS).
- 12th March – Cyclogenesis occurred off the west coast of Scotland to form storm "Luis" (PERILS).
- 13th March – "Luis" was centred just north of Germany in the North Sea, bringing wind gusts exceeding 90 Km/h for northern France, Belgium, Germany and Netherlands (RMS).

Impact

- Max gusts per country: Netherlands, 120Km/h; Ireland, 119Km/h, France, 191Km/h; Germany, 151Km/h, UK, 150Km/h; Belgium, 108Km/h (PERILS).
- 1000 power outages are reported in Norfolk, UK (RMS)
- Structural damage to buildings in Germany, Belgium, Netherlands and the UK (RMS)
- Several major train routes blocked in Germany (Deutsche Bahn).
- The fire brigade of Brussels was involved in 118 incidents, and fire brigades in northern Germany were called to 410 incidents (RMS).



Storm Klaus (top) and Storm Luis (bottom) wind gust forecasts (EuroTempest images)

ST Southern U.S.A. 24-26 March 2021

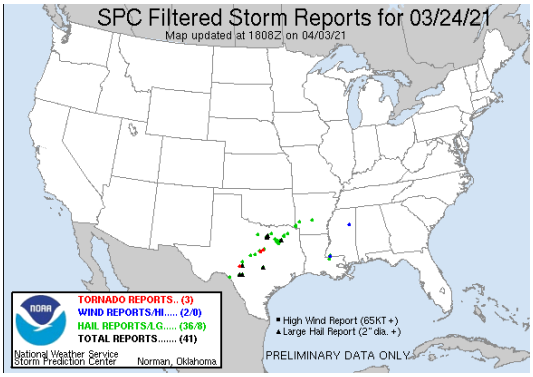
Southern & Southeast U.S.A.

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

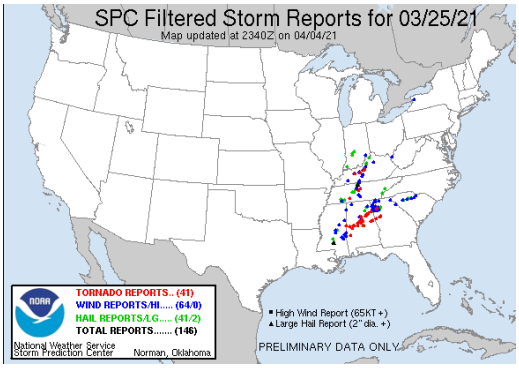
Fatalities: 6 (PCS)

Timeline and Meteorology

- An upper-level low pressure system originating from the Four Corners region moved eastward into the southern Plains, bringing large hail up to 3" in diameter to north/central Texas including Austin and the Dallas areas.
- The low-pressure center began to intensify and led to a tornado outbreak developing over the Southeast / Lower Ohio Valley.
- Along with the tornadoes, winds created damage across Southeast regions of and Ohio Valley including the states of Mississippi, Tennessee, and Kentucky.
- By early March 26, the storm system made its way northeast, bringing damaging winds to states including Ohio, Pennsylvania, New York, and New Jersey before moving offshore.



Thunderstorm reported on March 24 (source: SPC, NOAA)



Thunderstorm reported on March 25 (source: SPC, NOAA)

Impact

- An emergency was declared in several affected counties in Alabama.
- Hailstones up to 1.75 inches were reported in state of Georgia and up to 2 inches in affected regions of Tennessee and Texas.
- Trees toppling, roof damage due to high wind speeds and hail damage were the most common forms of damages reported in these regions.
- Close to 300,000 properties were affected by power outages in the entire region.

St Vincent (La Soufrière) Volcanic Eruption — 9-22 April 2021

St Vincent and the Grenadines

Insured losses
(in USD millions)
- ~

Economic losses
(in USD millions)
- ~230-300 (UNDP)
- 30% of GDP (IMF)

Evacuees
- ~16,000 (UNOCHA)

Fatalities
- 0 (UNOCHA)

Timeline

- La Soufrière volcano, on the island of St Vincent, erupted explosively on 9th April 2021. This followed a period of greater volcanic unrest, increased seismic activity and lower-level effusive eruptions since December 2020.
- Explosive eruptions continued periodically with the last major eruption on 22nd April.
- Eruptive and seismic activity decreased after the eruption on 22nd April, with the volcano alert level reduced from Red to Orange, and as of 14 December 2021, to Yellow.
- Later in the year, heavy rains and tropical storms (Hurricane Elsa) caused flooding and landslides, and re-mobilised some ash into lahars.

La Soufrière Volcano as of 9th April (Source: NASA)

Impact

- Eruption column reached a height of 10km and ashfall mainly affected the north of the island.
- High hazard zones in the north (vulnerable to significant ashfall, pyroclastic density currents and lahars) were evacuated within 24 hours. This process was further complicated by additional requirements for Covid-19 vaccinations for evacuees to enter cruise ships and neighbouring islands.
- Pyroclastic density currents and lahars were reported in localised areas in the north of the island, throughout the two-week eruption period.
- Ashfall also reached the surrounding islands of the Grenadines, Barbados and St Lucia but did not cause any significant damage or disruption.
- Eruption affected water and power supplies on St Vincent, closed airports and severely damaged crops and livestock.

Map of La Soufrière as of 9th April (Source: European Commission)

ST Texas U.S.A.	15-16 April 2021

Texas U.S.A.

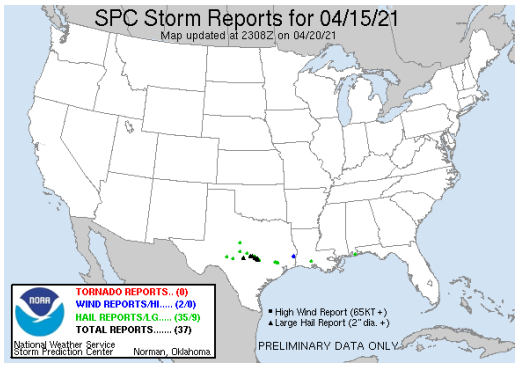
Insured losses
(in USD millions)
- **>1,000** (PCS)

Timeline and Meteorology

- On April 15th, scattered thunderstorms developed over central TX along a surface front in a region of steep temperature lapse rates and deep wind shear.
- The setup led to the formation of large hail, gusty winds and localized flash flooding.
- The northern Greater Austin area was among the hardest hit, which resulted in widespread damage to roofs and vehicles.
- The convection very slowly slid to southeastern Texas brining more severe thunderstorms, heavy rainfall and localized flooding for far eastern Texas
- Storms weakened and eventually shifted to the east of Texas by the evening hours on the 16th April.

Impact

- Large hailstones were reported in serval parts of Williamson County, Leander City, Round Rock City and Burnet County.
- The storm caused severe damage to homes and vehicles, shattering glass windows and windshield.
- Strong wind gusts in Central Texas led to downed trees and caused damage to housing structures and vehicles.



Thunderstorm reported on April 15 (source: SPC, NOAA)

ST Southern U.S.A.	27 April – 2 May 2021

Southern & Northeast U.S.A.

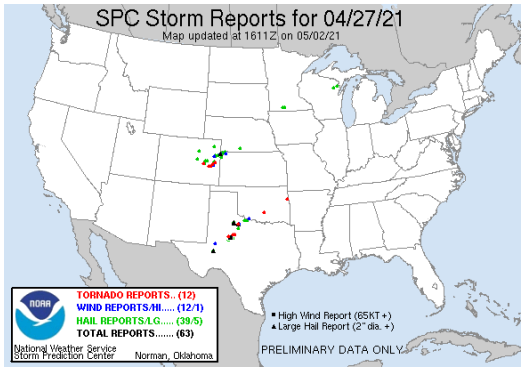
Insured losses
(in USD millions)
- **>1,000** (PCS)

Timeline and Meteorology

- On April 27th, an upper-level low located over the Central Rockies triggered severe thunderstorms impacting the central United States.
- Thunderstorms formed northeast of Colorado in a region of maximized low-level convergence, producing several tornadoes, large hail, severe wind gusts, and abundant precipitation. .
- Additional strengthening of the system occurred on 1st May, leading to heavy rainfall and thunderstorms movement through the Southeast on the 2nd May. Several tornadoes were observed in Louisiana and Mississippi
- The system generally weakened and moved out of the Southeast region by the late evening on the 2nd.

Impact

- Washington and Montgomery county, Maryland reported severe wind gust leading to thousands of power outages across area.
- Hailstones up to 4 inches in size were reported in Medina county. Hail of up to 3 inches in size was reported in Cheyenne, Val Verde, Tarrant, and Cleveland counties.
- Several tornadoes were reported in states of Louisiana, Mississippi, Oklahoma and Texas.
- Strong winds downed trees onto roadways in portions of the affected regions.



Thunderstorm reported on April 27 (source: SPC, NOAA)

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

ST Midwest U.S.A.	17-20 June 2021

Midwest & Northeast U.S.A.

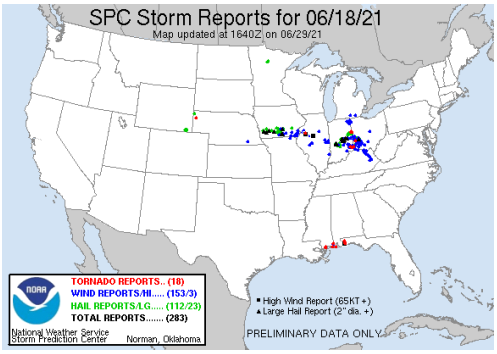
Insured losses
(in USD millions)
- **>1,000** (PCS)

Timeline and Meteorology

- On 17th June, a cold front moved over the upper Mississippi valley resulting in widespread, large hail and damaging wind gust over southeastern and western Wisconsin.
- By 18th June, severe thunderstorms developed across central Indiana, resulting in large hail and strong wind gusts over northeastern Indianapolis.
- There were reports of a few tornadoes across Illinois through western Ohio, with a large EF1 tornado confirmed southwest of Dayton, Ohio.
- On the backside of the frontal system, a line of severe thunderstorms intensified across the Midwest resulting in locally heavy rainfall and some areas of dangerous flash flooding.
- By 19th June, very heavy rainfall was reported from central Illinois through Ohio.
- Later, the line of severe thunderstorms moved eastward across the southern end of Lake Michigan resulting in strong wind gusts, tornados, and hail.
- A damaging tornado impacted the Chicago metro area near Naperville, Illinois.

Impact

- Several tornadoes with wind gust varying from 110 to 70 mph were reported to have caused damages to farm outbuildings and residential buildings in the state of Illinois.
- Hailstones, 3 inches or larger, were reported in Iowa, Michigan, Indiana, and Minnesota.
- Many reports of damage to roofs and siding damage to homes and commercial buildings and vehicles damage was reported in almost all affected areas.



Thunderstorm reported on June 18 (source: SPC, NOAA)

Europe Hail	18 June – 1 July 2021

Austria, Czech Republic, Germany, Switzerland

Insured losses
(in USD millions)

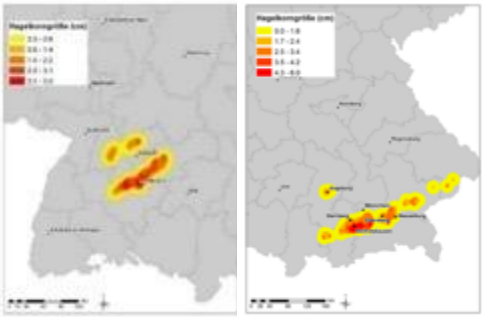
- >1,132 (AIR) in Germany
  >1,000 (AIR) in Switzerland
- 1,132 (Munich Re) in Germany
- 4,500 (Swiss Re)
- 2,821 (MSK) in Europe
  >1,132 (MSK) in Germany
- 1,919 (GDV) in Germany

Fatalities

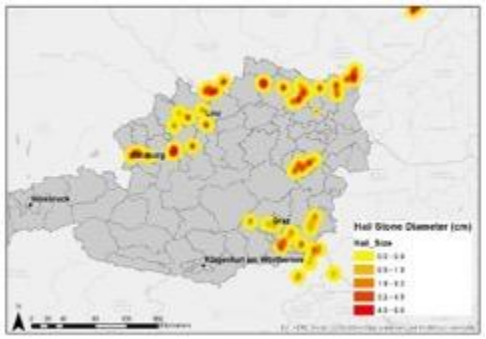
- **5 (RMS)**

Timeline and Meteorology

- Late June- central Europe was under the influence of a high-pressure system with warm temperatures and high humidity. This system was repressed by low-pressure systems arriving from the west with cold Atlantic air causing the two atmospheric layers to combine.
- The unstable atmospheric conditions created strong convection which produced severe storms with heavy rainfall and hail (RMetS).
- On June 18th severe thunderstorms formed in Germany, which moved from northwest into southern parts of Germany, where ideal conditions of enough wind shear and warm and moist air in the lower atmosphere facilitated the formation of a rotating mesocyclone (supercell) (RMetS).
- June 21st - two low pressure systems called Volker and Wolfgang facilitated the formation of two hailstorm streaks with nearly the same track over suburbs south of Munich (DWD).
- Severe convective storms caused by the same macro weather situation occurred around Reutlingen and Stuttgart on June 23rd.
- Northern and southeastern parts of Austria were affected from June 25th – 28th until the storm activity shifted northeast towards the Czech Republic (RMetS).
- Another hailstorm event from June 28th to July 1st came from a low-pressure system called Xero, which caused major hail damage in Switzerland and heavy rainfall in Germany.



Hail Volker, combined Hail Size Footprint in Munich and Reutlingen 21st – 23rd June (source: Gallagher Re using ESWD data)



Hail Austria, consolidated Hail Size Footprint 21st – 28th June (source: Gallagher Re using ESWD data)

Impact

- The aggregated impacts of the severe convective weather events caused widespread damage to property, motor vehicle and agricultural areas as well as infrastructure (DWD).
- The majority of the damage resulted from giant hail and heavy rainfall. Southern Germany and Austria were most heavily affected by Hail (DWD & ZAMG).
- Numerous observations of hailstone sizes in excess of 2cm (up to 6cm+ in Germany and up to 11 cm in Austria) (ESWD).
- Heavy rainfall totals affecting the south of Germany (up to 115l/m² per day) (DWD).
- The severe convective storm activity across Europe culminated in a destructive tornado, which caused widespread damage in southern Moravia, Czech Republic (RMS).

Czech Republic Tornado

24 June 2021

South Moravia, Czech Republic

Max. Category F4

Insured losses
(in USD billions)

- 0.24 (Generali)
- 0.16 (Primm)
- 0.15 - 0.2 (RelIns News)

Economic losses
(in USD billions)

- unknown

Fatalities

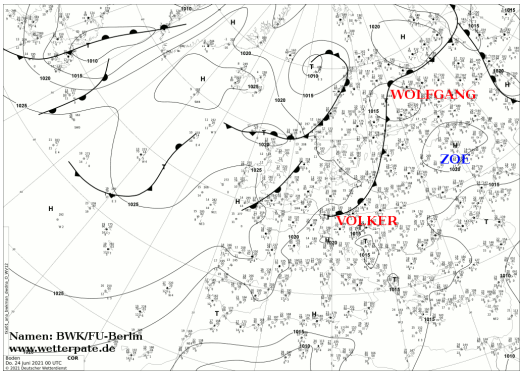
- 5 (RMS, BBC)

Timeline and Meteorology

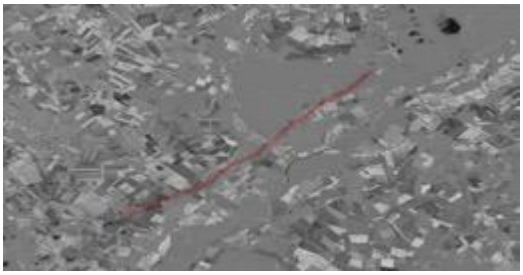
- The tornado occurred in the South Moravia region of the Czech Republic between 7 pm and 8 pm local time (17:00-18:00 UTC), destroying several villages and towns within a track more than 25 km long and 700 m wide. The EF4 tornado is one of the strongest European tornadoes recorded.
- It formed near the village of Hrusky and went through the southern part of the village moving north-eastwards, passing through Moravska Nova Ves further north, then crossing Mikulčice and Lužice, and eventually ended in Hodonin (EUMETSAT).
- It was part of a severe convective storm system (June 21-25), which brought up large hail, heavy rains, and flash flooding to Breclav and Hodonin districts in the Czech Republic as well as to parts of Poland (RMS).
- Wind speeds were estimated to be between 165 and 200 mph (265-320 km/hr), corresponding to an intensity of EF4 on the Enhanced Fujita Tornado Intensity Scale.

Impact

- The tornado completely leveled half of Hrusky (The Guardian), destroyed the church tower, and removed the roof of the elementary school. According to local authorities, only 15% of the buildings were undamaged in Hrusky (BBC).
- The tornado completely leveled half of Hrusky (The Guardian), destroyed the church tower, and removed the roof of the elementary school. According to local authorities, only 15% of the buildings were undamaged in Hrusky (BBC).
- In Lužice, 120 houses were damaged (a third of the village).
- More than 100,000 homes lost power during the event (BBC).
  Significant traffic disruption due to fallen trees and power lines, particularly along the motorway between Prague, and Bratislava has been reported.



Ground pressure chart with fronts and pressure systems from June 24, 2021 00UTC (FU-BERLIN)



Tornado Footprint based on Sentinel-2 HDVI difference data (EUMETSAT)

European Floods — 12-19 July 2021

Austria, Belgium, France, Germany, Netherlands, Switzerland

Insured Losses (in USD millions)

- **5,700-9,100 (Hannover Re)**
- **13,000 (Swiss Re)**
- **9,100 (Germany only, GDV reported as €8.2 billion)**
- **2,100 (Belgium only, Assuralia)**

Fatalities

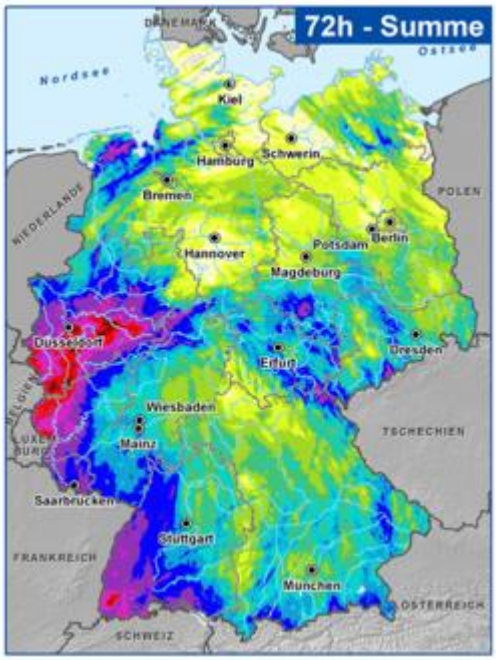
- **196 (Science)**

Timeline and Meteorology

- From the 12th to 19th of July, the low-pressure system 'Bernd' brough prolonged heavy rainfall to parts of central/western Europe, bringing significant flooding impacts.
- A weak jet stream led to the blocking of Bernd over central Europe for several days, during which it drew in moisture from the Mediterranean, leading to high and in places historical, rainfall totals.
- Soils were at or near saturation as a result of a wetter than average, which meant soils in the worst affected areas had very little storage capacity.

Impact

- Severe flooding occurred particularly in the German states of North Rhine-Westphalia and Rhineland-Palatinate, as well as in Luxembourg, and along the river Meuse and some of its tributaries in Belgium and the Netherlands.
- In **Germany**, significant localised rainfall amounts of 150-200mm within 24 hours occurred, which exceeded the 100yr precipitation return period according to WRN partners. According to ICEYE, over 37,000 buildings were damaged in Germany, with further damage occurring to infrastructure including bridges and roads (ICEYE).
- In **Belgium**, the central and eastern regions of Wallonia, Liege and Limbourg were most impacted, with significant property damage reported in Liege. Over 27,000 buildings were affected in Belgium according to ICEYE.
- In the **Netherlands**, south Limburg was most notably affected, with property damage occurring in Valkenburg following the overflowing of the De Geul river within the city. ~1,700 structures were impacted in the Netherlands by the flooding according to ICEYE.
- Less significant flooding impacts were also observed in **Switzerland**, **Luxembourg** and north-eastern **France**.
- Current market loss estimates suggest Bernd is the largest German flood loss on record, with initial loss estimates deteriorating as the scale and damage extent of the flooding became clear. As of late 2021, market speculation indicated the final event loss could be in excess of 12bn EUR (>13.4bn USD) (Gallagher Re).



Accumulated precipitation over 72 hours over Germany for 12th to 14th of July 2021 (source: DWD)

Dixie Wildfire	14 July – 5 October 2021

California, U.S.A.

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

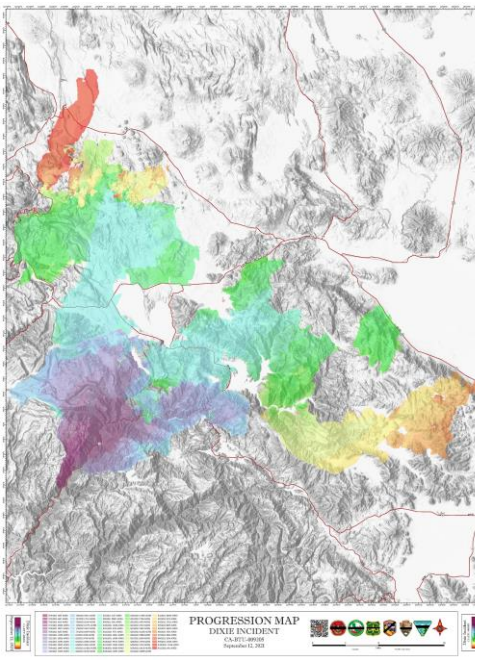
Fatalities: Unknown

Timeline

- The Dixie Fire burned from mid-July to early October 2021 in the Plumas National Forest, Lassen National Forest, and Lassen Volcanic National Park; and in the California counties of Butte, Lassen, Plumas, Shasta and Tehama.
- Exceptionally dry vegetation, caused by drought, combined with hot weather and strong winds to produce very active fire behavior.
- The nearby Fly Fire, which started on July 22, was managed under the Dixie Fire East Zone command and eventually merged with the Dixie Fire.
-

Impact

- The Dixie Fire burned 963,309 Acres
- A total of 1329 structures were destroyed, and 95 structures were damaged.



Extent of the Dixie Wildfire (source: InciWeb)

China Floods | 19-21 July 2021

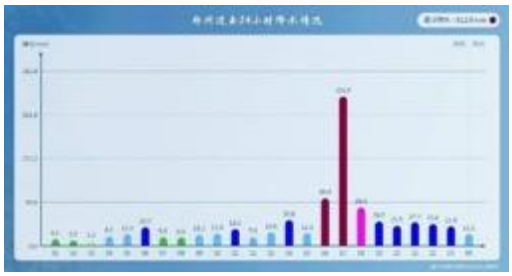
Henan, China

Insured Loss Estimate
(in USD billions)
- **1.92 (CBIRC)**

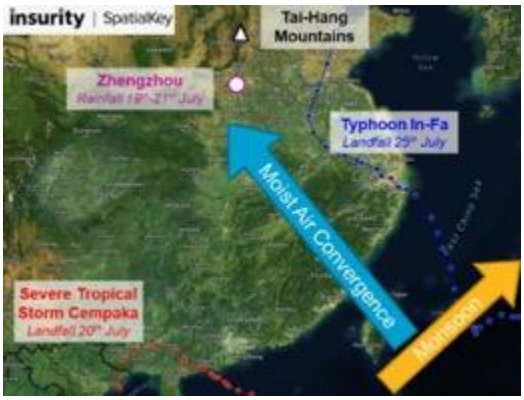
Fatalities
302 (RMS)

Timeline and Meteorology

- Throughout the month of July, heavy rainfall caused by thunderstorms affected Henan Province in China.
- 19th July - A system of nearly stationary thunderstorms developed causing flooding in the province of Henan, mainly affecting the cities around the Yellow and Haihe Rivers.
- Between 21:00 UTC on 19th July and 21:00 UTC on 24th July, Zhengzhou received 644.6 mm of rain which is greater than its average annual precipitation of 640.9 mm, and broke the record for the highest one-hour rainfall amount with 201.99 mm/hr .
- 20th July - Severe Tropical Storm Cempaka made landfall in Guangdong.
- 25th July - Typhoon In-fa made landfall in Zhejiang. The monsoon circulation fed these two cyclones which provided additional moisture.
- The cyclones also helped to funnel a mass of moist air from the monsoonal circulation towards the foothills of the Tai-hang Mountains.
- The funneling caused extra cooling and condensation of the air mass and led to the large area of intense thunderstorms to form near the city of Zhengzhou.



Maximum hourly rainfall in Zhengzhou on 20th July 2021 (China Meteorological Administration).



Spatial Key map of affected region with Kinetic Corp Tropical Cyclone Tracks and key synoptic settings labelled.

Impact

- 26th July - Approximately 933,800 people had been evacuated, with an estimated 13 million people affected (Henan Business Daily).
- As of the 2nd August, 302 deaths were reported (JBA).
- 972,100 hectares of crop land were damaged (Henan Business Daily).
- 14,000 houses have collapsed with a further 32,000 badly damaged by the flooding (JBA).
- In Zhengzhou, the subway system was flooded, with reports of 12 fatalities and 5 injuries as a result of this.
- In the city of Luoyang, a 20 m breach occurred along the Yihetan Dam, forcing the military to perform a controlled blast to release the flood waters (Independent).
- As of the 7th September, 513,200 insurance claims had been submitted with 346,000 of those having been settled already (CBIRC).

Aerial view of the flooded main urban area in Zhengzhou, Henan Province (Aljazeera).

Southern European Wildfires	July – September 2021

Greece, Italy, Turkey, Spain

Insured losses
(in USD millions)
- Unknown

Economic losses
(in USD millions)
- Unknown

Fatalities
- Unknown

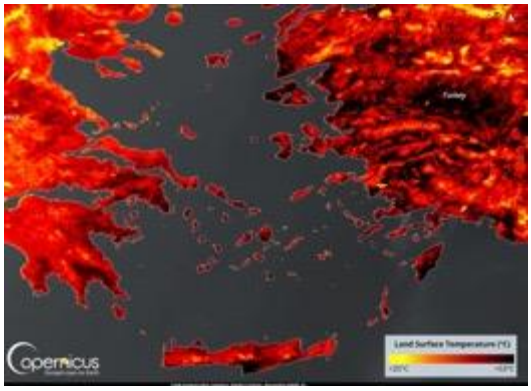
Timeline
- From July to September wildfires ignited across areas of southern Europe with Greece, Turkey, Spain, and Italy being severely impacted.
- During this period Southern Europe experienced one of the most intense heatwaves in the last 30 years, with daily temperatures frequently reaching in excess of 45°C. In addition to this strong northerly winds also prevailed which created conditions prime for wildfires.
- The European Forest Fire Information System (EFFIS) estimated that more than 600,000 hectares burnt across the region.

Turkey
- Wildfires broke out at the end of July mainly affecting the provinces of Muğla and Antalya.
- There were 8 fatalities over the period (BBC).
- 10,000 people fled their homes, and the Turkish Government is offering between 10,000 - 50,000 liras to affected citizens.
- The Agricultural Insurance pool (TARISM) has reported 85m Turkish Lira of losses.

Greece
- Wildfires ignited across the country, with significant fires in the suburbs of Athens and on the island of Evia, resulting in 2 fatalities.
- 2,000 people were evacuated from Evia and 50,900 hectares were burnt (Copernicus).
- The Hellenic Association of Insurance Companies has estimated the economic loss to be greater than €410m, with €38.5m of that loss being insured.

Italy
- Southern mainland Italy, Sardinia, and Sicily experienced multiple large fires with 5 fatalities being reported.
- In Sardinia, 20'000 hectares were burnt and 1500 were evacuated (The Guardian).

Spain
- Multiple wildfires took hold across Spain, with the most widespread damage occurring within the northwestern region of Castilla y León.
- In August, 8 villages had to be evacuated in Castilla y León as 22,768 hectares burnt in this major forest fire (Reuters; Copernicus).
- There was 1 fatality as a result of the September wildfire in Andalusia, which prompted the evacuation of 2,000 people and burnt 7,400 hectares (BBC News).



Land Surface Temperature heatmap for Greece and Tukey from 3rd August (Copernicus)

Aerial view of the Evia Wildfire, captured on 7th August (European Space Agency, PlanetScope)

Map showing the damage grading of the Castilla y León fire as of 19th August (Copernicus)

Central Africa Floods	10-26 August 2021

Niger, Sudan, South Sudan

Insured losses (combined for all countries)
(in USD millions)
- Unknown

Economic losses
(in USD millions)
- Unknown

Fatalities

Niger
- 77 (OCHA)

Sudan
- 43 (Floodlist)

South Sudan
- 7 (Floodlist)

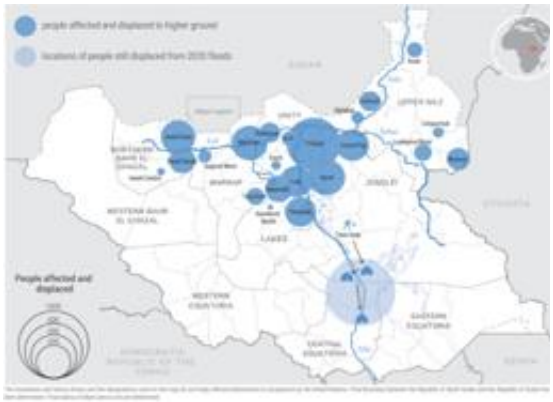
Timeline and Meteorology
- The central African rainy season typically extends from May to October with wettest periods between July and September.
- In 2021 heavy rainfall throughout much of mid-June to late-August resulted in numerous flooding events across much of Central Africa, with the most severe impacts being observed in Niger, Sudan and South Sudan.

Niger
- Over the rainy season flooding affected 238,000 people with a total of 77 fatalities being recorded, 20,000 houses destroyed and facilitating widespread cholera outbreak across the country (OCHA).
- The worst single event occurred between 10-26 August affecting 158,000 people across 77 communes in all eight regions of the countries and resulting in 60 fatalities (Floodlist).

Sudan
- Heavy rain since the start of the rainy season coupled with exceptional rainfall between 24-31 August caused the Nile River water levels to exceed danger levels (OCHA).
- Flooding affecting over 380,000 people in 12 out of Sudan's 18 states. (ReliefWeb)
- 43 Fatalities were reported at the end of august due to flooding (FloodList).

South Sudan
- Heavy rains since the start of the rainy season caused flooding which affected over 466,000 people in 15 out of South Sudan's 22 states (OCHA).
- In the worst affected area of Unity state, overflowing dykes resulted in 7 fatalities.

Flooding Occurrence in Central and Western Africa ***Source: OCHA***



People affected in South Sudan (*Source: Reliefweb*

FL Turkey	10-14 August 2021

Turkey – Northern Turkey

Insured losses
(in EUR millions)
- **Unknown**

Fatalities
- **81** (FloodList)

Timeline and Meteorology
- Heavy rainfall that began on August 11, 2021, impacted northern Turkey and caused floods in the cities of Bartin, Kastamonou and Sinop (AFAD).
- Heavy rainfall of 200 to 300 mm triggered floods and landslides, causing damage to property, motor and infrastructure (AFAD).

Impact
- Approximately 45cm of rain fell in less than three days in one village near Bozkurt, the worst affected region (Aljazeera).
- More than 1700 people were evacuated from the affected areas and as many as 330 villages were left without power (BBC).
- Approximately 454 buildings, some bridges and vehicles were severely damaged in three provinces (Aljazeera).
- 81 fatalities were reported to have occurred due to the floods (FloodList).

Floods in Sinop, Turkey, August 2021. Photo: Turkish Coast Guard (Source: Floodlist)

HU Grace | 13-21 August 2021

Mexico, Caribbean

Max. Category 3
Category 1-3 at landfall

Insured losses
(in USD billions)

- 0.3-0.33 in Mexico (Insurance Journal)
- 0.03 in the Caribbean (Insurance Journal)

Economic losses
(in USD billions)

- Unknown

Fatalities

- At least 8 (BBC)

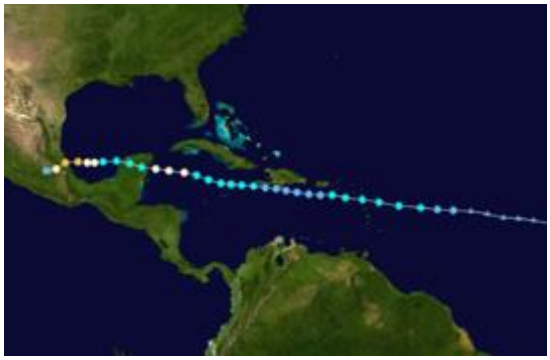
Hurricane Grace was the seventh tropical cyclone in the 2021 Atlantic Hurricane Season.
It was the most damaging storm this year to impact the Caribbean.

Caribbean

- Grace formed in the central tropical Atlantic on the 13th August, before intensifying on the 14th August when heavy rainfall was experienced around the Lesser Antilles.
- On August 16th Grace impacted Haiti and the Dominican Republic
- Between 17th-18th August Jamaica and the Cayman Islands experienced heavy rain and wind.
- Haiti experienced flooding and high winds which exacerbated the effects of the earthquake it experienced on August 14th.
- The Dominican Republic saw several power outages and 558 houses were damaged by high wind.
- In Jamaica, power outages and blocked roads were experienced, in addition to flooding (Relief Web).
- The Cayman Islands saw little damage, although there was disruption to power and water supplies as well as flooding (ReliefWeb).

Mexico

- Once Grace reached Mexico, landfall was made on 19th August on the Yucatán Peninsula at Category 1.
- On 21st August landfall was made as a Category 3 hurricane to the south of Tuxpan, Veracruz.
- In the Yucatán Peninsula, damage was low and mostly consisted of fallen trees.
- Approximately 700,000 people experienced temporary power shortages in the Yucatán Peninsula (Forbes Mexico).
- Significant damage was experienced in Central Mexico to coastal structures.
- Severe flooding and mudslides occurred in Veracruz.



Wind Speed and Path of Hurricane Grace (Source: NASA, NHC)

Satellite Image of Hurricane Grace (Source: NASA)

EQ Haiti | 14 August 2021

Haiti

Magnitude 7.2
Depth 10km

Insured losses
(in USD millions)
- 250 (KCC)

Economic losses
(in USD millions)
- 1,600 (IDB)

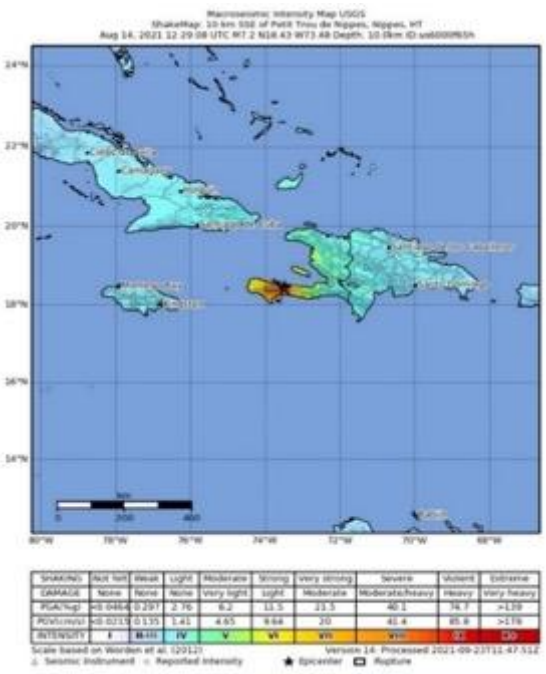
Fatalities
- 2,248 (Relief Web)

Timeline and Seismology

- On 14th August 2021 at 09:30 local time Haiti experienced a Mw 7.2 earthquake. This was felt in Hispaniola and the islands of Puerto Rico, Cuba and Jamaica (USGS).
- It occurred at a depth of 10km due to oblique thrust faulting in the Enriquillo-Plantain Garden fault zone.
- 900 aftershocks were detected in the south of the island, with roughly 400 of these with Mw ≥ 3 (ReliefWeb).
- A significant number of landslides occurred which were exacerbated by heavy rainfall from Hurricane Grace between 16th-17th August. This hindered aid reaching those affected.

Impact

- 2,248 deaths, 12,763 injured and 800,000 people affected in Haiti (Relief Web).
- 137,585 homes have been damaged or destroyed and 60 Healthcare facilities were destroyed (ReliefWeb).
- Residential buildings in rural areas were hardest hit (ReliefWeb).



USGS shaking intensity (MMI) footprint for the 14/08/21 Mw 7.2 event

HU Ida	29 August – 2 September 2021

Northeast U.S.A.

Category 4 at landfall

Insured losses
(in USD millions)
- >1000 (PCS)
- 31'000-44'000 (RMS)

Fatalities: Unknown

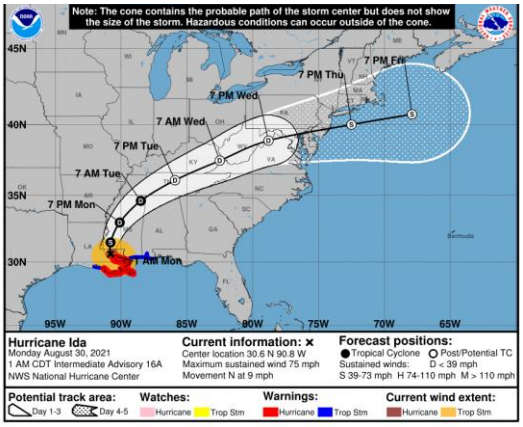
Timeline and Meteorology

- On 22nd August, a tropical wave entered the eastern Caribbean Sea. The wave continued westward and on 26th August The National Hurricane Center declared it as tropical depression nine. Later that day the storm intensified to become tropical storm Ida.
- 24 hours prior to landfall in Cuba, the storm strengthened into a Category 1 hurricane. Later it intensified to Category 2 after a volatile interaction with storms over the Gulf of Mexico. This led to a rapid intensification as Ida passed over an eddy of especially warm, deep ocean water in central Gulf of Mexico, causing the storm to finally develop into a Category 4 hurricane on 29th August.
- Hurricane Ida made US landfall during the morning of 29th August near Port Fourchon, Louisiana as a high-end Category 4 hurricane with 150 mph sustained winds.
- Ida brought and extremely dangerous storm surge of 8-12 feet to southeast Louisiana; catastrophic wind damages to New Orleans; and torrential rainfall to Alabama, Florida, and Arkansas.
- By 30th August, Hurricane Ida weakened to a tropical storm. By 1st September, after causing huge destruction in the south and southeast, Ida brought heavy rainfall and flooding to the northeast. By 2nd September, Ida moved to offshore enroute to Canadian provinces

Impact

- A state of emergency was declared in portions of almost all states along the path of Ida. And flash flood warning was issued in affected regions of Kentucky, Louisiana, Massachusetts, Rhodes Island, Tennessee, New York and West Virginia.
- Cars were stranded and soaked in flood waters in the state in Delaware.
- Wind gust of up to 172mph were reported in state of Louisiana.
- At least, 10 tornadoes were reported in the state of Philadelphia as torrential rains caused the Delaware river to reach a 10-year high water level.
- As of this writing, more than 13,000 residents affected by Ida still need sheltering assistance.
- More than 1,000,000 properties were affected by power outages throughout the affected regions.

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



Hurricane Ida's path as of August 30 (source: NOAA)

EQ Mexico — 7 September 2021

Mexico, Guerrero

Magnitude 7.0
Depth 20km

Insured losses
(in USD millions)

- 200 (Insurance Journal)

Economic losses
(in USD millions)

- <1% of GDP (USGS)

Fatalities

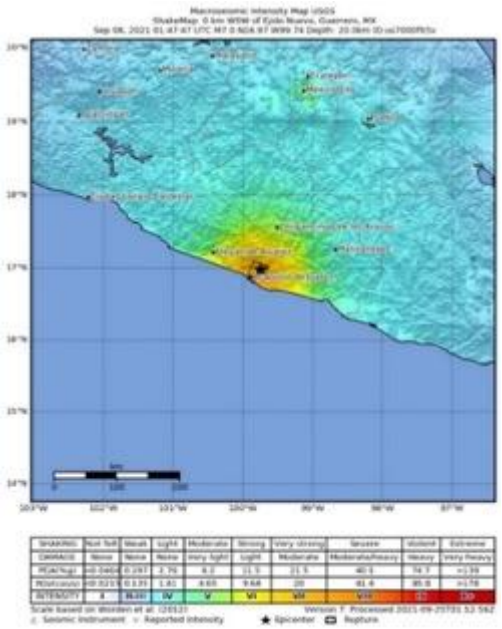
- 1 (Reuters)

Timeline and Seismology

- On 7th September at 20:48 local time a Mw 7.0 earthquake struck the city of Acapulco
- The earthquake was caused by shallow thrust faulting near the Cocos and North America plate boundary. It occurred at a depth of 20km (USGS).
- Several aftershocks were recorded, the highest being Mw 5.2 (SSN).
- Secondary perils include a tsunami of 48cm and landslides (USGS).

Impact

- One fatality in Coyuca de Benítex, 23 injured, 985,00 people affected by very strong shaking (ReliefWeb).
- Five fatalities from a landslide in El Chiquihuite (USGS).
- Electricity shortages affected 1,864,616 people in Mexico City, Mexico State, Guerrero, Morelos and Oaxaca (ReliefWeb).
- Gas leaks reported in Guerrero (USGS).
- 8,700 structures were damaged, including Acapulco International Airport (USGS).



USGS shaking intensity (MMI) footprint for the 07/09/21 Mw 7.0 event

Cumbre Vieja Volcanic Eruption

19 September - 14 December 2021

La Palma, Spain

Insured losses
(in USD millions)
- **71** (as at 9 December; CCS)

Economic losses
(in USD millions)
- **623 - 793** (Canary Islands government)

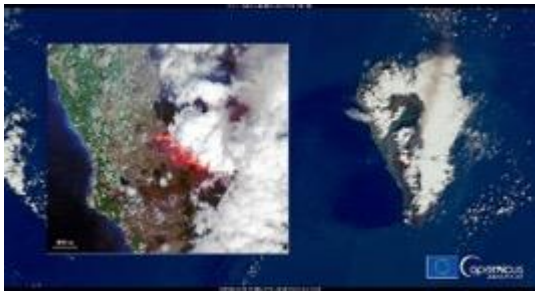
Fatalities
- **1** (AccuWeather)

Timeline

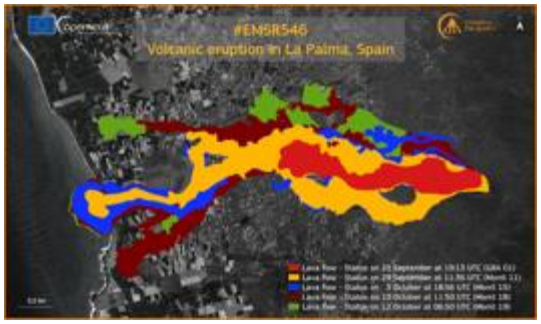
- After half a century of repose, the ridge-shaped Cumbre Vieja volcano erupted on 19 September, 2021.
- In October 2017 and February 2018, two separate earthquake swarms were detected, with the former consisting of 128 events over 8 days – an early sign of volcanic unrest.
- On 11 September, 2021, the number of earthquakes detected increased rapidly to several hundred per day, were recorded at much shallower depths (< 12 km) and were accompanied by marked ground deformation.
- 8 days later, two eruptive fissures (~ 200 m long) emerged on the northwestern flank of the volcano and lava flows initially travelled downslope at 700 m/h (Science).
- From the beginning of the eruption up until 18 November, 5,100 tremors were recorded, equating to 85 a day.
- On 14 December, visible activity significantly decreased and volcanic tremor was almost absent for the first time since the eruption began (Volcano Discovery).

Impact

- The eruption forced the evacuation of ~6,400 residents and destroyed infrastructure worth over 400 million EUR (Science).
- One fatality was reported in the town of Los Llanos de Aridane (AccuWeather).
- Ashfall and accumulation resulted in intermittent closures of La Palma airport, prompting the cancellation of >300 flights negatively affecting tourism which is cardinal to the island's economy (Science).
- As of 19 November, 66 km of roads were damaged by the lava, including 2.1 km of the important LP-2 (El País).
- The economic losses estimated by the regional premier of the Canary Islands, Ángel Víctor Torres, qualifies La Palma for access to the European Union's solidarity fund. This is because damages exceed 1% of gross domestic product (GDP), which is approximately 430 million EUR.
- As of 9 December 2021, the Insurance Compensation Consortium had received 2,603 compensation requests of which 2,135 were homes; 204 were automobiles; 246 were shops, hotels, and offices; and 18 were industrial facilities.



Optical image of the lava flow generated by the eruption on La Palma, acquired by one of the Copernicus Sentinel-2 satellites on 25 September, 2021 (Copernicus)



Map showing the temporal evolution of the lava flow extent from the Cumbre Vieja eruption from 20 September – 12 October, 2021 (Copernicus)

EQ Crete | 27 September 2021

Greece

Magnitude: 6.0
Depth: ~6 km

Insured losses
(in USD millions)
- **Unknown**

Economic losses
(in USD millions)
- 32% probability of losses between 10 and 100 (USGS)

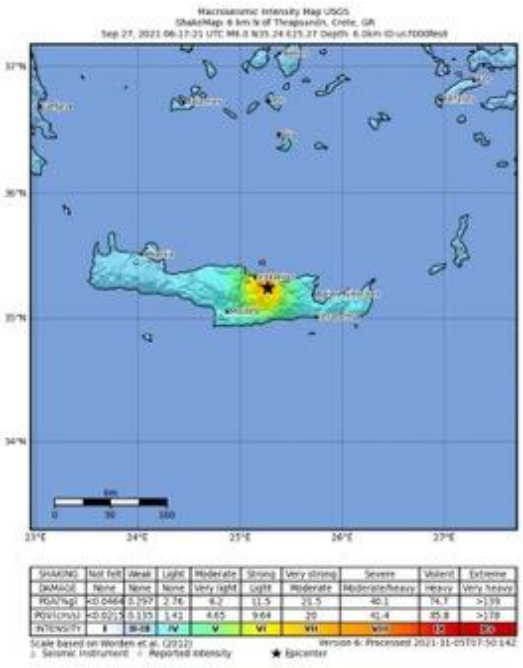
Fatalities
- **1** (News247)

Timeline and Seismology

- On 27th September 2021 at 09:17 am local time (06:17 UTC), a Mw 6.0 earthquake struck southeast of Heraklion, Crete, with the epicentre located 6km north of Thrapsanón (USGS).
- The earthquake was preceded by a 3.7Mw foreshock in the week prior to the event. Several aftershocks occurred following the mainshock, with the largest being a Mw 5.3 (USGS).
- The earthquake was felt widely across Crete and 'Strong' to 'Very Strong' shaking intensities were felt in towns surrounding the epicentre, such as Arkalochori and Heraklion (USGS).

Impact

- ~5,000 structures were destroyed or damaged as a result of the earthquake, with ~3,900 houses deemed 'uninhabitable' (EFSYN).
- In Arkalochori, ~80% of the structures in the town were deemed to be damaged (IN).
- There was one fatality from the event during the collapse of a church dome and several injuries occurred from falling masonry (News247).
- Approximately two weeks after the 27th September event, a 6.4Mw earthquake struck off the coast of eastern Crete on the 12th October, however seismologists indicated this was not related to the September event.



USGS shaking intensity (MMI) footprint for the 27/09/21 Mw 6.0 event

TC Shaheen	30 September – 4 October, 2021

Oman, Iran, India

Max. Category 1
Category 1 at landfall

Insured losses
(in USD millions)
- **161** (Capital Market Authority)

Economic losses
(in USD millions)
- Unknown

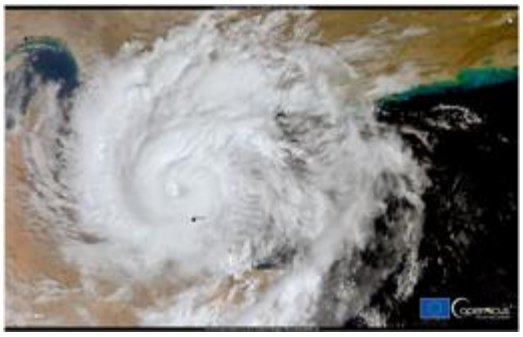
Fatalities
- 14 (The Associated Press)

Timeline and Meteorology

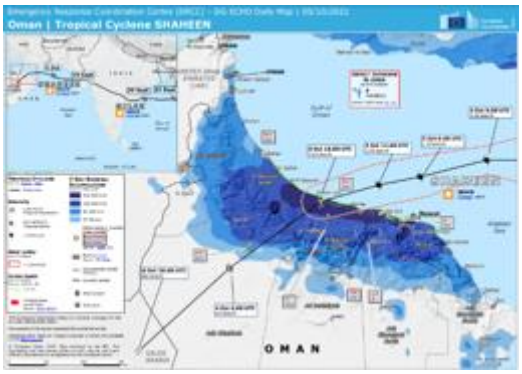
- Between 30 September and 1 October 2021, Cyclone Shaheen formed in the Arabian Sea from the remnants of Cyclone Gulab, which originated in the Indian Ocean, and then travelled westwards into the Gulf of Oman (Middle East Institute).
- Although this movement was initially slow, the Cyclonic Storm later accelerated, turning west-southwest towards the Al Batinah North Governorate of Oman (EUMETSAT).
- On 3 October, this Category 1-strength cyclone made landfall near Al Suwaiq, approximately 75 miles west-northwest of the Omani capital city of Muscat (Yale Climate Connections).
- Cyclone Shaheen brought winds of up to 150km/h and heavy rain, with 279.4mm recorded in Al Suwaiq in the 24 hours following 13:00 UTC, 3 October (211.5% more than the average *yearly* rainfall) (Yale Climate Connections).
- Upon landfall, Shaheen rapidly weakened and dissipated into a depression on 4 October 2021 (EUMETSAT).

Impact

- In Iran, 2 fishermen were found deceased and the Omani authorities reported 12 fatalities in total, 2 of which were caused by a resultant landslide in an industrial zone (BBC News, The Associated Press).
- More than 5,000 people were forced to seek refuge in shelters established in affected provinces (BBC News).
- On 21 December 2021, the Omani Capital Market Authority reported that claims totalling 161 million USD had been made to insurers due to the impact of Cyclone Shaheen, ~73% of which concerned damages to property and ~12%, engineering (Capital Market Authority).



Satellite image showing Tropical Cyclone Shaheen just north of Muscat, Oman, on 3 October 2021, at 5:55 UTC (Copernicus)



Map showing Cyclone Shaheen's footprint as it made landfall near Al Suwaiq, Oman, produced on 5 October 2021 (ERCC)

WS Aurore (Hendrik-Ignatz)

20-23 October, 2021

France, Belgium, Germany, Poland, Luxembourg, Czech Republic

Insured losses (combined for all countries)

(in USD millions)

- 362 (PERILS)

Fatalities

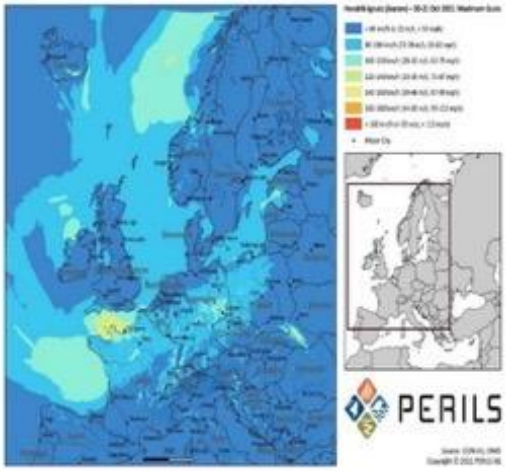
- 1 death in Germany (PERILS)
- 4 deaths in Poland (RMS Owl)

Timeline and Meteorology

- Hendrik-Ignatz, was the first significant extratropical cyclone of European Windstorm 2021 season.
- Hendrick, a low-pressure complex cell developed over the Irish sea (South of Ireland). Ignatz, another secondary low developed on 19th October. They both later merged and were renamed collectively as Aurore by Meteo-France (Meteo-France).
- The strongest gust of 175 km/h was observed in Fecamp Normandy in France (PERILS).

Impact

- 1 fatality and 5 severe injuries in Germany. Power outage affecting 55,000 houses and businesses across Germany (PERILS)
- Train services disruptions in Germany and large number of roads blocks due to fallen trees. (RMS; PERILS)
- Temporary halt in train services between Brussels-Amsterdam and Brussels-Luxembourg (Aubange) in Belgium. Local flash flooding in Brussels and Wallonia (PERILS).
- Massive power outage affecting 250,000 houses and businesses across France (RMS).
- Travelers stranded due to interrupted train services in Paris (RMS).
- 270,000 houses were affected by power outage across Czech Republic. There were several property damages reported due to fallen trees (RMS).
- 100,000 people affected due to powerlines across Poland. Large number of property damages and vehicle damages were reported due to fallen trees. Four people died after a tree fell on a car (PERILS).



20-21 October Maximum Gusts (PERILS image)

Australia Hail	28-29 October 2021

Southern Australia

Insured Loss Estimate
(in USD millions)
- 733 (PERILS)

Fatalities: Unknown

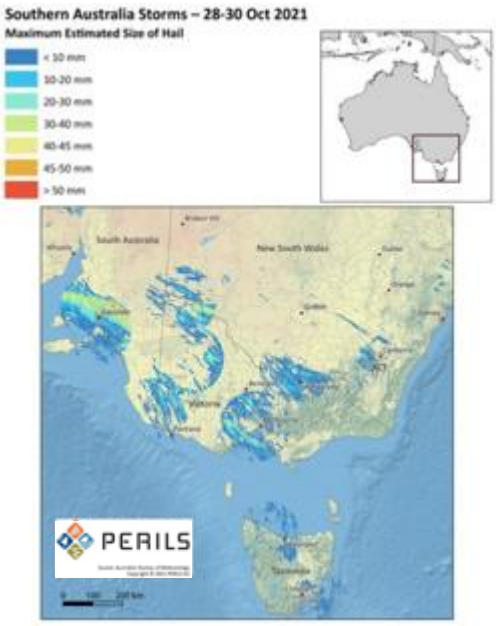
Timeline and Meteorology

Throughout the month of October, numerous hailstorms affected southern and eastern Australia with multiple severe weather warnings issued by the Bureau of Meteorology (BOM).

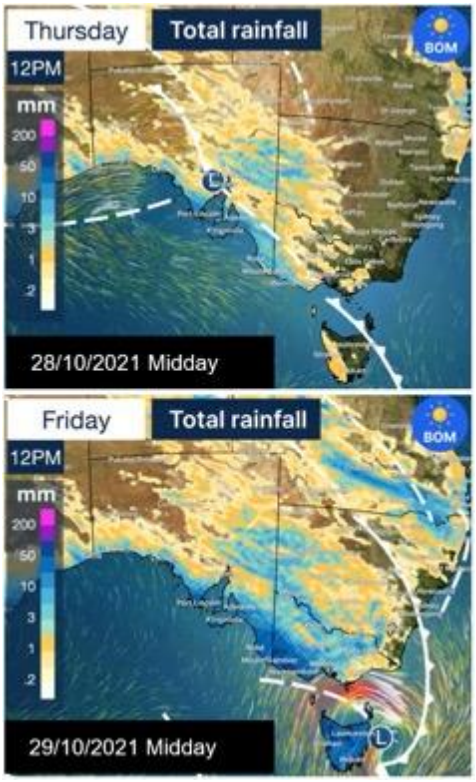
- *27th October:* A cold front moved from South Australia (SA) in a south-easterly direction towards southern Victoria (VIC) and Tasmania (TAS).
- *28th October:* The cold front linked up with tropical moisture causing a low-pressure system to deepen. This triggered an outbreak of severe thunderstorms across SA. The urban center of Adelaide and surrounding regions were the first areas to be impacted by heavy hailstorms and strong winds.
  The BOM issued severe weather warnings for damaging winds, storms, and heavy rain for SE Australia for the 28th and 29th of October. The low-pressure system continued to deepen rapidly and moved southeast into Victoria overnight, bringing heavy rainfall, hail and strong wind gusts of up to 146 km/h.
- *29th October:* The storm front continued across the state of VIC towards TAS bringing strong winds and torrential rain before moving out over the Tasman sea.
- The severe weather across Australia this season is thought to be partly driven by the **negative Indian Ocean dipole** (the first negative phase in five years) which causes westerly winds to intensify along the equator and warmer water to concentrate in the eastern Indian Ocean, north-west of Australia.

Impact

- According to the Insurance Council of Australia (ICA) most damage claims are from policyholders in areas including the Barossa Valley, Elizabeth, the Adelaide Hills, Salisbury and Craigmore.
- Two thirds of claims were motor, while crop losses are also expected to be substantial in the Barossa Valley (ICA).
- Australia's border control regime is making it difficult to deploy insurance industry staff into the region which may make it difficult to settle claims. However, the industry is working with the State Government on this issue (ICA).



Maximum estimated size of hail (PERILS)



Forecast rainfall totals for Thursday 28th and Friday 29th October at midday. The largest rainfall totals were expected in Victoria and Tasmania (Bureau of Meteorology).

WS Arwen	26-28 November 2021

UK

Insured losses (combined for all countries)
(in USD millions)

- 330-396 (PwC)

Fatalities

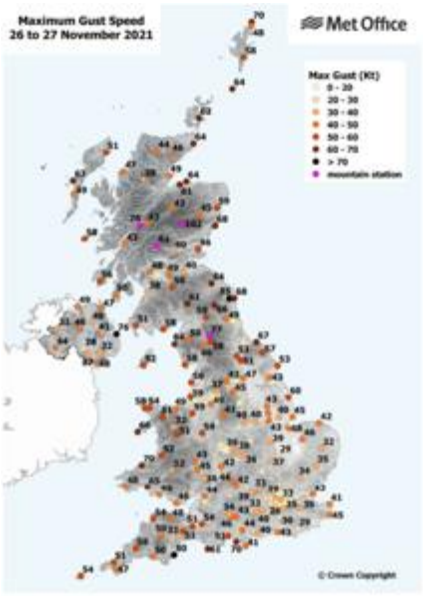
- 3 (Met Office)

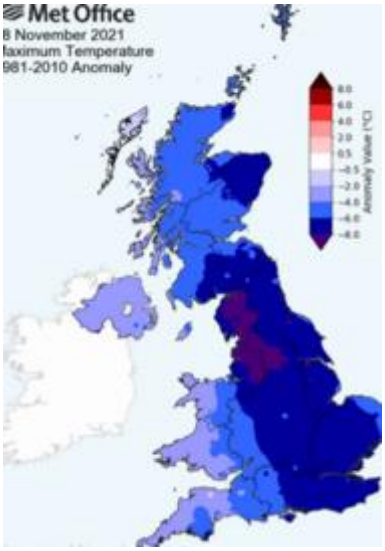
Timeline and Meteorology

- 25th November – Arwen is named by the Met Office and amber alerts are issued.
- 26th November – The Met Office issues red weather warning for wind in coastal areas of eastern Scotland and northern England (Met Office).
- 26th – 28th November - A depression with central pressure of 977mb moves southwards through the North Sea. The center of the depression tracked very closely to eastern Scotland and northeast England (RMS; Met Office).
- 26th-27th November – The UK is exposed to windy conditions with gusts exceeding 65mph. Heavy precipitation in northeastern areas (Met Office).
- 27th-29th – UK exposed to cold temperatures from northerly wind (6 to 8°C below 1981-2010 average for this date) (Met Office).

Impact

- 117mph gust recorded at Cairnwell, in the Highlands of Scotland (Met Office).
- In Scotland 80,000 homes were without power, 50,000 cut off for several days.
- In northeast England 240,000 homes were without power, 32,000 cut off for several days (RMS).
- Across the UK, more than 1 million homes experience a loss of power (Met Office).
- There is widespread disruption to road and rail transport due to fallen trees and snow in the Pennines (Met Office). Rail transport disrupted for several days (RMS).
- Structural property damage across UK, reports of overturned vehicles, and very dangerous sea-faring conditions.





Storm Arwen windiness and ensuing cold spell (Met Office images).

EQ Peru | 28 November 2021

Peru, near city of Barranca

Magnitude 7.5
Depth 112.5km

Insured losses
(in USD millions)
- Unknown

Economic losses
(in USD millions)
- Unknown

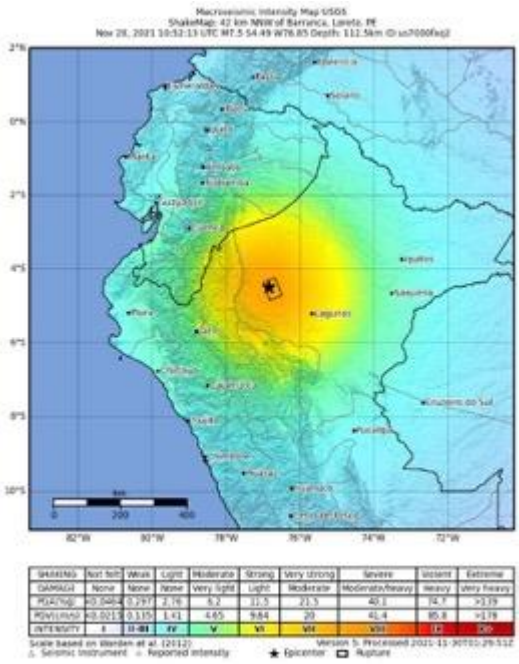
Fatalities
- 0 (Relief Web)

Timeline and Seismology

- On 28th November at 05:52 local time a Mw 7.5 earthquake struck the Amazonas region 42km northwest of the city of Barranca.
- The earthquake was caused by normal faulting at a depth of 112.5km within the subducted lithosphere of the Nazca plate (USGS).
- Secondary perils include several landslides near the epicentre (Relief Web).

Impact

- No recorded fatalities.
- 12 people were injured and 2,800 people across 35 provinces were affected (INDECI).
- 535 Houses and 59 public buildings were damaged. 127 houses were destroyed, leaving 600 people homeless (Relief Web).
- Over 4km of roads were damaged (Relief Web).



USGS shaking intensity (MMI) footprint for the 28/11/21 Mw 7.5 event

ST Midwest U.S.A.	Dec 10 to 12, 2021

Midwest & Northeast U.S.A.

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

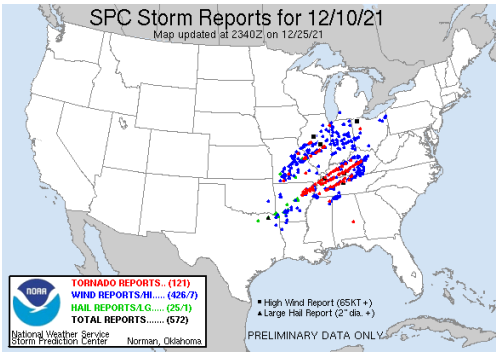
Fatalities: 90 (NYT)

Timeline and Meteorology

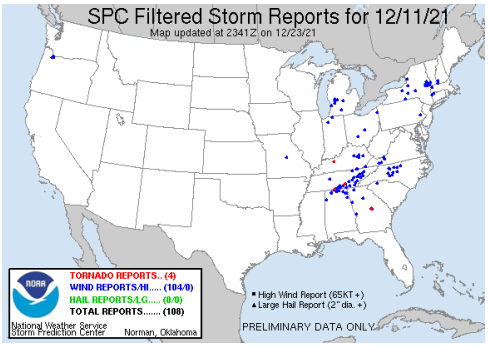
- On 10th December, a strong low-level jet in the Lower Mississippi Valley combined with warm moist air extending from the Gulf of Mexico as far north as southern Illinois and Indiana, giving rise to a potent atmosphere for convective storm development.
- Several discrete supercell thunderstorms formed in this environment and moved northeastward across Texas, Arkansas, Missouri, Tennessee, and Kentucky.
- Many of the most intense cells spawned violent, long-lived tornadoes and large hail up to 2 inches in diameter.
- Straight line winds also caused significant damage.
- The strongest winds were consolidated in the central portion with eastern Tennessee and Kentucky seeing gusts well above 60 mph.
- On the morning of 11th December, damaging wind gusts were observed in the Great Lakes region, particularly in Ohio and Michigan. By evening, remnants of the convective system moved to the Northeast.

Impact

- Nashville International Airport recorded a peak gust of 78 mph, which was the third highest wind gust ever recorded at that location.
- With widespread damages and heavy casualties in state of Kentucky, a request for an expedited major disaster declaration was approve.
- Many roofs and automobiles were damaged in the affected regions.



Thunderstorm reported on December 10 (source: SPC, NOAA)



Thunderstorm reported on December 11 (source: SPC, NOAA)

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.

WS

Name	Date	Location	Losses (USD millions)	Fatalities
Storm Filomena	**8 to 10 Jan**	**Spain**	**Insured (private): 259 (UNESPA)** **Insured (public fund): 509 (Ministerio del Interior)** **Economic: 1700 (Mayor of Madrid)**	**4 (Spanish government official)**
Storm Christoph	**18 to 20 Jan**	**UK, Norway**	**Insured: 106-159 (PwC)**	**Unknown**
Stroms Hortense-Gaetan-Ignacio	19 to 26 Jan	Spain, Portugal, France, Italy, UK	Hortense: Economic; 80 (CatNat database)	Unknown
Storm Justine	30 to 31 Jan	Spain, France	Economic: 80 (CatNat database)	1 (CatNat database)
Storm Darcy	6 to 8 Feb	UK, Netherlands, Belgium Germany	Losses not yet available	Unknown
Storm Klaus-Luis	**10 to 13 Mar**	**France, Belgium, UK, Ireland, Germany, Netherlands, Luxembourg**	**Insured: 192 (PERILS)**	**2 (PERILS)**
Daniel	1 to 2 May	Austria	Economic: 2 (VIG)	0
Storm Eugen	04-May	Germany, France, Belgium	Losses not yet available	Unknown
South Auckland Tornado	Jun 19	New Zealand (North Island)	Insured: 22 (ICNZ)	Unknown
Storm Evert	29 to 30 Jul	UK	Losses not yet available	Unknown
South Island Windstorm	Sep 13	New Zealand	Insured: 13 (ICNZ)	Unknown
Strom Athina	4 to 9 Oct	Greece, Italy	Losses not yet available	Unknown
Storm Ballos	15-Oct	Greece	Losses not yet available	1+ (Greek fire service)
Storm Aurore	**20 to 23 Oct**	**France, Belgium, Germany, Poland, Luxembourg, Czech Republic**	**Insured: 362 (PERILS)**	**5 (RMS, PERILS)**

Storm (Medicane) Apollo	22 to 25 Oct	Italy, Algeria, Tunisia, Libya	Losses not yet available	5+ (Floodlist)
Storm (Medicane) Blas	5 to 18 Nov	Algeria, Balearic Islands, Spain France, Morocco, Sardinia, Sicily	Losses not yet available	6+ (Algerian Civil Protection)
Storm Arwen	**26 to 28 Nov**	**UK**	**Insured: 330-396 (PwC)**	**3 (Met Office)**
Storm (unnamed)	29 to 30 Nov	Turkey	Losses not yet available	0
Strom Barra	5 to 8 Dec	UK, Ireland, Spain	Losses not yet available	1 (local police)

❄ Blizzard/Cold Front

Name	Date	Location	Losses (USD millions)	Fatalities
Heavy Snowfall	Jan 7	Japan	Insured: 424 (GIAG; Zenkyoren)	35 (GIAG; Zenkyoren)
U.S.A. Winter Storm	**Feb 12 to 15**	**Western & Southern USA**	**Insured: >1000 (PCS)**	Unknown
U.S.A. Winter Storm	Feb 12 to 14	Southern USA	Insured: <100 (PCS)	Unknown
U.S.A. Winter Storm	**Feb 16 to 20**	**Midwest & Southern USA**	**Insured: >1000 (PCS)**	Unknown
Winter weather (severe frost affecting vineyards)	6 to 8 April	France	Economic: 2400 (French government estimate)	Unknown

Severe Thunderstorm (Tornado/Hail/Straight Wind)

Name	Date	Location	Losses (USD millions)	Fatalities
Canterbury southwards rain and hail	Jan 3	New Zealand	Insured: 3 (ICNZ)	Unknown
U.S.A Severe Weather	Jan 11 to 13	Western U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Jan 17 to 20	California U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Jan 25 to 26	Southern U.S.A.	Insured: <100 (PCS)	Unknown
U.S.A. Severe Weather	Jan 24 to 29	Arizona & California U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Feb 25 to 26	Texas U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Mar 9 to 11	Minnesota U.S.A.	Insured: <100 (PCS)	Unknown
U.S.A. Severe Weather	Mar 9 to 11	Midwest & Southern U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Storm	Mar 22 to 23	Texas U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	**Mar 24 to 26**	**Northeast & Midwest U.S.A.**	**Insured: >1000 (PCS)**	**6 (PCS)**
U.S.A. Severe Weather	Mar 27 to 29	Northeast, Southern & Midwest U.S.A.	Insured: <1000 (PCS)	16 (PCS)
U.S.A. Severe Weather	Apr 6 to 8	Texas U.S.A.	Insured: <1000 (PCS)	Unknown

U.S.A. Severe Weather	Apr 9 to 11	Southern U.S.A.	Insured: <1000 (PCS)	1 (PCS)
U.S.A. Severe Weather	Apr 9 to 14	Louisiana & Texas U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	**Apr 15 to 16**	**Texas U.S.A.**	**Insured: >1000 (PCS)**	**Unknown**
U.S.A. Severe Weather	**Apr 27 to May 2**	**Southern & Northeast U.S.A.**	**Insured: >1000 (PCS)**	**Unknown**
U.S.A. Severe Weather	May 3 to 4	Southern & Northeast U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	May 7 to 11	Southern & Midwest U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	May 14 to 19	Southern & Midwest U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	May 26 to 28	South & Northeast U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	May 25 to 26	Northeast U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	May 29 to 31	Midwest U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Jun 7 to 9	Texas U.S.A.	Insured: <100 (PCS)	Unknown
U.S.A. Severe Weather	Jun 11 to 14	Midwest & Northeast U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	**Jun 17 to 20**	**Midwest & Northeast U.S.A.**	**Insured: >1000 (PCS)**	**Unknown**
June Europe Hailstorm	**Jun 18 to Jul 1**	**Austria, Czech Republic, Germany, Poland, Switzerland, Slovakia, France, Italy**	**Insured: 2,132 (AIR)** **Insured: >3,953 (MSK)** **Insured: 1,919 (GDV)**	**5 (RMS)**
Czech Republic Tornado	**Jun-24**	**Czech Republic**	**Insured: 240 (Generali)** **Insured: 160 (Primm)** **Insured: 150-200 (Reins News)**	**5 (RMS, BBC)**
U.S.A. Severe Weather	Jun 24 to Jul 1	Midwest U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Jul 8 to 10	Midwest U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Jul 9 to 11	Southern U.S.A.	Insured: <1000 (PCS)	Unknown
July Hailstorm	Jul 1 to Jul 27	Austria, Switzerland	Economic: 7 (VVaG) Economic: 10 (Schweizer Hagel)	0
U.S.A. Severe Weather	Jul 22 to 25	Arizona & New Mexico U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Jul 24 to 24	Michigan U.S.A.	Insured: <100 (PCS)	Unknown
U.S.A. Severe Weather	Jul 26 to 27	Minnesota & Wisconsin U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Jul 28 to 29	Midwest & Northeast U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Aug 1 to 1	Texas U.S.A.	Insured: <100 (PCS)	Unknown
U.S.A. Severe Weather	Aug 7 to 9	Midwest U.S.A.	Insured: <100 (PCS)	Unknown
U.S.A. Severe Weather	Aug 10 to 13	Midwest & Northeast U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Aug 10 to 16	Arizona U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Aug 17 to 19	Western U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Aug 21 to 22	Tennessee U.S.A.	Insured: <100 (PCS)	Unknown
U.S.A. Severe Weather	Aug 26 to 28	Midwest U.S.A.	Insured: <1000 (PCS)	1
U.S.A. Severe Weather	Sep 6 to 7	Midwest U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Sep 15 to 17	Midwest U.S.A.	Insured: <100 (PCS)	Unknown

U.S.A. Severe Weather	Sep 24 to 9	Southern U.S.A.	Insured: <100 (PCS)	Unknown
U.S.A. Severe Weather	Sep 30 to Oct 2	Texas U.S.A.	Insured: <100 (PCS)	Unknown
U.S.A. Severe Weather	Oct 4 to 7	Southern U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Oct 10 to 11	Southern U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Oct 10 to 12	Western U.S.A.	Insured: <100 (PCS)	Unknown
U.S.A. Severe Weather	Oct 24 to 28	Western & Southern U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Oct 24 to 25	Midwest U.S.A.	Insured: <100 (PCS)	Unknown
U.S.A. Severe Weather	Oct 25 to 27	Northeast U.S.A.	Insured: <1000 (PCS)	Unknown
U.S.A. Severe Weather	Oct 24 to 25	Northeast U.S.A.	Insured: <100 (PCS)	Unknown
Southern Australia Severe Hail	**Oct 28 to Oct 29**	**South Australia**	**Insured: 733 (PERILS)**	**Unknown**
U.S.A. Severe Weather	Nov 11 to 13	Washington U.S.A.	Insured: <100 (PCS)	Unknown
U.S.A. Severe Weather	Nov 14 to 16	Texas U.S.A.	Insured: <100 (PCS)	Unknown
U.S.A. Severe Weather	Nov 10 to 11	Texas U.S.A.	Insured: <100 (PCS)	Unknown
U.S.A Severe Weather	**Dec 10 to 11**	**South-eastern- central U.S.A**	**Insured: >1000 (PCS)**	**90 (NYT)**
U.S.A. Severe Weather	Dec 13 to 16	Texas U.S.A.	Insured: >1000(PCS)	Unknown
U.S.A. Severe Weather	Dec 17 to 18	Texas U.S.A.	Insured: <100 (PCS)	Unknown
U.S.A. Severe Weather	Dec 21 to 21	Florida U.S.A.	Insured: <100 (PCS)	Unknown

Tropical Cyclone - Atlantic Ocean

Name	Date	Location	Landfall Category	Losses (USD millions)	Fatalities
Claudette	Jun 18 to 23	Southern U.S.A., Mexico	TS	Insured: <1000 (PCS)	Unknown
Elsa	Jul 01 to Jul 14	U.S.A, Barbados, Cuba, Saint Lucia	1	Insured: <1000 (PCS)	Unknown
Fred	Aug 11 to 20	U.S.A., Lesser Antilles, Puerto Rico, Hispaniola	TS	Insured: <1000 (PCS)	Unknown
Hurricane Grace	**Aug 13 to Aug 21**	**Mexico, Caribbean**	**3**	**Insured Losses: 300-330 in Mexico and 30 in Caribbean (Insurance Journal)**	**At least 8 (BBC)**
Henri	Aug 21 to 23	Northeast U.S.A.	TS	Insured: <1000 (PCS)	Unknown
Hurricane Ida	**Aug 26 to Sep 2**	**USA, Venezuela, Colombia, Jamaica, Cayman Islands, Cuba**	**4**	**Insured: >1000 (PCS) Insured: 31'000-44'000 (RMS)**	**Unknown**
Nicholas	Sep 12 to 17	Louisiana & Texas U.S.A.	TS	Insured: <1000 (PCS)	Unknown

**Saffir-Simpson Hurricane scale*

Tropical Cyclone - Northwestern Pacific

Name	Date	Location	Landfall Category	Losses (USD millions)	Fatalities
Tropical Storm Dujuan	Feb 22	Philippines	TD	Economic: 3 (NDRRMC)	5 (NDRRMC)
Typhoon Surigae	Apr 14	Western Pacific (No Landfall)	No Landfall	Economic: 5 (NDRRMC)	9 (NDRRMC)
Tropical Storm Choi-Wan	May 30	Philippines	TS	Economic: 6 (NDRRMC)	11 (NDRRMC)
Tropical Storm Koguma	Jun 13	China	TD	Losses not yet available	Unknown
Severe Tropical Storm Cempaka	Jul 20	China	STS	Economic: 4 (Yangxi.gov)	Unknown
Typhoon In-Fa	Jul 25	China	Cat 1	Losses not yet available	Unknown
Tropical Storm Lupit	Aug 7	China	TS	Unknown	Unknown
Tropical Storm Lupit	Aug 7	Taiwan	TS	Economic: 15	4 (Taiwan News)
Tropical Storm Omais	Aug 24	South Korea	TS	Losses not yet available	Unknown
Typhoon Conson	Sep 7	Philippines	Cat 1	Economic: 28 (NDRRMC)	24 (NDRRMC)
Typhoon Chanthu	Sep 11	Philippines	Cat 5	Economic: 1 (NDRRMC)	Unknown
Typhoon Chanthu	Sep 12	Taiwan	Cat 3	Losses not yet available	Unknown
Typhoon Dianmu	Sep 23	Thailand	TS	Losses not yet available	8 (Bangkok Post)
Tropical Storm Lionrock	Oct 7	Philippines	TS	Economic: 0.2 (NDRRMC)	3 (NDRRMC)
Tropical Storm Lionrock	Oct 8	China	TS	Losses not yet available	Unknown
Tropical Storm Kompasu	Oct 12	Philippines	TS	Economic: 127 (NDRRMC)	43 (NDRRMC)
Severe Tropical Storm Kompasu	Oct 13	China	TS	Economic: 780 (News 18)	Unknown
Typhoon Namtheun	Oct 19	Western Pacific (No Landfall)	No Landfall	Losses not yet available	Unknown
Typhoon Rai	Dec 16	Philippines	Cat 4	Economic: >584 (NDDRMC)	406

**Saffir-Simpson Hurricane scale*

Tropical Cyclone - Southern Pacific and Oceania

Name	Date	Location	Landfall Category	Losses (USD millions)	Fatalities
Severe Tropical Cyclone Niran	Mar 6	New Caledonia	Cat 3	Losses not yet available	Unknown
Severe Tropical Cyclone Seroja	Apr 4	Australia	Cat 1	Insured: 281 (PERILS)	Unknown

Saffir-Simpson Hurricane scale

Tropical Cyclone - Indian Ocean

Name	Date	Location	Landfall Category	Losses (USD millions)	Fatalities
Cyclone Eloise	Jan 19 to Jan 25	Mozambique, Madagascar, Eswatini, South Africa		Economic: 80 (CatNat database)	21+ (Reliefweb)
Cyclone Guambe	19-Feb	Mozambique		Losses not yet available	Unknown
Cyclone Jobo	21 to 22 April	Tanzania, Seychelles		Losses not yet available	22 (CatNat database)
Extremely Severe Cyclone Storm Tauktae	May 17	India	Cat 3	Insured: 160 (RMSI); Economic: 2100 (RMS)	104 (RMSI)
Very Severe Cyclonic Storm Yaas	May 26	India	Cat 1	Economic: 2760 (Times of India)	3 (Times of India)
Cyclones Gulab-Shaheen	**Sep 30 to Oct 3**	**Oman, India**		**Economic (Oman only): 78-130 (retired governmental civil engineer)**	**13 (Omani and Iranian state media)**

Saffir-Simpson Hurricane scale

Tropical Cyclone – Pacific

Name	Date	Location	Landfall Category	Losses (USD millions)	Fatalities
Tropical Storm Andres	May 09 to May 11	México	TS	Economic Losses: Not Significant	0
Tropical Storm Dolores	June 18 to June 20	México	TS	Economic Losses: Low	Unknown
Hurricane Enrique	June 25 to June 30	México, Central America	Cat 1	Economic Losses: Low	Unknown
Hurricane Felicia	July 14 to July 20	México, Central America	Cat 4	Economic Losses: Not Significant	0
Hurricane Linda	Aug 10 to Aug 19	México, Hawaii	Cat 4	Economic Losses: Not Significant	0
Hurricane Nora	Aug 25 to Aug 30	México, US	Cat 1	Economic Losses: Low	Unknown
Hurricane Olaf	Sep 7 to Sep 11	México	Cat 2	Economic Losses: Low	Unknown
Hurricane Pamela	Oct 10 to Oct 13	México	Cat 1	Economic Losses: Low	Unknown
Hurricane Rick	Oct 22 to Oct 26	México	Cat 2	Economic Losses: Low	0

Saffir-Simpson Hurricane scale

Flood

Event Name	Date	Country	Losses (USD millions)	Fatalities
Indonesia Flooding	Jan 1	Indonesia	Economic: 94 (BPPT)	40
South-East EU floods	Jan 6 to Jan 12	Serbia, Bulgaria, Albania, Kosovo, Greece	Losses not yet available	0
Spain flash floods	Jan-08	Spain	Losses not yet available	2 (Floodlist)
Floods in Southeastern Europe	11 to 12 Jan	Albania, Kosovo, Bulgaria, Serbia and Greece	Losses not yet available	Unknown
Izmir flash floods	Jan-12	Turkey	Losses not yet available	0
Flooding in southern Spain (Storm Filomena)	19 to 21 Jan	Spain	Losses not yet available	2 (Floodlist)
UK Storm Christoph flooding	Jan 19 to Jan 22	United Kingdom	Losses not yet available	0
Flooding in South Africa	23 Jan to 14 Feb	South Africa	Losses not yet available	30 (Floodlist)
Indonesia Flooding, Feb	Feb 1	Indonesia	Losses not yet available	10 (RMS)
Greece flash floods	Feb 1 to Feb 2	Greece	Losses not yet available	1 (EFAS)
Izmir flash floods	Feb 1 to Feb 2	Turkey	Losses not yet available	2 (EFAS)
Floods in Morocco	8 -9 Feb	Morocco	Losses not yet available	28 (Floodlist)
Flooding in Algeria	03-Mar	Algeria	Losses not yet available	24 (Floodlist)
South Spain flash floods	Mar-05	Spain	Losses not yet available	0
South Eastern Australia Floods	Mar 16	Australia	Insured: 536 (PERILS)	3 (PERILS)
Floods in Angola	16 Mar to 24 Apr	Angola	Losses not yet available	24 (Floodlist)
Floods in Tanzania	30 Apr to 14 May	Tanzania	Losses not yet available	22 (Floodlist)
Guatemala Floods	May-Nov Rain Season	Country-wide	Economic Losses: Low	~ 30 (FloodList)
Floods in Ethiopia	2-14 May	Ethiopia	Losses not yet available	16 (Floodlist)
Iran – Flash Floods	05-May	Iran	Losses not yet available	10(Floodlist)
Romania floods	May-13	Romania	Losses not yet available	0
Slovakia floods	May-17	Slovakia	Losses not yet available	1 (EFAS)
Canterbury Flooding	May 30	New Zealand	Insured: 32 (ICNZ)	Unknown
France & Belgium flash floods	Jun-01 to Jun 03	France, Belgium	Losses not yet available	0
Netherlands & Luxembourg floods	Jun-03	Netherlands, Luxembourg	Losses not yet available	0
Germany floods	Jun 3 to Jun 8	Germany	Losses not yet available	1 (Floodlist)
Croatia floods	Jun 6 to Jun 7	Croatia	Losses not yet available	0
South & Central Spain floods	Jun 5 to Jun 6	Spain	Losses not yet available	0
Ankara flash floods	Jun-09	Turkey	Losses not yet available	0
Victorian Severe Storms & Flooding	13-Jun	Australia	Insured: 200 (ICA)	Unknown

Spain flash floods (La Rioja)	Jun-14	Spain	Losses not yet available	0
Europe flash floods	Jun-21 to June-25	Czech Republic, Germany, Poland, Italy	Losses not yet available	4 (Floodlist)
Crimea floods	Jun 17 to Jun 18	Crimea	Losses not yet available	0
North & Eastern France floods	Jun 20 to Jun 21	France	Losses not yet available	1 (Floodlist)
Switzerland flash floods	Jun 22 to Jun 23	Switzerland	Losses not yet available	0
Romania flash floods	Jun 18 to Jun 23	Romania	Losses not yet available	1 (Floodlist)
Silven flash floods	Jun-26	Bulgaria	Losses not yet available	1 (Floodlist)
Russia floods	Jun-28	Russia	Losses not yet available	0
Honshu, Japan Heavy Rainfall and Mudslides	Jul 1	Japan	Insured: 67 (GIAJ)	26 (GIAJ)
Crimea floods	Jul-04	Crimea	Losses not yet available	2 (Floodlist)
Russia floods	Jul-04	Russia	Losses not yet available	1 (Floodlist)
Floods in Chad	7 Jul – 20 Sep	Chad	Losses not yet available	15 (Floodlist)
Cambridgeshire flash floods	Jul-09	United Kingdom	Losses not yet available	0
Europe floods	**Jul 12 to Jul 19**	**Austria, Belgium, France, Germany, Netherlands, Switzerland**	**Insured: 5,700-9,100 (Hannover Re)** **Insured: 13,000 (Swiss Re)** **Insured: 9,100 (GDV)** **Insured: 2,100 (Assuralia)**	**196 (Science)**
Yemen – Flash Floods	14-Jul	Yemen	Losses not yet available	14 (Floodlist)
Rize floods	Jul-14	Turkey	Losses not yet available	6 (Floodlist)
Luxembourg flood	Jul-14	Luxembourg	Losses not yet available	0
Austria flood	Jul 17 to Jul 19	Austria	Losses not yet available	0
Romania flood	Jul 15 to Jul 18	Romania	Losses not yet available	0
China Henan Floods	**Jul 19 to Jul 21**	**China**	**Insured: 1,920 (CBIRC) - Economic: 17,600 (RMS)**	**302 (RMS)**
Wellington Floods	Jul 19	New Zealand	Insured: 12 (ICNZ)	Unknown
North Island (excluding Wellington) Floods	Jul 19	New Zealand	Insured: 5 (ICNZ)	Unknown
Upper South Island Floods	Jul 19	New Zealand	Insured: 12 (ICNZ)	Unknown
West Coast Flooding	Jul 19	New Zealand	Insured: 66 (ICNZ)	Unknown
Rize floods	Jul-22	Turkey	Losses not yet available	0
Sochi floods	Jul-23	Russia	Losses not yet available	4 (EFAS)
Belgium floods	Jul-24	Belgium	Losses not yet available	0
Western Europe floods	Jul-25	Switzerland, UK and Germany	Losses not yet available	0
Lake Como floods	Jul 25, Aug 4 to Aug 5	Italy	Losses not yet available	0
China Floods	Jul 26	China	Losses not yet available	69 (Floodlist)
South Sudan – Flooding	8 Aug – 1 Sep	South Sudan	Losses not yet available	7 (Floodlist)
Amur floods	Aug-09	Russia	Losses not yet available	0

Northern Turkey floods	**Aug 10 to Aug 14**	**Turkey**	**Losses not yet available**	**81 (AFAD)**
Floods in Niger	**10 - 26 Aug**	**Niger, Sudan, South Sudan**	**Unknown**	**127 (Floodlist; OCHA)**
Russia floods	Aug-10	Russia	Losses not yet available	0
Southern Japan Flooding	Aug 11	Japan	Insured: 194 (GIAJ)	13 (GIAJ)
Floods in Nigeria	11 Aug – 20 Sep	Nigeria	Losses not yet available	37 (Floodlist)
Europe floods	Aug-16	Germany, Austria Italy	Losses not yet available	2 (Floodlist)
Sweden floods	Aug-18	Sweden	Insured: 513 (Svensk Försäkring)	0
Russia floods	Aug-22	Russia	Losses not yet available	unknown
France floods	Aug-24	France	Losses not yet available	0
Spain floods	Aug-25	Spain	Losses not yet available	0
Castellón floods	Aug-29	Spain	Losses not yet available	0
West Auckland Flooding	Aug 31	New Zealand	Insured: 39 (ICNZ)	Unknown
Catalonia floods	Sep-01	Spain	Losses not yet available	0
Mexico Floods	Sep-07	Hidalgo State	Economic Losses: Low	17 (FloodList)
Lot-et-Garonne floods	Sep-08	France	Losses not yet available	0
Gard floods	Sep-14	France	Losses not yet available	0
Italy floods	Sep-16	Italy	Losses not yet available	0
Thailand September Floods	Sep 16 to Oct 2	Thailand	Economic: 594 (Bloomberg)	8 (Floodlist)
Andalusia floods	Sep-23	Spain	Losses not yet available	0
Ljubljana floods	Sep-29	Slovenia	Losses not yet available	0
Shanxi Province, China Flooding	Oct 2 to Oct 7	China	Losses not yet available	Unknown
Mexico Floods	Oct-03	Querétaro	Economic: Low	4 (FloodList)
Liguria floods	Oct-04	Italy	Losses not yet available	0
Flooding in Cote d'Ivoire	22 - 24 Oct	The city of Abidjan, Côte d'Ivoire (Ivory Coast)	Losses not yet available	6 (GDACS)
Algeria floods	Oct-24	Algeria	Losses not yet available	1 (Floodlist)
Tunisia floods	Oct-24	Tunisia	Losses not yet available	3 (Floodlist)
Italy floods	Oct-24	Italy	Losses not yet available	2 (Floodlist)
Flood in Congo-Brazzaville	3 Nov – 15 Dec	Congo-Brazzaville	Losses not yet available	15+ (IRFC in Floodlist)
Bosnia floods	Nov-04	Bosnia	Losses not yet available	0
Sicily floods	Nov-10	Italy	Losses not yet available	1 (Floodlist)
Sardinia floods	Nov-15	Italy	Losses not yet available	1 (Floodlist)
Colombia Floods	Nov-19	Chocó	Economic: Not Significant	Unknown
Panama Flash Floods	Nov-21	Panama Province	Economic: Low	2 (FloodList)
Northern Spain floods	Nov 24 to Nov 29	Spain	Losses not yet available	0
Malta floods	Nov-25	Malta	Losses not yet available	0
Vietnam and Thailand Flooding	Nov 26	Vietnam, Thailand	Losses not yet available	18 (Floodlist)
Flood in Kenya	4 to 6 Dec	Kenya	Losses not yet available	32 (Floodlist)
Brazil Floods	Dec-09	Bahia	Economic: Low	~ 24 (FloodList)

Navarre floods	Dec 9 to Dec 12	Spain	Losses not yet available	2 (Floodlist)
Malaysia Floods	Dec 16 to Dec 31	Malaysia	Economic: 1,260 to 1,550 (DOSM)	Unknown

Earthquake

Date	Local Time	Location	Magnitude (Mw)	Depth (km)	Losses (USD millions)	Fatalities
Jan-06	18:01	Petrinja, Croatia	4.7	10	Losses not yet available	0
Jan 15	01:28	32 km S of Mamuju, Indonesia	6.2	10	Economic: 43,100 (West Sulawesi Province Government Data)	107 (RMS)
15-Jan	21:31	Bandar-e Lengeh, Iran	5.4	8	Economic: 85% prob losses are between 0-1 (USGS)	0
Feb 07	12:22	9 km W of Magsaysay, Philippines	6.0	16	Economic: 0.3 (NDRRMC)	Unknown
Feb 13	**23:07**	**72km E/NE of Namie, Japan**	**7.1**	**44**	**Insured: 2,134 (GIAJ)**	**2 (Zenkyoren, USGS)**
17-Feb	18:35	Yasuj, Iran	5.4	7	Economic: 100% prob losses are between 0-1 (USGS)	0
Jan-21	22:53	Ankara, Turkey	4.3	10	Losses not yet available	0
Jan-23	12:15	Andalusia, Spain	4.2	10	Losses not yet available	0
Jan-26	22:54	Atarfe, Spain	4.3	10	Losses not yet available	0
Jan-28	19:49	Andalusia, Spain	4.3	10	Losses not yet available	0
Feb-24	10:05	Southern Peninsula, Iceland	5.6	10	Economic: 36% probability of losses between USD 10s-100s of millions (USGS)	0
Mar-03	12:16	Larissa EQ, Greece	6.3	8	Economic: 35% probability of losses between USD 10s-100s of millions (USGS)	1 (Daily Sabah)
4-Mar	18:38	Týrnavos, Greece	5.8	10	Economic: 35% prob of losses between 10-100 (USGS)	0
Mar 4	06:41	Kermadec Islands, New Zealand	7.4	43	Losses not yet available	Unknown
Mar 4	02:27	182 km NE of Gisborne, New Zealand	7.3	10	Losses not yet available	Unknown
18-Mar	00:04	Bejaïa, Algeria	6	8	Economic: 45% prob of losses between 10-100 (USGS)	0

Mar 20	18:09	30km E of Ishinomaki, Japan	7	43	Insured: 86 (GIAJ)	Unknown
Apr 10	14:00	Offshore East Java, Indonesia	6	82	Losses not yet available	10 (RMS)
Apr 18	20:14	15 km SSW of Hualien City, Taiwan	5.8	12	Losses not yet available	Unknown
18-Apr	06:41	Bushehr, Iran	5.8	8	Economic: 51% prob of losses between 100-1000 (USGS)	0
Apr 28	07:21	8 km NNW of Dhekiajuli, India	6	34	Losses not yet available	2 (The Hindu)
17-May	00:54	Bojnūrd, Iran	5.4	7	Economic: 100% prob losses are between 0-1 (USGS)	0
May 21	02:04	Southern Qinghai, China	7.3	10	Losses not yet available	Unknown
May 22	21:48	25 km NW of Dali, China	6.1	9	Losses not yet available	Unknown
10-Jun	08:54	Kabare, Democratic Republic of the Congo	5	10	Losses not yet available	Unknown
Jun-25	21:28	Bingol, Turkey	5.4	3	Economic: 100% probability of losses between USD 0-1m (USGS)	0
Jul-21	16:15	Panama	6.7		Economic: Not Significant	0
Aug-12	22:25	Granada, Spain	4.6	10	Losses not yet available	0
Aug-14	**09:30**	**Haiti**	**7.2**		**Economic: 1,600 (IDB)**	**2,248 (Relief Web)**
Aug-31	14:04	Kutahya, Turkey	5.1	10	Losses not yet available	0
Sep-07	**20:48**	**Mexico- Guerrero**	**7**		**Insured Losses: 200 (Insurance Journal)**	**1 (Reuters)**
13-Sep	04:02	Qūchān, Iran	5.1	10	Losses not yet available	0
Sep 21	09:15	Victoria Earthquake, Australia	5.9	12	Losses not yet available	Unknown
Sep-22	03:57	Nicaragua	6.5		Economic: Not Significant	0
Sep 22	09:15	39 km S of Mount Buller, Australia	5.9	12	Losses not yet available	Unknown
Sep-27	**08:17**	**Arkalochori (Crete), Greece**	**6**	**6**	**Economic: 32% probability of losses between USD 1-10s of million and 10s-100s of millions (USGS)**	**1 (NEWS247)**
28-Sep	04:48	Ano Arhanes, Greece	5.3	10	Losses not yet available	0
1-Oct	01:15	Bandar-e Genāveh, Iran	5.2	10	Losses not yet available	0
Oct-12	11:24	Lasithi, Greece	6.4	4	Economic: 35% probability of losses between USD 10s-100s of millions (USGS)	0
Oct 25	13:11	Yilan, Taiwan	6.2	69	Losses not yet available	Unknown

Nov-08	20:43	Konya, Turkey	5.1	10	Losses not yet available	0
11-Nov	13:21	Selfoss, Iceland	5.1	10	Losses not yet available	0
14-Nov	12:08	Hormozgan earthquakes	6.3	8	Economic: 50% prob of losses between 0-1 (USGS)	1
14-Nov	12:07	Hormozgan earthquakes	6	7	Economic: 50% prob of losses between 0-1 (USGS)	1
Nov-19	15:40	Erzurum, Turkey	5.1	10	Losses not yet available	0
Nov-28	**05:52**	**Peru- Barranca**	**7.5**	**112**	**Economic: Low**	**0 (Relief Web)**

Wildfire

Name	Date	Location	Hectares Burnt	Losses (USD millions)	Fatalities
Perth Hills Wildfire	Feb 5	WA, Australia	10,000 (Reinsurance News)	Insured: 63 (ICA)	Unknown
Wildfire in Ciudad Real, Spain	12-Jul	Ciudad Real, Spain	1,126 (Copernicus)	Losses not yet available	Unknown
Bootleg Fire	Jul 17 to Aug 6	Oregon, USA	> 410,000	Insured: <1000 (PCS)	Unknown
Dixie Fire	**Jul 17 to Aug 5**	**California, USA**	**> 960,000**	**Insured: >1000 (PCS)**	**Unknown**
Fire in Sardinia, Italy	24-Jul	Sardinia, Italy	11,000 (EU ERCC)	Losses not yet available	Unknown
Fires in Castilla La Mancha, Spain	24-Jul	Castilla La Mancha, Spain	Unknown	Losses not yet available	Unknown
Southern European Wildfires	**Jul – Sep**	**Greece, Turkey, Spain, Italy**	**>1,482,632**	**Losses not yet available**	**Unknown**
Forest Fire in Valencia province, Spain	06-Aug	Valencia province, Spain	1,500 (Copernicus)	Losses not yet available	Unknown
Fire in Calabria, Italy	08-Aug	Calabria, Italy	14,836 (Copernicus)	Losses not yet available	Unknown
Algeria Forest Fires	09-Aug	Kabylia region, Algeria	12,000 (Copernicus)	Losses not yet available	69+ (ReliefWeb)
Caldor Fire	Aug 14 to Oct 5	California, USA	>221,000	Insured: <1000 (PCS)	Unknown
Corkscrew Fire	Aug 15 to Aug 30	Washington, USA	>15,000	Insured: <100 (PCS)	Unknown

Fire in Castilla y Leon, Spain	15-Aug	Avila & Navalacruz, Spain	15,000 (Copernicus)	Losses not yet available	Unknown
Israel wildfires	15-Aug	Judaean Mountains, Israel	Unknown	Losses not yet available	Unknown
Fire in Algarve, Portugal	16-Aug	Algarve, Portugal	9,000 (Copernicus)	Losses not yet available	Unknown
Fire in Var, France	17-Aug	Var, France	7,000 (Copernicus)	Losses not yet available	2 (Prefecture du Var)
Wildfire in San Felices de los Gallegos, Spain	17-Aug	San Felices de los Gallegos, Spain	1,600 (Copernicus)	Losses not yet available	Unknown
Wildfire in Galicia, Spain	09-Sep	Galicia, Spain	Unknown	Losses not yet available	Unknown
Wildfire in Andalucia, Spain	09-Sep	Andalucia, Spain	7,400	Losses not yet available	1 (local authorities)
Marshal Wildfire	Dec 30	Colorado, USA	>1,600	Losses not yet available	Unknown

Volcanic Eruption

Name	Date	Location	Losses (USD millions)	Fatalities
Piton de la Fournaise volcano, La Reunion	09-Apr	La Reunion	Losses not yet available	Unknown
La Soufrière	**April 09 to April 22**	**Saint Vincent**	**Economic: 230-300 (UNDP) 30% of GDP (IMF)**	**0 (UNOCHA)**
Nyiragongo volcano	22-May	Democratic Republic of Congo	Losses not yet available	32 (The Borgen Project)
Cumbre Vieja volcano, La Palma	**19-Sep to 14-Dec**	**La Palma, Spain**	**Insured: 71 (CCS) - Economic: 623 – 793 (Canary Islands government)**	**1 (AccuWeather)**
Mount Semeru Volcanic Eruption	Dec 4	Indonesia	Losses not yet available	34 (Al Jazeera; The Guardian)

Landslide

Name	Date	Cause	Location	Losses (USD millions)	Fatalities
Norway Landslide	Dec-30	Quick Clay	Gjerdrum	Insured: 14 (Tryg) Economic: 99 (Finans Norge)	10 (NRK)
Venezuela	Aug-26	Heavy Rainfall	Mérida State	Economic Losses: Low	20 (BBC)
Colombia	Nov-02	Heavy Rainfall	Nariño	Economic: Not Significant	11 (FloodList)

Abbreviations

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

Sources

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Guatemala)** (conred.gob.gt/site/index.php), **COPECO** (copeco.gob.hn/), **Copernicus** (efas.eu), **Copernicus Emergency Management Service** (CEMS), **Croatian Insurance Bureau** (huo.hr), **Daily Sabah** (dailysabah.com), **Dartmouth Flood Observatory** (floodobservatory.colorado.edu), **Digital Typhoon** (http://agora.ex.nii.ac.jp/digital-typhoon/), **DSNS** (dsns.gov.ua), **DWD** (https://www.dwd.de/DE/Home/home_node.html), **EA** (environmentagency.blog.gov.uk), **Earth Networks** (Earthnetworks.com), **Earth Observing System Data and Information System (EOSDIS)** (earthdata.nasa.gov/eosdis), **EFFIS** (https://effis.jrc.ec.europa.eu/), **EFSYN** (https://www.efsyn.gr/), **El Pais** (https://english.elpais.com/), **EM-DAT** (The International Disaster Database: emdat.be), **EO** (Earth Observatory of Singapore: EOS.org)**, ERCC** (ec.europa.eu/echo), **ESWD** (https://eswd.eu/), **European Parliament** (Parliamentary questions), **EuroNews** (Euronews.com), **EuroTempest** 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Australia), **ICEYE** (https://www.iceye.com/), **ICNZ** (Insurance Council of New Zealand), **IDB** (https://www.iadb.org/en), **IFRC** (International Federation of Red Cross and Red Crescent Societies: ifrc.org), **Iltalehti** (iltalehti.fi), **INCIWEB** (https://inciweb.nwcg.gov/), **INDECI** (https://www.gob.pe/indeci), **Indian Express** (https://indianexpress.com/), **Insurance Insider** (insuranceinsider.com), **Insurance Journal** (insurancejournal.com), **JBA** (jbarisk.com), **JMA** (Japan Meteorology Agency), Jutarnji (jutarnji.hr), **Karen Clark & Company (KCC)** karenclarkandco.com/news/year/2021/), **KIT** – Karlsruhe Institute for Technology, **livemint** (livemint.com), **MEM** (https://www.mem.gov.cn/), **Met Office** (metoffice.gov.uk), **Meteofrance** (meteofrance.com), **Milenio** (milenio.com), **Ministry of Infrastructure and Transport** (yme.gr), **Ministerio del Interior** (http://www.interior.gob.es/en), **Munich Re** (munichre.com), **NASA Earth Observatory** 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