JULY 2024

Natural Catastrophe and Climate Report: H1 2024

Preliminary Overview

Global Overview

US Severe Convective Storm (SCS) Insured Losses During Past 18 Months Surpass Record USD100 Billion Amid Highly Active H1 2024

Preliminary YTD (H1) Global Loss Totals: Economic (USD128 billion) and Insured (USD61 billion)

An active first half of 2024 for global natural catastrophes resulted in a near-average financial cost for governments and the insurance industry. The minimum USD128 billion in economic loss from all natural perils was slightly lower than the most recent 10-year H1 average (USD133 billion). The portion covered by the private insurance market or public insurance entities totaled at least USD61 billion, or 25% higher than the decadal average (USD49 billion). The above-average insured losses were attributed to a higher frequency of low- / mid-sized SCS events with robust insurance coverage in the United States. As more claims filings and processing occur, it should be expected that H1 loss totals will show continued loss progression development through the remainder of the year.

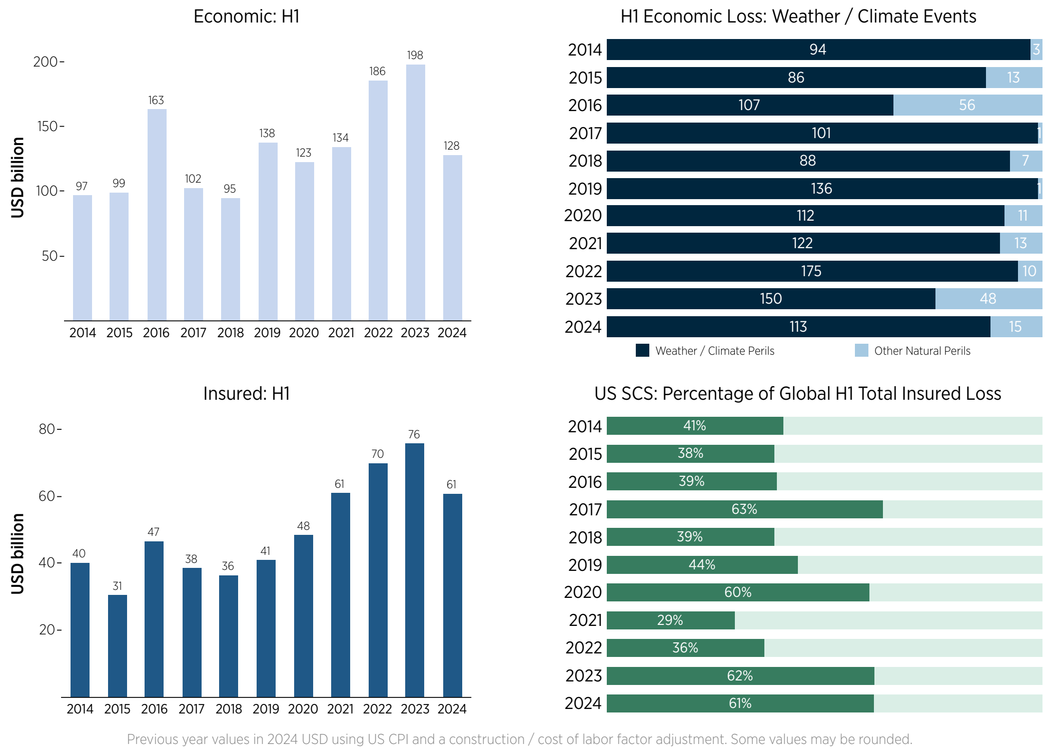
When looking solely at weather and climate-related disaster costs, which means excluding losses associated with earthquakes, volcanoes, or other non–atmospheric driven events, the economic cost was minimally USD113 billion. This was relatively close to the decadal average (USD117 billion). This was the sixth consecutive H1 with weather / climate-related economic losses at or above USD100 billion. Insurers covered at least USD57 billion, which was 22% higher than the decadal average (USD46 billion).

As we enter the second half of the year, there is heightened focus on the Atlantic hurricane season. Colorado State University, a new collaborative partner with the Gallagher Research Centre, has forecast the potential of a hyperactive season. The combination of record warmth in the Atlantic Ocean and the transition from El Niño to La Niña conditions in the central and eastern Pacific Ocean are major driving factors in this forecast. The insurance industry must be prepared for the possibility of a challenging second half of the year. Land and ocean temperatures set global records in 13 consecutive months from June 2023 to June 2024. These conditions, in tandem with the influence of climate change, have aided in more unpredictable and extreme events in 2024.

Key takeaways from H1 2024:

- Above-average losses for the global insurance industry
- US SCS accounted for 61% of all global insured losses
- 32+ billion-dollar economic loss events
- 19+ billion-dollar insured loss events (12+ multi-billion)
- El Niño dissipates with La Niña expected to arrive in Q3 2024
- Warmest H1 for the world on record dating to 1850

Note: All loss totals in this document are adjusted to 2024 USD unless explicitly stated otherwise. Totals were adjusted using the US Consumer Price Index, a construction index and cost of labor factor.



+1.51°C / 2.73°F

H1 2024 Global Land & Ocean Temperature Anomaly (NOAA Baseline: 1850-1900)

13

Consecutive months of modern era record warm global temperatures (June 2023 to June 2024)

254.8 mm

24-hour rainfall (10.03 in) at Al Ain, UAE on April 15-16, 2024; UAE averages ~80 mm (3.15 in) of rain per year

2 trillion

Estimated 2024 investment (USD) in clean energy technology per the International Energy Agency

Figure 1: H1 2024 executive summary of natural catastrophe activity | **Data & Graphic:** Gallagher Re

Economic Loss

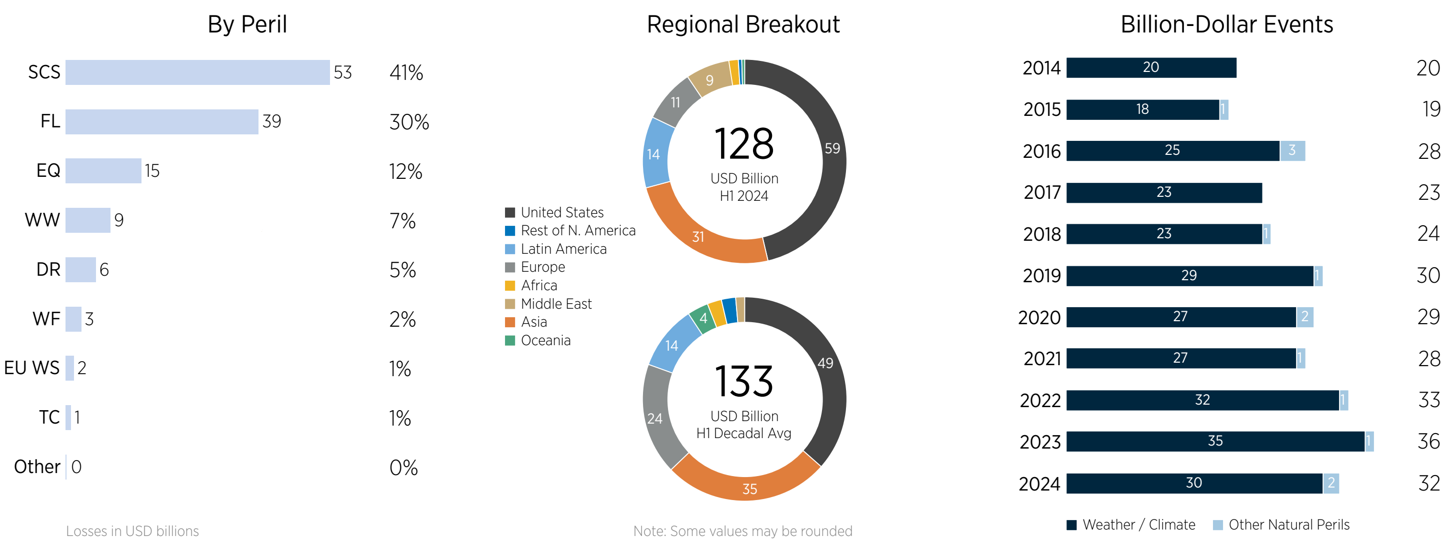
The total economic loss for H1 2024 was preliminarily estimated at USD128 billion, which was near the decadal average (USD133 billion). This was driven by at least six individual events which resulted in economic losses greater than USD5 billion. Two of these events occurred in Asia, and one each in the United States, Middle East, Europe, and Latin America. These six events alone accounted for USD47 billion (37%) of all economic losses during the first six months. Two other US SCS outbreaks were just under USD5 billion.

In total there were at least 32 individual billion-dollar economic loss events in H1. This was above the decadal average of 27 such events. These events included 20 in the United States (14 of which were from SCS outbreaks), 6 in Asia, 4 in Latin America, and 1 each in the Middle East and Europe. All but two (30) were weather/climate-related events, which was above the 10-year average of 26. A driving force in many of the weather/climate related disasters surrounded by lingering influence from El Niño. Shifts in the jet stream led to periods of extreme precipitation or drought in parts of South America, Africa, Asia, and the Middle East which led to costly results. Exceptional flooding in mid-April in the Middle East (notably the United Arab Emirates) resulted in the region's costliest weather-related economic cost on record, topping USD8.5 billion. Similar flooding in Brazil at the end of April and into May led to more than USD8 billion in loss costs in the state of Rio Grande do Sul. Intense drought conditions plagued parts of Mexico, South America, and Southeast Asia.

The most expensive peril, by far, was again SCS. It accounted for at least 41% of natural catastrophe economic losses in H1. The USD53 billion in global SCS losses were 36% higher than the decadal H1 average (USD39 billion). Flooding (30%) and earthquake (12%) were the only other perils that accounted for at least 10% of economic losses. While global inflation rates continued to slowly decline; supply, construction, labor, and claims litigation costs remained elevated and still had sizeable influence on disaster costs.

On a regional basis, the United States accounted for a minimum of USD59 billion, (46%) of economic disaster costs in H1. This was above the decadal average, but the damage costs associated with SCS, flood, and drought events were expected to bring further loss development in the coming months. Elsewhere, Asia accounted for at least USD31 billion (24%) of economic disaster costs in H1. This was slightly lower than average, but the arrival of an active seasonal monsoon in East Asia at the end of H1 into early Q3 was expected to elevate loss costs. The Middle East saw well above average losses, Latin America was equal to average, while Europe, Africa, and Oceania were below average.

For context, the first six months of the year in recent history have been less expensive than the last six months. In the period from 2014–2023, H1 economic losses have accounted for 37% of the annual total. As always, it only takes one large catastrophe to completely alter the trajectory of annual losses.



EQ: Earthquake	**SCS:** Severe Convective Storm	**TC:** Tropical Cyclone	**WW:** Winter Weather
DR: Drought	**EU WS:** European Windstorm	**WF:** Wildfire	**FL:** Flooding

Figure 2: H1 2024 global economic loss statistics | **Data & Graphic:** Gallagher Re

Top 10 Costliest H1 Economic Events and Event Visualization

The United States accounted for four of the top 10 costliest events of H1 2024. However, the top three costliest events occurred in Asia, the Middle East, and Latin America. There were six individual events which resulted in at least USD5.0 billion in economic losses. All but two of the top 10 events were weather-related.

Event Name	Date	Region	Countries	Economic Loss (USD)	Insured Loss (USD)
Noto Peninsula Earthquake	Jan 1	Asia	JP	12,000	3,000
Arabian Gulf Flash Floods	Apr 13–17	Middle East	AE, OM, YE, BH, QA, IR, SA	8,550	2,820
Rio Grande do Sul Floods	Apr 27–May 13	Latin America	BR, UY, AR	8,100	2,000
China Seasonal Floods	Jun 1-Jul 11	Asia	CN	7,000	440
Mid-March SCS Outbreak	Mar 12–17	US	US	5,900	4,700
Central Europe Floods	May 28–Jun 4	Europe	DE, IT, CH, HU, AT	5,000	2,160
Mid-May SCS Outbreak	May 17–22	US	US	4,900	3,675
Early May SCS Outbreak	May 6–10	US	US	4,800	3,750
Hualien Earthquake	April 3	Asia	TW	3,000	1,200
Early Jan SCS & WW	Jan 8-10	US	US	2,800	2,225
Grand Totals				**128 billion**	**61 billion**

Table 1: Top 10 costliest economic loss events (USD millions) in H1 2024 | **Data:** Gallagher Re

The map in Figure 3 showcases widespread natural catastrophe activity in all corners of the globe. The highest frequency of billion-dollar disasters was again found in the United States, where a highly active peak severe convective storm season saw repeated impactful thunderstorm outbreaks. Europe and Asia also recorded a higher volume of events overall.

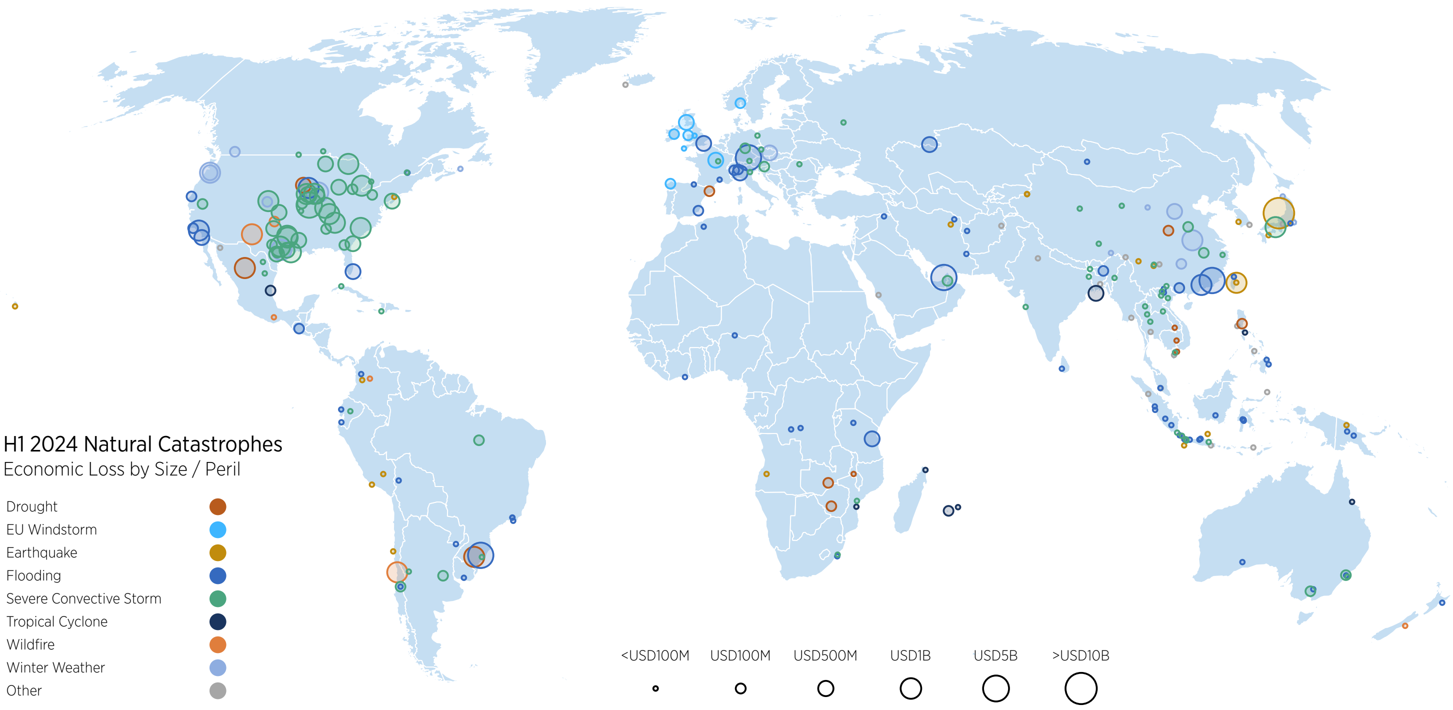


Figure 3: H1 2024 map of economic loss events by size and peril | **Data & Graphic:** Gallagher Re

Insured Loss

The total insured loss for H1 2024 was preliminarily estimated at USD61 billion, which was above the decadal average (USD49 billion). This total, which is expected to continue rising in the coming weeks and months, includes losses paid out by the private insurance market and public insurance entities. There were at least 19 individual billion-dollar insured loss events, which marked the second highest H1 total on record (behind the 20 in 2023 and 2022). Twelve (12) of those events resulted in a multi-billion-dollar loss.

Overall, the costliest peril was severe convective storm with the early global estimate exceeding USD40 billion. Most of these losses (USD37 billion) were incurred in the United States. The country recorded 13 individual billion-dollar insured SCS outbreaks, of which eight topped USD2 billion. This included H1's costliest insured event: a mid-March outbreak that has thus far resulted in USD4.7 billion in claims payouts. Hail was again the primary sub-peril driving the bulk of the insured costs across central and eastern portions of the US, but an above-average volume of tornadoes and non-tornadic wind occurrences (including a derecho in the greater Houston, TX metro area) also led to costly consequences. The USD37 billion H1 total already puts 2024 as the fourth costliest annual US SCS insured total on record, only behind 2023 (USD63 billion), 2020 (USD45 billion), and 2011 (USD41 billion).

Flooding was the only other peril that accounted for USD10 billion or more. There were multiple individual non-US events that resulted in a multi-billion-dollar impact for the insurance industry. This included Japan's Noto Peninsula earthquake (USD3 billion), Arabian Gulf Coast flash flooding in mid-April (USD2.8 billion), Central Europe (Germany) flooding in late May and early June (>USD2.1 billion), and Brazil (Rio Grande do Sul) flooding in late April and early May (USD2.0 billion).

Weather / climate events drove 93% of H1 2024 insured losses. This was slightly lower than the H1 decadal average of 95%. However, as further loss development occurs from Q1/Q2 events, this percentage will likely grow. There is traditionally a multi-month reporting lag for public insurance entity indemnity payout data, especially for costs associated with agriculture. As seasonal harvest periods arrive in Q3/Q4, this allows farmers to take stock of how much impact early-season weather events have had on yields and determines how many claims are filed.

The US accounted for more than USD43 billion, (70%) of the H1 total. This was above the region's decadal average of USD32 billion, and as previously mentioned, the expectation is that H1 US losses will only further increase in the months ahead. Other regions with higher-than-average H1 insured losses included Asia, Latin America, and the Middle East.

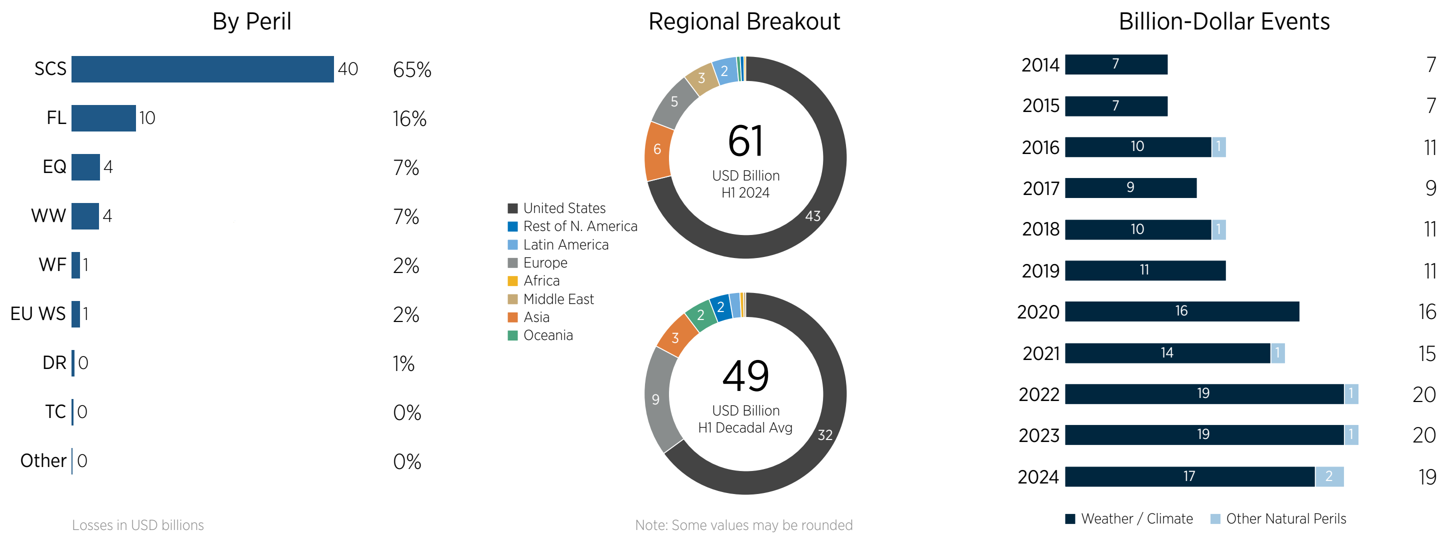


Figure 4: H1 2024 global insured loss statistics | **Data & Graphic:** Gallagher Re

Top 10 Costliest H1 Insured Events and Event Visualization

The United States accounted for six of the top 10 costliest insured loss events of H1 2024. Each of the top 10 events resulted in a multi-billion-dollar insured loss for private and public insurers. All events but one were weather–related. The six US events were all severe convective storms, which further highlights how this peril continues to drive significant annual loss costs for the US insurance market. Two additional US SCS events also led to a multi-billion-dollar loss but are not shown in this top 10 table. The Arabian Gulf flash flood event was poised to be one of the costliest, if not most expensive, individual weather events on record for the local insurance industry.

Event Name	Date	Region	Countries	Economic Loss (USD)	Insured Loss (USD)
Mid-March SCS Outbreak	Mar 12–17	US	US	5,900	4,700
Early May SCS Outbreak	May 6–10	US	US	4,800	3,750
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Rio Grande do Sul Floods	Apr 27–May 13	Latin America	BR, UY, AR	8,100	2,000
Early April SCS Outbreak	Mar 31–Apr 4	US	US	2,550	2,000
Houston Derecho	May 15–19	US	US	2,550	2,000
Grand Totals				**128 billion**	**61 billion**

Table 2: Top 10 costliest insured loss events (USD millions) in H1 2024 | **Data:** Gallagher Re

The map in Figure 4 showcases how a significant portion of the H1 losses emanated from events in the United States. As noted previously in this report, the US accounted for at least 70% of insured losses in the first six months of 2024. Despite many other impactful and costly events in parts of Latin America, Africa, and Asia, the continued low rates of insurance penetration in these regions are driving a significant global protection gap. (The protection gap is the portion of economic losses not covered by insurance.) The H1 2024 protection gap was 52% — much lower than the H1 decadal average of 67%. This total was lower due to the dominance of US SCS events for which typically have high insurance coverage. The H1 protection gap for non-US events was 74%.

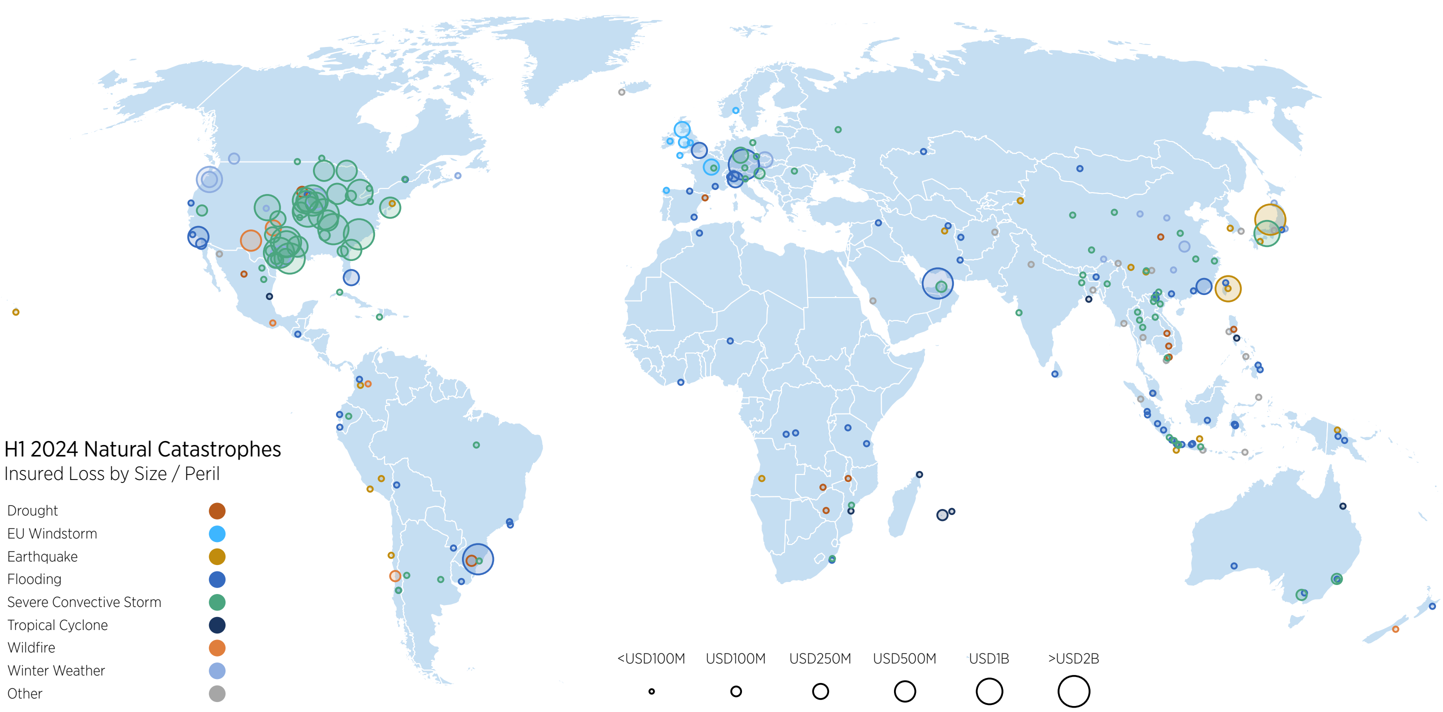


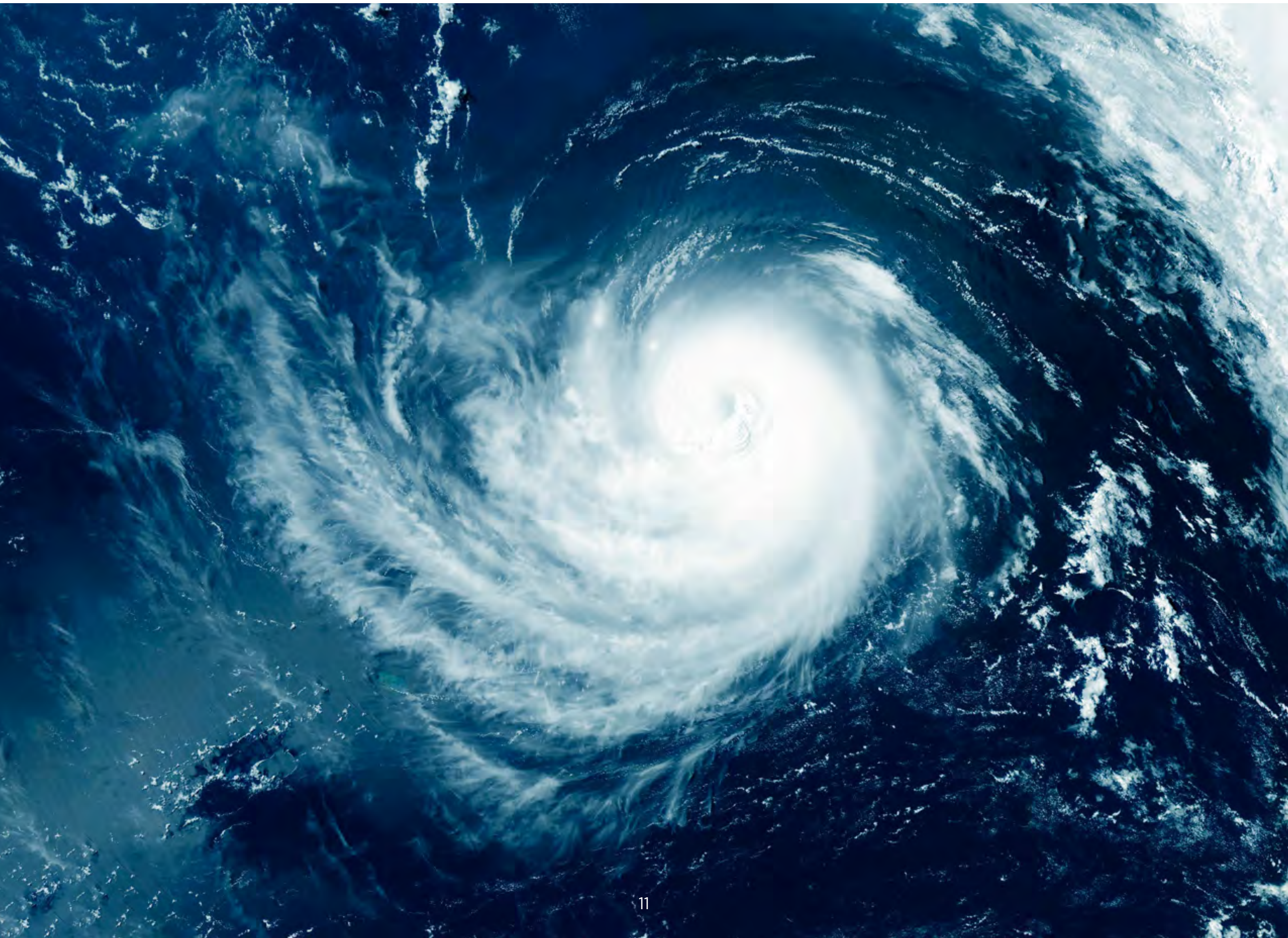
Figure 5: H1 2024 map of insured loss events by size and peril | **Data & Graphic:** Gallagher Re

Conversation Starters: H1 2024

Active Start to the Atlantic Hurricane Season Brings Fresh Concerns for the Insurance Industry

The rising threat of natural catastrophes, climate change, socioeconomics, and other complementary risks continue to drive the need for better research and forecasting. A recent Gallagher survey of 1,000 business owners found that 91% of respondents identified specific weather or other natural perils that posed a risk to their business. A further 85% of respondents were at least somewhat concerned about the threat of impacts to their business from climate change or natural disasters in the next 12 months. This context is important as it quantifies the need for clear communication — not only to explain uncertainty but also to provide appropriate expectations for how businesses and the public should prepare for natural catastrophe risk.

Keeping this in mind, there has been ample attention paid to the 2024 Atlantic hurricane season, and ample media hype, leading to the growing expectation of a hyperactive season. There are no certainties when it comes to any type of weather forecasting, but the atmospheric and oceanic conditions in place suggest a highly favorable set-up for robust storm development (cyclogenesis) through the end of the season in November. Early season activity has only raised concerns. Whether this translates to a challenging season for the insurance industry is the biggest unknown, but the potential exists. The following will dive into some background factors driving this Atlantic hurricane season and examine whether using historical analog years can provide clues. We will also give an update on the Florida insurance market following the June 1 reinsurance renewal cycle and a look at tropical cyclone expectations outside of the Atlantic.



Atlantic 2024: Seasonal Background Information

The 2024 Atlantic hurricane season officially began on June 1, and has already been active and consequential. Three storms had developed as of this publication, and all three made landfall (Alberto/Mexico; Beryl/Grenada, Mexico and the US; Chris/Mexico). Beryl rewrote much of the early season Atlantic Ocean record book by becoming the strongest hurricane ever recorded prior to August 1. It reached Category 5 intensity with 165 mph (265 kph) winds on July 2 (UTC). Climatology (1991–2020 average) says the first hurricane should arrive on August 14 and the first major hurricane on August 31. Beryl was formed before the end of June.

All major forecast agencies anticipate a highly active year. The National Oceanic and Atmospheric Administration's (NOAA) May seasonal forecast included the largest number of named storms the agency had ever predicted (seasonal forecasts began in 1999) and indicated an 85% chance for above normal activity. Likewise, Colorado State University (CSU), a collaborative partner in the Gallagher Research Centre's recently announced Tropical Cyclone Consortium, cited well above average activity in their July forecast update, with 25 named storms, 12 hurricanes, and 6 major hurricanes. Current climatology for the Atlantic Ocean is 14 named storms, 7 hurricanes, and 3 major hurricanes.

While an active season may increase the odds of more landfalls and higher losses, it is not a guarantee. Meteorologically active seasons have not always correlated to higher losses. Steering currents, which determine where storms track, are dependent on atmospheric variables, which can vary from week to week. Losses are likewise contingent on where a storm makes landfall. In any given year, one landfalling storm in a highly exposed coastal or inland region has the potential to generate large costs for the (re)insurance market. Even small deviations in track can radically alter storm loss potential. Every hurricane is unique in its size, intensity, track, and behavior.

The primary driving factors for the 2024 season are a confluence of record warm waters in the Atlantic's main development region (MDR) — the zone where most tropical cyclones form — in tandem with an expected transition to La Niña conditions by the peak of hurricane season (August to October). MDR ocean temperatures in late June and early July were on par with average temperatures normally seen in mid-September. La Niña is characterized by cooler than normal waters in the equatorial Pacific Ocean and tends to lessen wind shear in the tropical Atlantic. This promotes tropical cyclone development and intensification. NOAA officially declared that a shift to ENSO neutral conditions had occurred by mid-June.

The two tables below look at Atlantic hurricane seasons since 1851 that had the most hurricanes (Table 3) and the most major hurricanes (Table 4) in the basin. Years are color coded by ENSO phase: La Niña, Neutral, El Niño.

Hurricanes	Season(s)
15	2005
14	2020
12	2010, 1969
11	1995, 1950, 1933, 1887
10	2017, 2012, 1998, 1916, 1893, 1886, 1878, 1870

Table 3: Atlantic seasons with the most hurricanes | **Data:** NOAA

Major Hurricanes	Season(s)
7	2020, 2005
6	2017, 2004, 1996, 1950, 1933, 1926
5	2010, 2008, 1999, 1995, 1964, 1961, 1916, 1893
4	2021, 2016, 2011, 2001, 1955, 1948, 1932, 1909, 1894, 1886

Table 4: Atlantic seasons with the most major hurricanes | **Data:** NOAA

Using Historical Analog Years as Seasonal Guidance

One of the standard methods of trying to identify emerging trends in upcoming hurricane seasons is to seek clues from historical seasons with similar global oceanic or atmospheric patterns. Any such seasons that do reveal similar environmental conditions are referred to as historical "analog" years. For the 2024 season, researchers at CSU selected the following years: 1886, 1926, 1933, 1995, 2005, 2010, and 2020. These are years that showcased similar conditions in the month of June and early July as those currently seen in 2024.

CSU noted that they had some challenges in selecting specific historical analogs because we have never observed Atlantic Ocean waters to be this warm in the official era of record keeping in May and June, nor during a period while exiting out of an El Niño. Both 2023 and 2024 have featured historically warm Atlantic Ocean waters in the MDR despite the Pacific Ocean being in an El Niño. This is highly anomalous, since an El Niño usually features cooler Atlantic sea surface temperatures. These developments are likely to be studied closely in academic circles in the coming years.

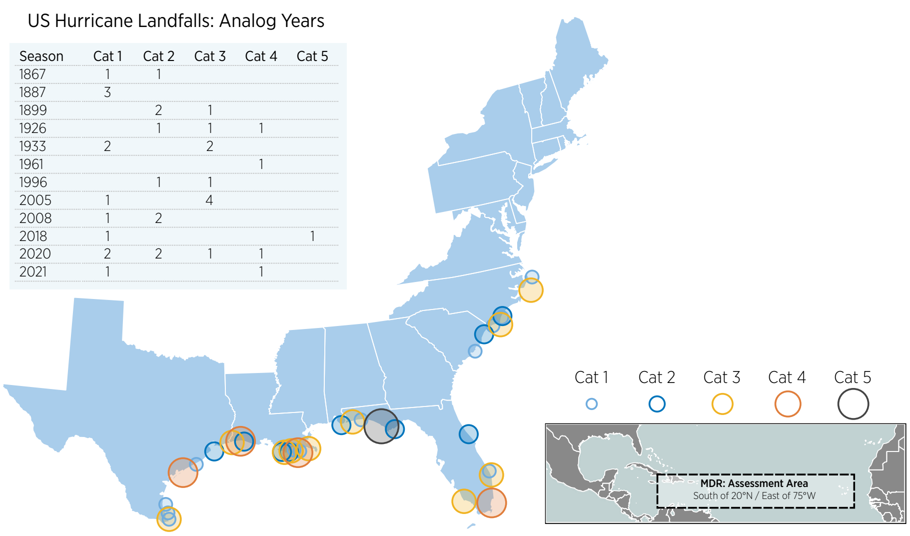
The analog years selected by CSU are marked by several seasons that featured significantly above average hurricane activity that also resulted in consequential major hurricane landfalls in the United States. In Figure 7, the graphic analyzes four historical analog years since 1950 (1995, 2005, 2010, 2020) that showed sea surface temperature anomalies on July 1, and then overlays full season storm tracks. Note that 2024 ocean waters are markedly warmer, especially in the Caribbean Sea, than the historic 2005 season at this stage. The right-hand side of Figure 7 includes seasonal statistics including the number of storms, the number of landfalling US mainland hurricanes (Category 1+ and Category 3+), and the overall economic and insured loss costs adjusted to today's dollars for the entire Atlantic season.

Because of these factors, CSU cites a "higher-than-normal" level of confidence in a highly active 2024 Atlantic hurricane season. A very busy season should not come as a surprise.

Hurricane Beryl: What Does This Mean for the Rest of 2024?

Hurricane Beryl's record-setting start to the 2024 season raises legitimate questions on whether there are any statistical data points to give clues to the rest of the season. The fact that Beryl reached Category 5 intensity at such an early start of the season, which beat the previous early calendar year record by roughly two weeks (Emily: July 17, 2005), is another indication that the highly anomalous warming in the tropical Atlantic has established environmental conditions that are ripe for more bouts of rapid intensification. To that end, Beryl became the first storm to undergo strengthening of at least 65 mph (110 kph) winds in a 24-hour period in the month of June. The only other storm in NOAA's HURDAT2 historical record to achieve this feat prior to August 1 was Hurricane Bertha in July 2008. This underlines the rarity of Beryl's early season behavior.

As repeatedly stated, the environmental conditions are extremely favorable for seasonal development. Can we infer anything from Beryl's genesis point or latitude intensity that would give us clues on possible US landfalls during the rest of the season? When analyzing the HURDAT2 historical catalog of events, which dates to 1851, there are only 12 years that recorded a hurricane in the MDR extending to the central Caribbean Sea (south of 20°N and east of 75°W) prior to August 1. The 12 seasons that are treated as analog years for this specific analysis include some of the most prolific seasons on record from a storm total, US landfall, and historical loss perspective. Figure 6 shows the comparison of all historical year averages for total hurricanes, major hurricanes and subsequent US landfalls. There is a notable difference of increased frequency in the 12 analog years versus the average across the full historical record.



Season	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
1867	1	1			
1887	3				
1899		2	1		
1926		1	1	1	
1933	2		2		
1961				1	
1996		1	1		
2005	1		4		
2008	1	2			
2018	1				1
2020	2	2	1	1	
2021	1			1	

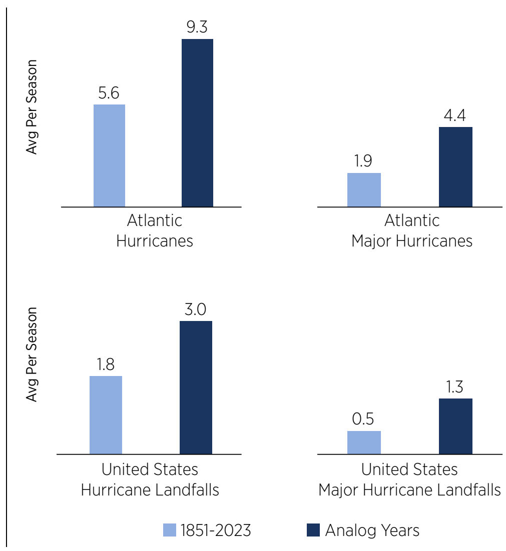
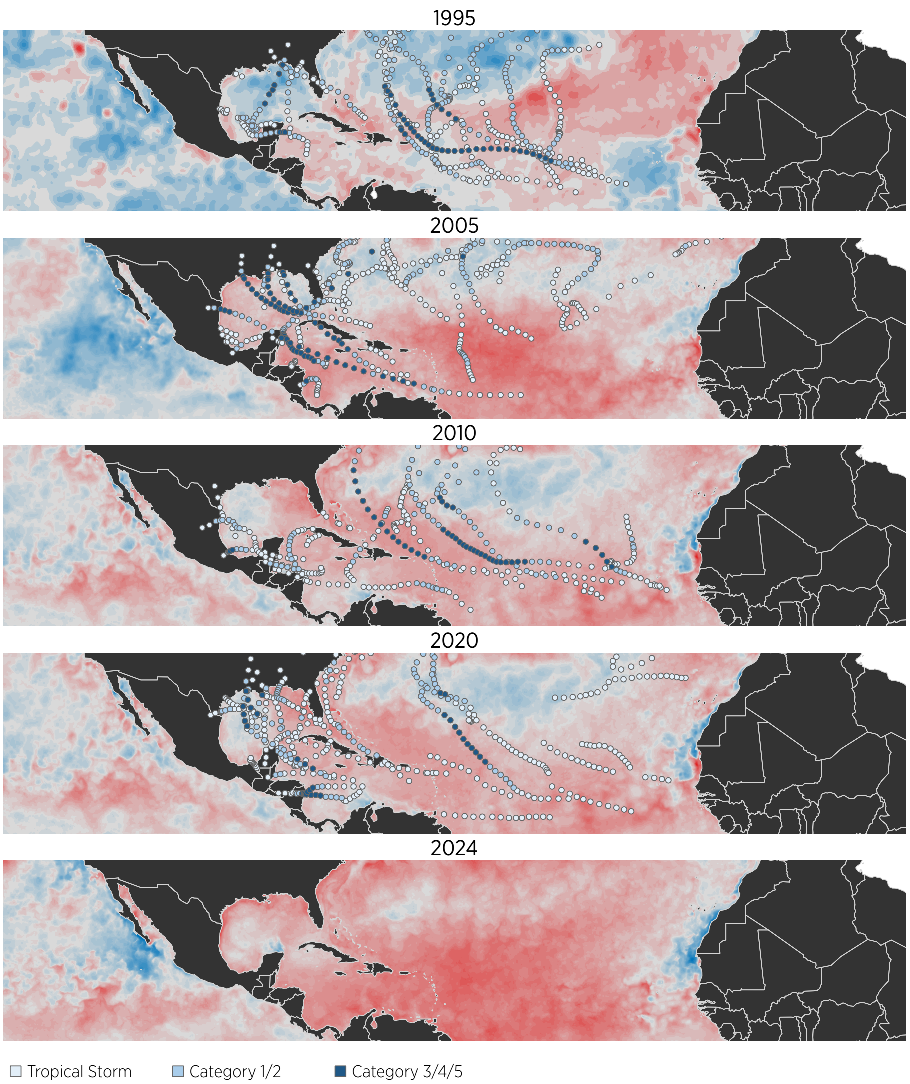


Figure 6: Analog years with hurricane formation prior to August 1 from the central Caribbean Sea eastward in the MDR (left) and basin totals/US landfall statistics (right)
Data: NOAA | **Graphic:** Gallagher Re

While these analog year statistics for pre-August 1 hurricane genesis suggest a greater potential of a highly active and possibly anomalously above average number of US landfalls, they should not be interpreted as an absolute. Using historical seasons to identify any trends is helpful in better understanding what might be plausible, but it does not eliminate the traditional uncertainties that exist with any individual hurricane season. However, this is another analysis that should be used to drive further awareness and caution that, given Beryl's record-setting early season behavior and genesis location, the odds of a hyperactive season are increasingly likely.

As seen in Figure 8, even in the CSU identified seasonal analog years, while there is notable pre-August 1 basin activity, the major seasonal "ramp-up" in storm development for hyperactive seasons does not typically begin until late July and August. Should 2024 behave similarly, then the insurance industry should be preparing for the plausibility of a very dynamic stretch from August to November.



Year	Named Storms	Hurricanes	Major Hurricanes	US: Category 1+ Hurricane Landfalls	US: Category 3+ Hurricane Landfalls	Atlantic Economic Losses	Atlantic Insured Losses
1995	19	11	5	2	1	29 billion	12 billion
2005	28	15	7	5	4	281 billion	137 billion
2010	19	12	5	0	0	14 billion	1.3 billion
2020	30	14	7	6	2	64 billion	30 billion
2024	To be determined in the 2024 season						

Losses in 2024 USD using a US Consumer Price Index adjustment and a construction / cost of labor factor

Figure 7: Sea surface temperatures on July 1 and seasonal storm tracks for historical analog years since 1950 (1995, 2005, 2010, 2020) compared to current conditions in 2024
Data & Graphic: Gallagher Re

State of the Florida Insurance Market

The forecasts for an elevated Atlantic hurricane season have come at a time when the overall US insurance market is grappling with capacity, availability, and affordability challenges across many parts of the country.

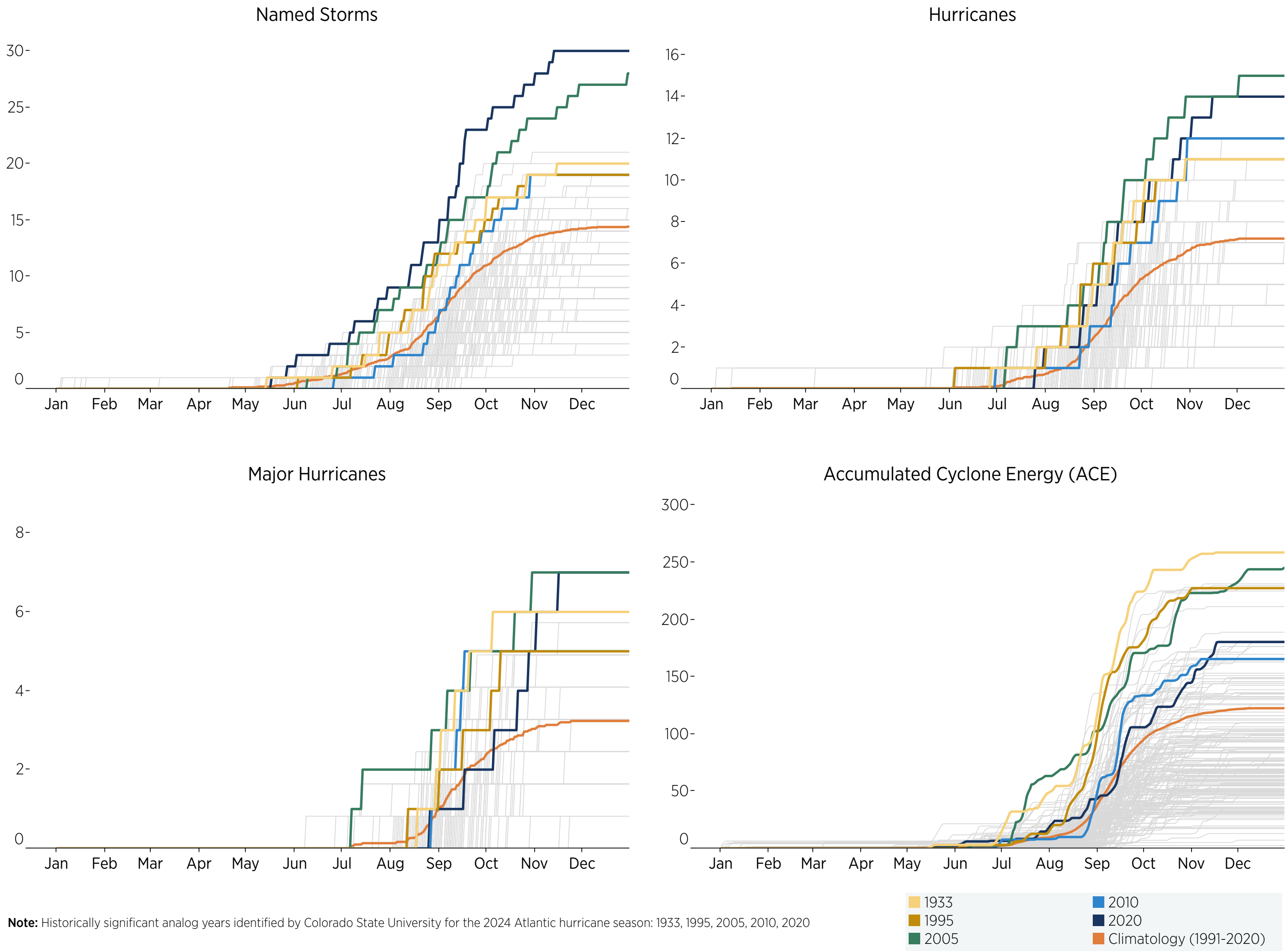
The state of Florida, which has been a central point of focus for the US insurance market, had experienced three consecutive years of double-digit premium growth heading into 2024. Gallagher Re's market analysis following the June 1, 2024 reinsurance renewal cycle suggested this year represented a bit of a reprieve. Risk-adjusted rates on most programs were either flat or down by as much as 10%. However, market softening primarily occurred early in the renewal cycle as reinsurers were more eager to increase their capacity. This started to change as the calendar got closer to June 1 and more ominous Atlantic hurricane season forecasts were released by NOAA, CSU, and other agencies. The result was reduced available capacity.

Gallagher Re also identified that the retro market saw reduced capacity nearing June 1 and what was available was deployed at higher prices. Through early July 2024, Citizens Property Insurance — Florida's state-run "insurer of last resort" — had 1.21 million active policies in force. This represented a decline from the recent peak of 1.41 million policies at the end of September 2023, but was still historically elevated. Just five counties (Broward, Hillsborough, Miami-Dade, Palm Beach, Pinellas) alone accounted for nearly 640,000 (53%) of the policies. Citizens remains the largest writer of property insurance policies in the Florida market. There has been an active push to depopulate Citizens by shifting policies towards the private insurance market, with hundreds of thousands of "takeout" policies having been approved by Florida's insurance commissioner in H1 2024.

Florida has also seen a slight uptick in National Flood Insurance Program (NFIP) policies to 1.72 million by the start of June. This marked an increase of nearly 30,000 from June 2023, which can likely be tied to the flood insurance mandate introduced in 2024 that requires proof of coverage to gain access to a Citizens policy for homes insured at a value of USD600,000 or greater. This is an anomaly when compared to the rest of the country. There has been a slow and steady decline in national NFIP take-up rates, notably in other high-risk coastal states. The most significant decline has occurred in Texas. At the end of May 2021, the state had 790,000 active polices.

By the end of May 2024, that number had declined by more than 135,000 to 654,601. Given the population boom that the state continues to experience, this means that not only are there fewer active flood policies heading into hurricane season, but a lower overall percentage of homes are prepared to deal with possible water damage costs.

Overall, the Florida insurance market remains in a stronger position today than it was just a few years ago. Should the state endure one or more hurricane landfalls in 2024, this will ultimately test the strength of reforms passed in 2022.



Note: Historically significant analog years identified by Colorado State University for the 2024 Atlantic hurricane season: 1933, 1995, 2005, 2010, 2020

Figure 8: Daily Atlantic tropical cyclone statistics with emphasis on five historically significant analog years identified by Colorado State University for the 2024 season
Data: NOAA | **Graphic:** Gallagher Re

Final Comments on the 2024 Atlantic Season

There are few years, if any, in the historical record that have featured environmental conditions as favorable to hurricane formation as those that are currently present in the Atlantic Ocean. With an already early and active start to the season, this may result in an extremely busy Q3/Q4 for the peril. It cannot be emphasized enough, however, that a higher number of hurricanes or major hurricanes does not automatically mean higher insured losses. While it is true that a higher frequency of events does bring a higher probability of landfall occurrence, nothing is guaranteed.

With that said, the insurance market should be paying very close attention. The historical analog years highlighted by CSU in this report do include seasons (1933, 2005, 2020) that were either meteorologically historic and/or quite impactful for the industry. CSU has identified a 57% probability of a major hurricane striking the US mainland, which is above the historical probability rate of 43%. Where the 2024 storms eventually track is the most important point of focus. As the oceans are fueled by further climate change influence, more of these types of active seasons are likely in the future.

TC Expectations Beyond the Atlantic Basin

Through early July 2024, the Western North Pacific (WNP) typhoon season has so far been historically quiet. While most activity in this basin occurs from July to October (~70%), there are still usually a handful of storms that develop prior to July 1. As of this publication, the basin had only recorded two named storms (Ewiniar and Maliksi), which formed in late May. Ewiniar also reached typhoon intensity.

However, this marked the fifth-latest starting season on record dating to the 1940s. Table 5 shows the monthly average number of named storms in the Western North Pacific during the second half of the year. Notably, the month of June 2024 featured no Accumulated Cyclone Energy (ACE) in the basin (or anywhere in the North Pacific Ocean), which marked only the third time on record that this has occurred (1969 and 2016). ACE is a metric that measures the intensity and longevity of individual storms.

Analyzing various short- and long-term atmospheric and oceanic parameters does suggest that the 2024 season should end with below- or near-normal activity. The July seasonal forecast from the European Centre for Medium-Range Weather Forecasts (ECMWF) predicted a below to near-normal frequency for typhoons. Taiwan's Central Weather Administration put out similar forecasts at the end of June, while the forecasts issued by Tropical Storm Risk (TSR) in July anticipated a season with below-normal activity.

The dominant driver of this likely quieter season is again the expected shift to La Niña. The current ENSO-neutral conditions are expected to remain until August or September, which would creep into the basin's peak development months. However, with continued cooling of tropical sea surface temperatures in the central Pacific Ocean, an earlier arrival of La Niña could further inhibit cyclogenesis in the basin. La Niña has historically led to a strengthening of the easterly trade winds that suppresses storm development. It also favors genesis in the northwest sector of the WNP basin, which subsequently could increase the landfall potential in the Philippines, Vietnam, and southern China.

The Indian Ocean Dipole (IOD) is currently neutral and is expected to remain neutral during the coming months. This means it would not be expected to have a significant effect on TC activity this season in the WNP Basin.

Despite increased wind shear, warm sea surface temperatures may support cyclogenesis and fuel the rapid intensification of tropical storms. Temperatures in the WNP basin are expected to remain 0.5°C to 1.0°C above average for August–October.

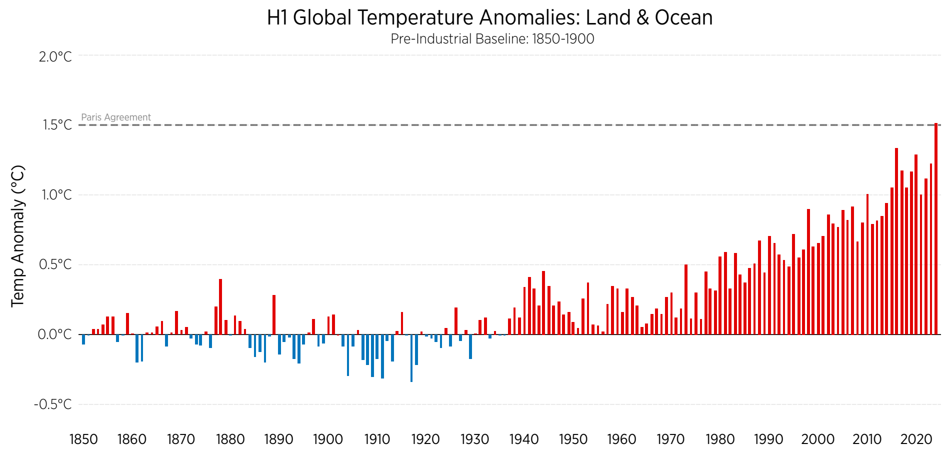
In the Eastern Pacific Ocean, a similar reduced seasonal frequency of storms was expected. NOAA's seasonal forecast cited a 60% likelihood of a below-average year and cited the transition to La Niña as the primary driving force. Shockingly, the Eastern Pacific had yet to record a single named storm as of this publication in mid-July.

ENSO Phase	June	July	August	September	October	November	December	Total
La Niña	1.3	3.4	5.3	5.3	3.4	2.2	0.8	21.7
Neutral	2.1	3.7	5.9	4.4	3.6	2.5	1.3	23.5
El Niño	2.1	4.0	5.7	5.4	3.8	2.2	1.2	24.4

Table 5: Number of tropical storms averaged over 1981–2020 by the full TC season ENSO phase | **Data:** NOAA

Weather / Climate Review

Global Temperatures Continue Setting Monthly Modern Era Records



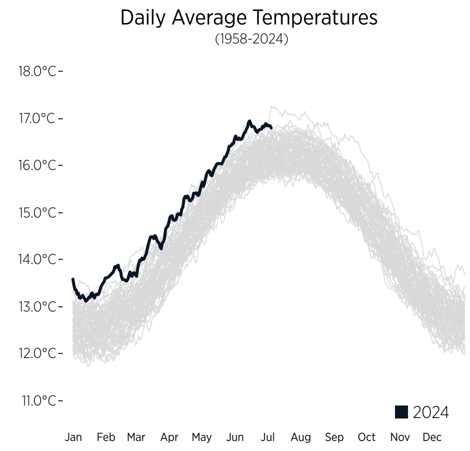


Figure 9: H1 global land and ocean temperature anomalies (left) and daily average temperatures (right) | **Data:** NOAA & JMA (JRA-55) | **Graphic:** Gallagher Re

Rank	Year	20th Century Baseline	Pre-Industrial Baseline
1	2024	1.29°C / 2.32°F	1.51°C / 2.73°F
2	2016	1.14°C / 2.05°F	1.33°C / 2.40°F
3	2020	1.09°C / 1.97°F	1.29°C / 2.32°F
4	2023	1.03°C / 1.85°F	1.22°C / 2.20°F
5	2017	0.98°C / 1.76°F	1.18°C / 2.12°F
6	2019	0.97°C / 1.75°F	1.17°C / 2.10°F
7	2022	0.92°C / 1.65°F	1.11°C / 2.00°F
8	2018	0.86°C / 1.54°F	1.05°C / 1.89°F
9	2015	0.85°C / 1.54°F	1.05°C / 1.89°F
10	2010	0.81°C / 1.46°F	1.01°C / 1.81°F

Table 6: Top 10 warmest H1 global land and ocean temperature anomalies
Data: NOAA (Dataset: 1850–2024)

Global surface land and ocean temperatures were the warmest on record for H1 2024. June marked the continuation of a streak that has now reached 13 consecutive months of record global temperatures. Official record keeping began in 1850. This meant that every calendar month of 2024, thus far, has been the warmest in the modern historical record. According to data from NOAA's National Centers for Environmental Information (NCEI), the temperature anomaly or the first six months of the year was +1.29°C (2.32°F) above the 20th Century Average. When compared to the Pre-Industrial Baseline (1850–1900), which is the key baseline used to show progress against global climate goals established by the 2016 Paris Agreement, the anomaly was +1.51°C (2.73°F).

Please note that while Figure 9 does show that H1 2024 has crossed the 1.5°C threshold, this does not necessarily suggest yet that this is a new normal. This threshold is an important climate benchmark as established by the Paris Agreement and puts the world on a path towards tipping points that would bring even more significant climate effects. However, scientists confirm that while even a single year surpassing the threshold is noteworthy, it will be of much greater concern when the threshold is regularly exceeded. Such global heat extremes are worrying, as they are likely to spur further melting of ice sheets, increase the intensity of tropical cyclones, and make local heatwaves more frequent and severe — confirming the projections of climate change research. Also, it is worth reminding that the major official global agencies do have differing pre-industrial baseline averages.

The record-setting H1 global warmth is quite notable but also not entirely surprising given that the first several months of 2024 featured lingering El Niño conditions. Despite NOAA citing that El Niño had officially ended in May, there was still "baked in" warming into the oceans and atmosphere that typically manifests for months after dissipating. While it is entirely expected that the consecutive record monthly warmth streak will come to an end as we head towards the arrival of a La Niña, scientists still anticipate months to stay warm and likely in the top 3 or 5. NOAA notes that there is a nearly 60% chance that 2024 ends as the warmest on record. There is a 95% confidence interval of being a top 2 warmest year.

Climate reanalysis data from Copernicus' ERA5, seen in Figure 10, revealed above-normal warmth across large parts of the global land area during the first half of 2024. Monthly temperatures for the eastern and parts of the central contiguous US ran above average from February to June, which was a fueling ingredient for a very active peak SCS season. Most climate reporting districts in the US Great Lakes and Northeast recorded a "top 5" warmest H1, with records dating to 1893. Elsewhere in the Americas, a large swath of Latin America saw anomalously high temperatures. Mexico has been in the grips of a historic drought for the last 18 months, which has created a drinking water availability crisis in many cities. A severe cold snap with frigid air emanating from the Antarctic gripped Argentina and Chile in May. Chile noted its coldest May since 1950.

Crossing into the Eastern Hemisphere, temperatures were largely above normal. The United Kingdom had its warmest May and meteorological spring on record. Nearly the entirety of the African continent was mired in anomalous warmth, which, in a large swath of the continent, was accompanied by little or minimal precipitation. Both Africa and South America had their warmest January to June period on record. Despite highly anomalous rainfall in the Arabian Gulf, temperatures remained largely warmer than usual. The rains were enhanced by warm ocean waters that helped fuel the tremendous rains in April.

Heatwaves were registered across a significant portion of Asia during the spring and early summer months. One exceptionally hot stretch was recorded in late April and early May. Myanmar set a new national temperature record in late April at 48.2°C (118.8°F), while the Lao PDR experienced a new daily maximum temperature record at 43.7°C (110.7°F). Sangley Point on Manila Bay in the Philippines set a national record for the warmest low temperature at 30.2°C (86.4°F). China set a new national record for the month of April when the thermometer reached 43.4°C (110.1°F) in Yunnan Province. Countries in Asia saw a spike in heat-related fatalities and hospitalizations during the heatwaves.

In Oceania, conditions were closer to normal or even slightly cooler than normal. Australia had its coolest April since 2015, in part due to a blocking ridge of high pressure that ushered in cool southerly winds across the continent. New Zealand registered a similarly near-normal austral summer season.

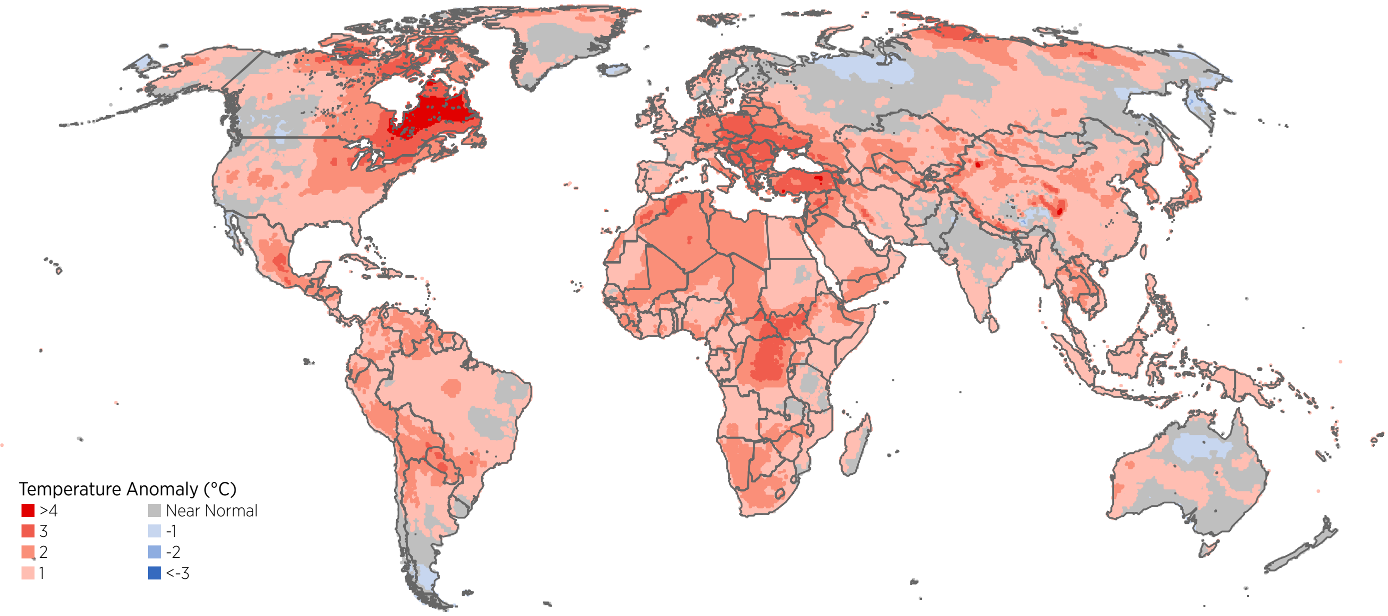


Figure 10: H1 2024 global temperature anomalies compared to the 1991–2020 climatological normal | **Data:** Copernicus (ERA5) | **Graphic:** Gallagher Re

As seen in Figure 11, the ongoing influence of El Niño resulted in numerous precipitation extremes around the globe in H1. Among the most consequential conditions were associated with drought. Severe drought was particularly notable in parts of Mexico, southern Africa, northern China, India, southeast Asia, and the Black Sea region. In parts of Asia, the delayed arrival of the seasonal monsoon has led to devastating impacts to agriculture and water availability. For example, Bengaluru, India marked its driest April in 41 years after receiving no rain during the month. Delhi's total rainfall from March to June was 84% below its climatological normal. Despite the passage of Cyclone Remal into Bangladesh, there was still a rainfall deficit after logging just 0.04 inch (1 millimeter) of rain in April. The Lower Mekong Basin faced moderate to exceptional drought in April and May. For Australia, serious rainfall deficiencies extended along Adelaide in southern Australia to Tasmania.

Continued dryness in the Black Sea region, which already saw its driest spring on record, was expected to have a meaningful impact on upcoming horticulture and crop yields. Southern Africa has been battling a prolonged drought due to a dry pattern typically associated with El Niño. Zimbabwe, Zambia, and Botswana saw their second driest January to June period.

In the Americas, the most serious drought conditions were found in Mexico as water reservoirs hit historic lows and aquifers for drinking water at many locations were at a state of near depletion. Below-average rainfall was also observed over parts of Brazil, Paraguay, and Argentina. Dry conditions in Venezuela resulted in record fire hotspot counts during the Southern Hemisphere summer.

A very wet precipitation anomaly could be seen extending from the Middle East to Afghanistan, which was battered by unrelenting rainfall during April and May. More than a year's worth of rain fell in a single day in the normally arid Arabian Gulf region. A positive phase of the Indian Ocean Dipole (IOD) helped spawn deadly heavy rains in Kenya and Tanzania in April. In Europe, Germany had its third wettest May on record, while seasonal precipitation records were set in parts of France and Italy. There was further significant flooding in southern Germany in May and June.

In Australia, the Northern Territory had its third wettest autumn since 1900, largely due to a very wet March from severe tropical cyclone Megan and tropical monsoon systems. Parts of New South Wales experienced flooding in April, and rounds of upper level troughs continued to impact western New South Wales during May. Heavy rains in Asia were particularly notable in China, as the Yangtze River Basin recorded considerable flooding in June. Sri Lanka also had an active flood season from the intensification of the southwest monsoon.

In the Americas, there was historic flooding in parts of the US Midwest in June after record rains prompted several rivers to exceed water heights set during the 1993 floods. An active period in May produced tremendous flooding in parts of South Florida, especially near the Fort Lauderdale metro region. In South America, severe thunderstorms and heavy rains impacted Brazil's southeast and its southernmost state, Rio Grande do Sul. The expanse of flooding was cited as the state's worst riverine flooding in 80 years as water levels surpassed those seen in the historic 1941 deluge.

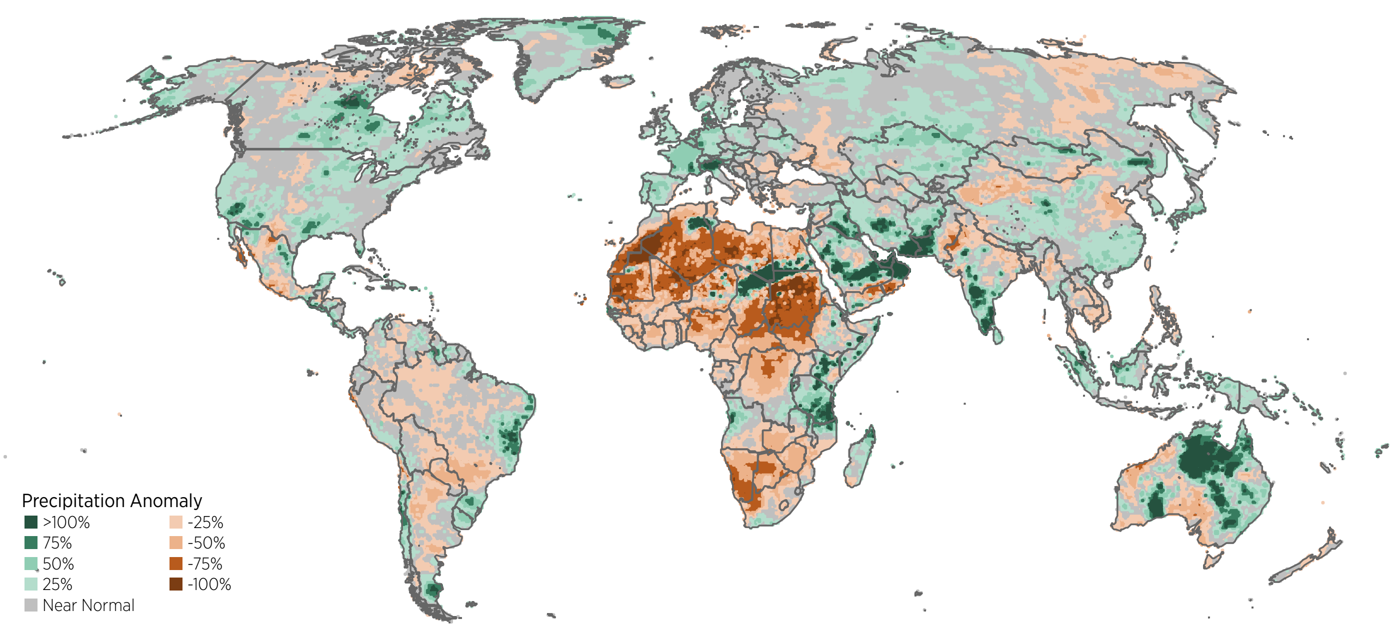


Figure 11: H1 2024 global precipitation anomalies compared to the 1991–2020 climatological normal | **Data:** Copernicus (ERA5) | **Graphic:** Gallagher Re

El Niño Officially Ends; NOAA Declares a "La Niña Watch" as Expected Transition Looms

NOAA officially declared the end of El Niño in June as ocean waters across the central and eastern Pacific Ocean had sufficiently cooled to mark the arrival of ENSO-neutral conditions. This signaled the end of the strongest El Niño phase since 2015/16. The agency additionally noted the issuance of a "La Niña Watch" as the quick cooling of surface waters in the Pacific's "Niño–3.4 Region" signaled the pendulum swing back towards La Niña. NOAA noted that there was a 70% likelihood that La Niña conditions would arrive by the August–October timeframe. This would directly coincide with the peak of the Atlantic hurricane season. The agency cited that La Niña would be anticipated to persist into the Northern Hemisphere winter months in 2024/25.

It should be noted that a quick transition to La Niña is common in the immediate aftermath of a strong phase of El Niño. This quick shift also occurred following historical strong El Niño events in 1982/83 and 1997/98. The arrival of La Niña should help moderate the accelerated rate of record land and ocean warmth that was observed during the most recent El Niño.

For background context, the El Niño-Southern Oscillation (ENSO) is a pivotal seasonal climate phenomenon that affects large-scale atmospheric and ocean circulations. This in turn greatly influences global temperature and precipitation patterns. ENSO is a recurring oscillation involving changes in the temperature of waters in the central and eastern equatorial Pacific Ocean and their subsequent impacts on atmospheric conditions. Warming periods are noted as El Niño cycles and cooling periods are known as La Niña cycles. The ENSO footprint historically has the greatest influence during the Northern Hemisphere winter months (December to March).

It is important to note that to be considered an ENSO phase, NOAA requires five consecutive three-month running mean averages of sea surface temperature (SST) anomalies in the Niño–3.4 region to be +0.5°C (El Niño) or -0.5°C (La Niña).

Large-scale atmospheric circulations associated with La Niña include rising air in the western Pacific, which aids in increased storminess and rainfall. The phenomenon is likewise linked to wetter than normal episodes in parts of northern South America and southern Africa. La Niña tends to enhance the odds of drier and milder conditions across the US Southwest which raises concerns of developing drought, decreased snowpack, and strained water resources. This often has links to drier conditions in California that may exacerbate wildfire risk. Further, the impacts of La Niña usually continue into the warm months for Australia. The east coast can experience severe flooding during La Niña summers. According to the Australia Bureau of Meteorology (BoM), 12 out of 18 La Niña events since 1900 have resulted in floods across the country.

While NOAA is generally considered the most globally definitive authority on tracking ENSO, there are other regional weather and climate centers worldwide that follow the phenomenon. These agencies often adopt different thresholds and metrics in tracking ENSO. Currently, all the international agencies agree on the likelihood of a La Niña to develop in the second half of 2024.

For example, the BoM selects its own climate models. Three of its seven surveyed models suggest the possibility of sea surface temperatures at La Niña levels beginning in September. The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) said that La Niña would become most likely in the October to December timeframe.

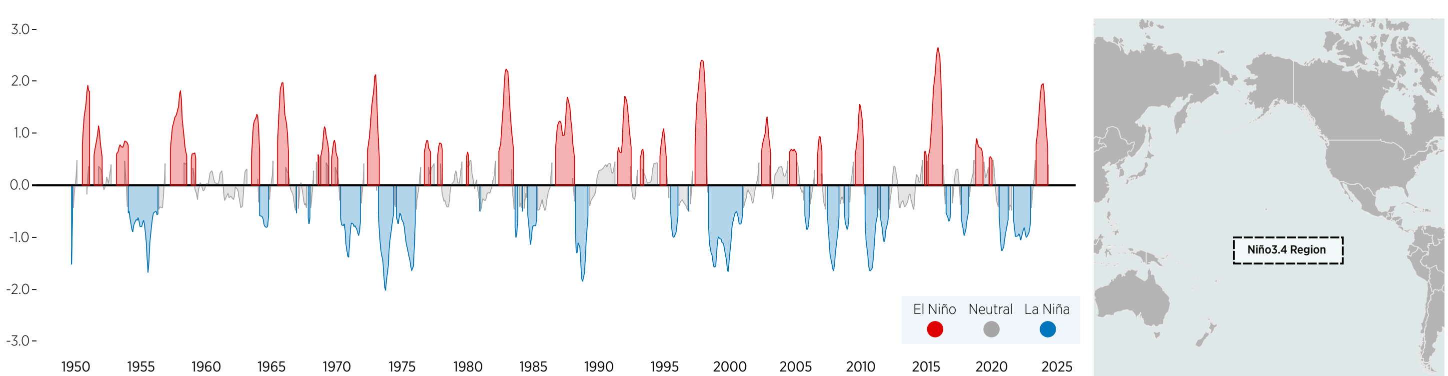


Figure 12: Monthly view of the Oceanic Niño Index (ONI) sea surface temperature anomalies in the Niño 3.4 region | **Data:** NOAA | **Graphic:** Gallagher Re

Major Event Review

US Severe Convective Storms

Severe convective storm (SCS) losses in the US continued to dominate global insured losses in H1, following a highly active period for the peril in late April and May. US SCS accounted for 61% of global insured losses during the first six months of 2024. Even more remarkable, when combining insured US SCS losses during the past 18 months (FY 2023 and H1 2024), we have officially topped USD100 billion. This is a staggering sum and the costliest two-year stretch ever recorded for the peril. For context, this threshold has only been breached twice on the US mainland for the tropical cyclone peril (2004/2005: USD179 billion and 2020/2021: USD105 billion). The hail sub-peril continues to drive a sizeable portion of thunderstorm-related losses for insurers on an annual basis.

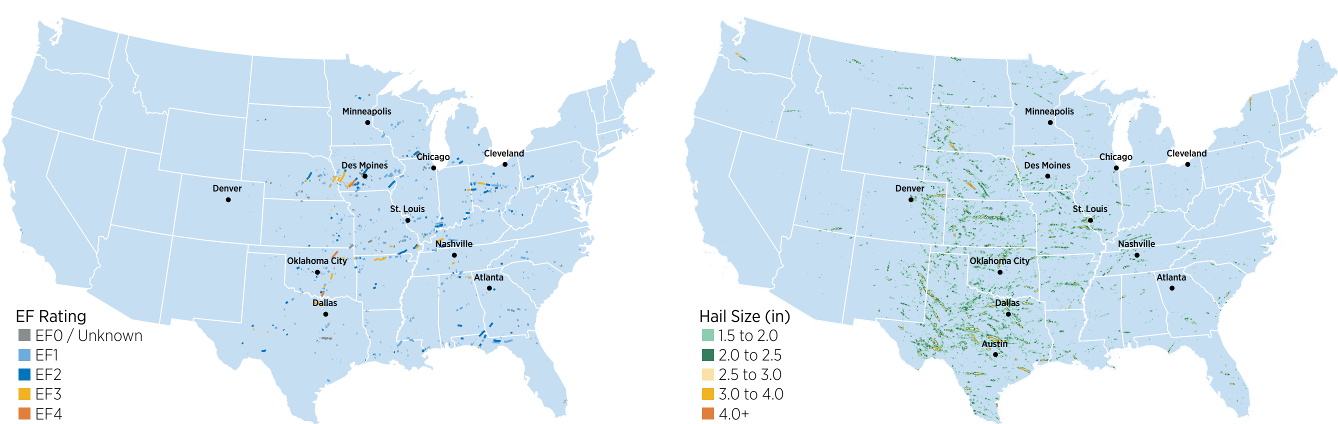
- Preliminary: H1 economic losses at USD48 billion with insurers covering USD37 billion of the total
- Second-costliest Insured H1 on record behind 2023 (USD47 billion): Third was 2011 (USD36 billion)
- Costliest outbreaks: Mar 12–17, May 6–10, and May 17–22
- ~1,300 tornado reports in H1: 1,064+ have been confirmed, including 34 rated EF3 (31) or EF4 (3)

There has been a major emphasis on US SCS activity as it is continuing to bring significant challenges to primary insurance carriers, with losses staying highly elevated. With the reduction in aggregate coverage availability from reinsurance or the high cost to obtain such coverage, this has resulted in increased direct loss costs for insurers that have eroded underwriting performance and quarterly earnings.

The drivers for these increased losses include inflation, the rising costs of supplies and repairs, expanding urban footprints in SCS-prone regions, and aging US housing stock. While there are currently limited signals in overall increased SCS frequency or intensity, future climate scenarios do show spatial and/or temporal shifts in activity. This includes a southward and eastward shift in SCS activity, an anticipated earlier start to the season, and an increasing trend in the number of days with conditions favorable for SCS outbreaks.

H1 economic losses were tentatively tallied at least USD48 billion with insurers covering roughly USD37 billion of the total. 2024 already ranks in the top 4 costliest insured SCS years on record, behind 2023 (USD63 billion), 2020 (USD45 billion), and 2011 (USD41 billion). The US had experienced 12 billion-dollar-plus insured SCS loss events in H1, of which eight saw multi-billion-dollar industry loss totals (USD2+ billion). Multiple other events were just below the multi-billion threshold. Further loss progression will continue in the months ahead.

As seen in Figure 12, the US recorded well above the most recent decadal average for local storm reports (LSRs) of tornadoes, large hail (≥2 inches or larger), and damaging straight-line winds. The large hail reports included swaths that tracked through parts of highly populated metro areas and were a significant driver of the loss of damage. This data comes via NOAA's Storm Prediction Center (SPC).



Timeframe	Tornadoes	Hail (>1")	Large Hail (>2")	Wind (>58 mph)
2024	1,285	4,170	681	9,485
2023	938	4,552	729	7,752
Decadal H1 Avg	788	4,601	525	8,591
1990-2023 H1 Avg	831	4,285	450	6,971

Figure 13: Map of H1 tornadoes (left), hail swaths of at least 1.5 inches (right), and comparative H1 storm statistics (bottom) | **Data:** NOAA | **Graphic:** Gallagher Re

The most prolific activity came in Q2, especially during an exceptionally active period from late April through May. The pattern featured favorable jet-stream winds which aided in deepening a succession of low-pressure systems across the central and eastern US. Near-daily outbreaks of SCS occurred when these systems and their associated frontal boundaries interacted with clashing air masses as warm and moist air was transported northward from the Gulf of Mexico.

Preliminary data from NOAA showed that as many as 571 tornadoes were recorded in May alone. If all were confirmed, this would surpass the previous record of 550 set in May 2003. The May 2024 total was more than double the climatological average (1991–2020). This included two destructive EF4 tornadoes which touched down near Barnsdall, Oklahoma, and Greenfield, Iowa. In H1, the US recorded 34 tornadoes rated EF3 (31) or EF4 (3). This was already higher than the full year decadal average of 24 such twisters.

Hail-related damage continued to drive substantial losses for insurers. Both the Dallas Metroplex (May 27) and Denver Metro region (May 30) saw billion-dollar industry hail losses.

The event near Denver saw hail accumulating like snow, with some hailstones reaching 2.75 inches (7 centimeters) in diameter. This was among the largest hail to impact the metro region in decades. Costly hail swaths likewise impacted populated regions near St. Louis and the Chicago suburbs in May. On June 2, a hailstone in Swisher County, Texas near Virgo Park exceeded 6.0 inches (15.2 centimeters) in diameter, potentially challenging the state record hailstone (6.4 inches/16.3 centimeters) which fell in the town of Hondo in 2021.

The Houston Derecho on May 16 was a reminder of the magnitude of damage that can be generated by non-tornadic winds, especially when they impact a highly urbanized and densely populated region. Wind gusts in Houston and surrounding communities during the event peaked at 100 mph (160 kph), equivalent to those seen in a strong Category 2 hurricane. Costly damage was incurred to residential and commercial properties, including several large skyscrapers that had a considerable volume of windows shattered or broken. More than one million customers lost power during the event, and extended outages were particularly concerning for vulnerable populations as multiple days of warm temperatures followed the storms.

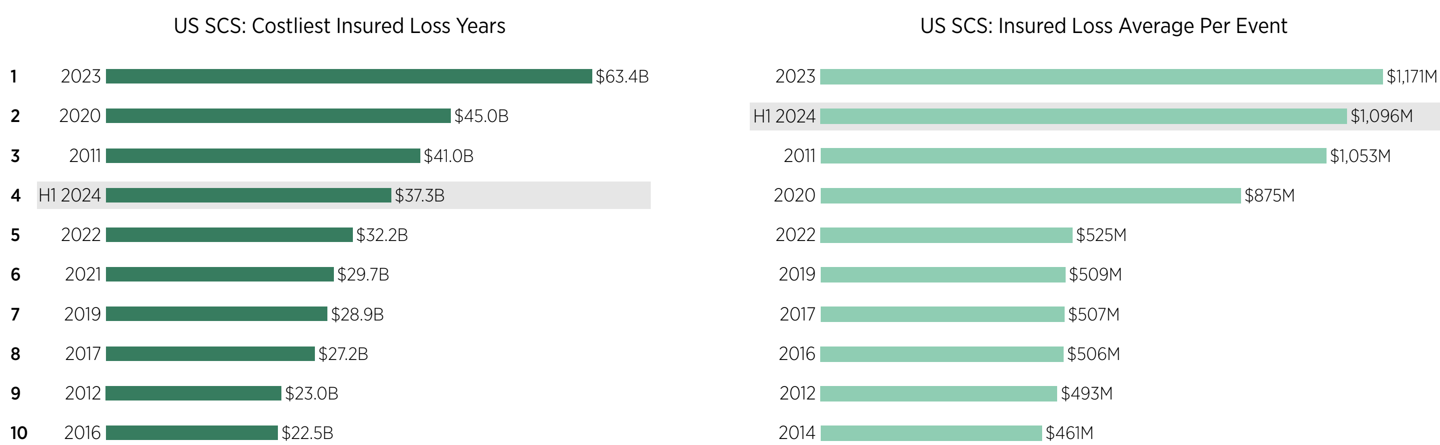


Figure 14: Costliest US SCS insured loss years on record (left) and costliest "insured average loss per event" (right) | **Data:** NOAA | **Loss Data & Graphic:** Gallagher Re

WHAT IT MEANS:

As is now widely known and accepted, the insured costs associated with the US SCS peril have continued to drive a greater portion of annual losses in recent years. This is putting tremendous strain on national and regional primary insurance carriers who are increasingly forced to absorb most, if not all, of their claims payouts, given that a very small portion of losses are being ceded to reinsurance. Higher reinsurance premium costs to obtain aggregate covers mean insurers pay more for the same or less coverage. As primary insurer losses rise and quarterly earnings are impacted, this is now leading to higher premiums being felt by residential policyholders. These higher reinsurance costs are driving the bulk of premium rate rises seen across all 50 US states in recent years.

Global Flood Recap

Several major flood events were recorded around the globe during H1, particularly in parts of South America, Europe, and the Middle East. The most notable events occurred in Q2 where locally significant inundation transpired in southern Brazil, the Arabian Peninsula, and Central Europe/southern Germany. The high cost of these events, all of which resulted in a multi-billion-dollar insured loss, grabbed the attention of reinsurers as a sizeable portion of the losses were ceded to reinsurance.

- Global: Insured flood losses in H1 reached USD10 billion, above the recent 10-year H1 average of USD6.5 billion.
- Germany: Late May and early June flooding in southern states generated a market loss exceeding USD2 billion.
- UAE: April flooding became the country's costliest insured event on record, with losses likely to reach USD2.3 billion.
- Brazil: Historic flooding that affected Rio Grande do Sul state in late April and early May left 175 people dead and became Brazil's costliest flooding event on record.

Central Europe / Southern Germany

A complex and slow-moving atmospheric pattern was fueled by deep Mediterranean moisture that spawned days of heavy rainfall and subsequent deadly flooding in parts of Central Europe in late May and early June. The southern German states of Bavaria and Baden–Württemberg were particularly impacted.

Large losses were incurred to residential and commercial properties, in addition to vehicles, agribusiness, and infrastructure. Several locations along the Danube River crested at the highest warning stage (Level 4). Total insured losses across central Europe were expected to minimally exceed USD2.2 billion, with most occurring in Germany. The flooding followed what the German Meteorological Service (DWD) said was the third-wettest May on record. Germany has been subject to several costly flooding events in recent years, including historic floods from Bernd in July 2021.

Bernd became Germany's costliest disaster on record (insured loss: nearly USD12 billion in today's dollars). Figure 15 shows rainfall comparisons between the July 2021 (Bernd) flooding and the recent events in Q2, demonstrating they were on the same order of magnitude. The main difference was that the 2021 rains were recorded in a region that typically receives less frequent heavy precipitation. Much less favorable topography (narrow valleys) also exacerbated water run-off impacts.

The 2024 floods across parts of Europe continue a stretch of years which has seen large annual variability dealing with intense drought or anomalous rainfall. These swings from one weather extreme to another are consistent with climate change research which suggests more "weather whiplash." This is defined as a quick shift from one weather extreme to another. Further mitigation and adaptation practices, to account for future climate conditions, are critical.

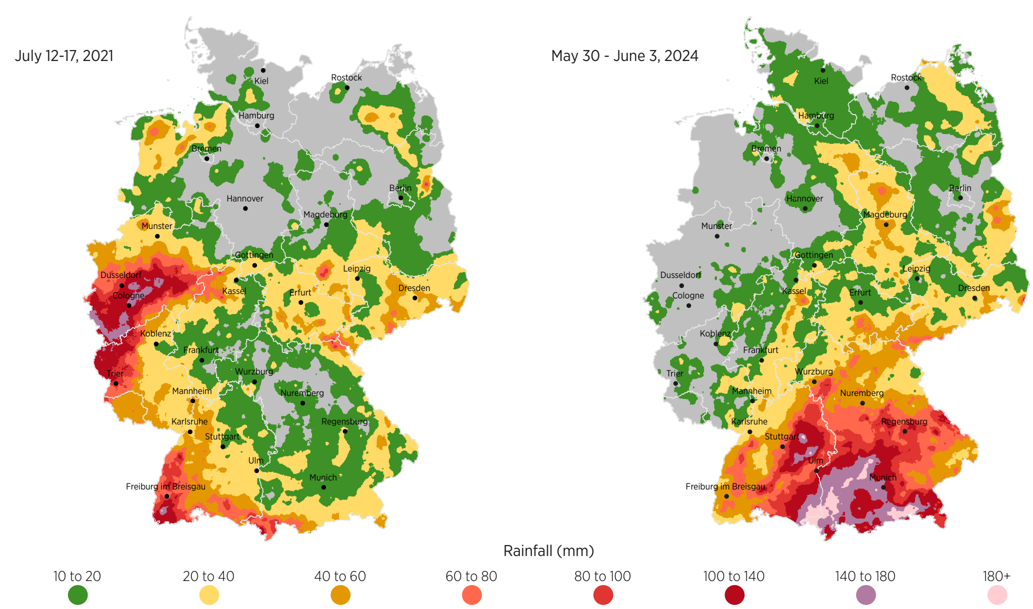


Figure 15: Germany rainfall totals from Bernd in 2021 (left) and the May/June 2024 event (right) in millimeters | **Data:** DWD/HYRAS | **Graphic:** Gallagher Re

Arabian Gulf

Torrential rains prompted exceptional flash flooding across the Arabian Peninsula from April 13–17. The event was aided by warm surface waters in the Arabian Gulf in tandem with a strengthening positive phase of the Indian Ocean Dipole (IOD), which is defined as an oscillation of sea surface temperatures in the Indian Ocean.

On April 16, the United Arab Emirates (UAE) reported its heaviest rainfall in at least 75 years of record-keeping. Nearly 10 inches (255 millimeters) fell in Khatm Al Shikla (Al Ain) in less than 24 hours. Figure 16 shows satellite-estimated rainfall in the Middle East during the April 13–17 stretch. In general, the UAE averages between 6.0 to 7.8 inches (150 and 200 millimeters) of rainfall per year. Impacts were particularly notable in the cities of Dubai and Abu Dhabi as well as the surrounding countries of Oman, Qatar, Bahrain, and elsewhere.

While claims processing remained ongoing, initial estimates from Gallagher Re indicated combined property and auto insured losses in the UAE alone were estimated between USD2.15 billion and USD2.95 billion. Losses were elevated due to rapid urbanization that has been marked by dramatic changes in local land use. With so much rain falling on arid soils and desert conditions, this put tremendous strain on local infrastructure unequipped to handle such large volumes of water. This kind of difficulty is unfortunately common in many parts of the world that are not prepared to handle the future climate.

Southern Brazil

Extreme rainfall prompted unprecedented flooding in southern Brazil during late April and early May. The floods were most exceptional in the agriculturally important state of Rio Grande do Sul. Porto Alegre registered its worst flooding event in more than 80 years as the Guaiba River burst its banks, with water levels surpassing those seen in the historic 1941 floods. Porto Alegre received 10.2 inches (258.6 millimeters) of rain in a three-day period beginning April 29, which was equal to more than double the monthly average total for either April or May.

Rains were enhanced by slow-moving storm systems and lingering El Niño conditions. In total, at least 100,000 homes were damaged or destroyed. More than 1.4 million people were left without electricity or running water (80% of households in Porto Alegre were without clean water). At least 175 people lost their lives. Inundation had significant impacts on the ongoing rice and soybean harvests. Rio Grande do Sul accounts for 70% of the country's annual rice production. It was estimated nearly 2.7 million hectares (6.6 million acres) of soil lost fertility due to the floods. The floods followed recent years of extreme drought that decimated crops in 2022/23.

Preliminary estimates of insured losses from the Rio Grande do Sul floods were up to USD2 billion. The bulk of the claims came from auto, commercial, and residential policyholders. This would become the costliest flooding event on record for the Brazilian market.

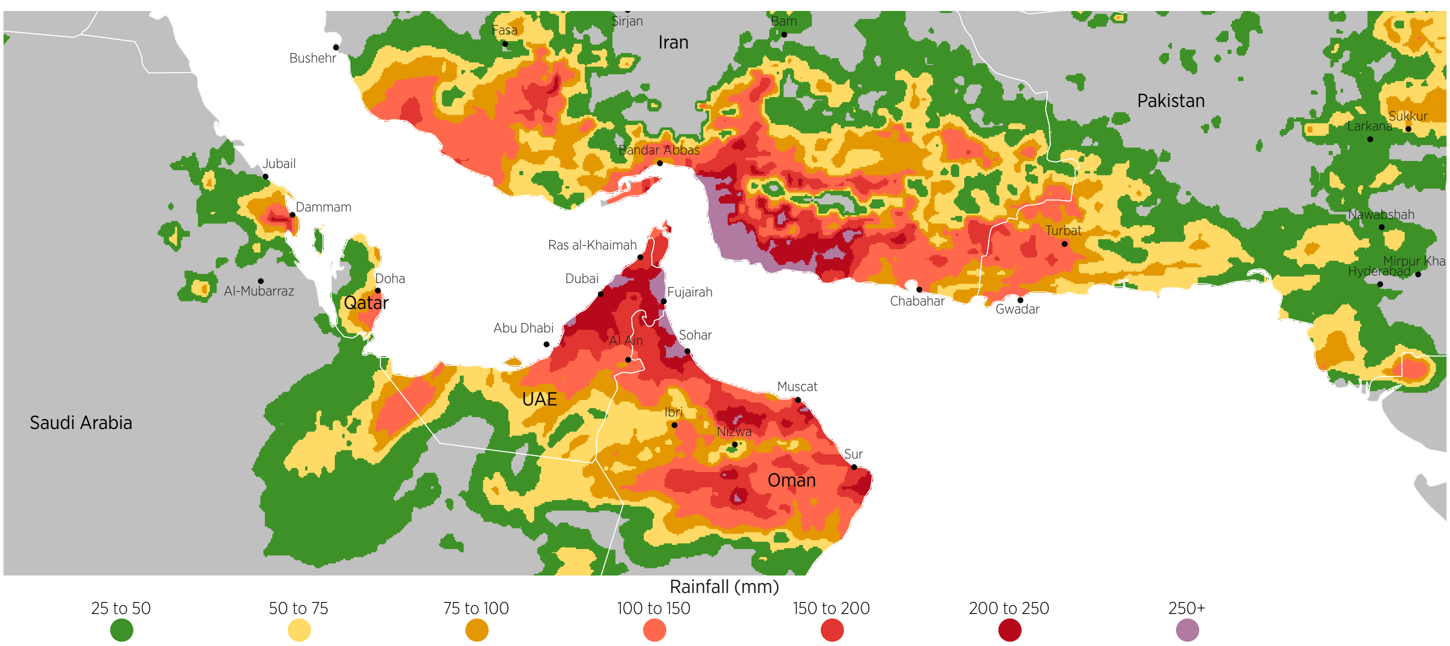


Figure 16: Satellite estimated rainfall totals in the Arabian Gulf from April 13–17, 2024 (UTC) | **Data:** NASA/GPM | **Loss Data & Graphic:** Gallagher Re

Southern China

The arrival of the seasonal monsoon in mid-June, known locally as "Plum Rain Season," brought exceptional rainfall and subsequent flooding across parts of southern China. Data from the China Meteorological Administration indicated that some provincial regions saw some of their worst floods and heaviest rains in recent memory.

The background meteorology noted that the western Pacific Ocean subtropical ridge of high pressure was strong and situated just to the west of South China. This helped steer plumes of moisture from the western Pacific Ocean to directly converge with the southwest monsoonal flow from the northern Bay of Bengal. These conditions led to prolonged rainfall and triggered flooding across Fujian, Jiangxi, Guangdong, Guangxi, Guizhou, and Chongqing provinces in China. Guangdong's average rainfall in June was at its historical highest since the start of the flood season. Some of the hardest-hit areas were in northeast Guangdong's Meizhou city, which saw rainfall anomalies of 86% above normal. There were also 47 fatalities in various parts of Meizhou city.

Prior to the summer seasonal floods, Guangdong was also impacted by major flooding in April. Heavy rains in north-central sections of the province prompted the Beijiang River to overflow its banks. It was the river's second-largest flood since 1924.

Elsewhere, the lower reaches of the Yangtze River Basin officially entered its plum rain season on June 17. With the rain belt shifting north, tributaries along China's longest river exceeded warning levels and inundated many communities. The Yangtze River saw its first flood on June 28. Severe floods are not new to China, but despite major financial investments to modernize its infrastructure and evacuation monitoring, damage costs continue to rise.

Given the ongoing nature of the floods that extended as of this writing well into early July, the initial seasonal flood economic loss total was minimally USD7 billion but expected to rise. An update by the authority on July 11 revealed that the market insured losses had topped USD440 million. The Chinese insurance market continues to mature as more policies are held by residential and commercial property owners.

WHAT IT MEANS:

Amid large annual variability, recent costly and deadly global flooding events continue to raise alarm bells across the insurance industry, as it pays more and more attention to the peril. As urbanization and changes in land use become more common around the world, this is putting a greater percentage of populations in flood-prone regions, and that further translates to more expensive assets in harm's way. As our climate warms, it is only amplifying the potential for heavier and more extreme rain events to occur in the years ahead. While some parts of the world are making progress in making insurance coverage more accessible, the reality is that this is a peril with a substantial protection gap. Most losses are uninsured — including in major insurance markets like the United States or Europe. Along with increased insurance coverage, both governments and private-sector actors need to develop more effective flood management strategies and control measures.

Global Extreme Heat/Drought

While there were brief individual episodes of very cold air during H1 2024 that affected some parts of the world, the opposite extreme — exceptional heat — was much more frequent and impactful. As shown in Figure 10, a majority of the globe's landmass saw anomalously warm temperatures, and H1 2024 was the warmest start to the year in recorded history since 1850. The prolonged and intense heat not only set localized temperature records, but also led to humanitarian crises, strained water resources, drought, and large impacts upon agricultural interests. Heatwaves also amplified environmental and economic risks through major wildfires. Episodes of widespread heat stress among the population are happening more frequently, amid the rise in warmer overnight lows and hotter daytime highs. The World Health Organization (WHO) reports that heat stress is the leading cause of weather-related deaths.

Figure 17 highlights the total number of days from May 1 to June 30 when temperatures exceeded 35°C (95°F) in Mexico, 40°C (104°F) in India, and 45°C (113°F) in Saudi Arabia. These represented three particularly impactful cases of temperature extremes during H1 2024.

- Mexico: Exceptional drought conditions worsened in Q2, with 76% of the country experiencing drought conditions.
- India: Delhi recorded an all-time record high in May of 49.1°C (120.4°F); there were 40 consecutive days with a maximum temperature at or above 40°C (104°F).
- Saudi Arabia: 51.8°C (125.2°F) registered in Mecca City on June 17, its hottest day in recorded history.

Latin America: Mexico

A persistent period of record-breaking temperatures and below-average rainfall resulted in extreme drought, loss of life, widespread impacts to agribusiness, and mandated water conservation practices. By the start of the summer months, at least 76% of the Mexican territory was impacted by drought conditions, which included nearly 14% of the country that was experiencing exceptional drought conditions. Data from the North American Drought Monitor indicated that this was the largest percentage of area impacted by exceptional drought conditions since 2010. While it is too early to provide a specific insured estimate (mostly from crop claims) at this time, the overall economic cost is likely to reach into the billions (USD).

According to atmospheric reanalysis data from the Copernicus ERA5 dataset, Mexico's monthly average daily temperatures in May were 2.3°C (4.1°F) above the 1991–2020 climatology. The Secretary of Health indicated that the heat contributed to at least 172 fatalities in H1. Further deaths were reported among wildlife and livestock. Water shortages were particularly dire in the capital of Mexico City.

The capital city measured a record daily high temperature of 34.3°C (93.7°F) in early May, which surpassed the previous record (set just weeks earlier) by a tenth of a degree. The city's rainy season usually peaks between May and September but was off to a slow start in 2024. By June, temperatures in the northern Sonora Desert hit 51.9°C (125°F). Regionwide, numerous wildfires were ignited across the country during Q2, which led to a deterioration in air quality.

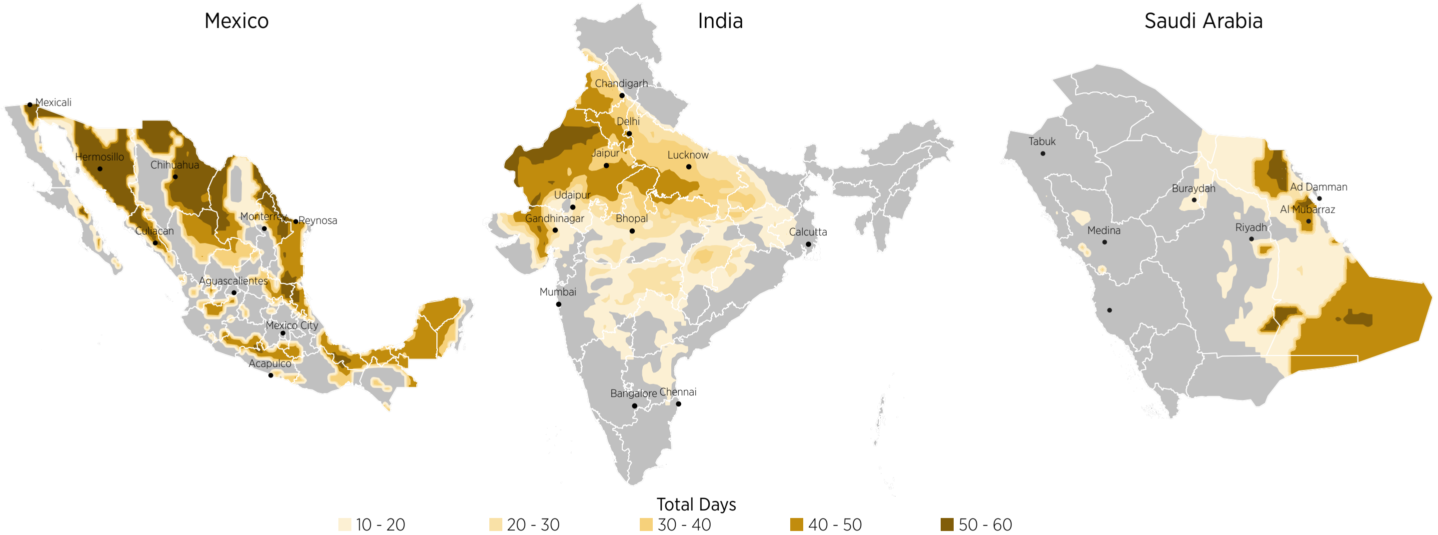


Figure 17: Total days from May 1 to June 30 with temperatures at least 35°C in Mexico, 40°C in India, and 45°C in Saudi Arabia | **Data:** ERA5 | **Graphic:** Gallagher Re

Asia

A widespread and deadly heatwave engulfed a large swath of Asia from March to June. In northern India, temperatures soared above 50°C (122°F). Overnight lows also did not provide much reprieve, as the city of Delhi recorded its hottest nighttime temperature at 35.2°C (95.4°F) on June 18. Cool overnight temperatures are essential for the bodily recovery from daytime heat. The city also documented 40 consecutive days of maximum temperatures at or above 40°C (104°F) from May 14 to June 22.

India's health ministry, which does not receive updated submissions from states, reported more than 41,000 heatstroke cases and hundreds of fatalities between March 1 and June 20. The extended heatwave also led to a spate of building and forest fires. As the world's second-largest agricultural producer, crops in India are heavily influenced by various types of extreme weather. Furthermore, thunderstorm-driven rainfall following a heatwave can be intense and destructive, as seen in late June in Delhi after floods devastated some parts of the capital. Of note, the spring and summer heatwave(s) triggered a unique parametric insurance product payout to more than 46,000 women in India.

Beyond India, hundreds of additional fatalities were officially reported, though unofficial totals suggested thousands perished in Asia during the first six months of the year. Pakistan, Bangladesh, Lao PDR, Vietnam, China, Hong Kong, Japan, the Philippines, Cambodia, Malaysia, Myanmar, and Thailand all reported exceptional record-breaking heat.

Middle East: Saudi Arabia

Tremendous heat affected Saudi Arabia in June, with the city of Mecca recording a remarkable temperature of 51.8°C (125.2°F) heat on June 17 that coincided with the annual haj pilgrimage. An estimated 1,300 pilgrims died. This was the hottest temperature ever recorded in the city and just 0.2°C (0.4°F) shy of Saudi Arabia's all-time record.

WHAT IT MEANS:

While the financial cost of extreme heat may not be immediately obvious, there are emerging signs of mounting direct and indirect losses. Prolonged heat and drought can erode the structural integrity of buildings as the changing soil composition disrupts foundations. This can lead to an insurance claim. Extreme temperatures are also noted for reducing worker productivity or making it difficult for workers to travel to their place of business. This indirectly brings higher downstream financial implications. By failing to reduce greenhouse gases, humanity is making the world a more challenging place to live. A recent study suggested that the human body may stop functioning optimally when the outside temperature reaches 40 to 50°C (104 to 122°F). As a growing chorus of regulators and activist investors seek solutions to climate risk, developing cost-efficient and sustainable insurance products becomes more important by the day. The era of green investment and transition is here.

H1: Miscellaneous Events

US/Canada

Moisture from a tropical disturbance prompted significant rainfall and costly flash-flooding in parts of southern Florida in June. This included highly urbanized regions of North Miami and Hollywood. A 72-hour rainfall total of 21.6 inches (549 millimeters) was measured at Miami Shores. In April 2023, this same general area recorded as much as 20 inches (500 millimeters) of rainfall in an event that caused considerable damage in Fort Lauderdale.

Persistent early-summer rains produced substantial flooding across parts of South Dakota, Minnesota, Iowa, and Nebraska in mid- to late-June. Rain exceeding 10 to 12 inches (250 to 305 millimeters) prompted rivers within the Mississippi watershed to burst their banks. Some river stations topped levels experienced in the historic 1993 floods, including the James, Big Sioux, Des Moines, and Minnesota rivers. In Iowa alone, water damage was observed in at least 1,900 homes. Economic costs, including those to property and agriculture, were likely to approach or exceed USD1 billion. Insured losses were expected to be notably lower, given low National Flood Insurance Program (NFIP) take-up rates in the most impacted counties.

The most damaging US wildfire(s) year-to-date were ignited in the Mescalero Apache Reservation of New Mexico in mid-June. The fires, named the South Fork and Salt Fires, led to the destruction of 1,400 structures. At least 500 were personal residences. The two fires merged and eventually burned more than 25,500 acres (10,320 hectares) of land in Lincoln County. This fire complex in New Mexico resulted in preliminary economic costs in excess of USD1.5 billion The largest US wildfire YTD remained the Smokehouse Creek Fire that burned 1.06 million acres (429,000 hectares) of land in Texas and parts of Oklahoma during March. Total combined US insured wildfire losses were initially estimated in the hundreds of millions (USD).

Wildfire season in Canada started off active but was substantially less so than the unprecedented fire season in 2023. Year-to-date there have been several notable wildfires and evacuations, particularly in British Columbia and Alberta. Despite cooler and wetter conditions this spring, fire risk will remain a concern in the summer months ahead.

Latin America

A period of widespread heavy rainfall, associated with a weather phenomenon known as a Central American Gyre (CAG), fell across central America in mid- to late-June. The CAG is an expansive cyclonic circulation which promotes heavy rainfall and can often spawn tropical cyclone development. The flooding resulted in more than 30 deaths across El Salvador (19), Guatemala (10), and Honduras (1).

Elsewhere, numerous early season wildfires were ignited in Brazil's Pantanal region in May, primarily in the Mato Grosso do Sul state. The fires were aided by drier and warmer weather, partially attributed to the recent El Niño episode and tied to illegal burning practices. Conditions are anticipated to worsen across the Pantanal in the months ahead as peak fire season approaches, particularly since the 2023/24 rainy season (October to March) brought lower than normal rainfall. Wildfires in Brazil's Pantanal typically peak between July and September.

The country cited a record 3,372 fire ignitions to start the year as the National Institute for Space Research (INPE) indicated fires in 2024 were already more numerous than the historic 2020 season, in which the biome incurred extensive damage.

Europe

The late spring and early summer months mark Europe's peak season for SCS, and several countries in the central and eastern parts of the continent have already reported notable outbreaks. In June, hail at least 3.9 inches (10 centimeters) in diameter generated locally significant damage in Romania's Iași County. Elsewhere, hail-driven damage from hailstones as large as 3.2 inches (8.0 centimeters) was reported in Austria, particularly in the states of Tyrol and Styria between June 7–9. Weeks later, several days of enhanced SCS activity brought strong winds, tornadoes, and hail to France, Germany, the Czech Republic, and surrounding countries. Hail-producing supercells generated locally notable damage in Germany and France from June 17–19. A slow-moving area of low pressure named Annelie later prompted storm- and flood-related damage in parts of France, Switzerland, and Italy at the end of June. Flooding was particularly impactful in regions of the Alps.

Africa

Major seasonal flooding affected parts of East Africa from March into May, which led to more than 550 fatalities. The floods, which were enhanced by the ongoing positive phase of the Indian Ocean Dipole, were additionally influenced by moisture from the passage of cyclones Hidaya and Ialy. Substantial structural and other physical damage was noted, particularly in Tanzania and Keyna. Initial economic loss estimates were listed at up to USD750 million. Note that at the end of June, a series of low-pressure areas tracked across West Africa which eventually spawned early-season tropical cyclone development in the Atlantic Ocean.

Elsewhere, parts of South Africa were impacted by a cut-off area of low pressure in late May and early June that spawned severe weather. The hardest-hit areas were in the Eastern Cape and KwaZulu-Natal, as powerful tornadoes and strong winds generated significant damage in the Tongaat area of KwaZulu-Natal. While tornadoes in this part of the country are not uncommon, the strength and extent of damage caused by the Tongaat tornado were locally significant.

Prolonged and severe drought conditions were felt in southern Africa in H1. The countries of Zambia, Zimbabwe, Angola, and Botswana were most impacted. The El Niño-driven drought was the worst seen across the region in decades, and seasonal rainfall totals were well below average. The drought resulted in an agriculture and humanitarian emergency, and economic losses were expected to reach into the hundreds of millions (USD).

Asia

The earthquake peril played a significant role in economic loss costs in Asia during H1 2024. As covered more extensively in our Q1 2024 Natural Catastrophe and Climate Report, the most expensive was the January 1 earthquake on Japan's Noto Peninsula. That event resulted in an insured loss that was expected to approach USD3.0 billion. Elsewhere, a magnitude–7.4 earthquake struck Hualien, Taiwan on April 3. This marked the strongest tremor to impact Taiwan since the magnitude–7.6 Chi-Chi earthquake on September 21, 1999. The 2024 Hualien earthquake was expected to result in sizeable insured losses mostly tied to damages in the semiconductor industry and associated business interruption costs.

Cyclone Remal made landfall in the Sundarbans of West Bengal, India on May 26 and slowly tracked through Bangladesh. Destructive impacts lasted for more than 36 hours in the country, which was one of the longest storm impact durations since Cyclone Aila (2009). The Bangladeshi government estimated economic losses at nearly USD600 million. The remnants also triggered severe flooding and landslides in northeast India.

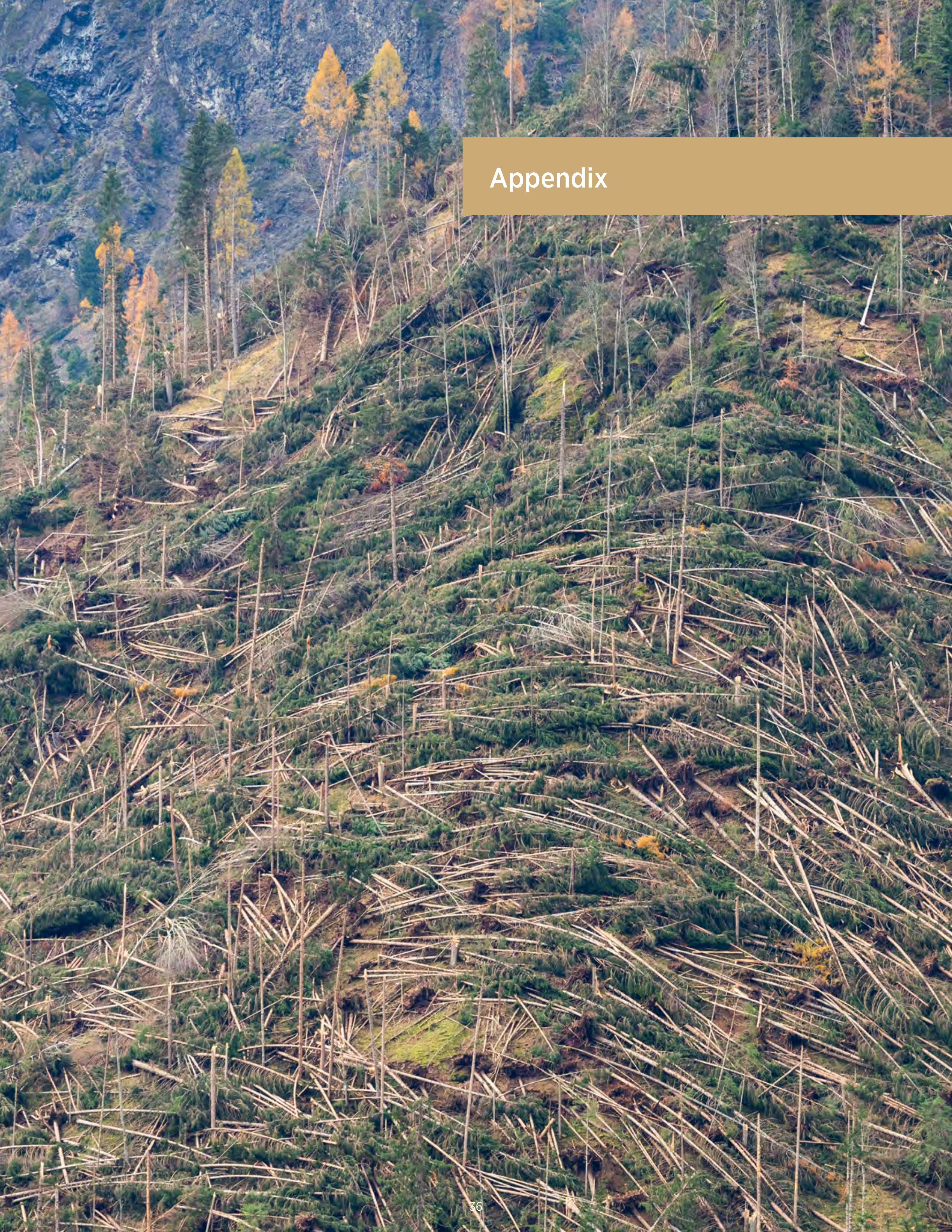
From a humanitarian perspective, recurring floods in Afghanistan and Pakistan left more than 740 people dead in April and May. This was exacerbated by Pakistan's wettest April since 1961. Poor urban planning, weak transboundary water management, and displaced populations linked to geopolitical risk contributed to the unfortunate loss of life.

Oceania

A weather phenomenon known locally in Australia as a "black nor'easter" impacted New South Wales (NSW) in early April. A "black nor'easter" is defined as a persistent area of low pressure on the east coast of Australia during the late spring and early autumn that can bring severe thunderstorms and flooding. The April 2024 event caused heavy rainfall, damaging winds, and flash flooding, especially in the Hawkesbury-Nepean and Illawarra regions. Additionally, in June, the city of Sydney observed its second wettest June day on record when 5.59 inches (142 millimeters) of rain fell. Also in June, the Hawkesbury-Nepean floodplain was again threatened by major flooding. NSW's recent 2024–2025 budget approved a USD3.8 billion financial package for natural disaster relief and recovery.

Elsewhere in Oceania, torrential rains caused flash flooding in mid-April affecting the Chimbu Province of the highlands region in Papua New Guinea (PNG). More than 20 fatalities were recorded, and thousands were displaced. A massive landslide also struck PNG on May 24. The enormous slide occurred in a mountainous region at a time when residents were sleeping. Given the volume of land that collapsed, authorities have only been able to estimate the potential death toll which currently ranges from 670 to 2,000. This was PNG's deadliest natural disaster event in decades.

Appendix



January–June 2024 Events: Preliminary Statistics

Please note that the Appendix solely includes a listing of global events that resulted in approximately USD100+ million in economic loss and/or 10+ fatalities. It typically does not include a listing of aggregated loss totals from agencies that are not easily attributed to an individual event. Economic losses are provided in USD millions and are adjusted to year-to-date dollar values using the US Consumer Price Index and further implementation of CPI variables such as a construction index and a cost of labor factor. Totals may be rounded, and are subject to future development.

Drought

Event Name	Date	Region	Countries	Economic Loss	Fatalities
Zimbabwe Drought	Jan 1-Jun 30	Africa	ZW	425+	-
Zambia Drought	Jan 1–Jun 30	Africa	ZM	225+	-
China Drought	Jan 1–Jun 30	Asia	CN	210	-
Philippines Drought	Jan 1–Jun 30	Asia	PH	175	-
Spain Drought	Jan 1–Jun 30	Europe	ES	100s of millions	-
Brazil Drought	Jan 1–Jun 30	Latin America	BR	2,000	-
Mexico Drought	Jan 1–Jun 30	Latin America	MX	2,000	-
US Drought	Jan 1–Jun 30	US	US	750+	-

Earthquake

Event Name	Date	Region	Countries	Economic Loss	Fatalities
Noto Peninsula Earthquake	Jan 1	Asia	JP	12,000+	299
Hualien Earthquake	Apr 3	Asia	TW	3,000	18

European Windstorm

Event Name	Date	Region	Countries	Economic Loss	Fatalities
Isha/Iris	Jan 20–22	Europe	BE, CH, DE, DK, FR, GB, IE, NL, NO	525	5
Jocelyn/Jitka	Jan 23–24	Europe	GB, IE, DE, DK, NL, NO, PL	160	-
Ingunn/Margrit	Jan 31–Feb 1	Europe	NO, GB, IE, SW	150	-
Louis/Wencke	Feb 21–23	Europe	FR, BE, NL, DE, DK, SE	600	1
Nelson/Nadja	Mar 27–29	Europe	FR, PT, ES, GB	100	4
Olivia/Sabine & Kathleen/Timea	Apr 4–7	Europe	IE, GB, FR, ES, PT, NL	125	-

Flooding/Landslides

Event Name	Date	Region	Countries	Economic Loss	Fatalities
Congo Floods Q1	Jan 1–17	Africa	CD	Millions	238
South Africa Jan Flood	Jan 10–20	Africa	ZA	10s of millions	13
Simiyu Region Landslide	Jan 13	Africa	TZ	-	22
East Africa Rainy Season	Mar 24–May 15	Africa	TZ, KE, UG, RW, ET, PG	750	550+
Idiofa Town Landslide	Apr 13	Africa	CD	-	15
Algeria Spring Floods	May 24–Jun 8	Africa	DZ	-	15
Niger Summer Floods	Jun 10–21	Africa	NE	Millions	18
Ivory Coast Floods	Jun 17–25	Africa	CI	-	27
Caraga & Davao Flood	Jan 16–19	Asia	PH	Millions	18
Zhenxiong Landslide	Jan 22	Asia	CN	-	44
Mindanao Flood/Landslide	Jan 28–Feb 6	Asia	PH	50	120
Nuristan Landslide	Feb 18	Asia	AF	-	25
West Sumatra Floods	Mar 7–8	Asia	ID	25	32
Central Java Floods	Mar 13–14	Asia	ID	-	13
Snowmelt & Orsk Dam Burst	Mar 27–Apr 20	Asia	RU, KZ	570	3
Afghanistan & Pakistan Flood	Apr 12–28	Asia	AF, PK	30	741
Tana Toraja Landslide	Apr 13	Asia	ID	-	20
China April Flood	Apr 15–21	Asia	CN	1,650	24
China May Flood	May 1–31	Asia	CN	165	3
South Sulawesi Flood	May 3	Asia	ID	-	16
West Sumatra Lahar	May 11	Asia	ID	-	67
Sri Lanka Seasonal Floods	May 15–Jun 30	Asia	LK	Millions	37
China Seasonal Floods	Jun 1–Jul 11	Asia	CN	7,000	200
India Seasonal Floods	Jun 4–30	Asia	IN	10s of millions	199
Nepal Seasonal Floods	Jun 11–30	Asia	NP	-	43
Henk/Annelie & Flooding	Jan 1–5	Europe	BE, DE, FR, NL, GB	610	3
Italy/Germany Floods & SCS	May 14–17	Europe	DE, IT	600	-
Central Europe Floods	May 28–Jun 5	Europe	DE, IT, CH, HU, AT	5,000	10
Southern Spain Floods	Jun 10–15	Europe	ES	150	-
Xandria/Alps Floods	Jun 21–23	Europe	CH, FR, IT, CZ, BA, PO, HU	220	5
Bolivia Q1 Floods	Jan 1–Mar 31	Latin America	BO	10s of millions	50
Colombia Landslide	Jan 12	Latin America	CO	Millions	36
Rio De Janeiro Jan Floods	Jan 13–14	Latin America	BR	90	12
Southeast Brazil Floods	Mar 22–23	Latin America	BR	75	27
Rio Grande do Sul Floods	Apr 27–May 13	Latin America	BR	8,100	175
Central America Flooding	Jun 15–Jun 24	Latin America	MX, SV, GT, HN, EC	Millions	30
Arabian Gulf Flash Flood	Apr 13–17	Middle East	AE, OM, YE, BH, QA, IR, SA	8,550	33
Chimbu Floods	Mar 13–19	Oceania	PG	50	23
Maip Mulitaka Landslide	May 24	Oceania	PG	-	670-2000
S. California Flash Flood	Jan 19–22	US	US	500	-
Western Atmospheric River	Jan 31–Feb 1	US	US	100	-
CA Atmospheric River #1	Feb 3–6	US	US	1,200	9
CA Atmospheric River #2	Feb 17–21	US	US	150	-
Southern Florida June Floods	Jun 10–14	US	US	750	-
Midwest Summer Flooding	Jun 19–30	US	US	1,000+	2

Severe Convective Storm

Event Name	Date	Region	Countries	Economic Loss	Fatalities
South Africa Cut-Off Low	May 31–Jun 4	Africa	ZA	50	23
China April SCS	Apr 1–31	Asia	CN	310	17
Hyogo Hailstorm	Apr 16	Asia	JP	1,500	-
China May SCS	May 1–31	Asia	CN	140	13
Mumbai and Delhi Dust Storm	May 10–13	Asia	IN	-	19
West Bengal Malda Storm	May 16	Asia	IN	-	12
Easter Weekend SCS	Mar 30–Apr 3	Europe	CZ, FR, IT, PO	100	5
Storm Tina	Jun 6–10	Europe	AT, DE, HU, CH, SK, RO	415	2
Storm Wibke	Jun 17–20	Europe	DE, FR, CZ, PO, CH, BE	420	-
Storm Annelie	Jun 28–30	Europe	FR, IT, CH	100s of millions	7+
Para March SCS	Mar 5	Latin America	BR	200	-
Argentina Hail & Floods	Mar 8–21	Latin America	AR	250	1
Chile June SCS	Jun 10–16	Latin America	CL	100	1
Ecuador June SCS	Jun 15–16	Latin America	EC	Millions	10
UAE Hail & Floods	Feb 11–13	Middle East	AR, OM	250+	4
Victoria Valentine's Day SCS	Feb 14	Oceania	AU	170	-
Early Jan SCS & WW	Jan 8–10	US	US	2,800	6
Jan Southern SCS & Flood	Jan 22–26	US	US	675+	-
Early Feb Outbreak	Feb 8–13	US	US	1,225	1
Polar Front & SCS	Feb 26–29	US	US	1,350	-
Western US Storm	Feb 28–Mar 4	US	US	140+	2
Early March Storm Complex	Mar 6–11	US	US	620	-
Mid-March SCS Outbreak	Mar 12–17	US	US	5,900	3
San Antonio Hail & SCS	Mar 21–23	US	US	700	-
Late March Southern SCS	Mar 24–28	US	US	200	2
Early-April Outbreak	Mar 31–Apr 4	US	US	2,550	1
Southern SCS & Floods	Apr 6–12	US	US	2,700	-
April Mid-Atlantic SCS	Apr 14–16	US	US	115	-
April Plains & Midwest SCS	Apr 15–16	US	US	90	-
Central & Eastern Outbreak	Apr 17–20	US	US	1,000	-
Texas April SCS	Apr 19–21	US	US	300	-
Late April Central SCS	Apr 25–29	US	US	1,200	6
Early May Hail & Flooding	Apr 30–May 2	US	US	390	1
Texas Flooding & SCS	May 3–5	US	US	320	-
Early-May SCS	May 6–10	US	US	4,800	5
Southern Flood & SCS	May 11–14	US	US	875	-
Houston Derecho	May 15–19	US	US	2,550	8
Mid-May SCS	May 17–22	US	US	4,900	5
Late May Plains Outbreak	May 23–24	US	US	720	-
Late May Central & East SCS	May 25–26	US	US	2,550	21
Dallas Hail & SCS	May 27–29	US	US	2,400	2
Denver Hail & SCS	May 30–Jun 1	US	US	2,200	-
TX Hail & MD Tornadoes	Jun 2–5	US	US	500	3
Early June Outbreak	Jun 6–10	US	US	500	-
Colorado June SCS	Jun 9–10	US	US	155	-
Midwest Mid-June Outbreak	Jun 12–14	US	US	950	-
Central & East Mid-June SCS	Jun 14–18	US	US	260	-
Central & East Late-June SCS	Jun 19–25	US	US	660	-
Midwest Late-June Outbreak	Jun 24–26	US	US	825	2
US Late-June Outbreak	Jun 27–30	US	US	635	-

Tropical Cyclone

Event Name	Date	Region	Countries	Economic Loss	Fatalities
Cyclone Belal	Jan 14–16	Africa	RE, MU	275+	4
Cyclone Gamane	Mar 27–29	Africa	MG	25	19
Cyclone Remal	May 26–28	Asia	IN. BD	635	4
Tropical Storm Alberto	Jun 19–21	US	MX, US	165	4

Wildfire

Event Name	Date	Region	Countries	Economic Loss	Fatalities
Central Chile Wildfires	Feb 1–Mar 22	Latin America	CL	1,100	134
Smokehouse Creek Fire	Feb 26–Mar 15	US	US	400	2
South Fork & Salt Fires	Jun 17–25	US	US	1,000	2

Winter Weather

Event Name	Date	Region	Countries	Economic Loss	Fatalities
China January Freeze	Jan 12–23	Asia	CN	365	3
China Feb Winter Freeze #1	Feb 1–5	Asia	CN	1,770	7
China Feb Winter Freeze #2	Feb 17–22	Asia	CN	980	-
Europe April Freeze	Apr 16–25	Europe	CZ, DE, AT, FR	670	-
Western Canada Freeze	Jan 12–15	N. America	CA	300	-
US January Freeze	Jan 11–14	US	US	1,200	7
Northwest Winter Storm #1	Jan 12–15	US	US	1,500	12
US Jan Polar Vortex	Jan 15–17	US	US	1,250	70
Northwest Winter Storm #2	Jan 16–18	US	US	500	8
Rockies Winter Storm	Mar 11–15	US	US	100	

Other

Event Name	Date	Region	Countries	Economic Loss	Fatalities
Thailand Heatwave	Jan 1–May 10	Asia	TH	-	61
India Heatwave	Mar 1–Jun 30	Asia	IN	-	143-448
Myanmar Heatwave	Apr 1–May 3	Asia	MM	-	50
Bangladesh Heatwave	Apr 22–30	Asia	BD	-	15
Pakistan Heatwave	Jun 21–30	Asia	PK	-	49-568
Mexico H1 Heatwave	Mar 17–Jun 30	Latin America	MX	-	172
Saudi Arabia Heatwave	Jun 14–19	Middle East	SA	-	1,301+

Country Name	Abbreviation
Afghanistan	AF
Åland Islands	AX
Albania	AL
Algeria	DZ
American Samoa	AS
Andorra	AD
Angola	AO
Anguilla	AI
Antarctica	AQ
Antigua and Barbuda	AG
Argentina	AR
Armenia	AM
Aruba	AW
Australia	AU
Austria	AT
Azerbaijan	AZ
Bahamas	BS
Bahrain	BH
Bangladesh	BD
Barbados	BB
Belarus	BY
Belgium	BE
Belize	BZ
Benin	BJ
Bermuda	BM
Bhutan	BT
Bolivia	BO
Bonaire, Saint Eustatius, and Saba	BQ
Bosnia and Herzegovina	BA
Botswana	BW
Bouvet Island	BV
Brazil	BR
British Indian Ocean Territory	IO
British Virgin Islands	VG
Brunei	BN
Bulgaria	BG
Burkina Faso	BF
Burundi	BI
Cambodia	KH
Cameroon	CM
Canada	CA
Cape Verde	CV
Cayman Islands	KY
Central African Republic	CF

Country Name	Abbreviation
Chad	TD
Chile	CL
China	CN
Christmas Island	CX
Malaysia	MY
Maldives	MV
Mali	ML
Malta	MT
Marshall Islands	MH
Martinique	MQ
Mauritania	MR
Mauritius	MU
Mayotte	YT
Mexico	MX
Micronesia	FM
The Grenadines	VC
Moldova	MD
Monaco	MC
Mongolia	MN
Montenegro	ME
Montserrat	MS
Morocco	MA
Mozambique	MZ
Myanmar	MM
Namibia	NA
Nauru	NR
Nepal	NP
Netherlands	NL
Fiji	FJ
Finland	FI
France	FR
French Guiana	GF
French Polynesia	PF
French Southern Territories	TF
Gabon	GA
Gambia	GM
Georgia	GE
Germany	DE
Ghana	GH
Gibraltar	GI
Greece	GR
Greenland	GL
Grenada	GD
Guadeloupe	GP

Country Name	Abbreviation
Guam	GU
Guatemala	GT
Guernsey	GG
Guinea	GN
Guinea-Bissau	GW
Guyana	GY
Haiti	HT
Heard Island and McDonald Islands	HM
Honduras	HN
Hong Kong	HK
Hungary	HU
Iceland	IS
India	IN
Indonesia	ID
Iran	IR
Iraq	IQ
Ireland	IE
Isle of Man	IM
Israel	IL
Italy	IT
Ivory Coast	CI
Jamaica	JM
Japan	JP
Jersey	JE
Jordan	JO
Kazakhstan	KZ
Kenya	KE
Kiribati	KI
Kosovo	XK
Kuwait	KW
Kyrgyzstan	KG
Laos	LA
Latvia	LV
Lebanon	LB
Lesotho	LS
Liberia	LR
Libya	LY
Liechtenstein	LI
Lithuania	LT
Luxembourg	LU
Macao	MO
Macau	MO
Macedonia	MK
Libya	LY

Country Name	Abbreviation
Liechtenstein	LI
Lithuania	LT
Luxembourg	LU
Macao	MO
Macedonia	MK
Madagascar	MG
Malawi	MW
Macedonia	MK
Malaysia	MY
Maldives	MV
Mali	ML
Malta	MT
Marshall Islands	MH
Martinique	MQ
Mauritania	MR
Mauritius	MU
Mayotte	YT
Mexico	MX
Micronesia	FM
Moldova	MD
Monaco	MC
Mongolia	MN
Montenegro	ME
Montserrat	MS
Morocco	MA
Mozambique	MZ
Myanmar	MM
Namibia	NA
Nauru	NR
Nepal	NP
Netherlands	NL
Netherlands Antilles	AN
New Caledonia	NC
New Zealand	NZ
Nicaragua	NI
Niger	NE
Nigeria	NG
Niue	NU
Norfolk Island	NF
North Korea	KP
Northern Mariana Islands	MP
Norway	NO

Country Name	Abbreviation
Oman	OM
Pakistan	PK
Palau	PW
Palestinian Territory	PS
Panama	PA
Papua New Guinea	PG
Paraguay	PY
Peru	PE
Philippines	PH
Pitcairn	PN
Poland	PL
Portugal	PT
Puerto Rico	PR
Qatar	QA
Republic of the Congo	CG
Reunion	RE
Romania	RO
Russia	RU
Saint Kitts and Nevis	KN
Saint Lucia	LC
Saint Martin	MF
Saint Pierre and Miquelon	PM
Saint Vincent & The Grenadines	VC
Samoa	WS
San Marino	SM
São Tomé and Principe	ST
Saudi Arabia	SA
Senegal	SN
Serbia	RS
Serbia and Montenegro	CS
Seychelles	SC
Sierra Leone	SL
Singapore	SG
Sint Maarten	SX
Slovakia	SK
Slovenia	SI
Solomon Islands	SB
Somalia	SO
South Africa	ZA
South Georgia and the South Sandwich Islands	GS

Country Name	Abbreviation
South Korea	KR
South Sudan	SS
Spain	ES
Sri Lanka	LK
Sudan	SD
Suriname	SR
Svalbard and Jan Mayen	SJ
Swaziland	SZ
Sweden	SE
Switzerland	CH
Syria	SY
Taiwan	TW
Tajikistan	TJ
Tanzania	TZ
Thailand	TH
Togo	TG
Tokelau	TK
Tonga	TO
Trinidad and Tobago	TT
Tunisia	TN
Turkey	TR
Turkmenistan	TM
Turks and Caicos Islands	TC
Tuvalu	TV
Virgin Islands (U.S.)	VI
Uganda	UG
Ukraine	UA
United Arab Emirates	AE
United Kingdom	GB
United States	US
Uruguay	UY
Uzbekistan	UZ
Vanuatu	VU
Vatican City	VA
Venezuela	VE
Vietnam	VN
Wallis and Futuna	WF
Western Sahara	EH
Yemen	YE
Zambia	ZM
Zimbabwe	ZW

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