Climate and Catastrophe Insight

AON

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Economic Loss

$368B

14 percent above the 21st century average

Insured Loss

$145B

54 percent above the 21st century average

Hurricane Helene, Costliest Event

243

fatalities in the third-deadliest U.S. hurricane of the 21st century, causing $75 billion in economic losses

Warmest Year on Record

1.55°C/2.79°F

temperature anomaly in 2024 compared to pre-industrial period (1850 – 1900), marking the warmest year on record (WMO)

54

billion-dollar economic loss events, above the average of 44

34

billion-dollar insured loss events, above the average of 16

Spain, Brazil, UAE, Vietnam

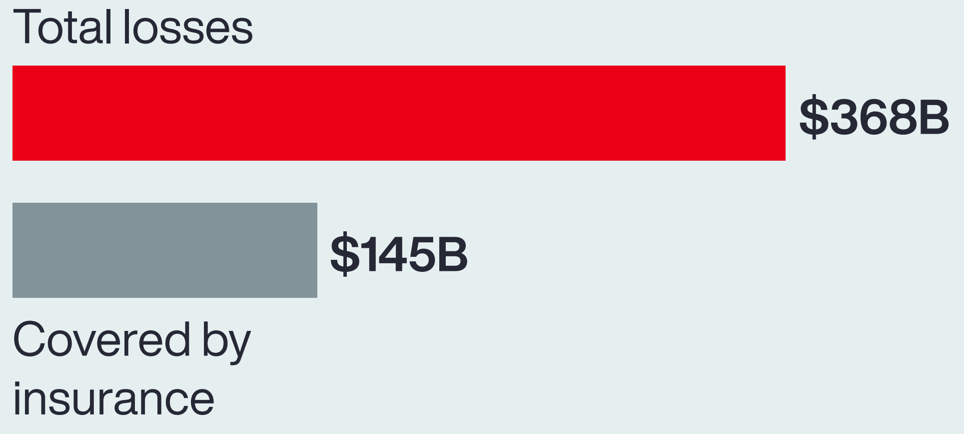
recorded their costliest insurance events

15

consecutive months of record-high global temperatures between July 2023 and August 2024

60%

global protection gap



78%

of global insured losses were recorded in the United States

20

countries and territories that recorded their highest temperatures

Tropical Cyclone

peril with the highest economic losses; severe convective storms was the most damaging peril for insurers

$61B

global insured losses from SCS, the second-highest on record

18,100

fatalities driven by heatwaves and floods, lowest since 1992

Executive Summary

Insured losses reach $145 billion in the sixth-costliest year on record as global events show that adaptation and disaster preparedness can mitigate damage and loss of life in the current and future climate.

Economic Losses Were Above Average Due to Weather Disasters

Global natural disasters in 2024 resulted in economic losses reaching at least $368 billion and were primarily driven by tropical cyclones, severe convective storms and floods. The single most devastating event was Hurricane Helene, which is estimated to have caused approximately $75 billion in direct damage, mainly due to inland and coastal flooding. Global losses surpassed $300 billion for the ninth time in a row and were 14 percent higher than the long-term average. Some territories suffered a disproportionate impact relative to their economic output, such the island of Mayotte from Cyclone Chido.

2024 was the Sixth-Costliest Year for Insurers

The costliest events for insurers were two Atlantic hurricanes — Helene and Milton — which are expected to result in losses of approximately $37.5 billion, including public insurance from the National Flood Insurance Program. While these losses were substantial, southeastern United States avoided the worst-case scenario, and the impact was manageable by the (re)insurance industry. Severe convective storm was the costliest peril for insurers, as total annual losses exceeded $60 billion and were the second-highest on record after 2023. Additionally, Spain, Brazil, UAE and Vietnam all recorded their costliest insurance events.

The global protection gap was relatively low at 60 percent — with 40 percent of damage being covered by insurance. The gap has decreased from 69 percent in 2023. However, notable differences between regions and peril remained and providing affordable and sustainable insurance products will be crucial to enhance financial resilience in the future.

Socioeconomic Factors Continue to Drive Losses

Increase in population, wealth and overall exposure to natural hazards in high-risk areas continues to be a crucial component of growing disasters losses. For example, staggering development in hurricane-prone Florida or spatial growth of U.S. cities in areas regularly affected by severe convective storm (SCS) activity increases the likelihood of billion-dollar disasters. Many regions continued to suffer from impacts of inflation and other economic factors. For example, the increase in building construction costs seen in Canada in recent years, coupled with shortage of skilled labor and supply chain disruptions, have driven up the costs of rebuilding efforts.

Global Fatalities Were Among the Lowest in 30 Years

Approximately 18,100 people were killed by natural disasters in 2024, well below average. This is consistent with the overall long-term decline in the number of casualties and echos improvements in early warnings, weather prediction, crisis management and disaster preparedness. While this is a positive development, continued improvements are still needed even in countries that are better positioned to deal with disasters due to their economic development level.

2024 Was the Hottest Year on Record

For the first time, global temperature anomaly in 2024 exceeded 1.5°C above the pre-industrial levels. This not only manifested itself in heatwaves and record temperatures around the world, but also in continued impact on severity and frequency of various perils. This underscores the need for reliable climate data and analytics to accurately assess the impact on people and property.

Adaptation and Disaster Preparedness Can Mitigate Damage and Create More Resilient Communities

Disasters of 2024 provided valuable lessons on how building resilient infrastructure and adaptation measures can help reduce material and financial impacts in current and future climate. For example, adherence to building codes in Florida helped to partially mitigate damage from Helene and Milton. Similarly, improved preparedness through better warning systems, weather forecasts or evacuation planning is crucial in reducing the risk to human lives, as was shown during the flooding in Central Europe or effects of typhoons in the Philippines.

Foreword by Greg Case
CEO, Aon

It has been almost 20 years since Aon published its first Climate and Catastrophe Insight report. Since then, a lot has changed in our understanding of the forces driving the complexity and volatility that businesses and communities tackle every day.

Our research — and conversations we have with clients and governments around the world — highlights four megatrends impacting business decision making: Trade, Technology, Workforce and, the focus of this report, Weather.

Aon's Climate and Catastrophe Insight report tells two very important stories about the Weather megatrend. First, that weather, and particularly climate risk, can affect almost every aspect of business operations across the other three trends — such as where to locate a new facility or how best to protect employees. Second, to tackle rapidly changing climate risk, the (re)insurance industry must accelerate innovation and access new forms of capital to respond to increasing and evolving risks.

In 2024, the world endured $368 billion in global economic losses. Unfortunately, 60 percent of those losses were not covered by insurance, which significantly compromises the ability for communities to rebuild and adapt for the future climate. We call this the "protection gap" and it must be closed.

To address climate risk — and our new normal of extreme weather events — Aon is investing in data, technology and next-generation forecasting models to deliver insights. Driven by our commitment to help businesses and communities make better risk and people decisions, our teams of modellers, data and analytics experts and (re)insurance professionals are using these insights to develop and deliver solutions that better protect businesses and vulnerable communities.

Parametrics, for example, are increasingly key to attracting new forms of capital and are helping clients mitigate uncertainty and recover faster after an event. Elsewhere, our Property Risk Analyzer is helping clients identify exposures driven by natural catastrophes to decide which risks should be retained or transferred.

At the same time, we are building partnerships to advance climate solutions and further close the protection gap. Aon is working with the International Federation of the Red Cross and Red Crescent Societies' Disaster Response Emergency Fund to create an insurance policy that provides more immediate funding when disaster strikes the world's poorest areas. In 2024, this policy was triggered because the world was hit by so many floods and landslides.

When it comes to climate risk, the stakes could not be higher. The data in this report delivers powerful insights that can help global businesses become even more resilient to climate risk. Certainly, the year ahead presents great challenges but also an opportunity for our industry to innovate and collaborate in new ways that profoundly strengthen the global economy.

How This Report Helps Organizations Thrive

We analyze global natural hazards to better inform organizations on the risk and human impact of catastrophes and climate. Our goal is to connect sectors including insurance, government, academia, construction and finance as we collaboratively build a more resilient future.

To demonstrate how we can make better decisions to protect people and property, we assess the impact of weather-related catastrophic events on workforce resilience, emerging technology and trade continuity with insights on how organizations can accelerate adaptation.

Risk management is key as weather patterns increase the severity of natural catastrophes.

Physical damage impacts homes, businesses, lives and livelihoods, highlighting the need for better adaptation strategies. The insurance industry plays a critical role by providing capital to reduce risk and increase resilience.

1. Understand the impact of climate risk to buildings and people to build more resilient infrastructures and workforces.
2. Ensure natural perils and climate are evaluated and managed with the same rigor as other risk exposures, using tools and analytics to support decision making.
3. Grow the volume of sustainable investment assets to accelerate green initiatives and meet net-zero emissions goals.
4. Ensure climate risks are assessed for both infrastructure and people to understand the total cost.

Leaders must proactively boost workforce resilience amid natural catastrophe and climate challenges.

Heat can impact workforces through health and safety, wellbeing, productivity and performance. The future of work will see a higher demand for professionals with climate skills in construction and crisis management, as well as more businesses using location analytics and job assessments to redeploy resources and ensure employee safety.

1. Evaluate the current and future impacts of climate risks on the workforce across key indicators, including productivity, healthcare costs and talent supply to adapt to change and help manage risk.
2. Develop robust disaster recovery plans and support services with just-in-time employee relief.
3. Proactively prepare to help employees understand potential risks, avoid uncertainty and improve communication during an event.
4. Upskill employees with climate and sustainability skills and recruit experts from beyond your sector with specialist knowledge.

Focus on strategies to mitigate the risks climate poses to critical technology.

Natural perils can have a significant impact on global technology infrastructure, supply chains, and digital connectivity. For instance, Hurricane Sandy led to tech outages due to flooding, and an earthquake in Indonesia in 2022 caused internet connectivity problems by damaging deep-sea cables. Equally, technology plays a crucial role in reducing the impact of climate risks — for example, by adopting alternative energy sources to support the increasing energy demand from AI data centers that enable real-time climate risk assessment.

1. Evaluate the role of renewable energy and distributed power generation to manage growing energy demand from AI data centers.
2. Adopt advanced analytics to evaluate the exposure of critical technology infrastructure (data centers, submarine cables, manufacturing locations) to climate events.
3. Climate-proof critical technology infrastructure and supply chain processes.
4. Attract alternative forms of risk capital for climate risks to protect critical technology infrastructure (parametrics, ILS).

Strengthening supply chains is essential to mitigate the impact of nat cat on trade.

Natural disasters disrupt trade by halting production, impeding transportation and losing sales. This can cause economic, operational and reputational damage, as well as a loss of market share and competitiveness. Risk management solutions include parametric insurance to provide support around non-physical damage with triggers around loss of sales or spikes in temperature.

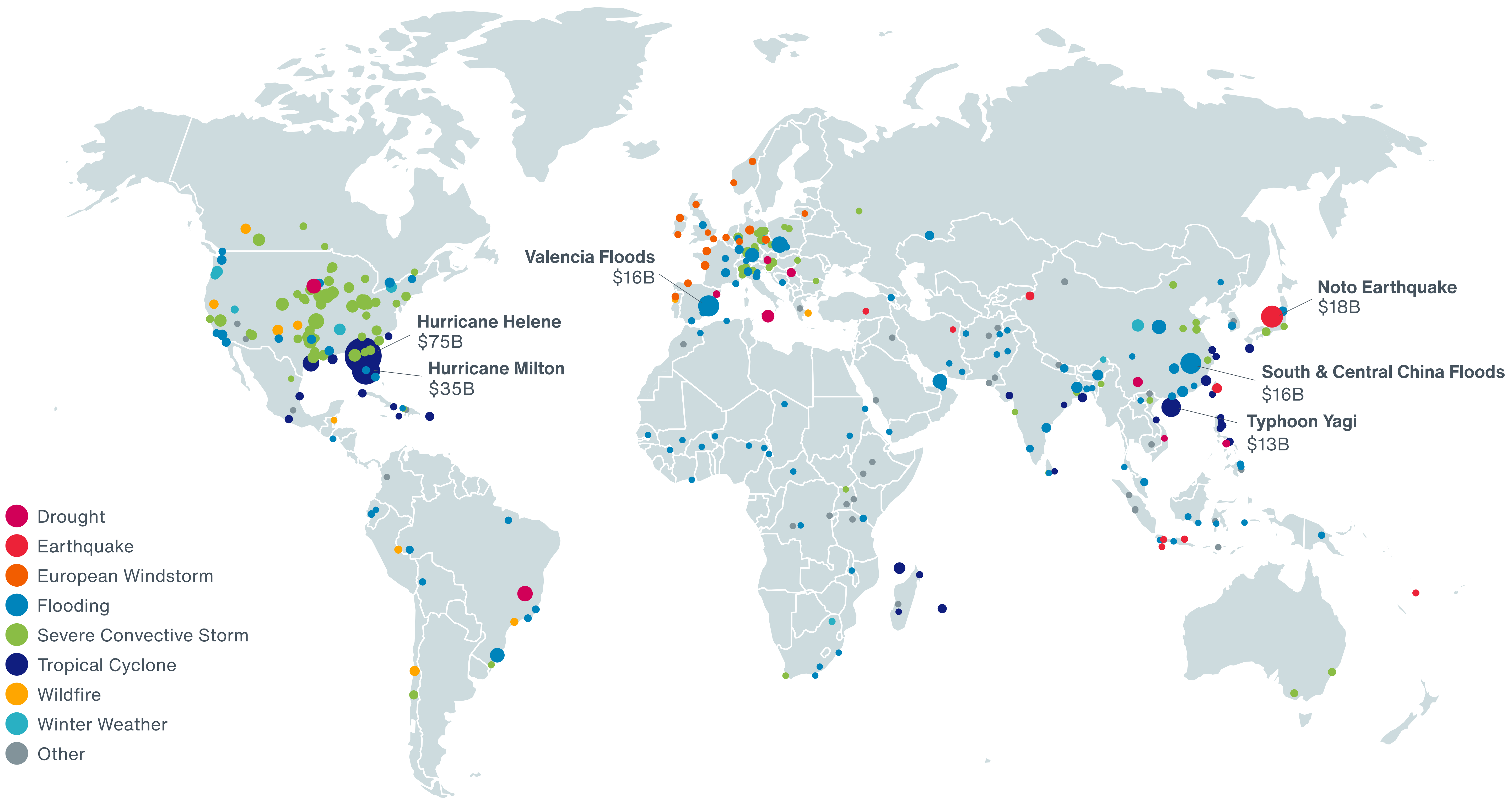
1. Adapt to the changing climate with new forms of capital, such as parametric, to avoid loss of market share and competitiveness.
2. Invest in renewable energy, diversify supply chains, improve transparency and traceability and access new sources of capital to protect your business interests.
3. Integrate advanced analytics, Internet of Things (IoT), and AI into supply chain management, enhancing real-time monitoring and predictive capabilities to mitigate risks.
4. Climate-proof supply chains to help providers offer incentives, such as premium discounts and more favorable terms.

Natural Disaster Events and Loss Trends

Explore long-term trends and the impacts of the year’s major natural disasters from a global perspective

Global Economic Losses Above Average, Driven by Weather-Related Disasters

Exhibit 1: Notable 2024 Economic Loss Events



Data: Aon Catastrophe Insight

Economic losses from global natural disasters in 2024 are estimated at $368 billion, about 14 percent above the long-term average since 2000, after adjusting historical losses to today's values using the U.S. Consumer Price Index.

Distribution of disasters on the world map shows various patterns. For example, the largest concentration of catastrophe losses can be found in developed countries with high economic output, with the United States alone accounting for more than $218 billion in 2024. However, losses in emerging markets such as Brazil, India and China are accounting for an increasing portion of the global toll due to the rapid economic growth and urbanization in high-risk areas in recent years.

While losses in smaller economies might appear negligible on a global scale, they can have a disproportionately significant impact on national or regional economies relative to their total economic output. For example, Cyclone Chido hit the small island of Mayotte in December, causing catastrophic damage that might exceed the entire GDP of the island ($3 billion).

The map also does not fully illustrate the disparity between financial and human impacts. Developed countries generally tend to be better equipped to manage disaster consequences and can reduce potential fatalities through effective preparedness and disaster response strategies.

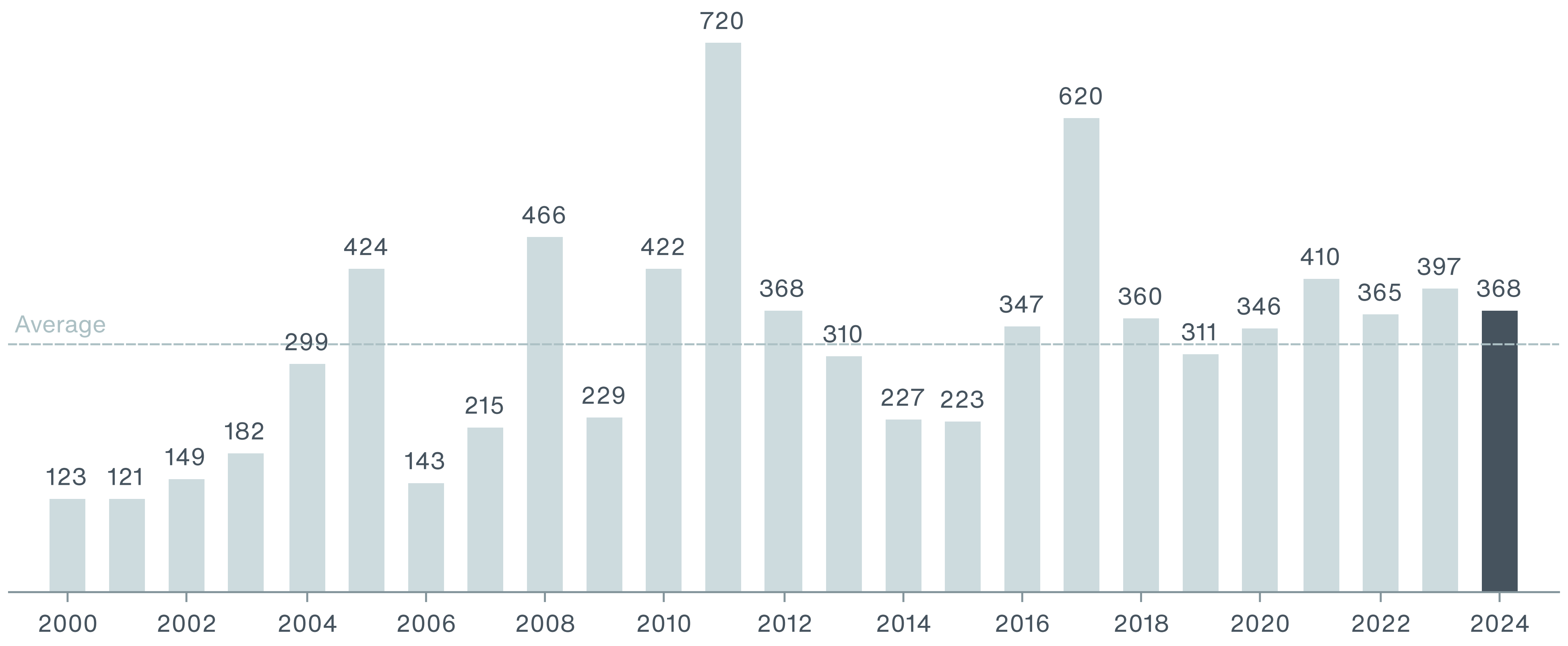
Exhibit 2: Top 10 Global Economic Loss Events in 2024

Date	Event	Location	Deaths	Economic Loss (2024 $B)	Insured Loss (2024 $B)
09/25 - 09/28	**Hurricane Helene**	U.S., Mexico, Cuba	243	**75.0**	17.5
10/08 - 10/11	**Hurricane Milton**	U.S., Mexico	35	**35.0**	20.0
01/01	**Noto Earthquake**	Japan	489	**18.0**	1.0
10/27 - 10/30	**Valencia Floods**	Spain	231	**16.1**	3.9
06/09 - 07/14	**South, Central China Floods**	China	470	**15.7**	0.4
09/01 - 09/09	**Typhoon Yagi**	China, Southeast Asia	816	**12.9**	0.7
07/01 - 07/11	**Hurricane Beryl**	U.S., Caribbean, Canada	70	**7.7**	3.7
09/12 - 09/16	**Central Europe Floods**	Central Europe	29	**7.5**	2.1
01/01 - 12/31	**Drought**	United States	N/A	**7.1**	3.5
05/06 - 05/10	**Severe Convective Storm**	United States	6	**6.6**	5.2
All Other Events			~15,700	**166.4**	87.0
Totals			**~18,100**	**368**	**145**

Hurricane Helene became the costliest event of the year from an economic loss perspective with an estimated $75 billion in total direct damage. While it impacted Florida as an unusually large and strong Category 4 storm, landfall point was in a relatively sparsely populated area and majority of the financial impact was actually incurred in North Carolina due to widespread and devastating floods. Helene ranks among the 15 costliest natural disasters globally since 1900 on a price-inflated basis and among the eight costliest tropical cyclones.

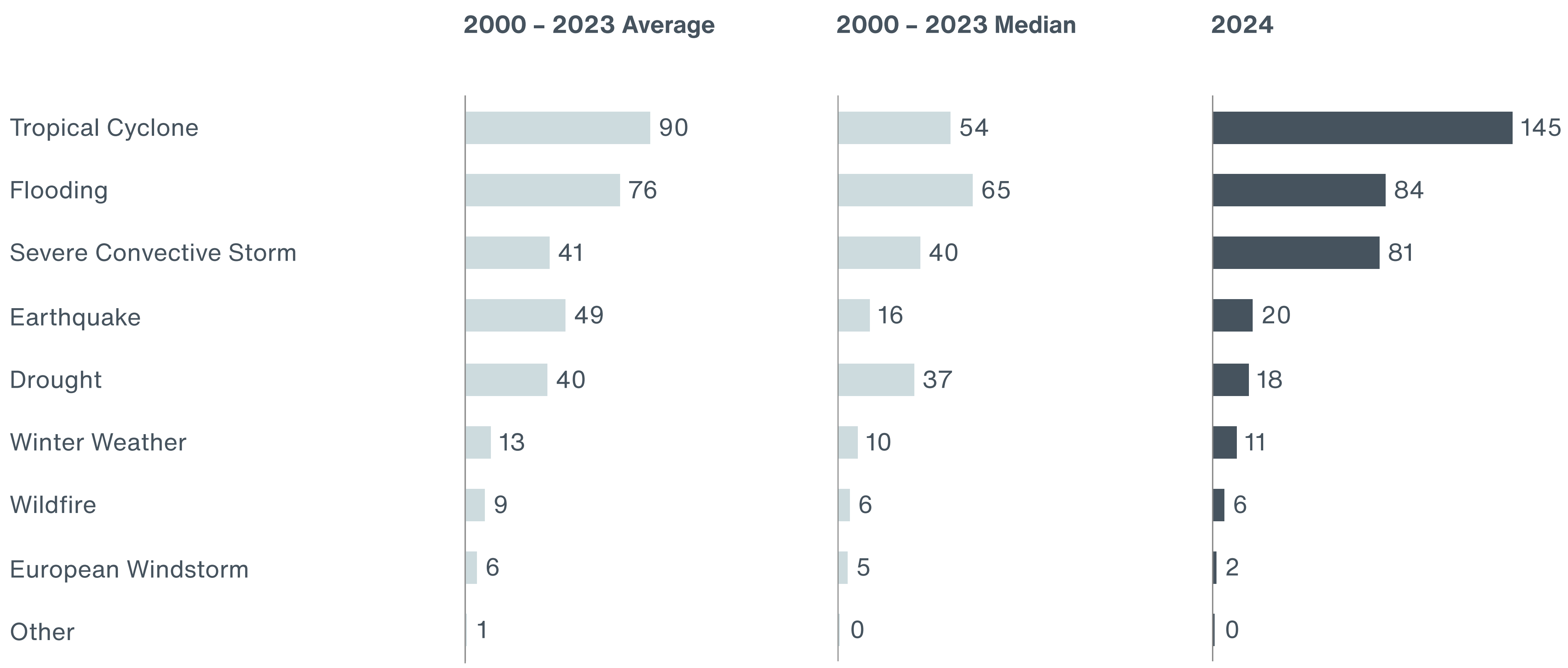
At least five other events resulted in economic losses of $10 billion and higher, with three events in the Asia Pacific region. Only one SCS event was among the top 10 in 2024, and the May 6 – 10 outbreak in the United States now ranks among the 10 costliest SCS events on record (in 2024 U.S. dollars).

Exhibit 3: Global Economic Losses from Natural Disasters (2024 $B)



Data: Aon Catastrophe Insight

Exhibit 4: Global Economic Losses by Peril (2024 $B)

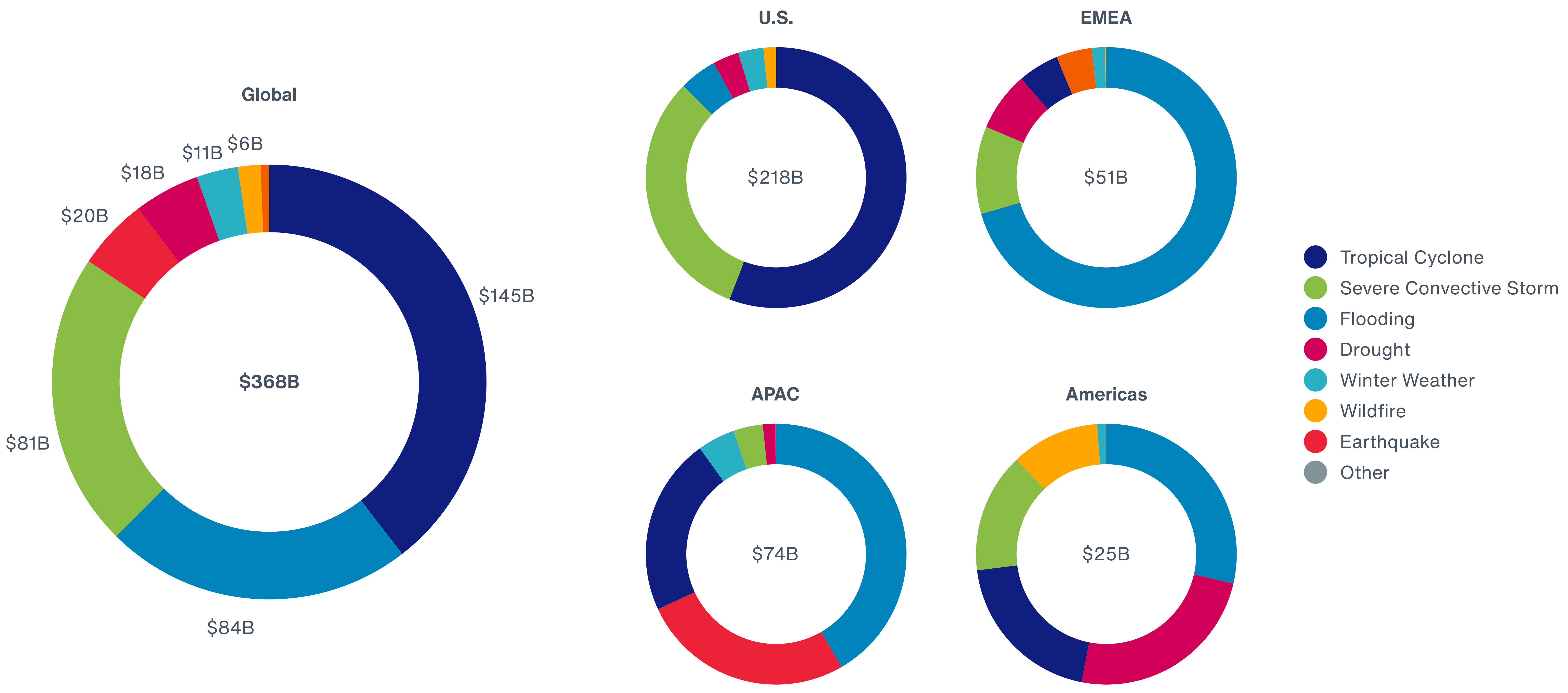


Data: Aon Catastrophe Insight

Global economic losses from natural disasters in 2024 were estimated to reach at least $368 billion and exceeded the 21st-century average ($324 billion) and median ($329 billion) on a price-inflated basis. They were close to the decadal mean and median ($360 and $354 billion, respectively). Economic losses emanating solely from weather-related disasters reached $348 billion, while earthquakes generated losses well below average at approximately $20 billion.

Tropical cyclone-related losses were estimated to reach at least $145 billion and were driven by costly Atlantic hurricanes Helene, Milton, Beryl and Debby, as well as by Typhoon Yagi in China and Southeast Asia. While all impacts associated with tropical cyclones are bucketed in this category for the purposes of this analysis, hurricane-driven inland flooding from Helene alone resulted in more than $45 billion of losses, making flood the costliest peril overall.

Exhibit 5: Global Economic Losses by Region and Peril (2024 $B)



Data: Aon Catastrophe Insight

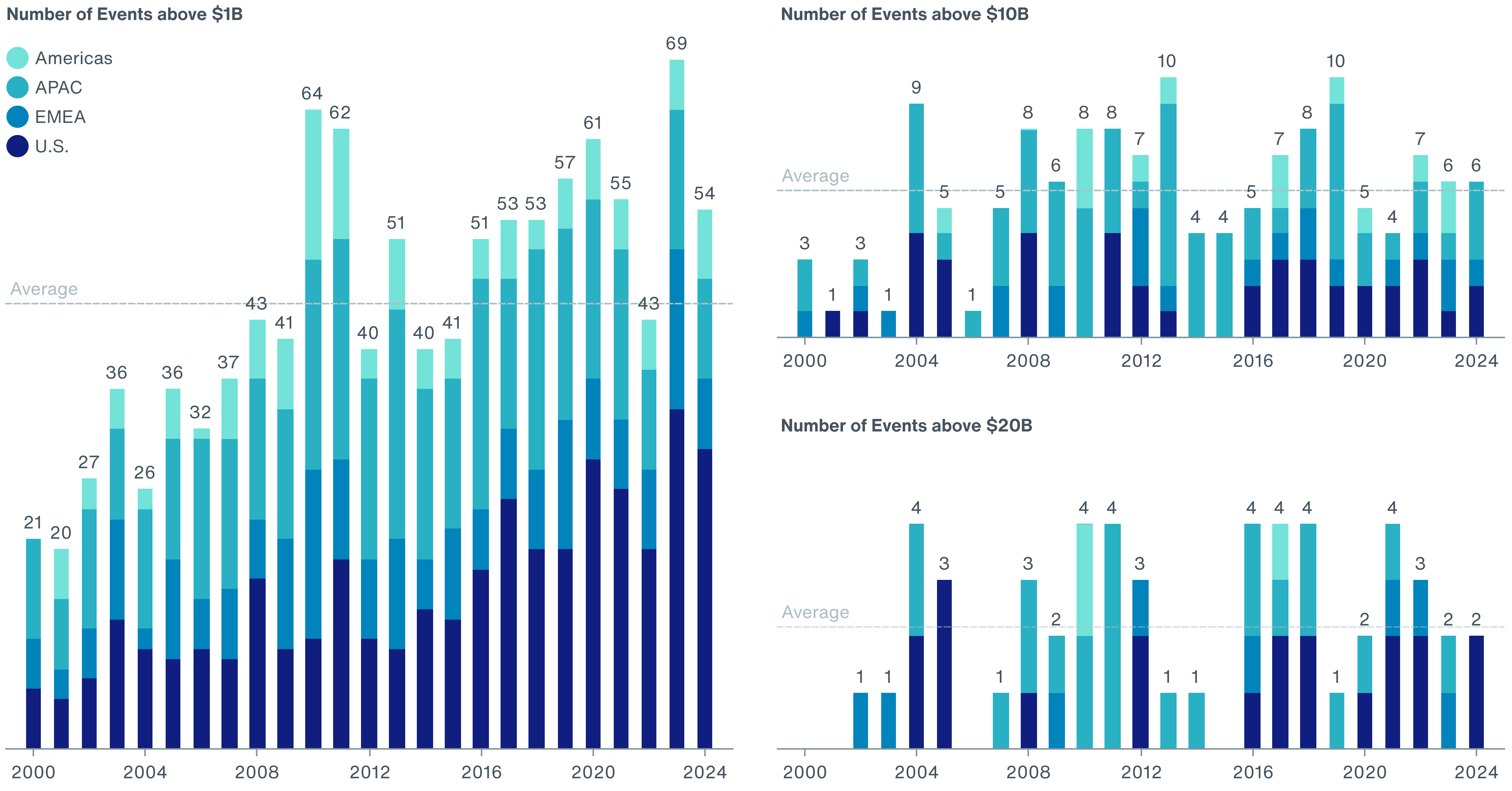
More than a half of all global economic losses occurred in the United States, followed by Asia Pacific (APAC), Europe, the Middle East and Africa (EMEA) and the Americas.

Tropical Cyclone and SCS perils were responsible for vast majority of losses in the United States, although a substantial part of the hurricane-related loss was a result of inland flood and storm surge.

Flooding was the dominant peril in EMEA and all its subregions, being responsible for more than $35 billion in losses. This was driven by events in Spain, Central Europe, Germany, United Arab Emirates and elsewhere.

Disaster impacts in North and South America (excluding the United States) resulted from a diverse mixture of perils. This was manifested in Canada, where four major events associated with four different perils (flood, wildfire, hurricane remnants and hailstorm) struck the country within a month. Economic losses in Asia Pacific were mainly driven by flooding events in China, the Noto Earthquake in Japan and Typhoon Yagi in China and Southeast Asia.

Exhibit 6: Global Billion-Dollar Economic Loss Events



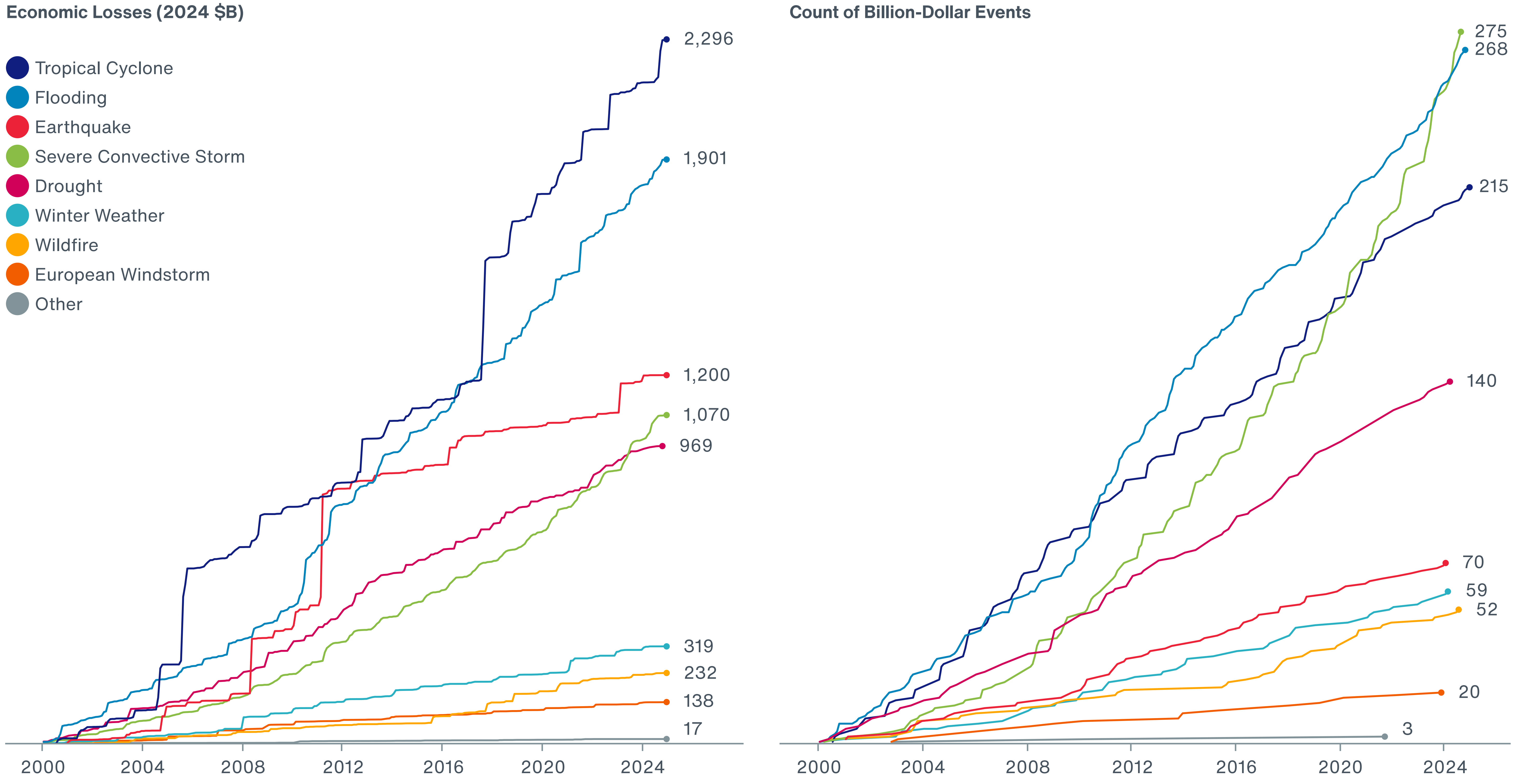
Data: Aon Catastrophe Insight

There were at least 54 global events that resulted in economic losses above $1 billion in 2024, which was well above the average of 44. Most of these events occurred in the United States (31), the second-highest count for the country after 2023 (34). Please note that for the purposes of this exhibit, all events are only counted once — for example, Hurricane Debby and its remnants resulted in billion-dollar losses in both the United States and Canada, but it is only counted here once, in the Americas bucket.

The increase in the number of billion-dollar-plus events is largely driven by the SCS peril in the United States and the increasing exposure to this risk.

On the other hand, no historical SCS event has yet resulted in losses above $20 billion. The costliest one so far was the outbreak that included the Midwest Derecho in 2020, which is currently estimated at $16.5 billion in total losses. Frequency of the events above the $20 billion threshold since 2000 in mainly driven by tropical cyclone peril (20), flooding (12) and earthquake (11).

Exhibit 7: Cumulative Global Economic Losses by Peril



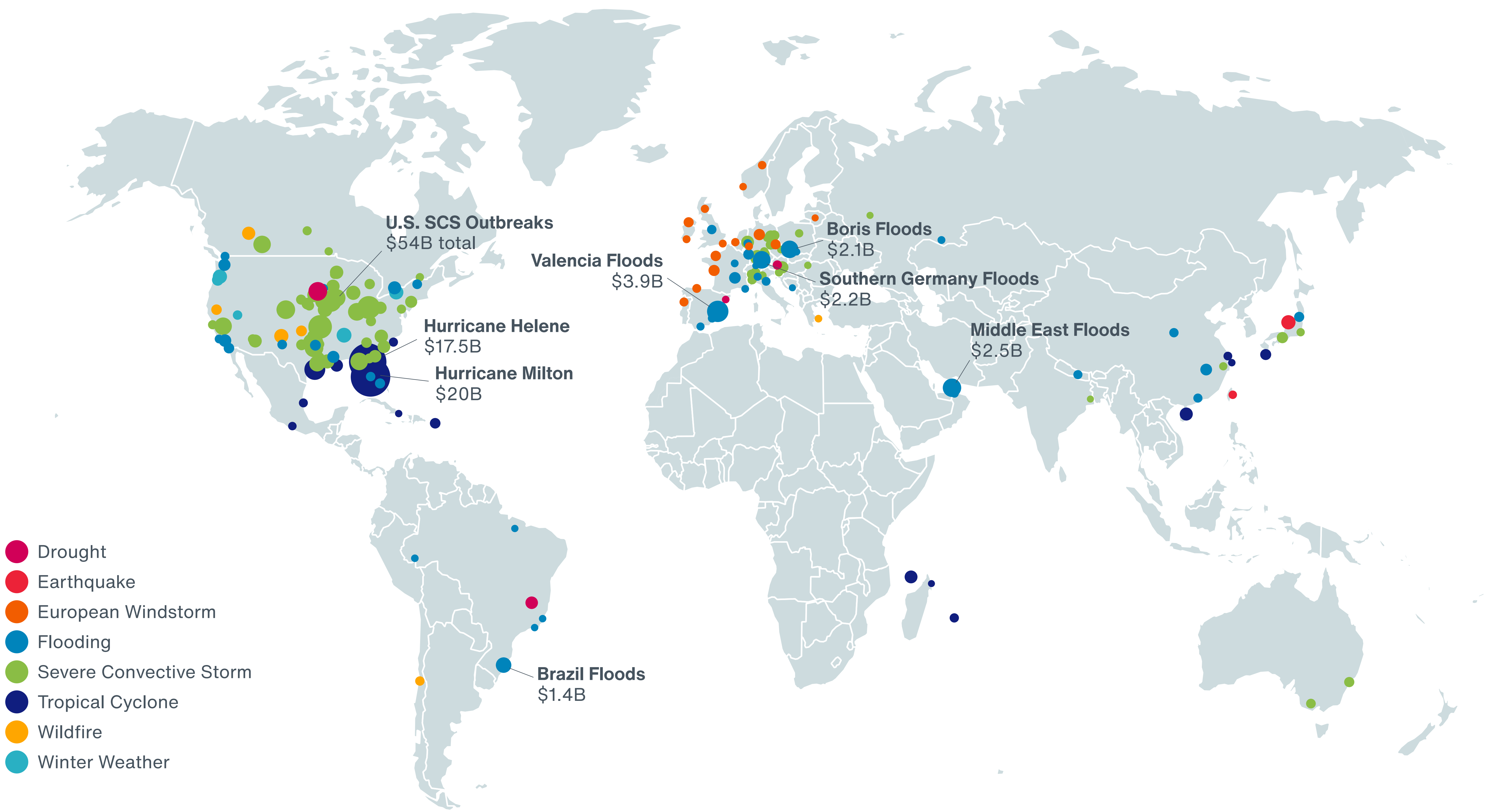
Data: Aon Catastrophe Insight

Cumulatively, tropical cyclone remains the costliest peril of the 21st century, with global price-inflated losses since 2000 currently running at $2.3 trillion. More than $145 billion was added in the calendar year of 2024, in what was one of the top five years, yet well below the record losses of 2017 ($404 billion) and 2005 ($312 billion). The flooding peril follows with about $1.9 trillion.

Earthquake, SCS and drought perils are now responsible for roughly $1 trillion in global economic losses since 2000. While growth of earthquake losses is driven by rare, individual catastrophic events, SCS shows accelerating increase and strong seasonality. SCS perils now lead in the total number of events above $1 billion in economic losses.

Global Insured Losses Exceed $145 Billion in the Sixth-Costliest Year on Record

Exhibit 8: Notable 2024 Insured Loss Events



Data: Aon Catastrophe Insight

Global insured losses from natural disasters in 2024 are estimated at $145 billion, well above the short-, medium- and long-term averages. This total is expected to evolve into 2025 due to additional loss development.

Approximately 40 percent of global economic losses were thus covered by private or public insurance, which constitutes a relatively low global protection gap of 60 percent. A notable portion of industry losses was related to insurance schemes with participation of national governments and public funding, such as the National Flood Insurance Program (NFIP) in the United States, or the Insurance Compensation Consortium in Spain.

Global losses were almost entirely driven by severe convective storms, tropical cyclones and flooding, while all other perils generated annual losses below their respective long-term averages. For the seventh consecutive year, secondary perils outpaced those described as primary, mainly due to another calendar year characterized by relentless SCS activity in the United States and nearly record-breaking number of billion-dollar events.

To read more about available reinsurance capital, please read **Aon's Reinsurance Market Dynamics Report**.

Exhibit 9: Top 10 Global Insured Loss Events in 2024

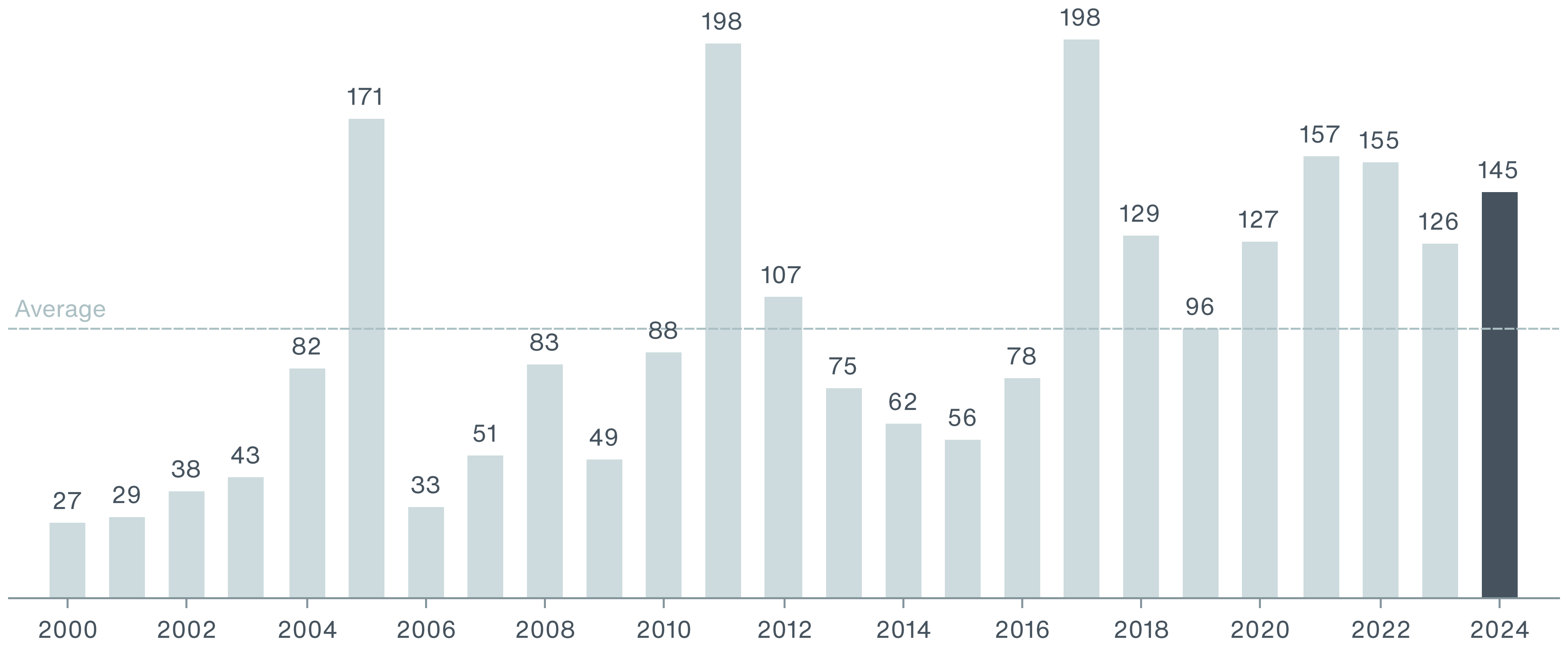
Date	Event	Location	Deaths	Economic Loss (2024 $B)	Insured Loss (2024 $B)
10/08 – 10/11	**Hurricane Milton**	U.S., Mexico	35	35.0	**20.0**
09/25 – 09/28	**Hurricane Helene**	U.S., Mexico, Cuba	243	75.0	**17.5**
05/06 – 05/10	**Severe Convective Storm**	United States	6	6.6	**5.2**
03/12 – 03/16	**Severe Convective Storm**	United States	3	6.0	**4.8**
10/27 – 10/30	**Valencia Floods**	Spain	231	16.1	**3.9**
05/17 – 05/22	**Severe Convective Storm**	United States	5	4.9	**3.9**
08/03 – 08/11	**Hurricane Debby**	U.S., Canada	6	6.2	**3.9**
07/01 – 07/11	**Hurricane Beryl**	U.S., Caribbean, Canada	70	7.7	**3.7**
05/25 – 05/26	**Severe Convective Storm**	United States	26	4.5	**3.6**
01/01 - 12/31	**U.S. Drought**	United States	N/A	7.1	**3.5**
All Other Events			~17,500	198.9	**75.1**
Totals			**~18,100**	**368**	**145**

The highest individual event-level losses for the global (re)insurance industry were caused by two Atlantic hurricanes, Milton and Helene. Together, they were responsible for approximately $37.5 billion in losses to private and public entities, including the National Flood Insurance Program (NFIP). This total might further evolve in 2025 with additional loss development.

Four SCS events ranked among the top 10 costliest disasters in 2024 — in contrast, there were seven such events in 2023, the year without occurrence of any $10-billion events and dominated by secondary perils.

The May 6-10 and March 12-16 outbreaks in the United States also rank among the top 10 costliest SCS events in the global historical record, after adjustment for price inflation (not for exposure growth). In contrast to hurricane and flooding disasters, SCS events exhibit lower protection gap.

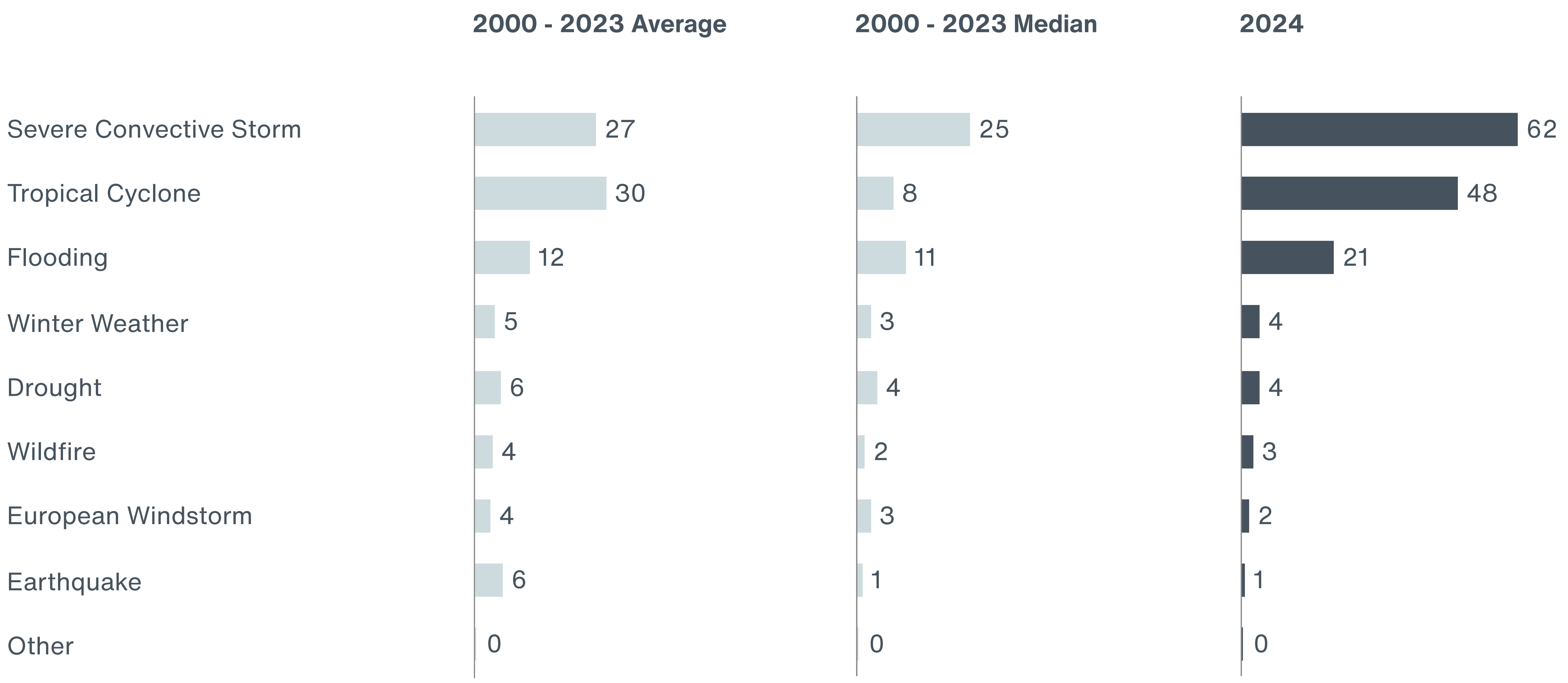
Exhibit 10: Global Insured Losses from Natural Disasters (2024 $B)



Data: Aon Catastrophe Insight

Global insured losses from natural disasters in 2024 reached at least $145 billion and were well above the 21st-century average ($94 billion) and median ($83 billion), slightly above the average of the period since 2017 ($141 billion). In the historical record, 2024 ranks as the sixth-costliest year on a price-inflated basis.

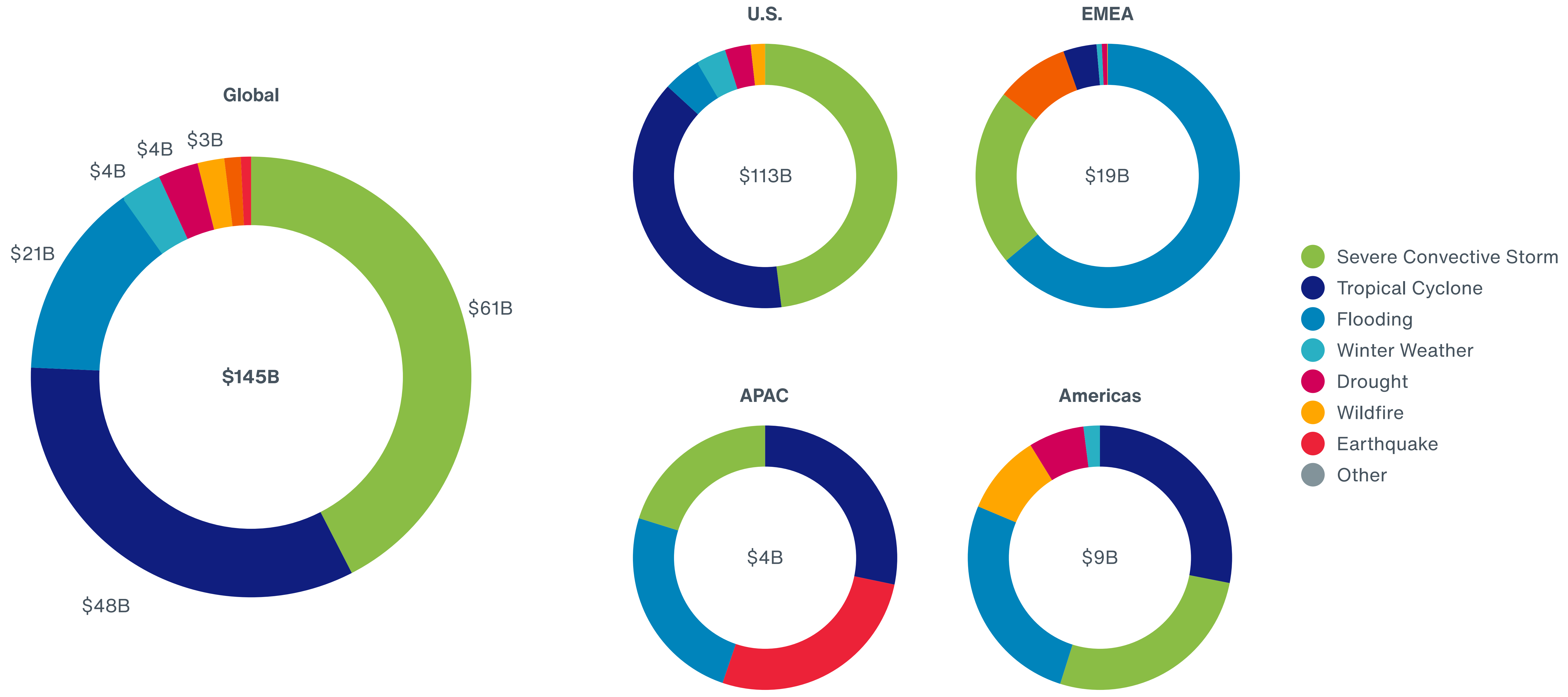
Exhibit 11: Global Insured Losses by Peril (2024 $B)



Data: Aon Catastrophe Insight

For the second consecutive year, the SCS peril resulted in the highest aggregated annual losses. However, its dominance was not as pronounced as in 2023, when it was responsible for about 60 percent of total global losses. Tropical cyclone and flooding followed; all other perils generated global insured losses below their respective long-term averages.

Exhibit 12: Global Insured Losses by Region and Peril in 2024



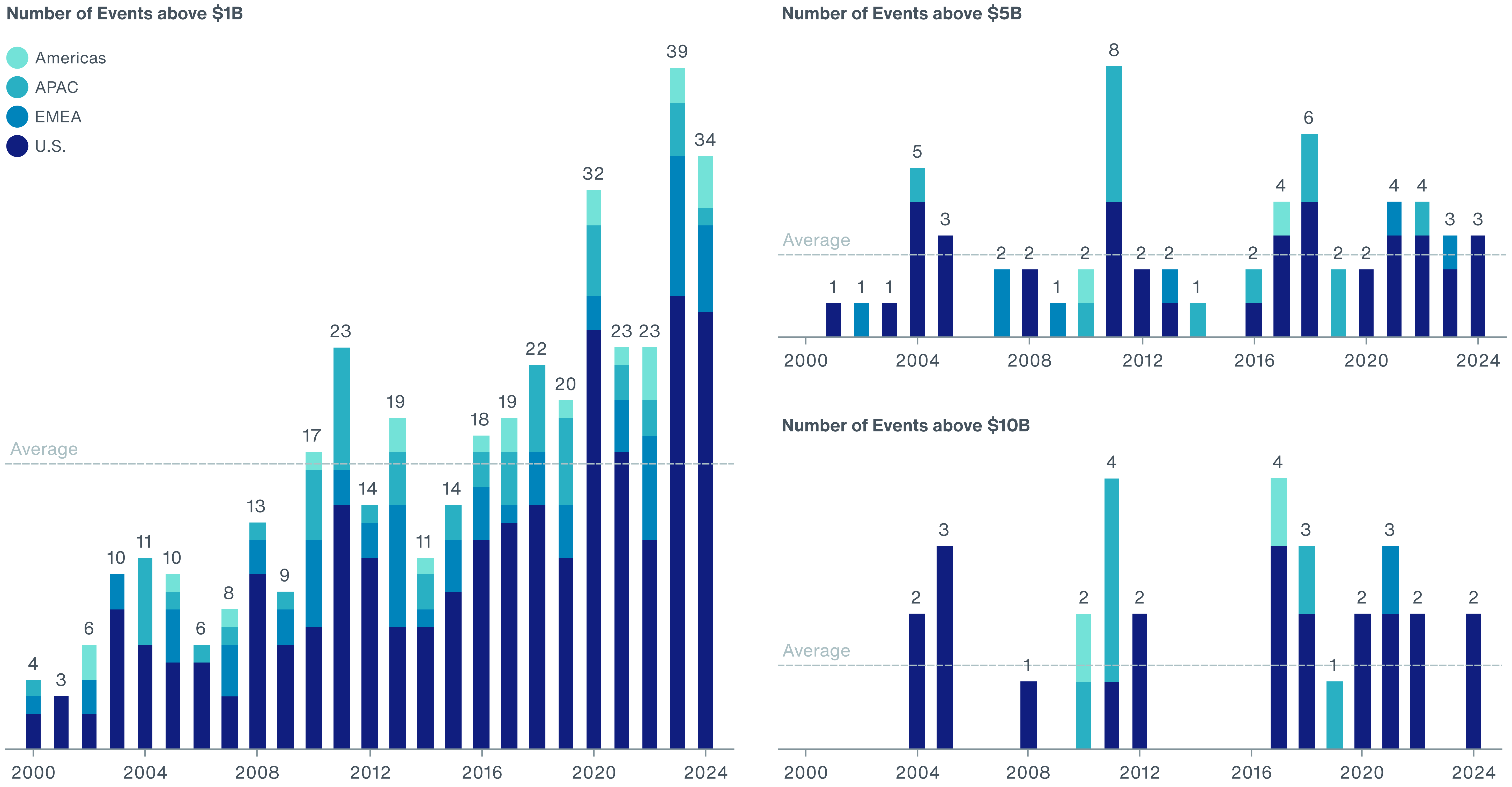
Data: Aon Catastrophe Insight

Regional and peril view of losses shows the diversity of hazards, as well as the maturity and structure of the insurance markets in different regions of the world.

As is typically the case, the United States incurred the highest portion of the global insured losses. The only two years since 2000 when the country did not lead the statistics was 2007 — when EMEA was first with losses driven by Windstorm Kyrill and the floods in the United Kingdom — and 2011, with record-breaking losses in Asia Pacific due to earthquakes in Japan and New Zealand, as well as floods in Thailand.

The majority of the industry losses in EMEA occurred due to a series of costly flooding events. The peril was also dominant as a result of relatively lower SCS losses. These were close to their long-term average since 2000 and lower compared to the previous three years with significant outbreaks in 2021 (Central Europe), 2022 (France) and 2023 (Italy).

Exhibit 13: Global Billion-Dollar Insured Loss Events



Data: Aon Catastrophe Insight

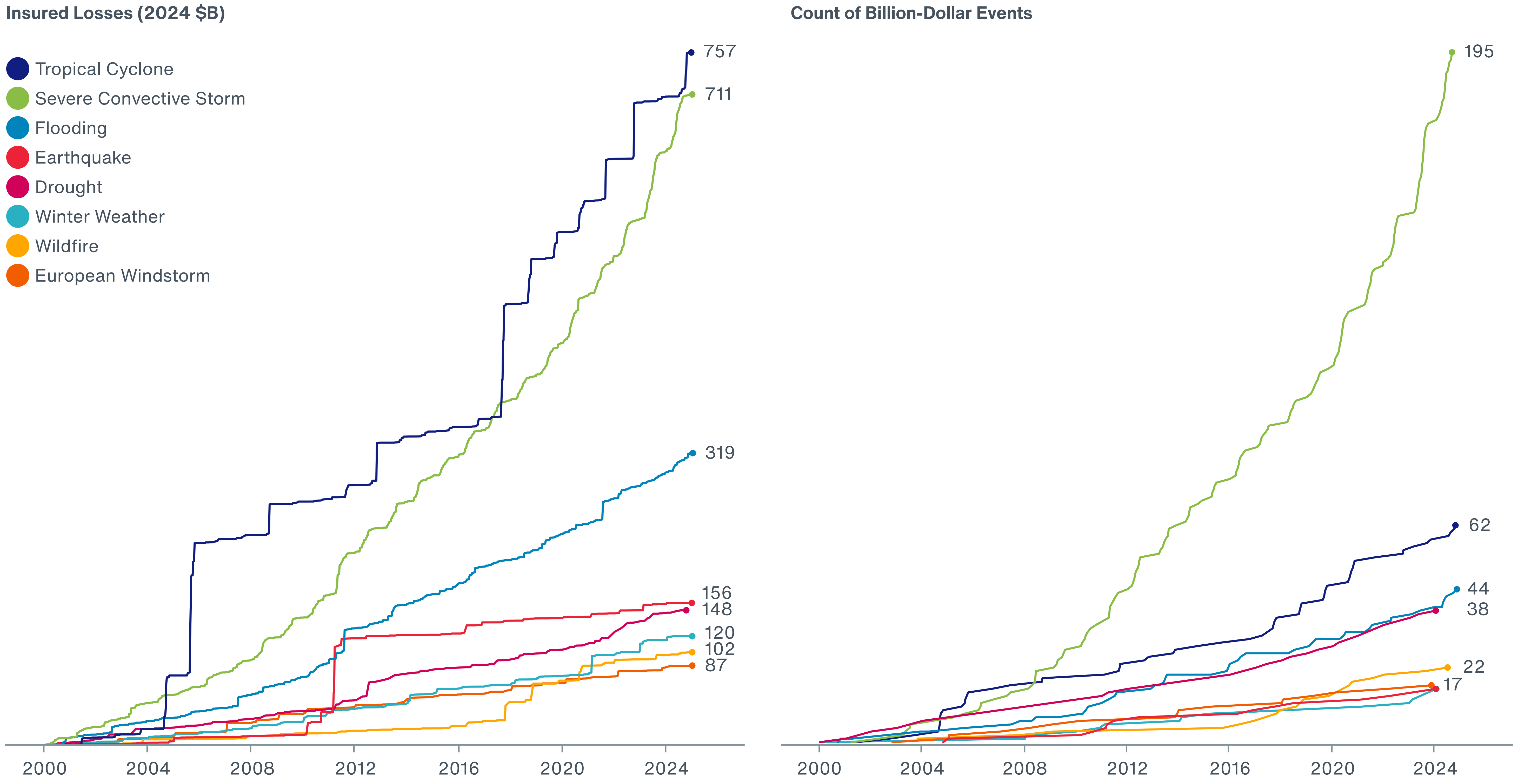
There were at least 34 disasters that caused insured losses of $1 billion or higher in 2024, second only to the record year of 2023 with 39 such occurrences on a price-inflated basis.

The number of such events in the United States reached at least 26 and was tied with 2023 as the highest on record. Please note that the exhibit counts Hurricane Debby only once, in the Americas.

The long-term increase can be largely attributed to the rise of the SCS peril as the major driver of aggregated secondary peril loss.

After a short break in 2023, the global industry once again saw two events that generated total losses in excess of $10 billion — Hurricanes Helene and Milton.

Exhibit 14: Cumulative Global Insured Losses by Peril



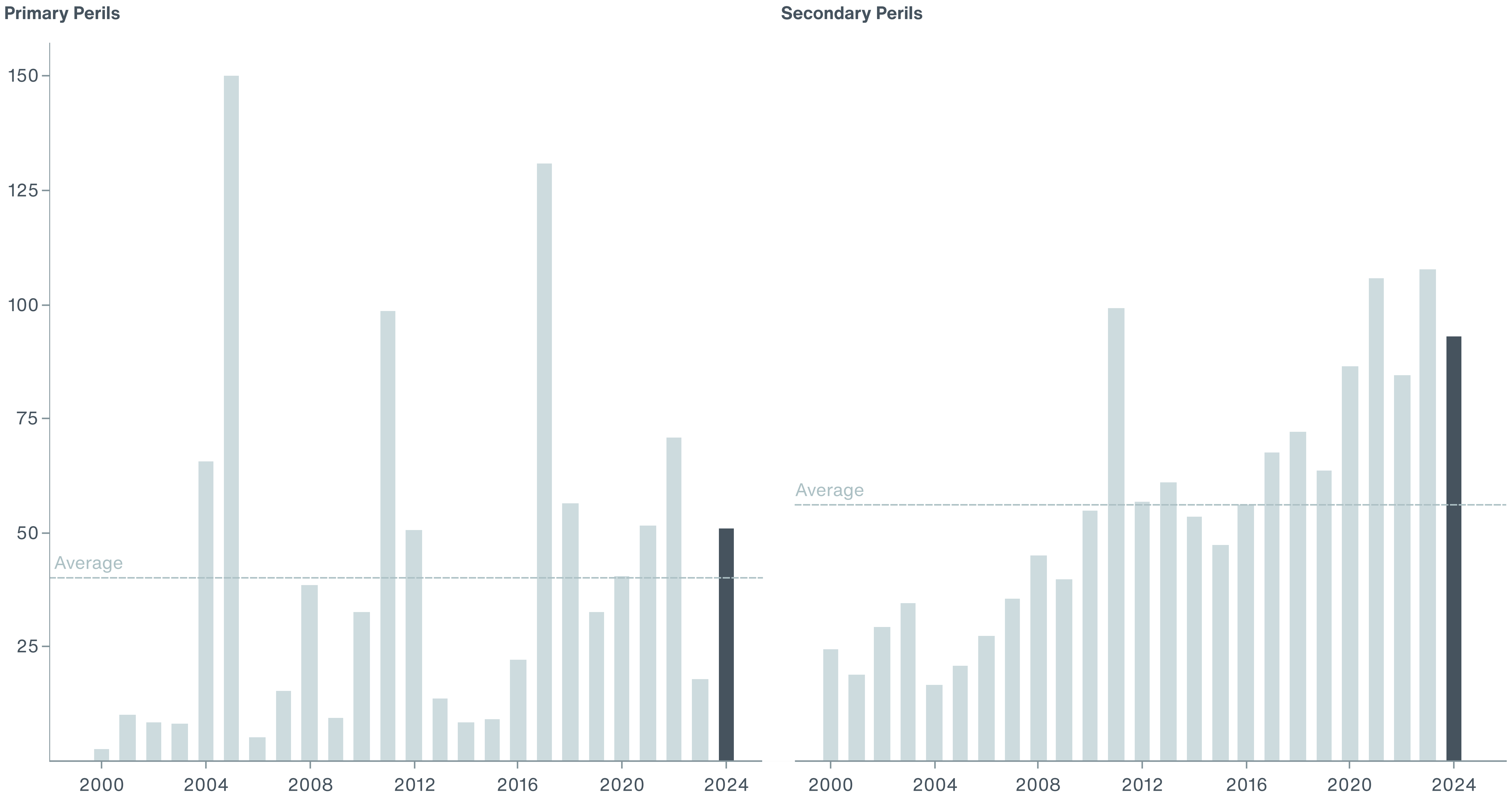
Data: Aon Catastrophe Insight

Tropical cyclone and SCS perils lead cumulative losses in the 21st century. Together, they generated approximately $1.46 trillion in losses to the insurance industry in 2024, compared to $932 billion caused by all other natural perils combined. However, it is worth noting that a substantial part of the tropical cyclone-related losses can be attributed to storm surge and inland flood subperils.

Historical record shows that the earthquake peril can generate the largest industry events apart from Atlantic hurricanes and is traditionally considered to be a primary peril. However, the last event that caused losses above $10 billion occurred in 2011 in Japan.

SCS peril clearly dominates the count of events that caused at least $1 billion in insured losses. Their number is currently at least 195, more than the next five perils combined.

Exhibit 15: Global Insured Losses from Primary and Secondary Perils (2024 $B)



Data: Aon Catastrophe Insight

Secondary perils now regularly surpass primary perils in terms of total accumulated annual losses; in fact, there were only three years when peak perils surpassed secondary: 2004, 2005 and 2017. On a cumulative basis, secondary peril losses since 2000 reached at least $1.39 trillion, while tropical cyclones, earthquakes, and European windstorms (traditionally considered as primary or peak) generated roughly $990 billion.

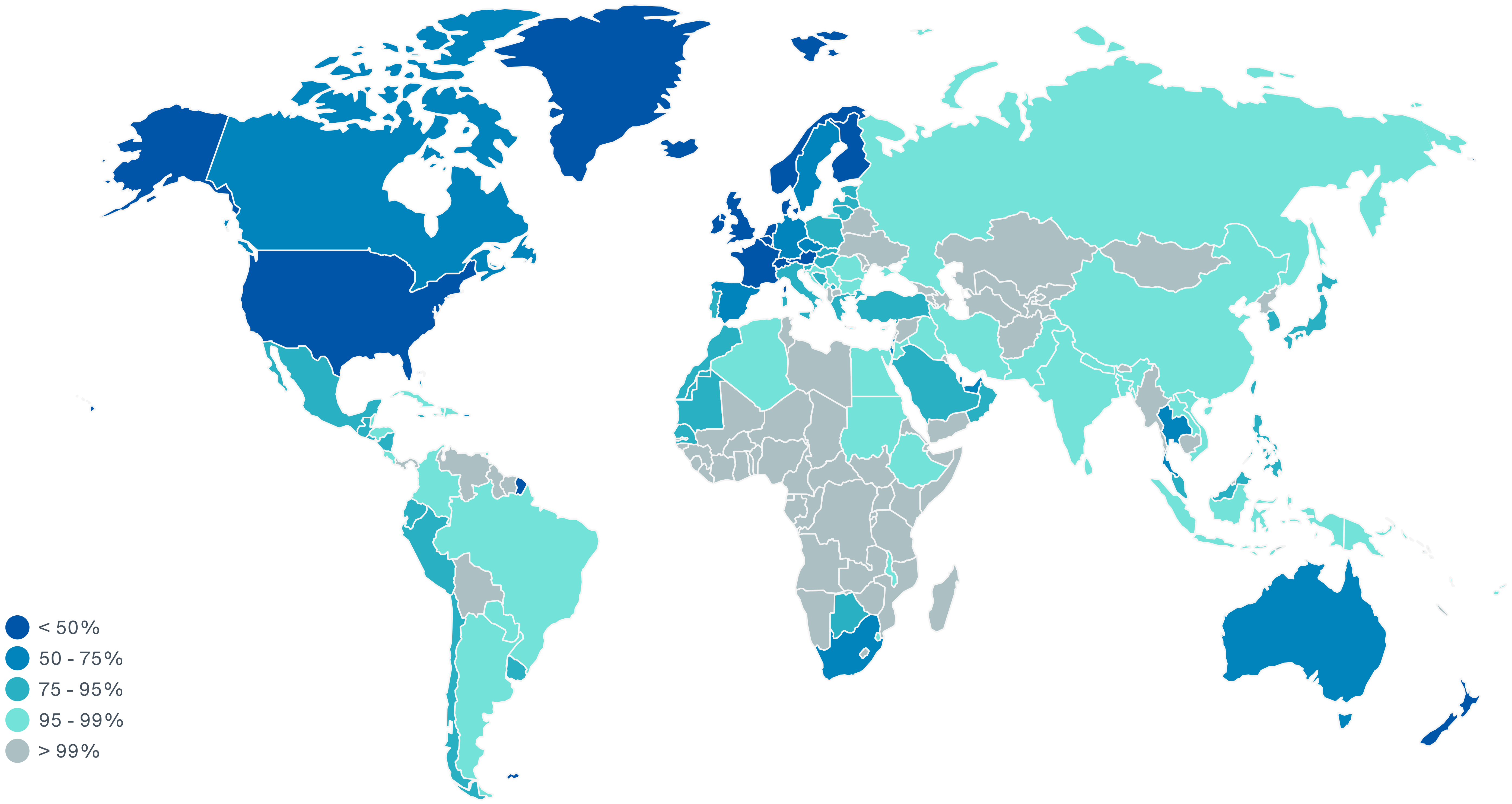
Addressing the trend of gradually increasing secondary losses requires innovative risk mitigation strategies that prioritize resilience to more frequent, smaller-scale disasters, alongside traditional efforts to manage primary risk perils.

What Are Primary and Secondary Perils?

The (re)insurance sector has traditionally categorized perils into primary and secondary types, even though their clear definition is not established. Primary perils have the potential for substantial individual event losses and significant societal impact. Earthquakes, tropical cyclones and European windstorms are considered primary perils for the purposes of this analysis.

In contrast, secondary perils are characterized by higher frequency. While secondary perils usually do not cause the costliest individual events, their cumulative impact can result in significant overall losses.

Exhibit 16: Protection Gap Since 2000 by Country



Data: Aon Catastrophe Insight

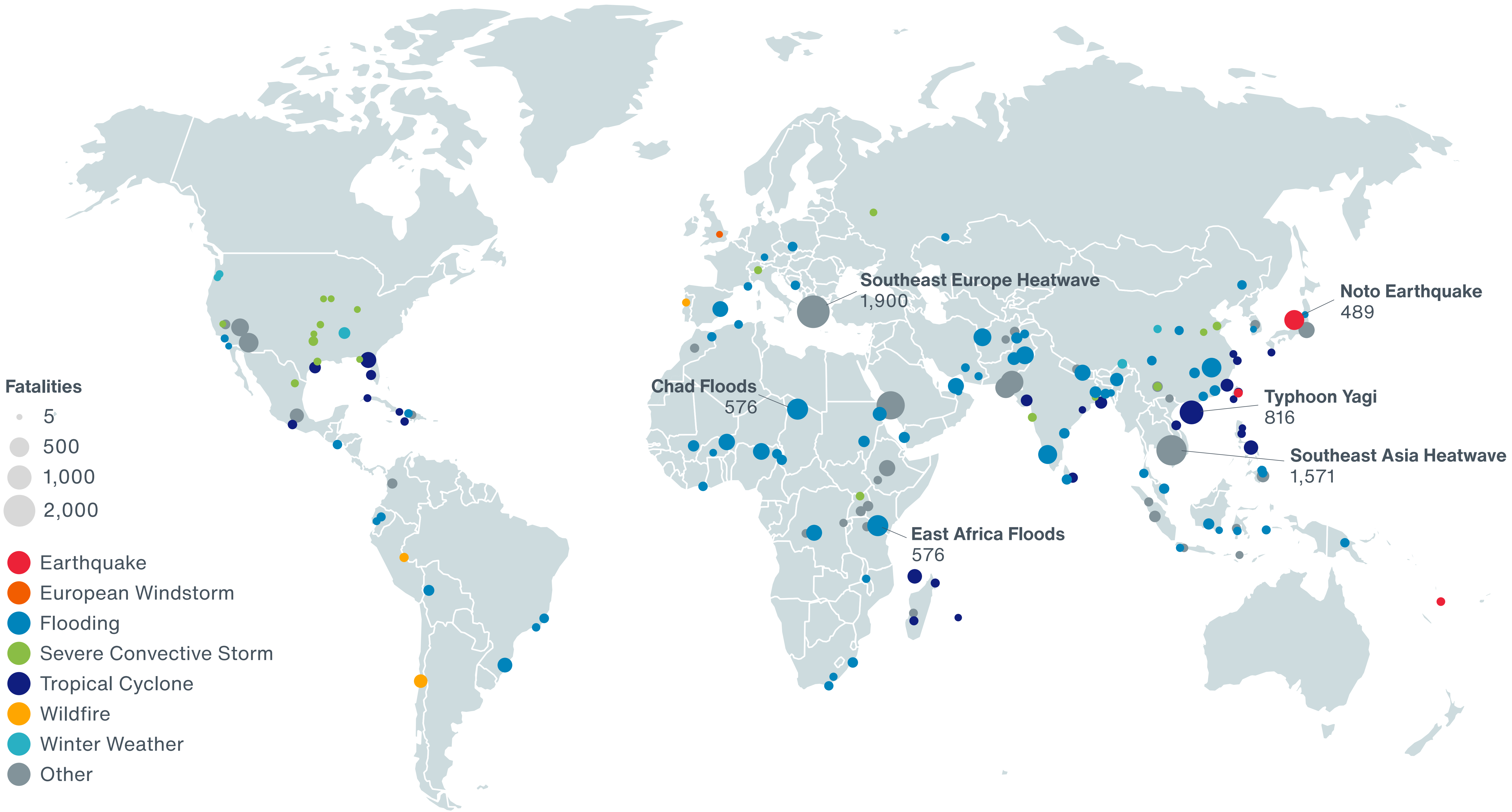
While the global protection gap was relatively low in 2024, significant uninsured risks related to various perils and regions remained around the world. Only about 30 percent of global economic losses since 2000 were covered by private or public insurance. This is driven by various factors, including relatively low insurance penetration in low- and middle-income countries, urbanization and economic development in disaster-prone areas, climate change affecting behavior of global hazard patterns, as well as the remaining problem of underinsurance in many high-income countries (e.g., for flood).

Regional disparities remain, with the gap being most pronounced in general in parts of Africa, Asia and Latin America, as shown in Exhibit 16. These are also the regions most affected by reporting bias and other uncertainties.

Closing the protection gap remains a systemic challenge, as well as an opportunity for national governments, communities and the (re)insurance sector. The collaboration between various stakeholders will be crucial in developing public-private partnerships and innovative insurance products in order to ensure a sustainable way of closing the gap.

Global Fatalities Among the Lowest in 30 Years

Exhibit 17: Notable 2024 Fatality Events



Data: Aon Catastrophe Insight

At least 18,100 people tragically lost their lives due to natural catastrophes globally in 2024. This is far below both the 21st-century average (72,400) and median (38,900). It's also lower than the death toll in 2023 (95,500), which was driven by the devastating earthquake in Turkey and Syria.

Only three events claimed more than 1,000 lives, all attributed to extreme heat:

- A mid-July heatwave caused about 1,900 deaths in Italy and Greece
- A prolonged extreme heat in Southeast Asia claimed at least 1,571 victims in April and May
- Extreme heat during a pilgrimage event in Saudi Arabia in June claimed another 1,300

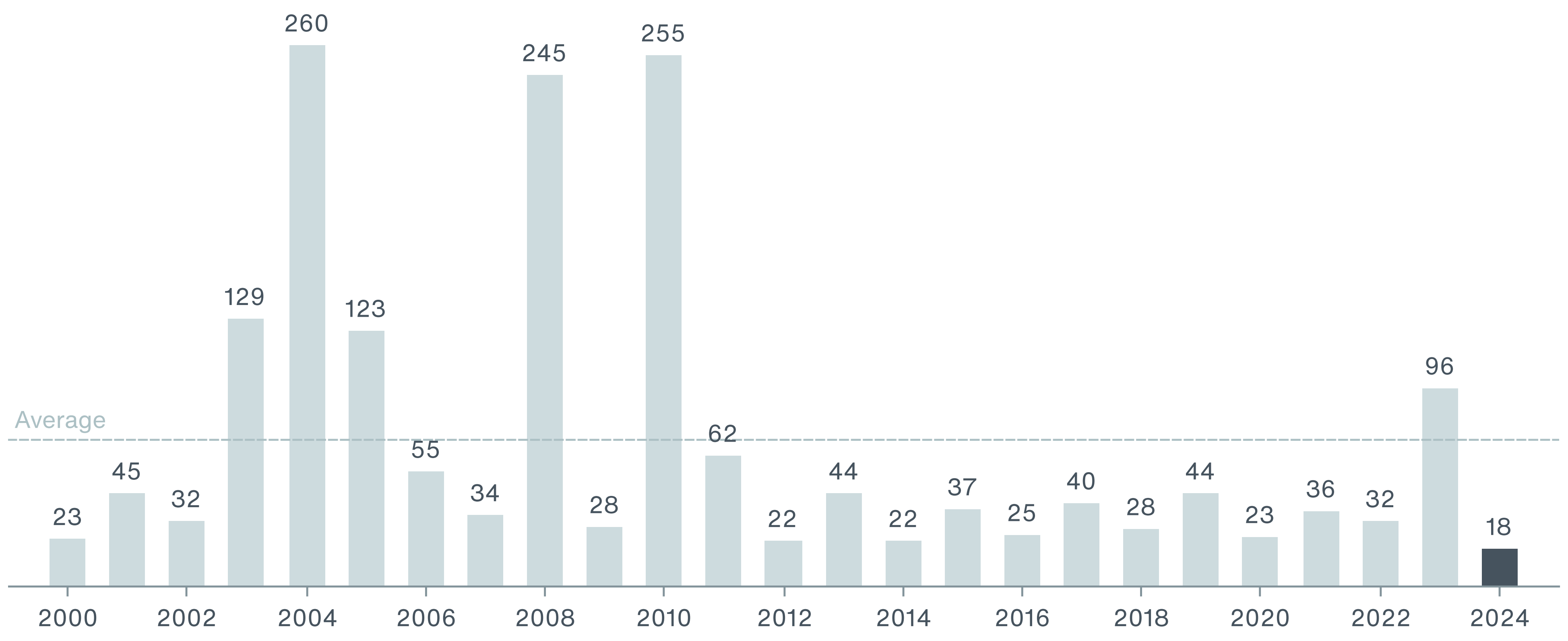
The top 10 events account for almost 50 percent of the casualties in 2024, adding up to at least 18,100 lives.

Exhibit 18: Top 10 Human Fatality Events in 2024

Date	Event	Location	Deaths	Economic Loss (2024 $B)
07/10 – 07/20	**Southeastern Europe Heatwave**	Italy, Greece	**1,900**	N/A
04/20 – 05/05	**Southeastern Asia April/May Heatwave**	Southeastern Asia	**1,571**	N/A
06/01 – 06/20	**Pilgrimage Extreme Heat**	Saudi Arabia	**1,300**	N/A
09/01 – 09/09	**Typhoon Yagi**	China, Southeast Asia	**816**	12.9
03/01 – 06/30	**India Heatwaves**	India	**733**	N/A
04/18 – 10/31	**Maricopa Heatwaves**	Arizona	**657**	N/A
03/20 – 04/30	**East Africa Seasonal Floods**	East Africa	**576**	0.1
08/01 – 09/30	**Chad Seasonal Floods**	Chad	**576**	N/A
06/20 – 06/30	**Karachi Heatwave**	Pakistan	**568**	N/A
01/01	**Noto Earthquake**	Japan	**489**	18.0
All Other Events			**~8,900**	337.0
TOTALS			**~18,100**	**368**

The 2024 fatality figures are consistent with the overall long-term decline in the number of casualties and echo improvements in early warnings, weather prediction, crisis management and disaster preparedness. While this is a positive development, continued improvements are still needed, even in countries that are better positioned to deal with disasters due to their economic development level, functioning governmental institutions and historical experience with catastrophic events. An example of an event that highlighted the need for improvement in the developed world was the flooding in Valencian region in Spain, which resulted in 231 fatalities.

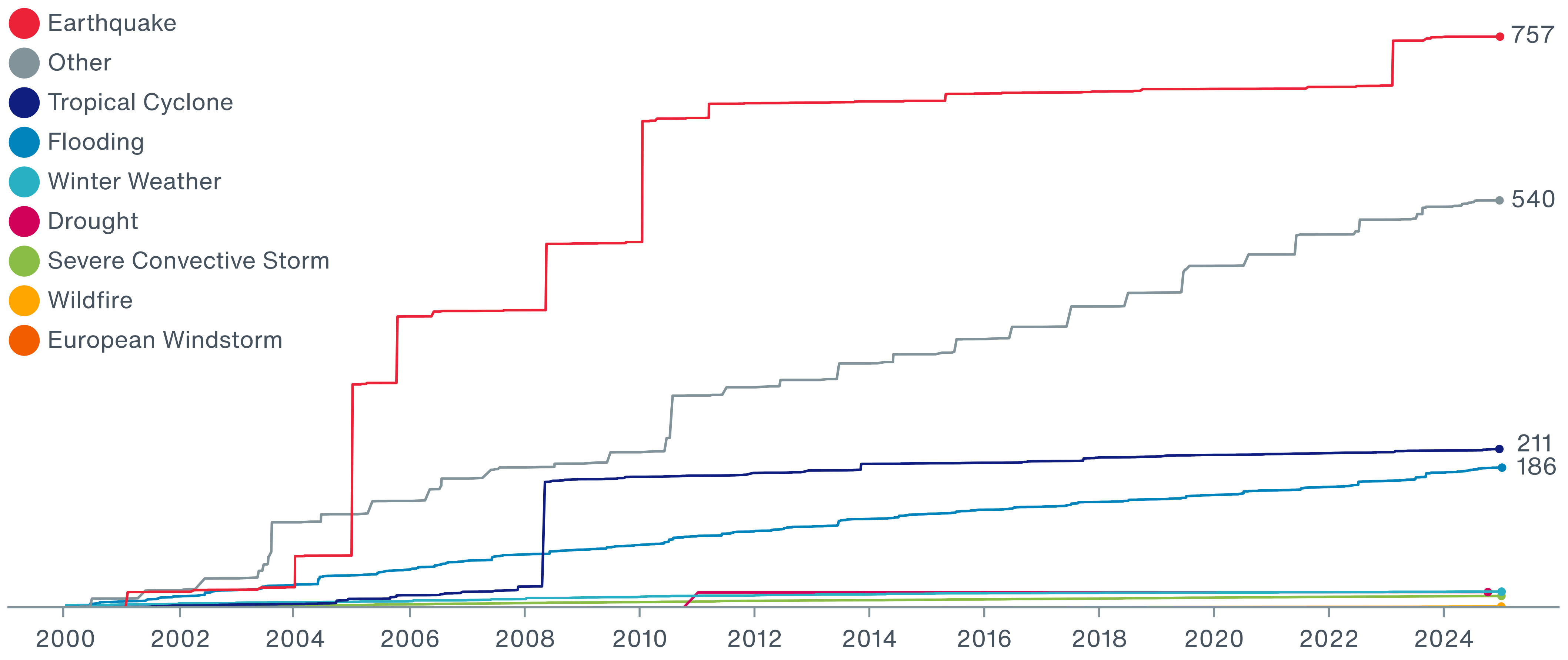
Exhibit 19: Global Natural Disaster Fatalities (thousands)



Data: Aon Catastrophe Insight

In 2024, global fatalities were significantly lower than the average of the 21st century, marking the fewest casualties since 1992, when 17,600 deaths were recorded. This reduction can be attributed to improved disaster preparedness and the absence of a major earthquake, as large earthquake events typically rank among the deadliest catastrophes.

Exhibit 20: Cumulative Global Fatalities by Peril (thousands)



Data: Aon Catastrophe Insight

The cumulative death toll from earthquakes, which currently runs at more than 757,000 since 2000, is driven by a small number of catastrophic events. On the other hand, heatwaves emerged as the second most significant cause of death due to a steady annual increase.

Regional Catastrophe Review

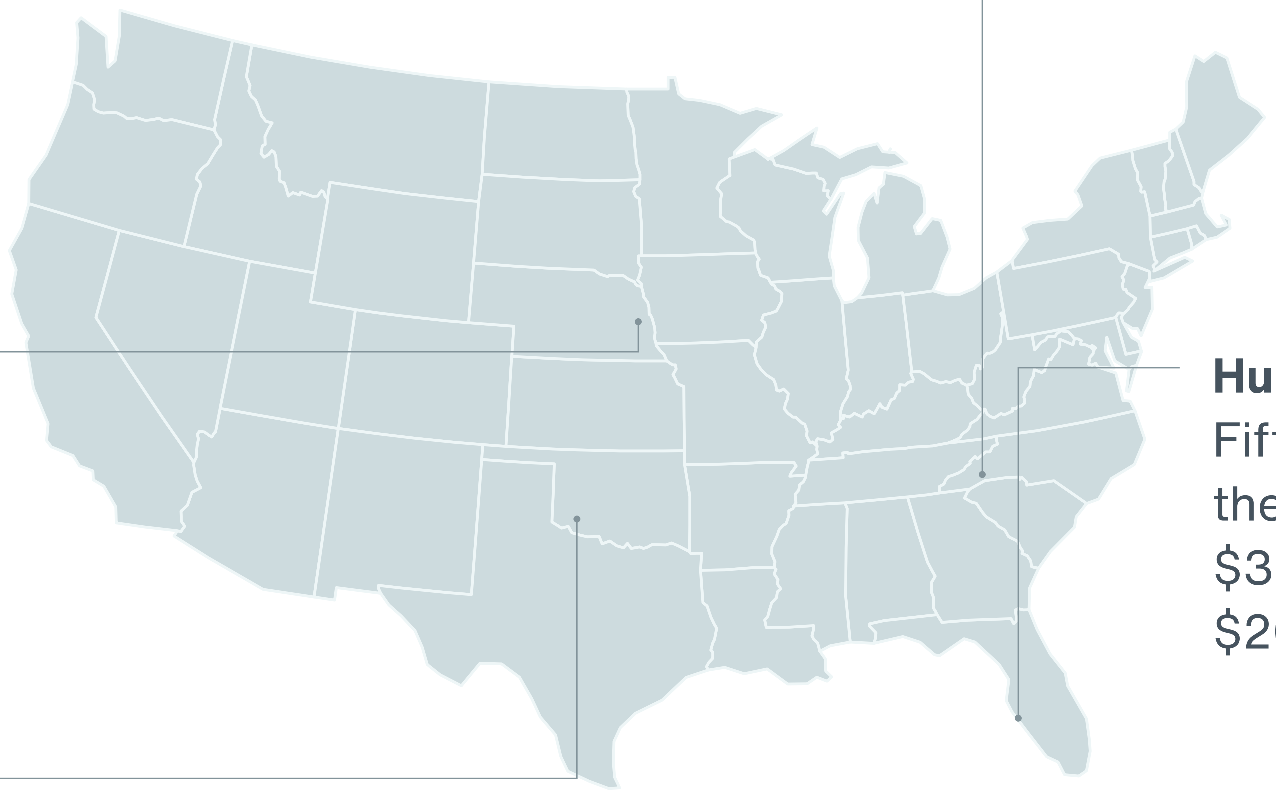
We highlight key natural disaster activity in each region to explore the drivers of economic and insured losses

United States

Hurricane Helene
Deadliest mainland U.S. hurricane since Hurricane Katrina (2005)
$75B economic loss
$17.5B insured loss
243 fatalities

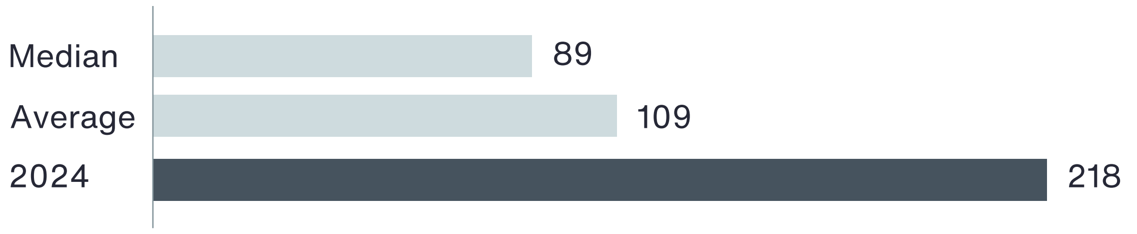
Severe Convective Storms
Second-highest insured loss total on record driven by 17 billion-dollar insured loss events
$69B economic loss
$54B insured loss

Agriculture Losses
Large crop insurance payments due to drought, flooding, and SCS
$6.7B in total

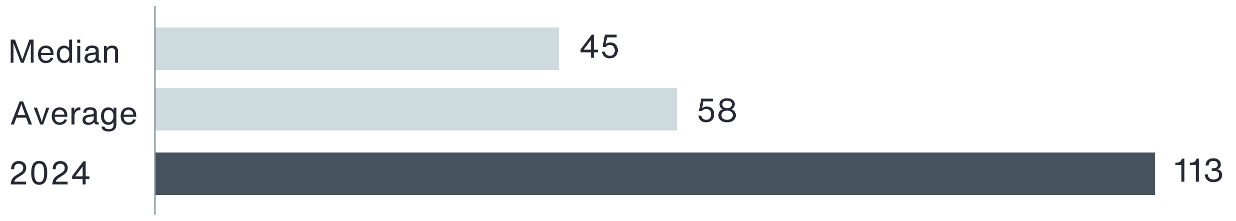


Hurricane Milton
Fifth-strongest hurricane in the Atlantic basin on record
$35B economic loss
$20B insured loss

Economic Losses (2024 $B)



Insured Losses (2024 $B)



59%
of global economic losses

78%
of global insured losses

52%
of losses covered by insurance

1,800+
preliminary tornado local storm reports from the Storm Prediction Center in 2024, the most since 2011

30.78 in/782 mm
highest storm total rainfall from Hurricane Helene measured in Busick, North Carolina

91
weather stations setting all-time record low temperatures during mid-January arctic outbreak

897 mb
lowest central pressure measured during Hurricane Milton, the fifth-lowest ever in the Atlantic Basin

U.S. Economic and Insured Losses Far Exceed Average

In the United States, economic losses from natural disasters in 2024 remarkably exceeded $200 billion for just the third time since 2000 and reached $218 billion, double the average ($109 billion) across the same period. Of this loss, roughly half was covered by public and private insurers as total insured losses reached $113 billion. This total also greatly exceeded the average ($58 billion) and median ($45 billion) insured loss figures across the 21st century.

Hurricanes Helene and Milton Dominate U.S. Losses

Two tropical cyclones in 2024 were responsible for a large portion of all economic and insured losses in the United States. The first storm, Hurricane Helene, caused catastrophic damage across the southeast U.S. and became the deadliest natural disaster in the mainland U.S. since Hurricane Katrina (2005). Roughly $75 billion in economic losses and $17.5 billion in insured losses were incurred, representing some of the highest tropical cyclone-related losses on record for the U.S. mainland.

The second storm, Hurricane Milton, narrowly avoided a much greater catastrophe for western Florida by tracking just south of Tampa Bay. Nevertheless, impacts from flooding, storm surge, wind, and even several strong tornadoes generated approximately $35 billion in economic losses and $20 billion in insured losses.

Despite substantial losses, Helene and Milton had little impact on the January 1 renewals.

Hyperactivity across the North Atlantic basin gave way to additional, but lesser, tropical cyclone-related impacts in the United States. Hurricane Beryl, the earliest Category 5 storm on record in the Atlantic, and its remnants caused $7 billion and $3.5 billion in economic and insured losses, respectively. The weary southeast, as well as the northeast U.S., experienced another billion-dollar event due to Hurricane Debby's torrential rainfall in August.

High SCS Activity Translates to Large Losses

Similar to recent years, severe convective storms in 2024 made up a large share of this year's aggregated losses. For the second consecutive year and second time on record, SCS-related insured losses crossed the $50 billion mark. With $54 billion and $69 billion in insured and economic losses, respectively, as well as 17 SCS-related billion-dollar disasters; all three figures recorded in 2024 remain only behind those set in 2023.

May was an exceptionally busy month for severe weather, accounting for half of the top 10 costliest SCS events in 2024. Early May also featured the costliest severe weather outbreak of the year, with roughly $6.6 billion in economic losses across the Great Plains, Midwest and Southeast.

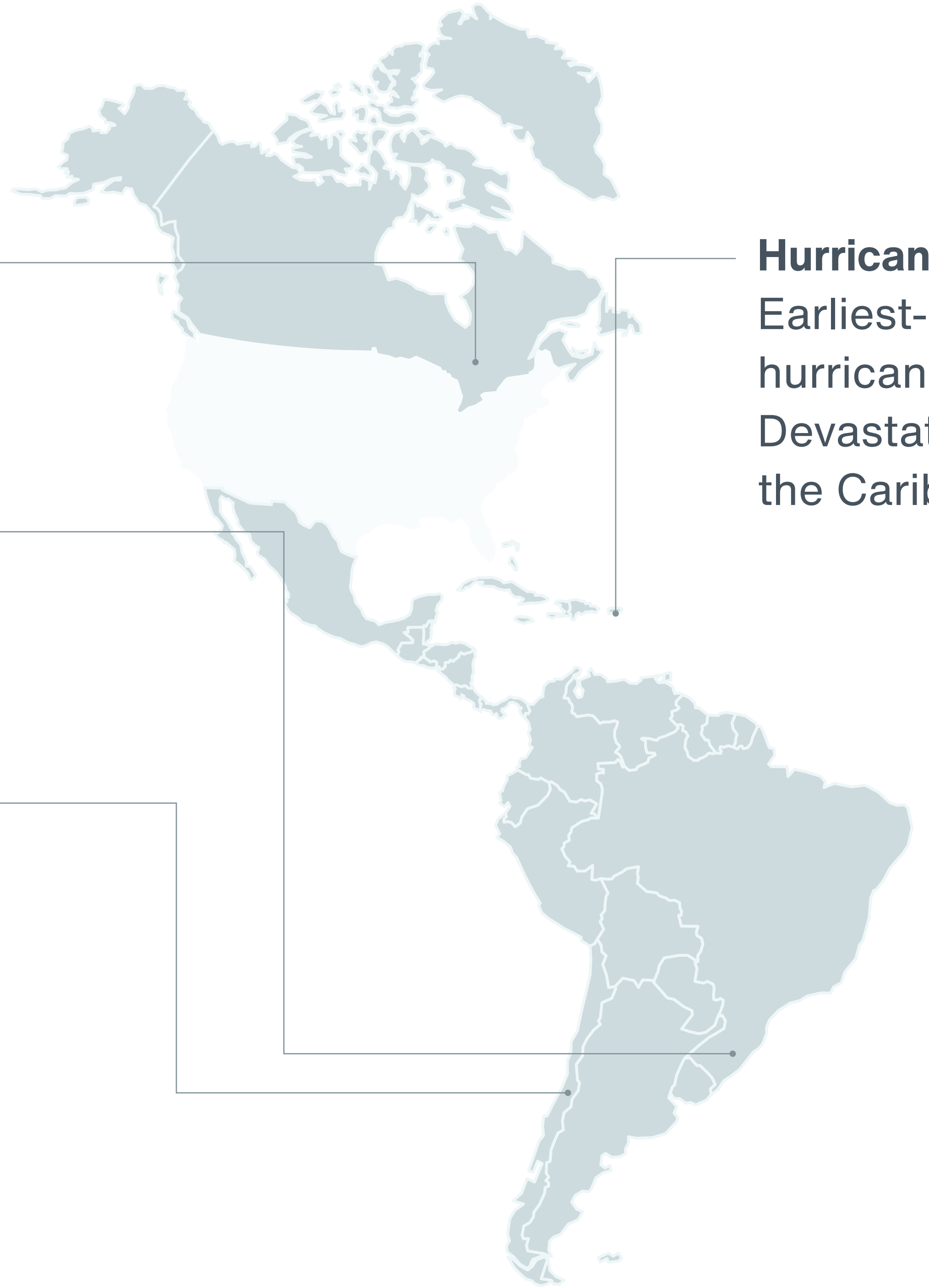
While much of SCS-related losses were attributable to hail, tornado-related impacts were also exceptional. Over 1,800 preliminary tornado reports were submitted to the Storm Prediction Center in 2024, the most since 2011. This encompassed multiple, large tornado outbreaks, including eight separate days with over 50 preliminary tornado reports. Straight-line wind impacts were also significant as at least five derechos occurred across the central U.S., causing notable damage in cities such as Houston and Chicago.

Notable Payouts for Crop Loss, Winter Weather and Wildfires

Aggregated effects of extreme weather, especially drought and flooding, resulted in nearly $6.7 billion in crop insurance payouts, as well as $13 billion in economic losses. These figures are notably lower compared to 2023, but still well above the average of the 21st century.

Other notable events across the U.S. in 2024 include multiple winter weather events in January. Ice storms in the Pacific Northwest and a major cold snap over the central U.S. caused over $3 billion in insured losses and over 90 fatalities. Additionally, an active wildfire season did not translate to above-average wildfire-related losses. However, the largest wildfire event of the year, the South Fork and Salt Fire complex, did generate over a billion dollars in damages in New Mexico.

Americas (non-U.S.)



Costliest Year on Record in Canada
Four major events within one month
Annual insured losses of CAD 8.5B/$6.3B

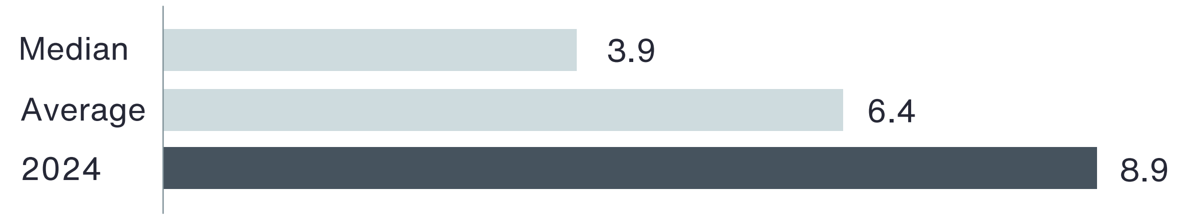
Brazil Floods
Widespread flooding in Rio Grande do Sul
Insured losses of $1.4B
Costliest event on record

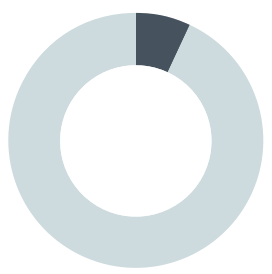
Chile Wildfires
Significant outbreak in February
Thousands of structures damaged
131 fatalities

Hurricane Beryl
Earliest-forming Category 5 hurricane on record
Devastating impact in the Caribbean

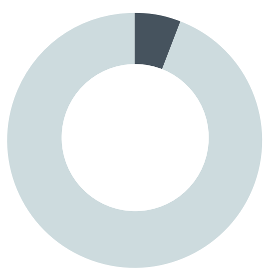
Economic Losses (2024 $B)

Insured Losses (2024 $B)





7%
of global economic losses



6%
of global insured losses

36%
of losses covered by insurance

July 2
earliest date of Category 5 hurricane forming within the Atlantic Basin, set by Hurricane Beryl

4
billion-dollar economic loss events occurring across Canada in July – August of 2024

5.31 m/17.4 ft
Guaíba Lake water level during floods in Porto Allegre, Brazil, breaking the previous record of 4.76m from 1941

15,200 ha/37,600 ac
burned by wildfires in Chilean Valparaiso region, almost double the long-term average

Overview

Economic losses from natural disasters in the Americas (excluding the U.S.) reached at least $25 billion, below the long-term average. Insured losses for the region were well above average and reached approximately $9 billion, being driven primarily by events in Canada.

Canadian Insurers Face Costliest Year on Record

The year 2024 was historic for the national (re)insurance sector in Canada. In July and August, four major events occurred within a month’s time and these alone resulted in insured losses of approximately CAD 7.7 billion ($5.6 billion), significantly affecting the industry. These included the flooding in southern Ontario (including Greater Toronto Area), the Jasper Fire in British Columbia, flooding in Quebec (including Montreal) from remnants of Hurricane Debby, and the Calgary Hailstorm on August 5.

Hurricane Season

Before impacting the United States, Hurricane Beryl caused devastation across multiple Caribbean islands and in Mexico. It was the earliest-forming Category 5 hurricane on record and made its first landfall on the island of Carriacou in Grenada on July 1 as a Category 4 storm.

Among other notable Atlantic systems were Tropical Storm Alberto, which affected northeastern Mexico, Hurricane Ernesto, which caused moderate damage in Puerto Rico and on Virgin Islands, and hurricanes Oscar and Rafael, which both made landfall in Cuba.

The most significant storm of the 2024 Pacific Hurricane season was Hurricane John, which impacted Mexico in September one year after the devastating impact of Hurricane Otis. It largely affected different parts of the state of Guerrero and the total economic impact was much lower than last year.

Brazil Floods

In 2024, South America experienced several significant flooding events, with the catastrophic floods in Rio Grande do Sul in Brazil standing out as the most devastating. The record rainfall in April caused widespread damage and dam collapses, resulting in over 80,000 displaced residents, at least 182 people killed, and an estimated $1.4 billion in insured losses.

Continued Drought and Wildfire Risk in South America

Drought risk persisted across South America in 2024. Chile also experienced a devastating outbreak of wildfires in early February, which damaged thousands of structures and killed 131 people.

Earthquake Activity Was Limited

One of the few major earthquakes in the region in 2024 was the event that struck southeastern Cuba on November 10 and damaged thousands of structures. Coupled with the impact of Hurricane Oscar less than a month earlier and the overall economic situation in the country, the event also had a notable humanitarian impact.

EMEA (Europe, Middle East and Africa)

European Floods
Major events in Germany, Central Europe and Spain
$31B in economic and $10B in insured losses
307 fatalities

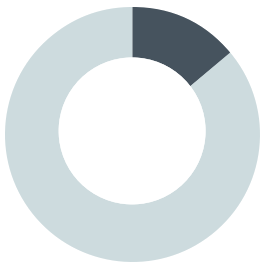
Persian Gulf Floods
Dubai particularly affected
$2.5B insured loss

Cyclone Chido
Widespread destruction in Mayotte and Mozambique
$675M insured loss

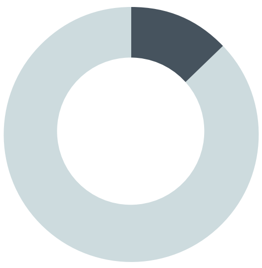
African Seasonal Floods
Eastern and Central Africa particularly hit
fourth-highest death toll on record, with almost 2,500 fatalities

Economic Losses (2024 $B)

Insured Losses (2024 $B)



14%
of global economic losses



13%
of global insured losses

37%
of losses covered by insurance

4
billion-dollar insured loss flood events in EMEA, the highest count on record

385.6 mm/15.2 in
daily rainfall recorded in the Czech Republic during the September floods, setting all-time national record

180 kph/112 mph
sustained winds generated by Cyclone Chido during landfall in Mayotte; became the most powerful system to impact the island

184.6 mm/7.3 in
hourly rainfall measured in Valencia Province, marking all-time national record for Spain

Economic Losses in EMEA Close to the Long-Term Average

Total economic losses from natural disasters in the EMEA region exceeded $50 billion and were close to the average and median of the 21st century. Insurers covered approximately $19 billion of that loss, which was well above the long-term mean. These totals present a notable decrease compared to 2023, which was affected by the devastating earthquake in Turkey and Syria.

Flooding Was the Dominant Driver of Loss

Loss statistics in the EMEA region for 2024 are characterized by the dominance of the flooding peril. It resulted in at least $36 billion in economic and $12 billion in insured losses. There were three European events that stood out. The first was the extensive flooding in southern Germany in early June, with economic damage of €4.1 billion ($4.5 billion) and estimated insurance impact of €2.0 billion ($2.2 billion).

The Central European Floods in September impacted parts of the Czech Republic, Poland, Austria, Slovakia and Romania. The driving meteorological situation and subsequent hydrological response prompted comparisons with other historic events, such as 1997, 2002 or 2010.

However, while the resulting insured loss (in excess of $2 billion) was significant for the regional (re)insurance industry, improvements in water management, warning systems and forecasts implemented after the previous events significantly helped to reduce the overall impact and loss of life.

In October, Spain experienced what is currently considered one of the worst natural disasters in its modern history. Catastrophic floods impacted the Valencian region, killed 231 people and caused substantial property and motor damage, with losses to the insurance consortium currently estimated at €3.5 billion ($3.7 billion).

Europe also saw significant flooding events in May in Saarland, Germany in May, in the Emilia-Romagna region of Italy in September and in Southern France in October.

Historic Flood Event Surprised the (Re)Insurance Sector in the United Arab Emirates

The Persian Gulf region experienced a significant flooding event in April, with particularly notable damage reported from Dubai. The local insurance industry was expected to incur a notable loss in excess of $2.5 billion.

Mayotte Was Devastated by Cyclone Chido

Chido, a powerful cyclone, resulted in widespread destruction and loss of life in Mayotte, a French overseas department in December and generated insurance loss estimated at more than €650 million ($675 million). The storm later continued to impact Mozambique.

Severe Convective Storm Losses Below Average After Three Costly Years

The period between 2021 and 2023 brought record-breaking SCS losses to European insurers. In 2024, aggregated annual losses were lower, and the costliest event, which was associated with a low-pressure system named Frieda, occurred in mid-July with an estimated insurance loss of €1.0 billion ($1.1 billion).

Windstorm Activity Was Limited to Smaller Events

In 2024, Europe did not see a windstorm event that would cause industry losses above $500 million, and the activity was largely limited to relatively minor and moderate events.

APAC (Asia and Pacific)

Noto Earthquake
$18B economic loss
$1B insured loss
489 fatalities

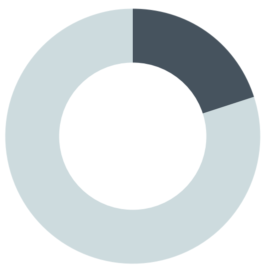
Typhoon Gaemi
Category 4 event causing $1.3B economic loss and killing 100+ people

Seasonal Floods
Multiple flooding events between May and September
India and China particularly affected
$25B economic loss

Typhoon Yagi
Six countries affected
The costliest event in Vietnam on record and the deadliest non heat-related event (800+ fatalities)

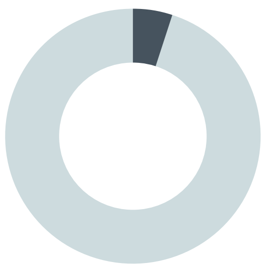
Economic Losses (2024 $B)

Insured Losses (2024 $B)



20%
of global economic losses

3%
of global insured losses



5%
of losses covered by insurance

5
tropical storms and typhoons that made landfall on Luzon Island, Philippines in just 30 days

260 kph/160 mph
one minute of sustained wind from Typhoon Yagi halfway between the Philippines and Hainan

7.6
magnitude of the January 1 earthquake in Japan, the largest to strike since the 2011 Tohoku earthquake

584 mm/23 in
record-breaking rainfall in Shaoguan, Guangdong province (China)

Losses in Asia Pacific Were Lower Than Average with a Significant Protection Gap

Catastrophe activity in the Asia Pacific region in 2024 was below average compared to historical record in terms of both economic and insured losses. Total direct damages were estimated to reach at least $74 billion, while insurance only covered approximately $4 billion. The main driver of economic losses was flooding, with a significant contribution of seasonal floods in China. A large portion of the losses was also attributed to two major events: the Noto earthquake in Japan and Typhoon Yagi in China and Southeast Asia.

Typhoon Yagi Becomes the Costliest Disaster for Vietnam

Multiple significant tropical systems affected the region, with the Philippines facing six devastating storms in quick succession, three of which were categorized as super typhoons. Storms Trami, Kong-Rey, Yinxing, Toraji, Usagi and Man-Yi hit the country between late October and mid-November, bringing torrential rains and subsequent flooding and landslides, overwhelming communities and disaster response systems.

The most consequential typhoon was Yagi. After devastating the Philippines and causing at least 21 deaths, it intensified into a Category 5-equivalent super typhoon over the South China Sea, wreaked havoc in China's Hainan province and made landfall in northern Vietnam. While it rapidly weakened, it brought devastating wind and flood-related impacts to parts of Vietnam, Laos, Thailand and Myanmar and underscored the urgent need for improved disaster preparedness and climate-resilient infrastructure in the region.

Among other notable storms were Typhoon Gaemi, which affected China, Taiwan and the Philippines in July, as well as Cyclone Remal, which struck India and Bangladesh in late May.

Seasonal Flooding Kills Hundreds in South Asia

Parts of Asia were affected by seasonal rainfall. Widespread flooding occurred in India between late May and September, affecting millions and killing at least 700 people. In August, widespread floods intensified in eastern Bangladesh and Tripura state in India.

Nepal was heavily impacted in late September, as heavy rainfall resulted in widespread floods and landslides. Exacerbated by poor infrastructure and urban planning, the event resulted in more than 300 deaths, economic losses of $340 million and insurance claims totaling $94 million.

Parts of China have suffered from several rounds of widespread flooding, with annual losses from flooding reaching at least $24 billion and only a small percentage covered by insurance.

Subdued Catastrophe Activity in Australia and New Zealand

For the first time since 1982, no catastrophe was declared by the Insurance Council of Australia (ICA) during the calendar year of 2024 (although he Christmas Storms in late 2023 lasted into early January 2024). There were two “significant events” in February and April, which did not meet the ICA's criteria for a CAT event, such as a sufficient increase in claim numbers or complexity. Insured losses in Australia were thus the lowest since 2004.

Similarly, New Zealand has not registered any significant disaster in 2024 in a stark contrast to 2023, which was characterized by record weather-related financial impacts.

Limited Major Earthquake Activity

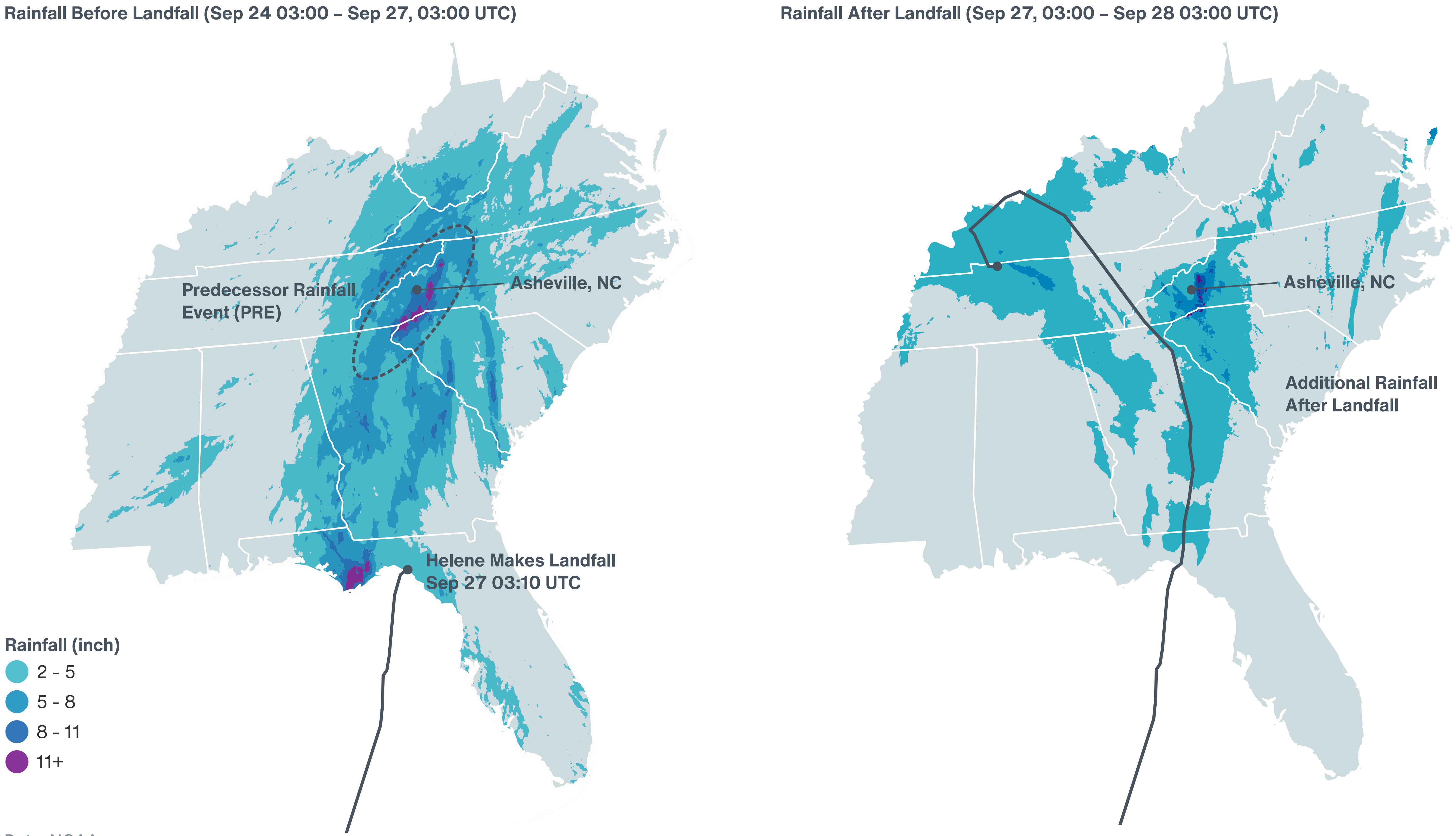
The region registered several notable earthquakes, with the costliest on the very first day of the year in Japan and resulted in approximately $18 billion in economic losses. Eastern coast of Taiwan was struck by a strong, 7.2-magnitude tremor in April. Despite its intensity, it hit a less densely populated area near Hualien and resulted in moderate infrastructural and property damage and several injuries. Another 7.3-magnitude event hit the island nation of Vanuatu in December and resulted in 14 deaths and notable property damage.

What We Learned

We examine the important issues highlighted by 2024’s catastrophe events, including the impact of socioeconomic and demographic factors

Atlantic Hurricanes Highlight Underinsurance and the Importance of Adaptation

Exhibit 21: Rainfall Associated with Hurricane Helene



Data: NOAA

Hurricane Helene Results in Devastating Inland and Coastal Flooding

Across the active 2024 Atlantic hurricane season, Hurricane Helene stands out as the most destructive storm to impact the United States. Helene is the third-deadliest U.S. hurricane (by states and territories) in the 21st century after causing 243 fatalities, behind only Katrina (2005) and Maria (2017). The storm's massive size and fast forward speed caused devastation far inland across the Southeast U.S., with economic losses reaching $75 billion.

One of the defining features of this event was the abundant rainfall seen over Southern Appalachia well ahead of Helene's landfall in Florida. As Helene traversed the eastern Gulf of Mexico, the storm became wedged between a high-pressure system over the western Atlantic Ocean and a low-pressure area to its northwest. Due to the orientation of Helene's surface winds between these two systems, a large channel of tropical moisture surged across the Southeast U.S. Once inland, this moisture was lifted into the atmosphere due to a pre-existing frontal boundary and the mountainous terrain of the Appalachians, resulting in continuous, heavy rainfall.

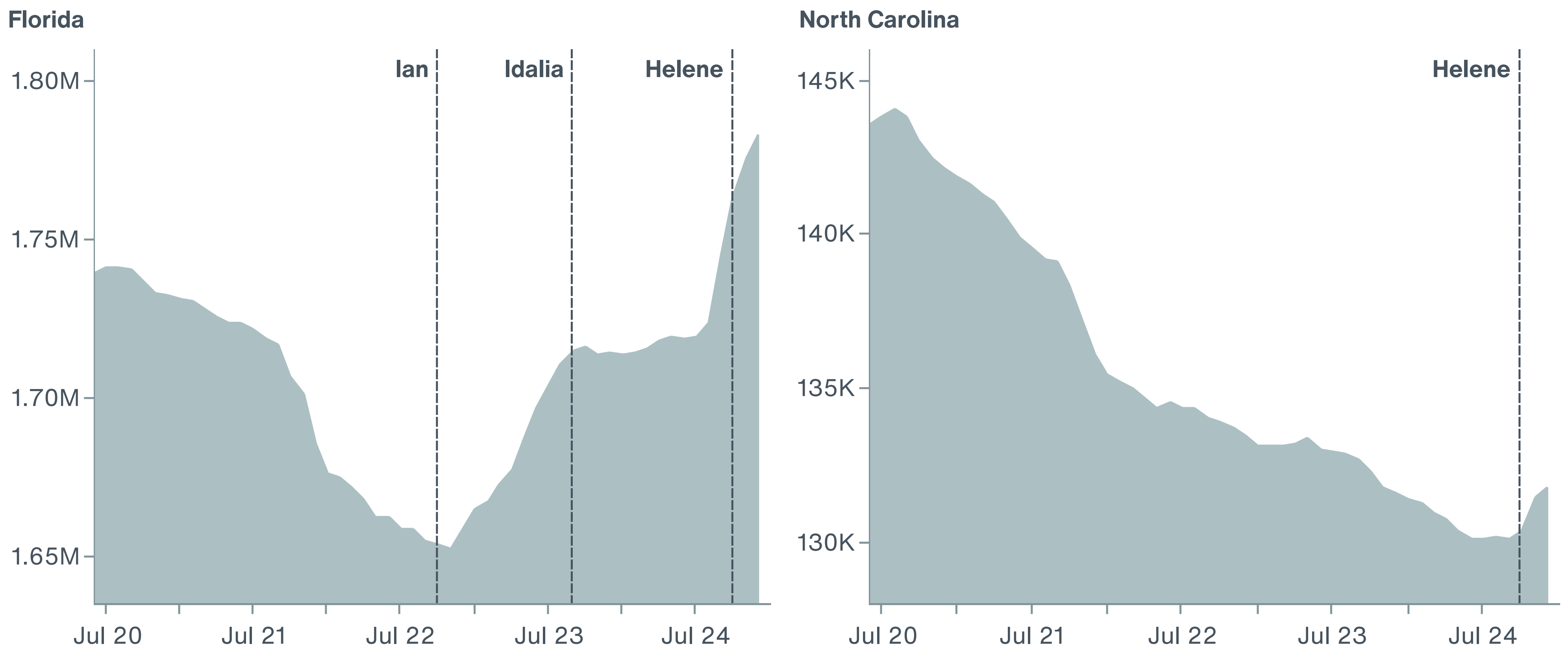
This lesser-known, but occasionally high-impact, scenario is known as a predecessor rainfall event (PRE). Over 10 inches (254 mm) of rain was seen across Southern Appalachia as a result of this PRE in the days prior to Helene's landfall, leading to over-saturated soils heavily susceptible to flash flooding.

Exhibit 22: North Carolina Damage and Needs Assessment for Helene (2024 $B)

Category	Direct Damage	Indirect/Induced Damage	Strengthening and Mitigation	Total
Economy	**9.8**	5.6	0.4	15.8
Housing	**13.5**	-	1.9	15.4
Utilities and Natural Resources	**5.3**	-	1.7	7.0
Transportation	**9.0**	0.1	1.3	10.4
Agriculture	**3.9**	0.8	0.2	4.9
Other Sectors	**2.9**	3.0	0.3	6.2
Total	**44.4**	**9.5**	**5.8**	**59.7**

Data provided by the Office of State Budget and Management as of December 13, 2024

Exhibit 23: NFIP Policies in Force in Florida and North Carolina

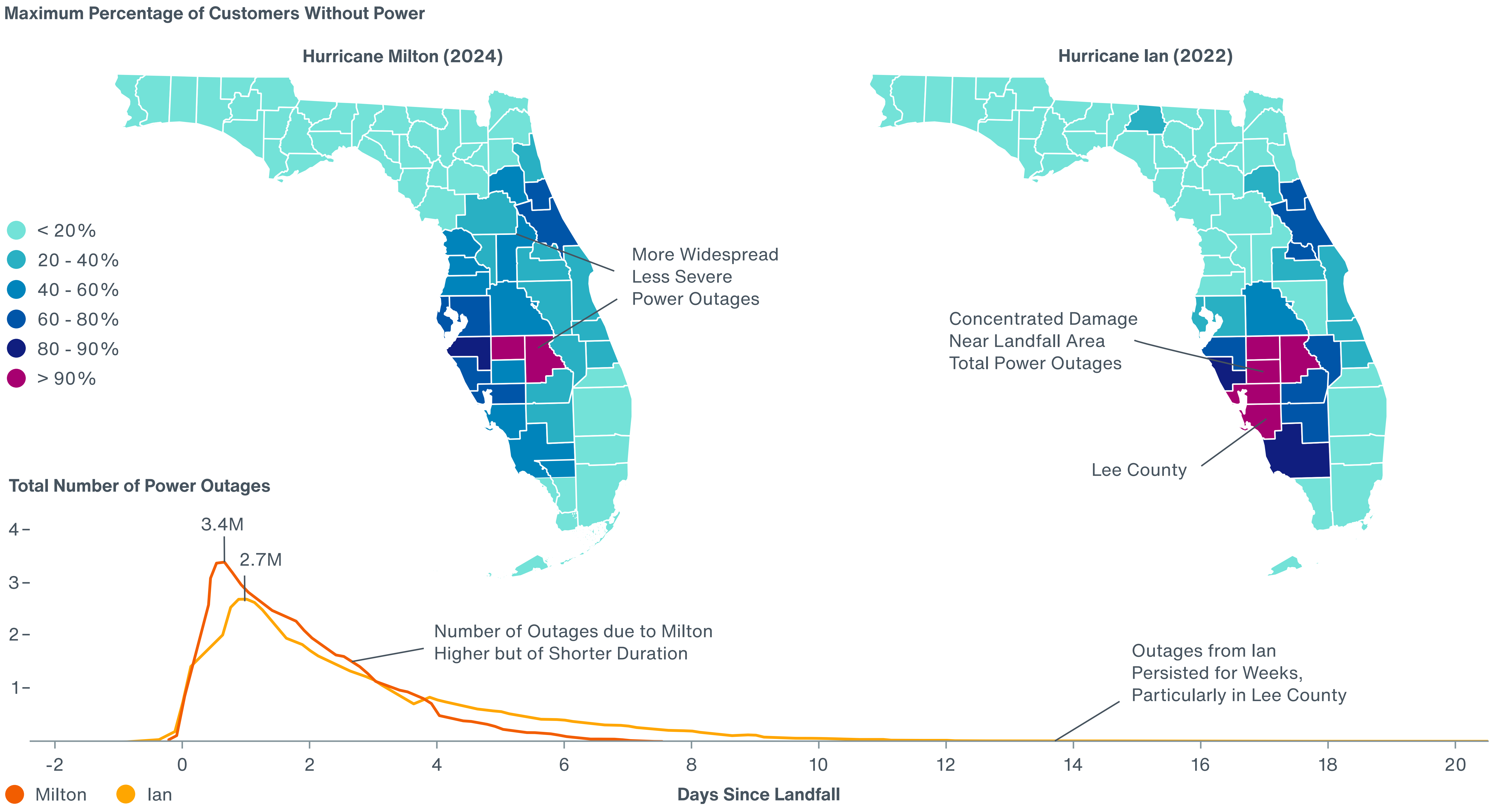


Data: FEMA

Unfortunately, Helene then moved directly across Southern Appalachia and brought its core of intense rain to this already-drenched region. This produced historic rain totals, and parts of western North Carolina even experienced a one-in-1000 rainfall event. Catastrophic flooding damage ensued in western North Carolina, with severe flooding damage also seen in South Carolina, Tennessee, Georgia and Virginia. Entire towns and large sections of roads were washed away, creating an unparalleled disaster for the affected area. According to North Carolina's Office of State Budget and Management, Helene generated nearly $60 billion in damage and losses across the state, including nearly $45 billion in direct damage (see Exhibit 22).

A compounding issue for counties hardest hit by Helene's flooding is very low public and private flood insurance take-up rates, creating a large insurance gap. For example, less than 2 percent of all residential structures are typically covered under the National Flood Insurance Program (NFIP) in western North Carolina and their number had been decreasing before Helene hit. Given that many studies indicate an increase in extreme tropical-cyclone-related rain events under a warming climate (1; 2; 3), flood protection measures should be heavily considered in vulnerable regions, especially those exhibiting underinsurance such as southern Appalachia. Financial incentives, such as FEMA's Increased Cost of Compliance program, will be needed to help communities adopt such protection measures.

Exhibit 24: Power Outages from Hurricanes Milton and Ian



Data: Florida Public Service Comission

Hurricane Milton's Impact Underscores the Importance of Resilient Building Practices in High-Risk Areas

Aside from catastrophic flooding and wind damage in the southeast U.S., Helene also generated significant storm surge damage across western Florida, including around Tampa Bay. Unfortunately, less than two weeks later, this same area was directly hit by Hurricane Milton, a Category 3 storm.

Compared to previous major landfalling hurricanes in Florida, Milton was unique for a number of reasons. Interactions with a pre-existing frontal boundary near landfall resulted in a dual-wind maxima north and south of Milton's eyewall, a feature that differs from the traditional, cyclonic wind fields seen in stronger hurricanes. Additionally, Milton produced the most prolific tornado outbreak to date across the Florida Peninsula with 46 twisters. This included three EF-3 tornadoes, a feat rarely seen with tropical cyclone-induced tornado outbreaks.

Fortunately, Western Florida was spared from a much larger catastrophe overall. Milton not only weakened just before landfall, but it also tracked south of Tampa Bay, preventing storm surge from severely impacting the densely populated Tampa metro region. Furthermore, Florida's strict building codes proved largely effective in withstanding Milton's strong wind gusts, demonstrating the benefits of adequate resiliency investment.

Exhibit 25: Examining Hurricane Damage in Manatee County, Florida

In response to the impacts from Helene and Milton, members from Aon's Impact Forecasting and Catastrophe Management teams conducted a damage survey in West-Central Florida in November 2024. Ground-truth observations and discussions with local residents provided valuable insights into damage patterns seen across Pinellas, Manatee and Sarasota counties.

Overall, the most extensive damage seen in these affected counties was limited to older risks, including most wind-related damages appearing on older structures with presumably older building codes. However, aged structures containing visible opening protections, such as window shutters, generally performed well.

Exhibit 26: Examining Hurricane Damage in Pinellas County, Florida

A common theme mentioned among residents was the extent of storm surge damage observed from Helene, particularly those residing within the nearby barrier islands. Many homes in these areas appeared largely intact despite clear evidence of substantial material losses, potentially due to wind-driven or flood-driven debris causing water infiltration.

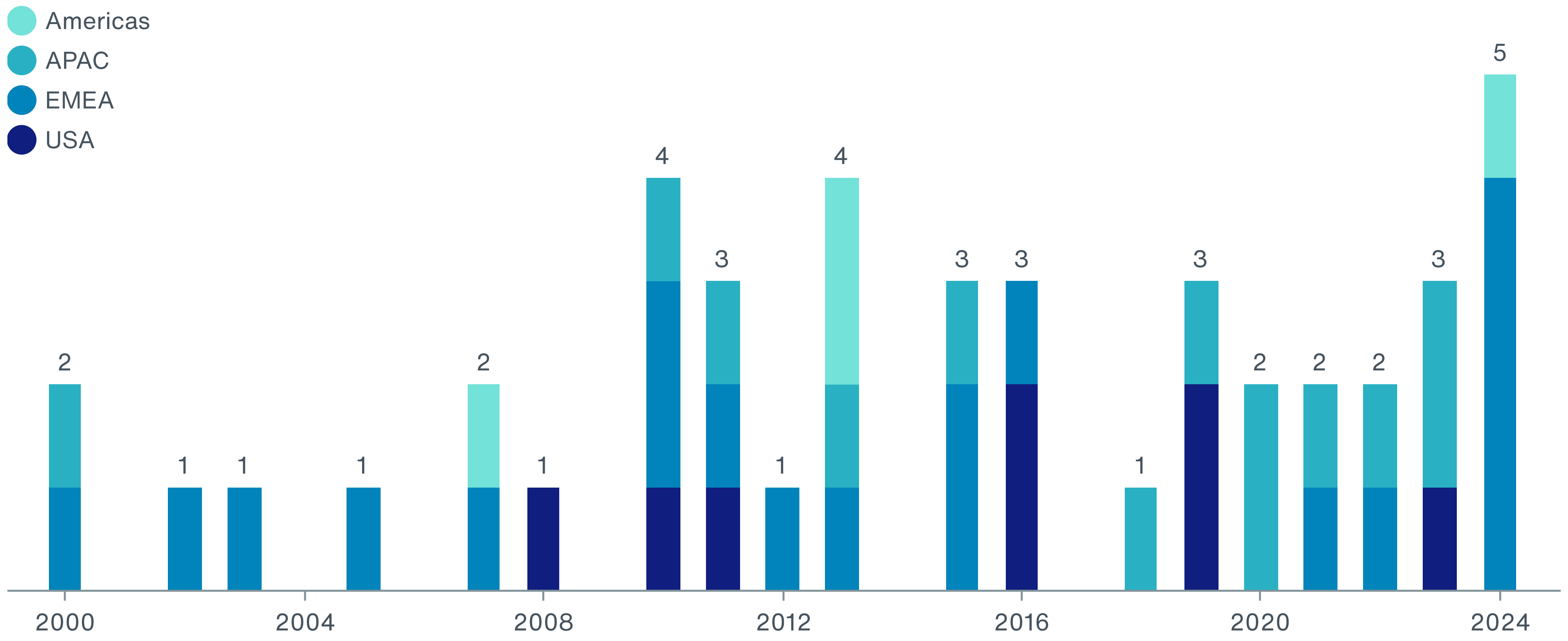
However, this was not the case for a number of elevated homes, which exhibited less material loss. Furthermore, the quick turnaround between Helene and Milton likely complicated not only claims adjustments in West-Central Florida, but also overall loss estimates assigned to each event.

Global Flood Events Revealed Contrasts in Preparedness Level

Exhibit 27: Billion-Dollar Insured Loss Flood Events in 2024

Data: Aon Catastrophe Insight

Exhibit 28: Global Billion-Dollar Insured Loss Flood Events

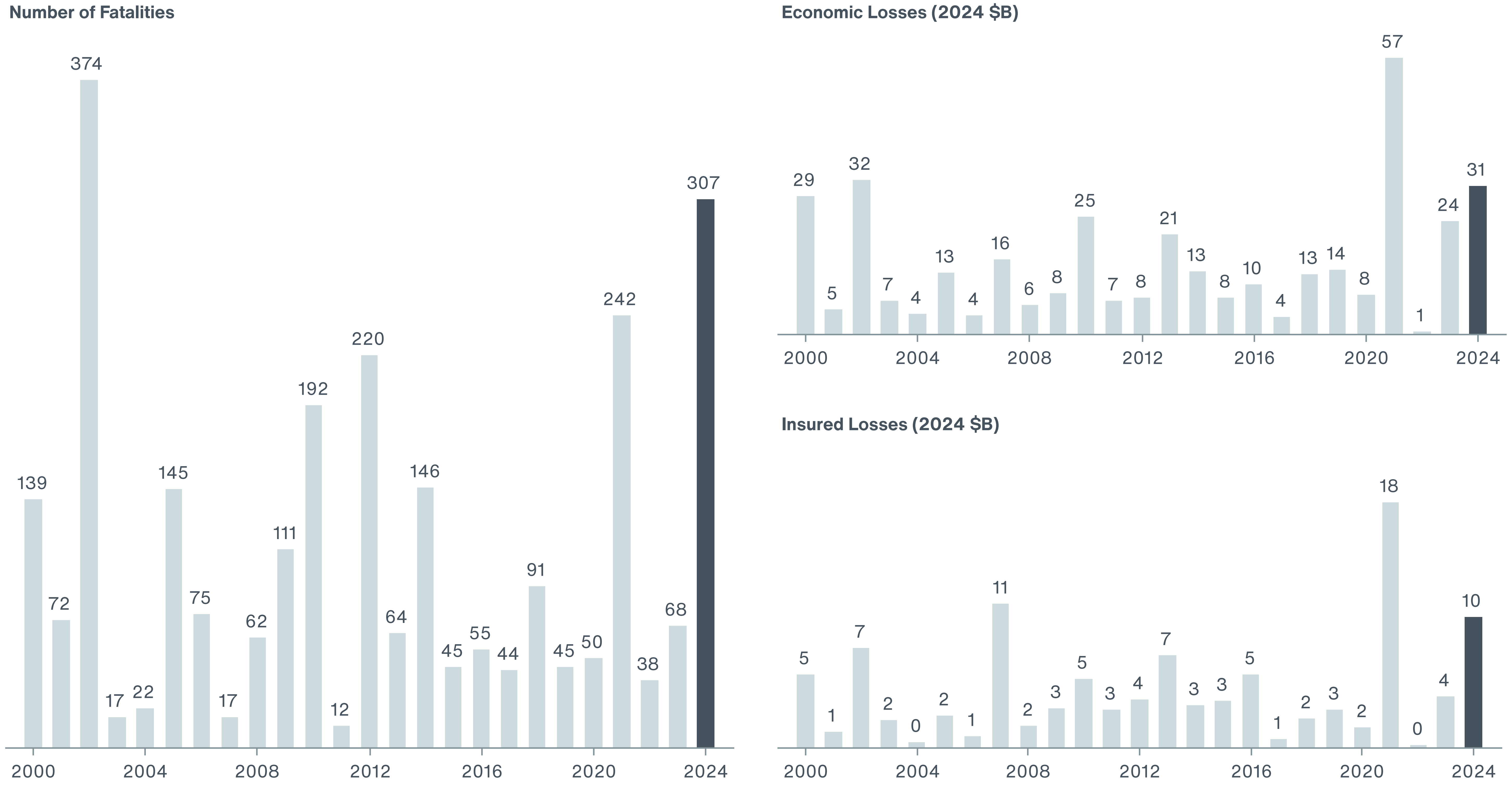


Data: Aon Catastrophe Insight

The year 2024 saw impactful flooding events, which affected various regions across the world. From a global loss perspective, flooding resulted in total economic losses of at least $84 billion that were 11 percent above the 21st-century average. However, global insured losses from flooding were estimated at $21 billion and exceeded the 21st-century average by 69 percent on a price-inflated basis, marking the seventh consecutive year with total insured losses from flood above the $10 billion threshold. The relatively low protection gap can be attributed to the fact that in 2024, significant floods repeatedly impacted regions with relatively higher insurance penetration.

In 2024, at least five events surpassed the billion-dollar insured loss mark, the highest number on record globally. This was driven by events across the EMEA region, including costly flooding in the Persian Gulf in April, Southern Germany in early June, Central Europe in September, and Spain in October. Another billion-dollar event occurred in Brazil's state of Rio Grande do Sul in April and May. These and other notable floods during the year revealed different socio-economic aspects that play a role in overall impact. These include limits in preparedness and adaptation to the flood risk, insufficiency of flood warning systems and evacuation planning, inadequate governmental response and insufficient or even non-existent insurance coverage.

Exhibit 29: Flood-Related Fatalities and Losses in Europe Since 2000



Data: Aon Catastrophe Insight

Contrasting Outcomes of European Flood Events

Although flood risk management in Europe has steadily improved, events in 2024 showed that catastrophic high-magnitude floods with significant loss of lives and property damage continue to occur. The 231 fatalities in Spain contributed to the highest flood-related death toll in Europe since 2002. The failure of the early warning system, delays and inefficiencies in emergency response and evacuation procedures, rapid urbanization without adequate planning for flood management, poorly maintained and insufficient infrastructure (dams, levees, drainage systems), were among the factors that contributed to the severity of this flood event.

In contrast, widespread floods that affected several Central European countries in mid-September demonstrated how preparation, the implementation of flood warning systems, and subsequent evacuations well in advance can save lives and mitigate damage. In this case, adaptation, investments in flood defenses, public awareness and effective weather forecasts helped avoid more casualties and billions in damage (4).

Despite the improvements, multiple notable flood events in 2024 drove the annual flood-related economic losses in Europe above $30 billion, marking the third-highest total on record.

Flood Underinsurance as a Global Challenge

In 2024, the flood protection gap was approximately 75 percent, denoting that flood remains an underinsured peril, as many property owners lack adequate insurance coverage. Despite the availability of flood insurance policies, there can often be a lack of awareness or understanding of the risks. Additionally, the high cost of flood insurance can be a deterrent for many, particularly in high-risk areas.

The high flood protection gap indicates a global need to elevate the conversation around flood protection measures and the need for collaboration across the public and private sectors to promote flood insurance adoption. While flood insurance take-up generally tends to be lower, even in developed regions such as Europe, other countries exhibit very limited or even non-existent coverage, and the costs have to be covered by population and governments. Insurance penetration may vary significantly even among regions within one country, as revealed during the floods in Southern Germany in June.

The high-magnitude events in recent years prompted national governments to initiate discussions about the role of insurance in stabilizing the economy after such occurrences and about potential changes to how these events are covered. The discussions might further escalate with the increasing frequency and severity of flood events due to climate change.

Heavy Rainfall a Threat to Urban Areas

In 2024, severe urban flooding caused substantial economic losses and property damage, business interruptions and costly repairs to infrastructure in cities worldwide. Notable urban floods affected multiple countries in the Persian Gulf in April, populous cities in Southeast China, or Montreal and Toronto in August. These events underscore the need for discussion about how to reduce impacts of flooding in high-exposure areas. This debate becomes more relevant since such events are expected to occur more frequently in the future with climate change and continued exposure growth.

Addressing these challenges requires comprehensive urban planning, investment in resilient infrastructure and effective emergency management strategies. Maintenance of sufficient drainage infrastructure might play a major role in urban centers to limit the damage caused by flash flooding. In some cities, such as New York, Singapore, Tokyo, Copenhagen and Rotterdam, particular attention has already been paid to the threat of urban flooding by developing water management systems and implementing innovative water retention solutions. After the costly flooding in April, the administration in Dubai announced it will spend $8.2 billion to boost its rainwater drainage system by 2033 (5).

Persisting Flood Vulnerability

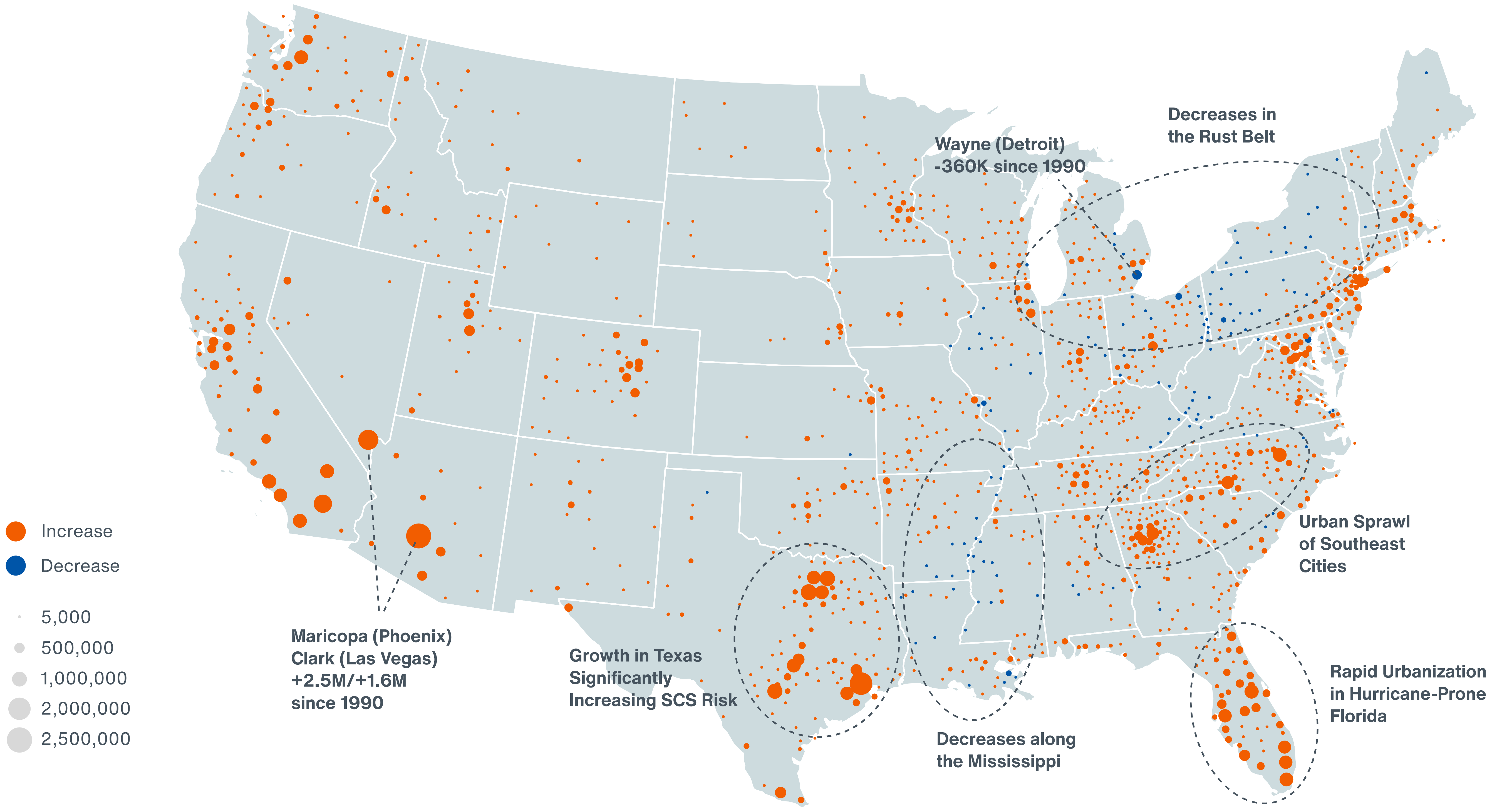
Many regions worldwide are naturally prone to flooding and still lack adequate drainage systems, flood defenses and water management infrastructure. Several of these areas were significantly impacted by floods in 2024, resulting in hundreds of fatalities and extensive material damage. Notable flooding occurred in the Brazilian state of Rio Grande do Sul in April and May, as well as in Nepal’s capital Kathmandu in September. High numbers of flood-related deaths were reported across South Asia. Approximately 2,500 people died in Africa, making it the fourth-deadliest year on record.

Failure of Infrastructure

In April, Southern Russia and Kazakhstan faced severe economic losses due to widespread floods. Heavy rainfall and rapid snowmelt caused the floods, which were further exacerbated by dam collapses, highlighting the impact of poorly maintained and outdated infrastructure on the outcomes of weather events.

Population Growth and Urbanization Continue to Drive Increasing Losses

Exhibit 30: U.S. Population Change by County from 1990 to 2023



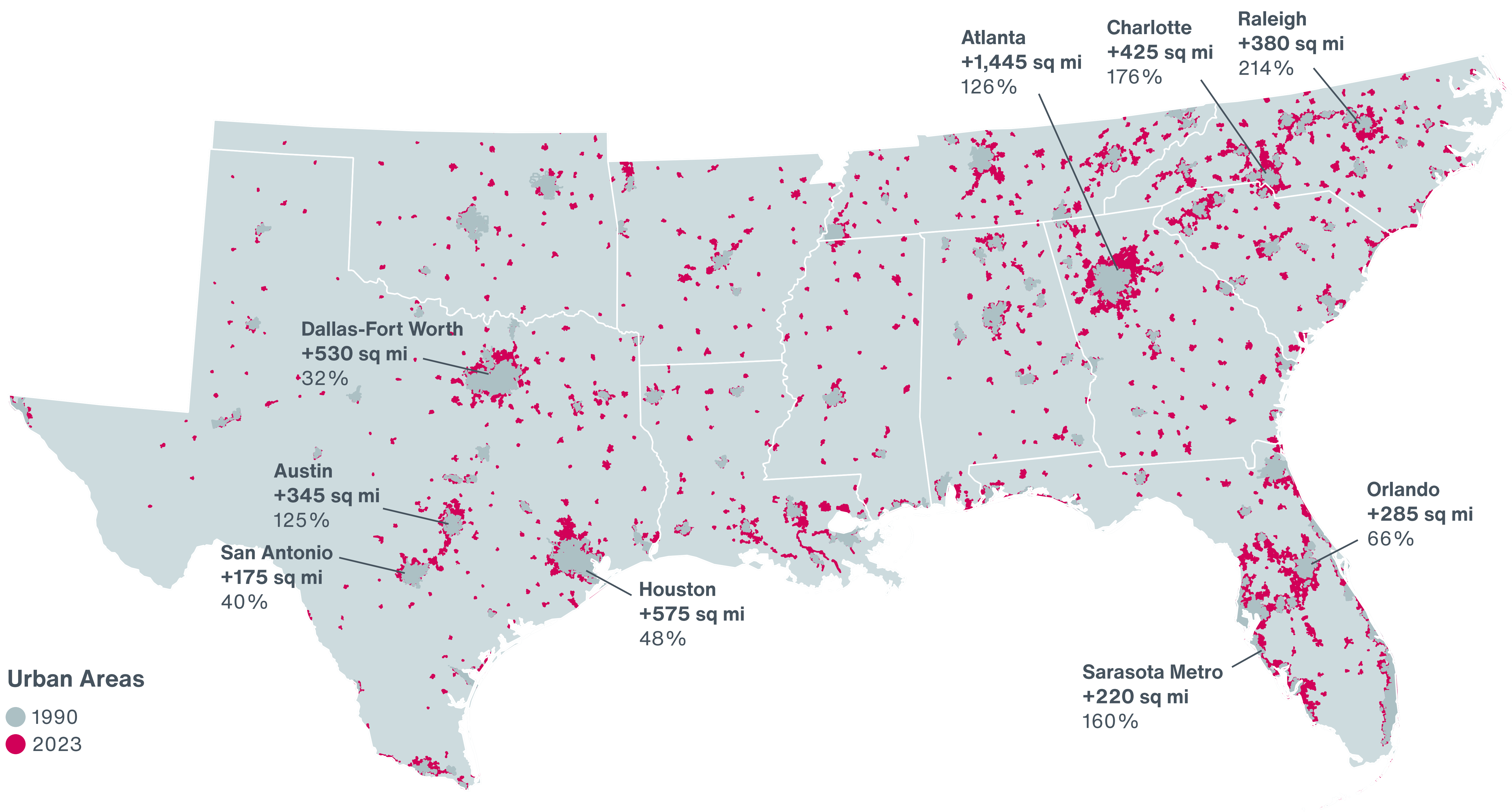
Data: U.S. Census Bureau

The population of the United States has grown from an estimated 249 million in 1990 to current 341 million, based on the data from the U.S. Census Bureau. The change is not spatially uniform and largely reflects wider economic and social trends. Some areas even experienced population decline after an economic downturn, such as the so-called Rust Belt.

As populations grow in high-risk areas, so does the exposure to various perils. Rapid development in Florida is an emblematic example of this trend, as its population nearly doubled since 1990. Enactment of ever stricter building codes and adaptation measures is a necessary consequence in light of the hurricane risk that the state faces.

However, the highest change since 1990 on a county level was recorded in Maricopa County in Arizona, which encompasses the city of Phoenix. Since 1990, the county's population grew from 2.1 million to 4.6 million currently. In the past two years, local communities suffered from prolonged heatwaves, which resulted in significant health impacts. Expansion of the urbanized area is associated with the urban heat island phenomenon, which exacerbates the impacts of temperature extremes intensified by climate change.

Exhibit 31: Urban Sprawl in Southern United States Between 1990 and 2023



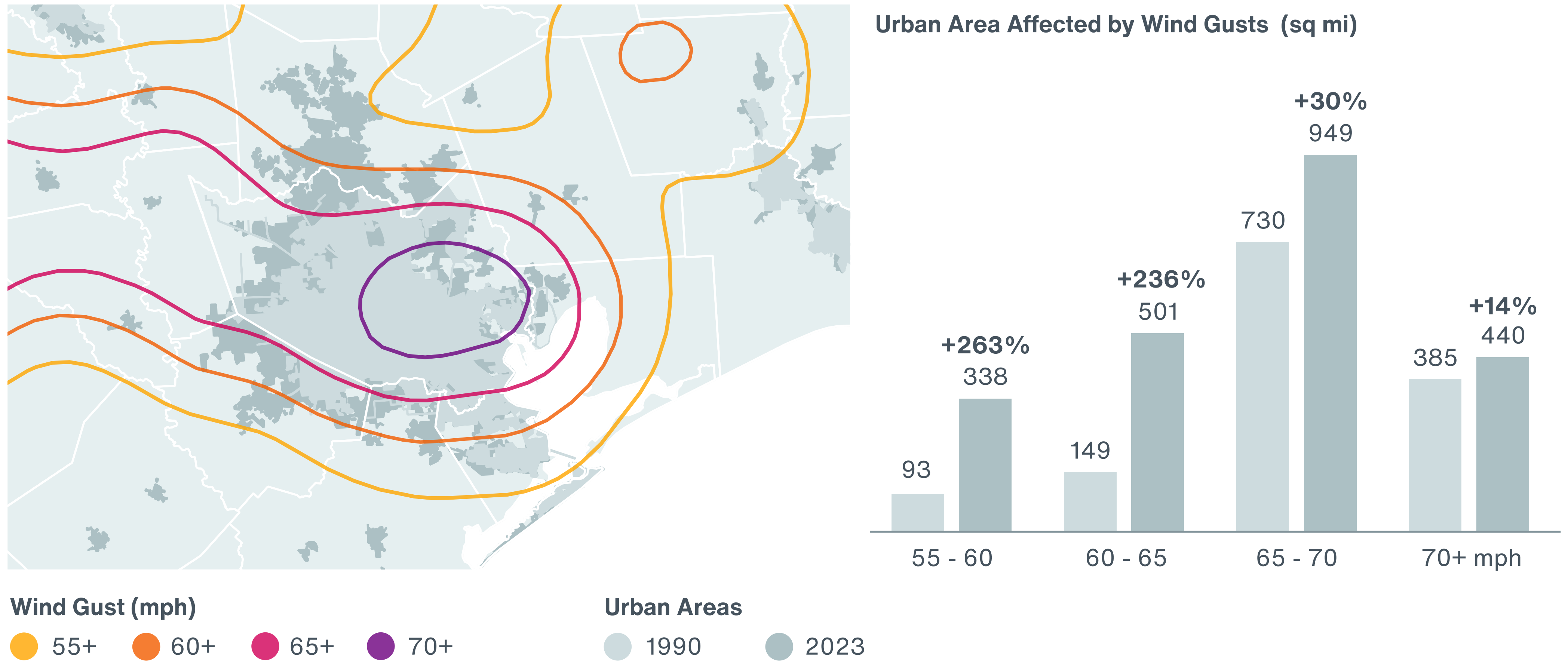
Data: U.S. Census Bureau

In the context of natural hazards, it is important to consider how North American cities grow, as the increase in total population and wealth are not the only factors that increase financial exposure. It is also the spatial extent of the urban centers, which extend into vast, lower-density suburban areas outside of their core. Notable examples of this urban sprawl phenomenon can be observed in cities in Southern states — Atlanta, Houston, Dallas-Fort Worth and others.

This is particularly relevant for severe convective storm risk, as it significantly increases the area potentially impacted by otherwise relatively small-scale phenomena. It has been described in the works by Ashley as a well-known expanding bull's eye concept (6).

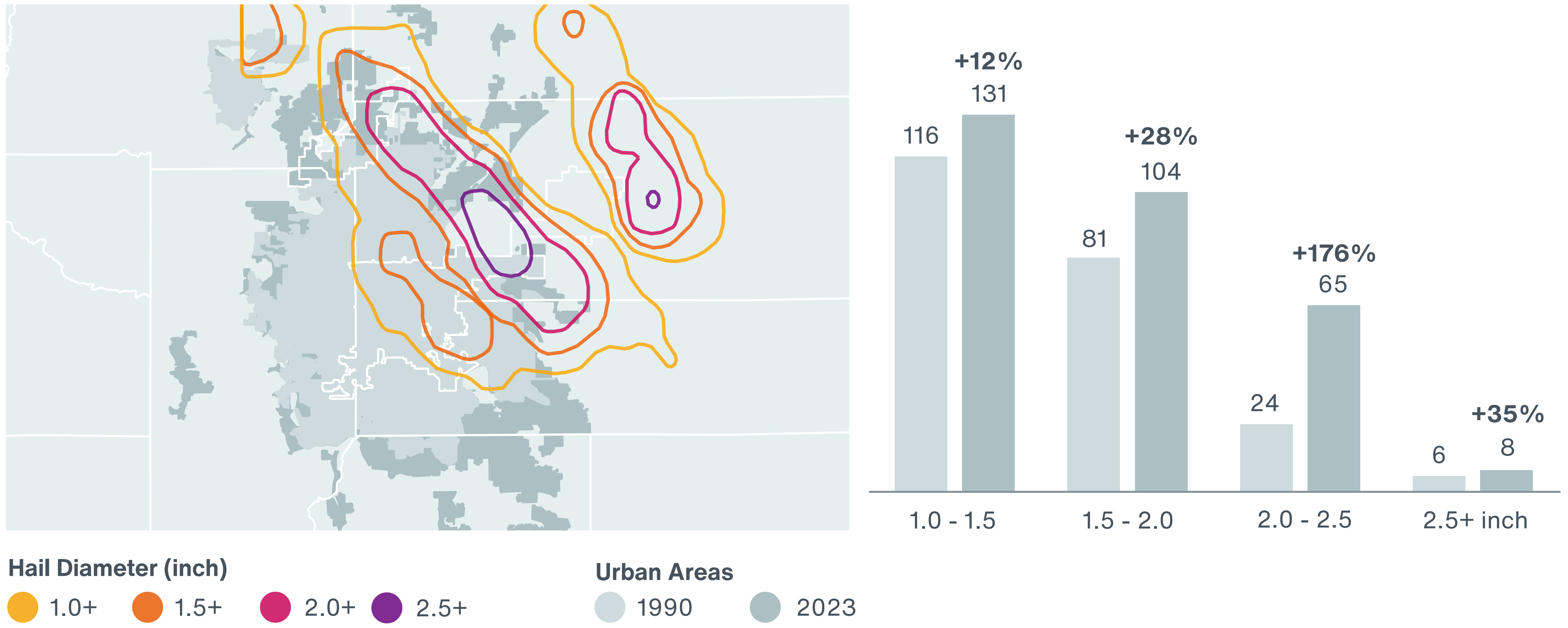
SCS losses in 2024 were the second-highest on record in both United States and globally. The long-term increase in the sheer volume of loss as well as the number of billion-dollar events has made this peril one of the major drivers of property and motor insurance payouts. Population growth, increase in the amount of fixed assets and overall wealth, as well as price inflation are all major factors as has been also noted in a recent Aon study. Changes in frequency and intensity of the hazard itself as a result of climate change also plays a role, with magnitude of this change being a subject of ongoing research.

Exhibit 32: Expansion of Houston's Urban Area Compared to May 16 Derecho Footprint



Data: Aon Impact Forecasting, U.S. Census Bureau

Exhibit 33: Expansion of Denver's Urban Area Compared to May 30 Hailstorm Footprint



Data: Aon Impact Forecasting, U.S. Census Bureau

The derecho event that impacted the Southern United States from Texas to Florida on May 16, 2024 caused notable property damage and disruption in the Houston metropolitan area. Analysis of its footprint shows that the area impacted by the highest wind speeds in Central and Eastern Houston has not grown significantly since 1990.

However, the area impacted by wind gusts between 55 and 70 mph (up to 113 kph) is much larger, particularly due to the significant urban expansion on the western and northern side of the metropolitan area. At the same time, it is worth noting that the newly built suburbs usually exhibit lower population and housing density than the urban core.

Another costly event in 2024 that serves as an example of how urban sprawl can increase the likelihood of otherwise spatially limited SCS events hitting insured assets was the hailstorm in Denver, Colorado, on May 30. The storm's main footprint was located in Eastern and Northern suburbs, which have seen significant growth over the past several decades. For example, the urban area that would be potentially hit by hail larger than 2 inches (5 cm), expanded from 24 to approximately 65 square miles since 1990.

Severe Convective Storms and Shingle Roofs: A Growing Challenge

Severe convective storms (SCS) are a growing concern for the insurance industry, particularly in relation to the durability and longevity of asphalt shingle roofs.

As climate patterns shift and the frequency and severity of these storms increase, insurers face a dual challenge of managing rising claims costs and ensuring affordable coverage for their customers.

The Joint Challenge for the Insurer and the Insured

The increased frequency of asphalt shingle roof replacements presents a profitability challenge for insurers.

Current types of insurance cover offered to policyholders may need to be adjusted by implementing a different deductible structure for roofs compared to the rest of the home. An alternative option is to explore co-pays for roof repairs or replacements, thereby sharing the financial burden between the policyholder and the insurer for the roof only.

Loss Mitigation and Reduction Strategies — Everyone Can Play a Part

Policyholders: regular maintenance and timely repairs of shingle roofs can significantly reduce the likelihood of severe damage. Educating homeowners about the importance of roof upkeep and providing incentives for proactive maintenance can help lower claims frequency.

Insurers: appropriately capturing roof cover and roof age data is key so that insurers can accurately underwrite and price the risk while providing targeted risk advice and adaptation solutions.

Best-in-class insurers carefully manage SCS risk by:

- Monitoring peak exposure concentrations and understand location-level risk
- Implementing a holistic view of SCS cost drivers in pricing to ensure rate adequacy
- Considering the strengths and weaknesses of catastrophe models and leveraging those that reflect the latest view of SCS trends and historical experience
- Proactively tracking catastrophe events using real-time data sources to assess event impacts as they unfold, and ensure that claims are settled quickly and efficiently to minimize loss settlement costs

As these roofs demonstrate a shorter lifespan and higher vulnerability to damage, insurers must adapt their strategies to manage rising claims costs and maintain profitability. Collaboration between policyholders and insurers in loss mitigation efforts is crucial to achieving a long-term, profitable equilibrium in the homeowners' insurance market.

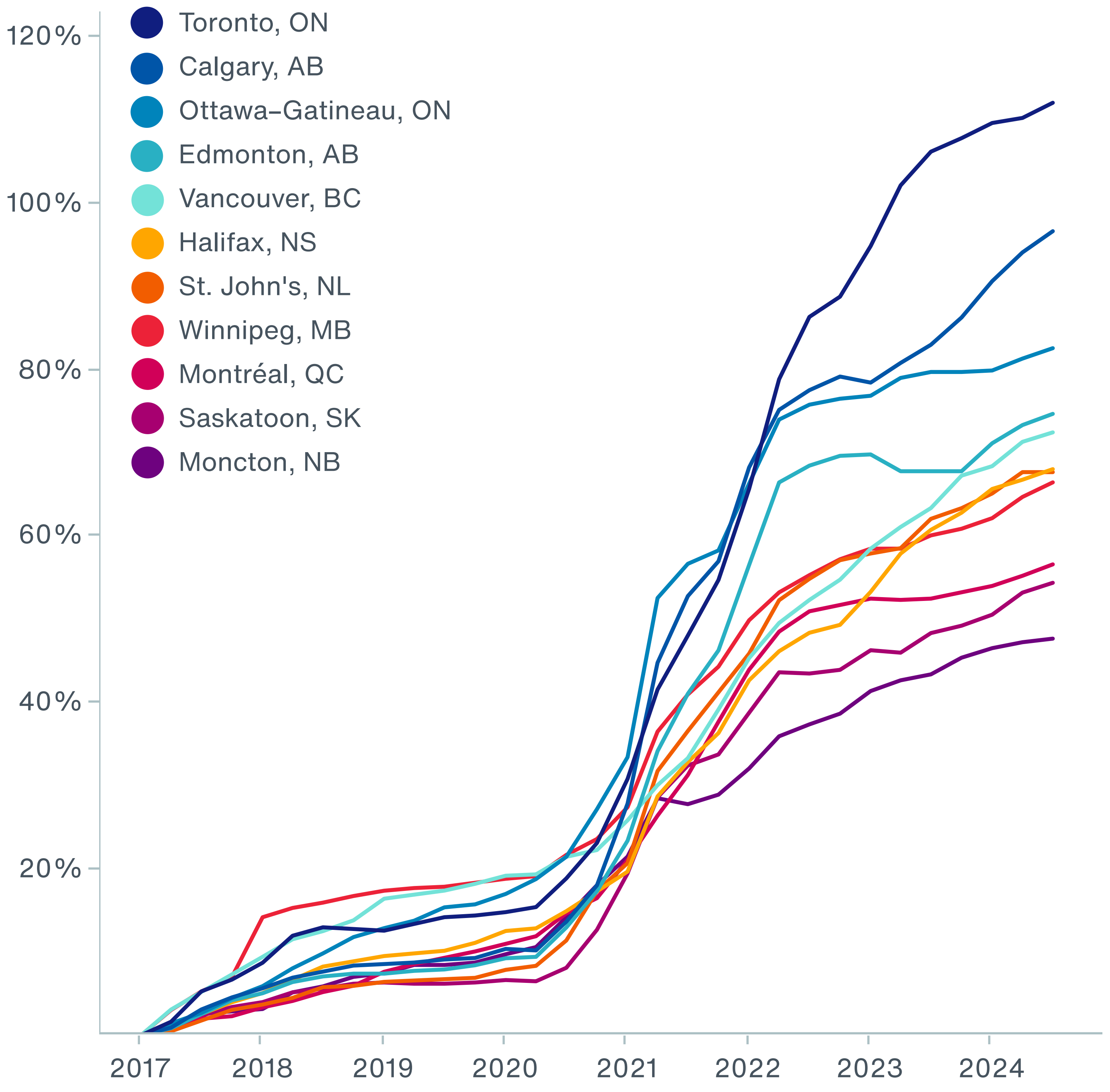
Paul Eaton
Head of Actuarial Consulting and Capital Optimization
Strategy and Technology Group
Aon

Adam Dawson
Director
Catastrophe Analytics
Aon

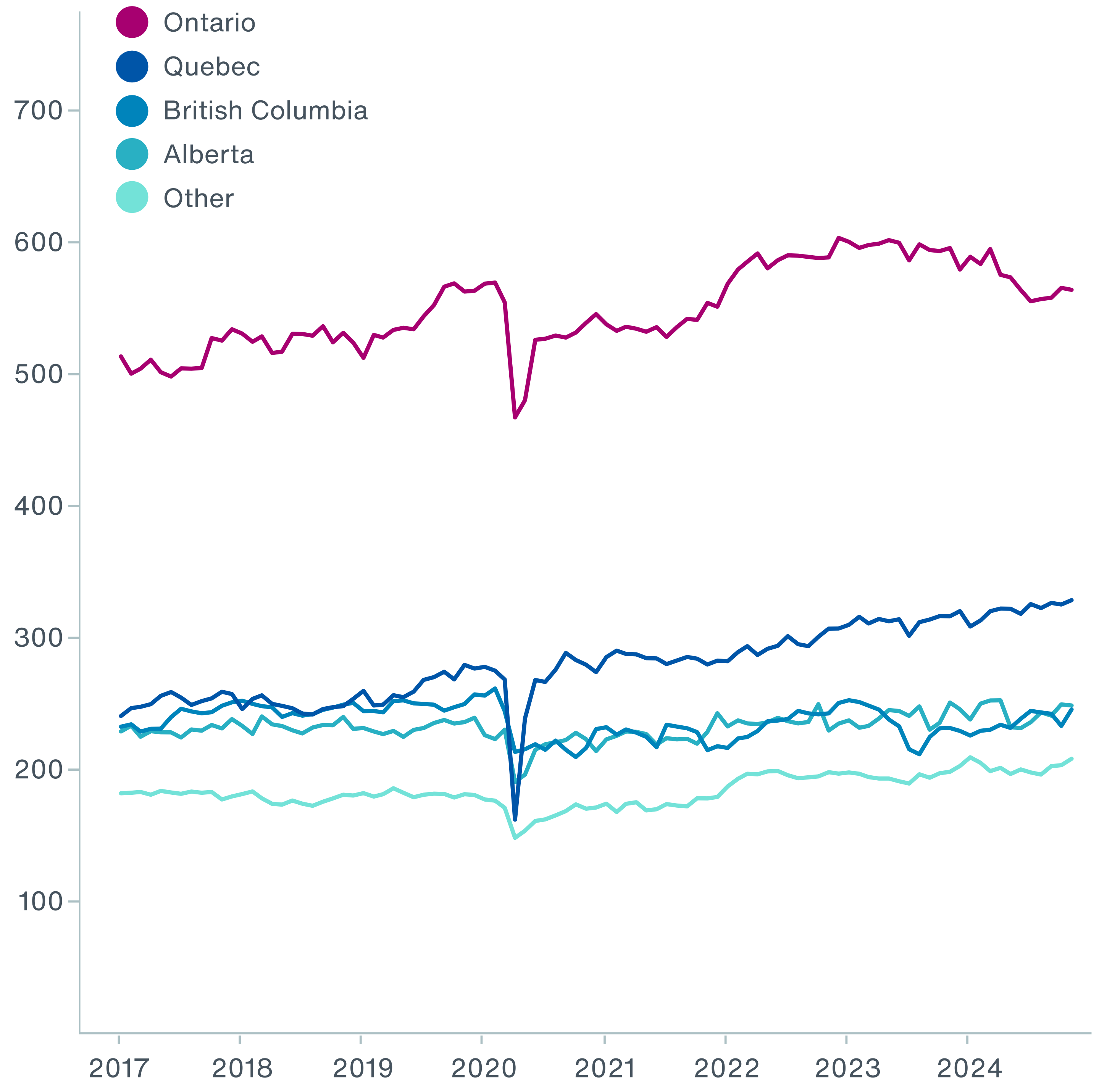
Historic Year for Canadian (Re)insurance

Exhibit 34: Construction Price and Labor Force Statistics in Canada

Increase in Building Construction Price Index since Q1 2017



Number of Workers in Construction (thousands)



Data: Statistics Canada

The Costliest Year on Record

Four major events, which occurred within a period of one month in July and August, drove the highest insured losses in Canada on record. These were 1) floods in southern Ontario, particularly the Greater Toronto Area, 2) Jasper Fire in Alberta, 3) flooding in Montreal from remnants of Hurricane Debby and 4) hailstorm in northern Calgary. These four events alone resulted in approximately CAD 7.7 billion ($5.6 billion) in claims. This makes 2024 the costliest on record, followed by 2016 and 2013.

Socioeconomic Drivers of Increasing Losses

The increase in building construction costs seen in Canada in recent years, coupled with a shortage of skilled labor and supply chain disruptions, has driven up the cost and time required for rebuilding efforts. As a result, insurers face higher claim payouts and prolonged claim resolution times. This comes in a period when increases in homeowners' home and mortgage insurance costs outpace overall inflation. Insurers are therefore under pressure to provide affordable and effective insurance to consumers and remain profitable at the same time.

Exhibit 35: Calgary's Urban Sprawl Since 1984

1984 2004 2024

Data: Landsat / Copernicus, Google

Another factor is the growth of exposed assets. The hailstorm in Calgary on August 5 primarily affected northern parts of the city. According to the Insurance Bureau of Canada, it resulted in approximately 130,000 claims and losses of nearly CAD 3 billion ($2.1 billion). The area has seen a staggering urban expansion in recent decades, similar to some U.S. cities (see Exhibit 35).

Analysis of satellite imagery in Exhibit 35 shows that since 1984, when Calgary had roughly half of its current population, northern outskirts expanded significantly, primarily with newly built residential neighborhoods aimed to provide more affordable housing to the growing number of residents. There was also additional development of commercial and industrial property and infrastructure, such as the new terminal and runway of the Calgary International Airport.

An overlay of the hailstorm footprint shows that if the event occurred 40 years ago, it would have affected mostly agricultural land and residential property losses would have been dramatically lower than in 2024.

Compared to historical experience, a relatively high proportion of claims from the Calgary hailstorm — more than a half of all damage notifications — was related to automobile insurance. There were several reasons for this, including a large number of vehicles in outside parking spaces without any cover.

Another factor that made this event unique is a significant loss sustained by aircraft and terminal buildings in the Calgary's International Airport, which was heavily impacted. WestJet, a major Canadian airline, had 16 of its aircraft grounded due to hail damage and experienced significant disruption of its services. This will also add a notable insurance loss on top of property and motor lines.

Challenges in Flood Insurance

Homeowners' flood policy limits remain relatively low in both the Greater Toronto Area and Montreal, areas heavily affected by urban flooding events in 2024. Such low limits can be insufficient in cases of significant property damage or rebuilding costs. As a consequence, many affected property owners experienced high out-of-pocket expenses. Additionally, calls for a national flood insurance program are likely to grow, particularly to protect homeowners in high-risk zones. Investments in urban flood defenses and resilient infrastructure will therefore be critical to reduce long-term risks and exposure for all stakeholders. In order to enhance understanding of flood hazard across Canada, Aon's Impact Forecasting and the flood risk intelligence firm Fathom have been awarded a contract by Public Safety Canada in August 2024 (7). This includes provision of extensive high-resolution inland flood data and expertise to support the development of a national flood risk assessment.

Impact on Reinsurance Renewals

In some cases, 2024 events highlighted the issue of concentration management, with some regional, but also national, insurers incurring large losses in excess of their provincial market share.

The 2024 events and associated issues also affected the reinsurance business. Due to the significant amount of losses, reinsurers maintained higher premiums and stricter underwriting standards. As a consequence, the Canadian market remained an exception in the overall trend of stabilization seen in the global reinsurance market.

Critical Climate Resilience Considerations for Infrastructure Assets

Rising costs of natural catastrophes and extreme weather events are impacting every stakeholder in the construction and infrastructure industry.

Contractors, builders, developers, real asset owners, investors, engineers, architects, industry associations and standardization bodies all have a role to play in advancing adaptation and resilience measures to curtail the trend.

Aon's research finds that key drivers of rising losses include a growing number and value of assets in exposed areas, aging infrastructure, increasing rebuilding costs and other macroeconomic factors.

So, while changing climate is a factor in rising losses, where and how we build assets influences losses the most. Practical considerations to reduce losses include:

- Limiting new development in disaster-prone areas
- Disaster-proofing existing and most vulnerable assets
- Modeling current and future physical climate risks to factor in appropriate risk mitigation approaches from asset design phase through to construction and operations
- Conserving and/or restoring natural assets, such as mangroves and wetlands, which provide flood and hurricane attenuation benefits
- Exploring alternative risk transfer solutions to free up capital for proactive investments into disaster risk reduction and resiliency initiatives

The most cost-effective time to introduce resiliency measures is at the time of new construction. There are numerous cost-benefit studies that estimate cost-to-benefit ratio of building resiliently in the range of 1:4 to 1:16. These benefits include avoided casualties, property damage, business interruptions, disaster response expenses and insurance costs.

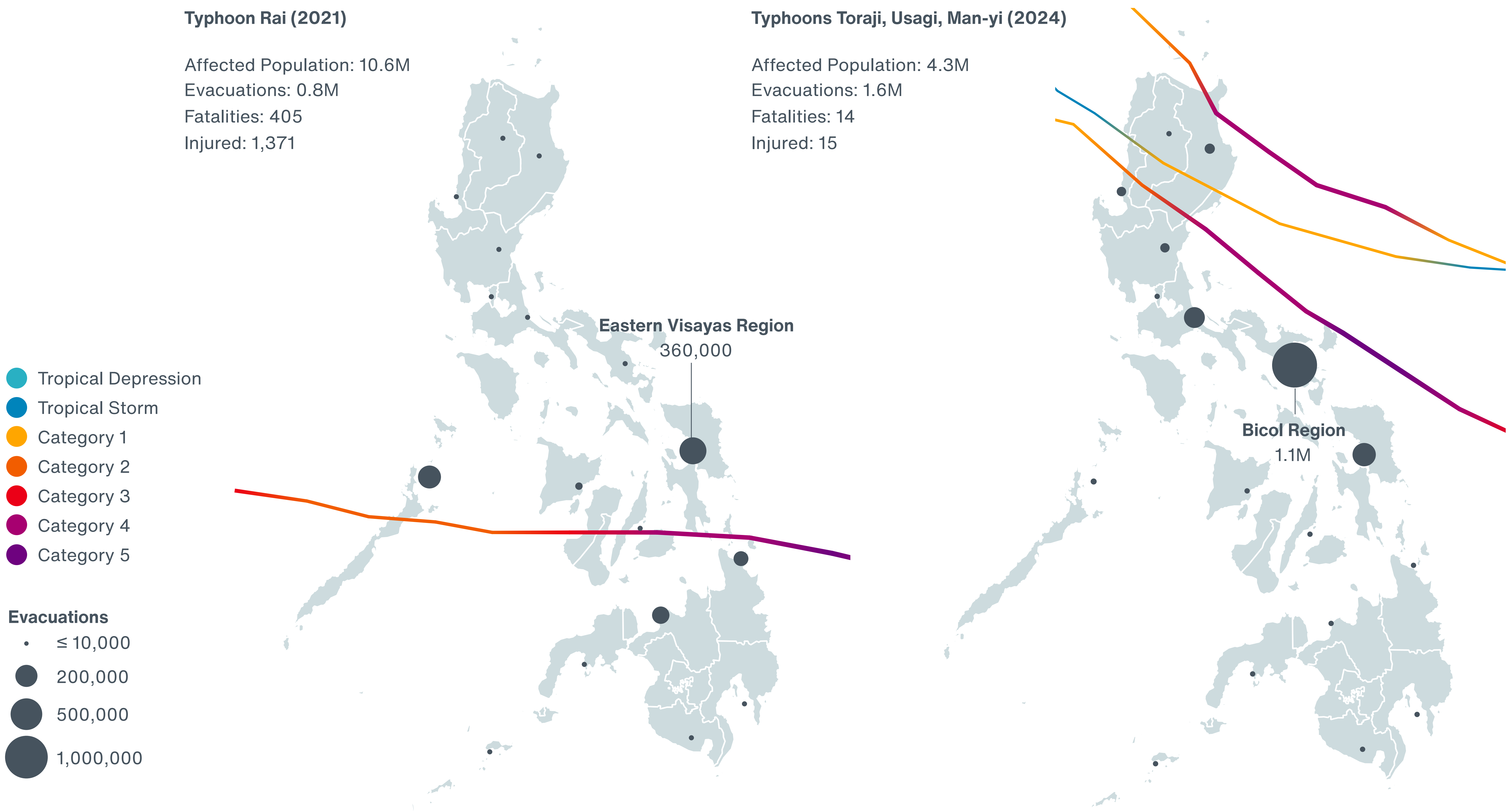
Commercial property lenders, private equity firms, infrastructure funds and other institutional investors are increasingly focused on mitigating their exposures to physical climate risk. For example, Aon is assisting several financial sponsor clients as they seek to factor in physical climate risks during deal due diligence for potential acquisition targets. By proactively pursuing climate-resilience measures, asset owners are not only investing in the physical protection of their property, but also into their long-term value.

According to the Global Infrastructure Hub, the world needs to invest $94 trillion in infrastructure between 2017 and 2040. Every dollar invested must apply a climate resilience lens to ensure we end up with insurable and investible assets down the road.

Natalia Moudrak
Managing Director
Climate Risk Advisory
Aon

Evacuation Planning Critical for Limiting Human Casualties

Exhibit 36: Evacuations Prior to Typhoons in the Philippines



Data: NDRRMC

Evacuation procedures have evolved significantly over the years, particularly in regions that face frequent natural catastrophes.

The Philippines, often impacted by tropical storms and typhoons this year, represents a good example of preparation improvements. Investments in advanced early warning systems, enhanced weather monitoring and forecasting helped to provide timely alerts. Local community involvement, better infrastructure, effective communication, attention to vulnerable populations, international collaboration, and legislative changes have all improved evacuation processes and management. More evacuations are now ordered even for weaker storms, as shown last year.

Historically, the Philippines has faced many devastating tropical cyclones, causing catastrophic damage and loss of life. In December 2021, Typhoon Rai (Odette) resulted in hundreds of casualties. This may have been influenced by the number of evacuation orders issued relative to the total population affected by the storm.

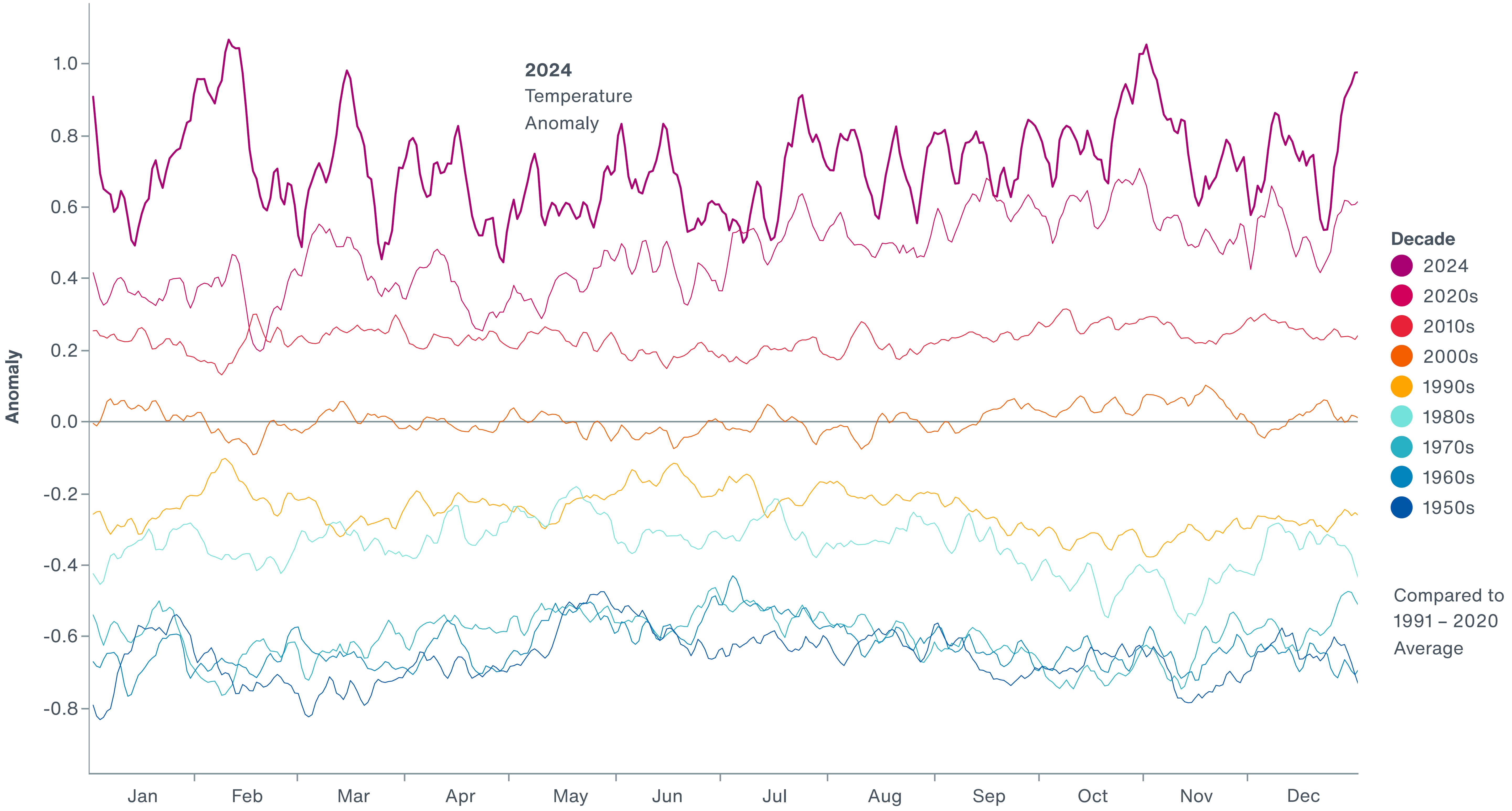
In September 2024, Typhoon Yagi highlighted varying preparedness levels in the Philippines, China and Vietnam. Vietnam faced some of the worst impacts, with hundreds of fatalities. One of the factors could have been insufficient evacuation orders, based on the numbers reported by local disaster management.

The Links Between Climate and Catastrophes

We focus on how climate change is contributing to weather pattern variability and natural disaster activity

2024: The Hottest Year on Record Exceeds 1.5°C Above the Pre-Industrial Levels

Exhibit 37: Global Temperature Anomalies Since 1950 (°C)

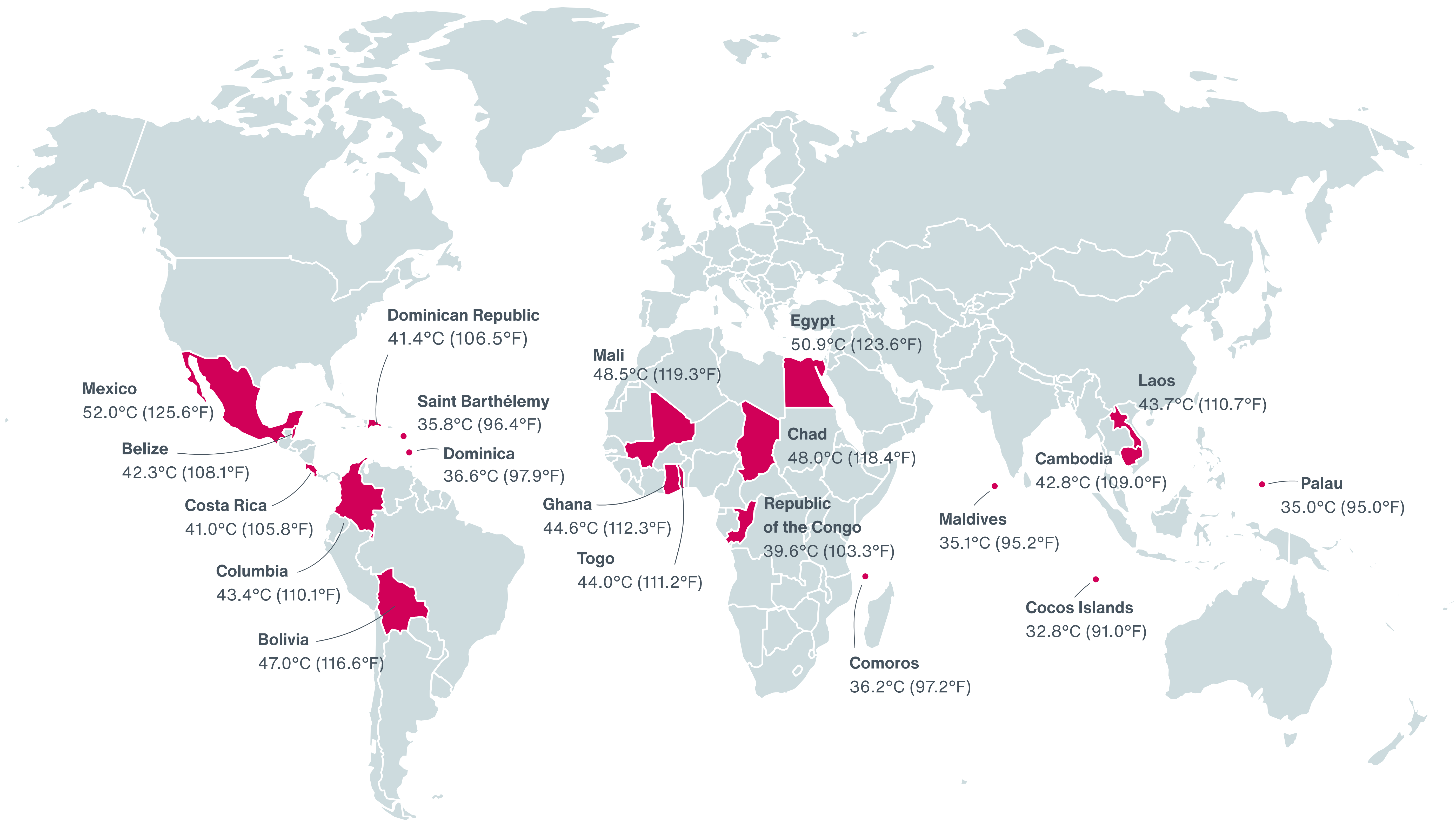


Data: ERA5 Reanalysis, Copernicus Climate Change Service

In a continuation of the long-term trend of global warming, 2024 was recorded as the warmest year on record. Combining six international datasets, the World Meteorological Organization (WMO) reported that global temperatures in 2024 were 1.55°C (2.79°F) above the pre-Industrial average (1850 – 1900). This makes 2024 the first year to ever exceed the 1.5°C (2.7°F) limit of global warming set by the 2015 Paris Agreement (8).

Based on the ERA5 data from the Copernicus Climate Change Service, the hottest day of the year was July 22, with a global average temperature of 17.12°C (62.9°F). This was approximately 0.9°C (1.6°F) above the 1990 – 2020 mean.

Exhibit 38: Reported All-Time Temperature Records Broken or Tied in 2024



Data: Yale Climate Connections

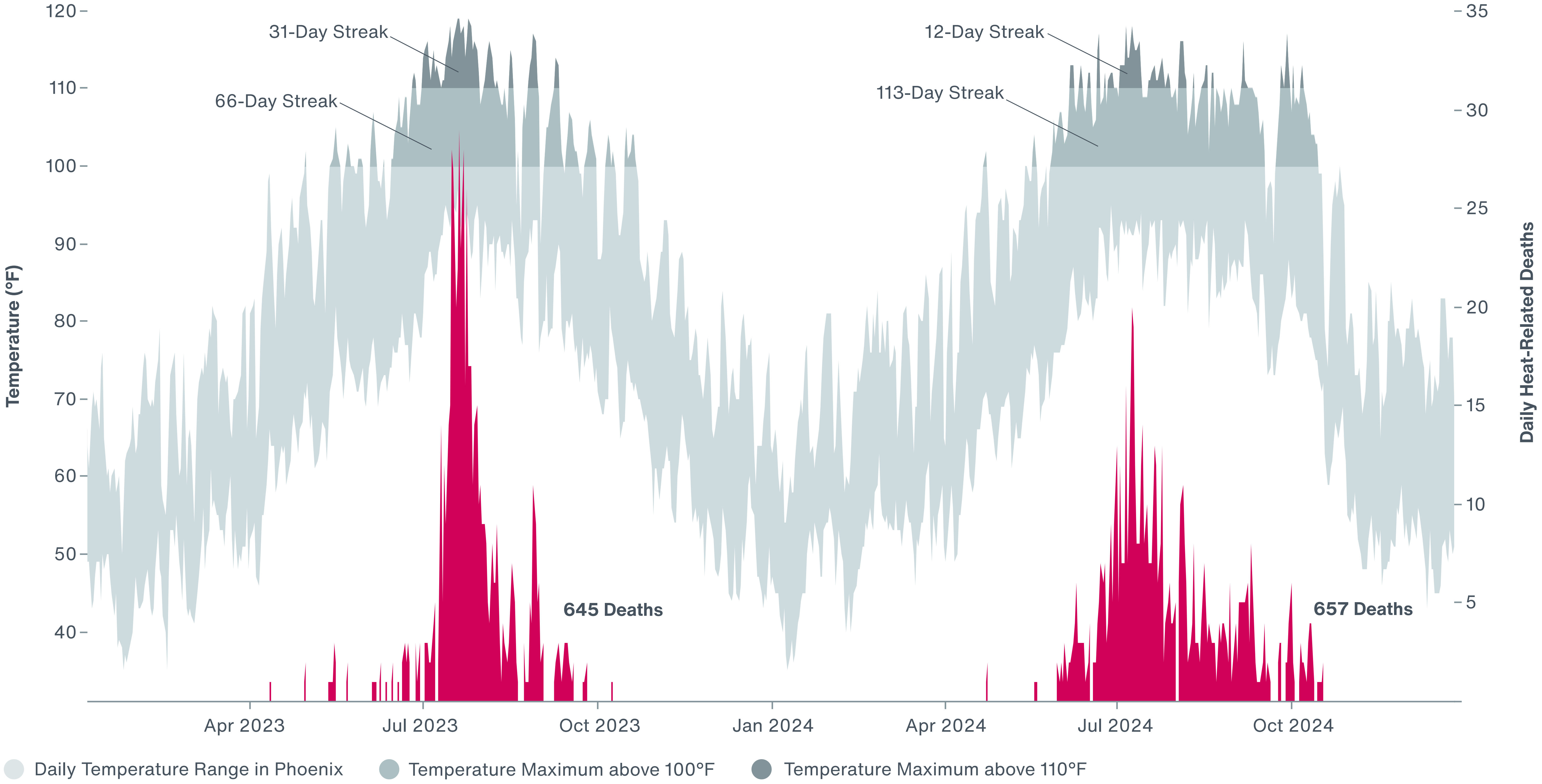
Multiple heatwaves across the world resulted in 20 countries or territories breaking or tying their all-time temperature records. The highest record of 52.0°C (125.6°F) was set at Tepache in Mexico on June 20, followed by Aswan in Egypt where temperatures exceeded 50.9°C (123.6°F). The third-hottest place was reported in Kayes in Mali with a temperature peaking at 48.5°C (119.3°F) (9).

In the EMEA region, all records were set in Africa between March and June, with Chad (48.0°C) being the hottest country after Egypt and Mali. In APAC, temperature records were set from February to June, with Laos recording the highest temperature (43.7°C). In the Americas, records were set for longer periods of the year, from March to October, with Bolivia (47.0°C) being the warmest country after Mexico.

Of all reported countries, Chad, Laos, Dominica and Saint Barthelmy recorded their temperature maximums for the second year in a row. Note that all records are subject to approval of the WMO, which acts as the official organization responsible for verifying the measured data.

Prolonged Extreme Heatwaves Increasingly Affect Human Health

Exhibit 39: Record-Breaking Streak of Extreme Temperatures Affecting Human Health in Maricopa County, Arizona



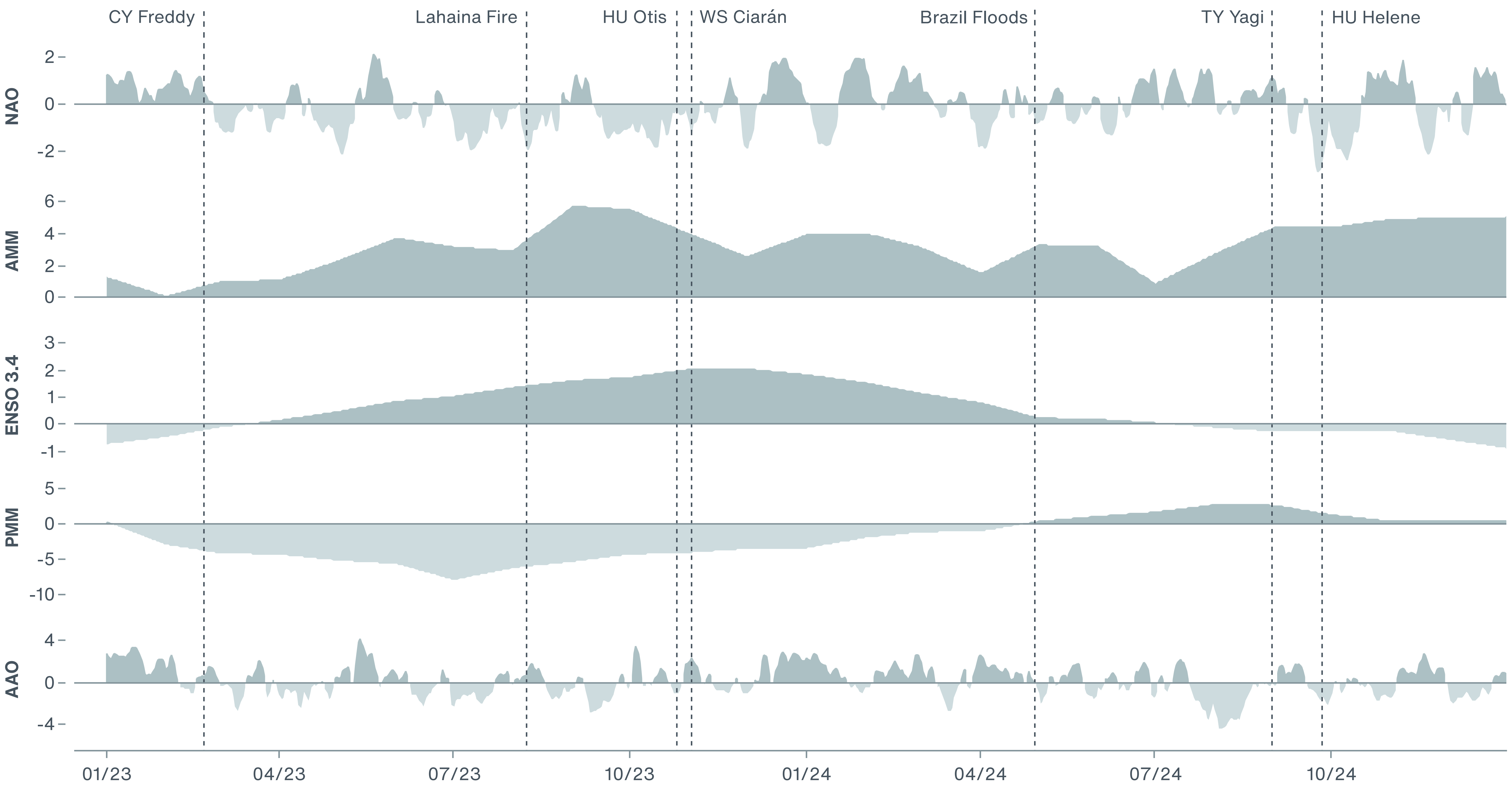
Data: Maricopa County Public Health Department, NCEI

The hottest year on record was marked by notable heatwaves and temperature extremes around the world. These risks are often overlooked when focusing primarily on material impacts of disasters. Tracking heat-related deaths also remains challenging, with many regions reporting incomplete figures.

Maricopa County, Arizona, is one example of how to adequately assess and visualize heatwave impacts, at least on the regional level. According to the preliminary data provided by the local Department of Public Health, up to 657 people died (466 cases confirmed, 191 under investigation) between April and November due to heat in 2024. The number of fatalities increased by 12 compared to the same period in 2023 when a record-breaking streak of maximum temperatures above 110°F (43.3°C), together with extreme nighttime temperatures, resulted in high daily mortality in the area. This year saw a 113-day streak of temperatures at or above 100°F (37.8°C) from late May to early September, compared to 66 days in 2023. While 2024's heatwave was less intense, it lasted much longer. This aligns with expectations that climate change will extend the duration of heatwaves (10).

Observing 2023 – 2024 Events Through Climate Oscillations

Exhibit 40: Climate Oscillation Indices and Selected Catastrophes in 2023 and 2024



Data: NOAA

Weather-related catastrophe events occur in a complex climate system influenced by natural variability. This is why it is important to understand climate oscillations: so that society can better predict the frequency and severity of devastating events in the future.

Climate oscillations refer to semi-periodic changes in weather parameters, such as air and sea temperature, and atmospheric pressure between two or more regions, which can lead to a specific atmospheric circulation, and therefore recurring weather patterns.

There are dozens of these oscillations, some of which have a greater impact than others. Some oscillations also occur more frequently, but others may recur only every few months, with each phase also lasting a different time period. Climate is very complex, and it is therefore extremely difficult to define one or more oscillations as a precursor for specific weather events.

Placing the most disastrous events of 2024 in the context of climate oscillations shows that hurricanes Milton and Helene occurred during the transition from El Niño to La Niña **(ENSO)**, which generally favors more hurricanes in the Atlantic. This is due to weaker vertical wind shear and trade winds, making the atmosphere less stable (11).

One of the implications of the El Niño phase is that sea surface temperatures (SST) increase in Eastern Pacific. Warm SST anomalies along the track of Hurricane Otis in 2023 were likely an important factor in its intensification (12).

The late 2024 hurricanes also occurred during a positive phase of the **Atlantic Meridional Mode**, which is associated with increased hurricane activity due to more heat in the tropical North Atlantic (which typically lasts several months), while the South Atlantic remains cooler (13).

Warmer water in the Western Pacific during a positive **Pacific Meridional Mode**, which represents north-south changes of temperature in the tropical Pacific, favors the modulation of hurricane activity in the East Pacific, as well as formation of typhoons in the West Pacific (14), like in the case of Typhoon Yagi.

Specific conditions set by this oscillation might have influenced the excessive drought that subsequently helped trigger the Lahaina Fire in Hawaii in 2023. Phase of this oscillation usually lasts from early winter to early summer.

Being an important driver of global cyclonic activity, the **Madden-Julian Oscillation** is a large-scale oscillation characterized by an eastward-moving disturbance of pressure that traverses the global tropics and returns to its initial position every 30 to 60 days (15). During its positive phase in 2024, less change in wind speed and more evaporation might have been associated with increased hurricane activity.

The **North Atlantic Oscillation** is considered a key weather indicator for Europe, representing the difference in air pressure between the Azores and Iceland. During the positive phase, low-pressure systems coming from the Atlantic toward Europe tend to be stronger (16). This generally leads to stormier conditions and more windstorm activity, as visible by the positive index throughout the 2023 – 24 season. The NAO phases can have variable length.

The **Antarctic Oscillation**, sometimes called the Southern Annular Mode, is another important driver of weather in the southern hemisphere. It is an oscillation characterized by the north-south movement of the westerly winds that encircle Antarctica (17). Modulating the weather as far as South America, the negative phase usually brings more drought to Australia and is likely linked to increased wildfire activity. This oscillation is highly irregular and usually lasts from weeks to months.

Tropical Cyclone Activity in 2024

Exhibit 41: 2024 Global Tropical Cyclone Activity by Basin Compared to Climatology

Basin	Named Storms		Hurricanes (Category 1+)		Major Hurricanes (Category 3+)	
	2024	Climo	2024	Climo	2024	Climo
North Atlantic	18	14	11	7	5	3
East Pacific	13	17	5	9	3	5
West Pacific	23	25	15	16	9	9
North Indian	4	5	1	2	0	1
Northern Hemisphere	**58**	**61**	**32**	**34**	**17**	**18**
Southern Pacific	4	10	1	5	0	2
South Indian	18	16	12	9	7	4
Southern Hemisphere	**22**	**26**	**13**	**14**	**7**	**6**
Totals	**80**	**87**	**45**	**48**	**24**	**24**

Compared to the 1991-2020 climatological average. TCs within all basins are classified based on the Saffir-Simpson hurricane wind scale. Southern Hemisphere statistics include full calendar year 2024 events.

Source: National Hurricane Center; Joint Typhoon Warning Center; Colorado State University

North Atlantic

As prominently advertised prior to June 1, the 2024 Atlantic hurricane season was officially labeled as “hyperactive” after reaching an Accumulated Cyclone Energy (ACE) mark of 162. This metric, commonly used to reflect overall storm activity for a given year, was well above the 1991 – 2020 average of 123. Despite the previously mentioned pause in activity during the seasonal peak, the number of named storms — 18; hurricanes — 11; and major hurricanes — 5; all surpassed their respective long-term averages.

The season began at a historic pace due to Hurricane Beryl, the earliest Category 5 storm on record in the Atlantic basin. Beryl devasted a number of Caribbean nations before making landfall in southern Texas, leaving billions of dollars in damage in its wake. In the two months following Beryl, only Hurricane Debby would end up generating billions in damages due to impacts in the U.S. and Canada. Hurricanes Ernesto and Francine were two other notable storms during this period.

During the second half of the season, the U.S. experienced back-to-back major disasters with hurricanes Helene and Milton. Remarkably, this meant the mainland U.S. saw five landfalling hurricanes in 2024, which is tied for the second-most landfalls in a season. Four of these storms hit the Southeast U.S., including three in Florida alone.

East Pacific

Tropical cyclone activity in the Eastern Pacific basin was below average overall. With 13 named storms, five hurricanes and three major hurricanes, each metric fell below their respective 1991 – 2020 climatological averages. The lack of vigorous tropical cyclone activity also led to an aggregate ACE index value of 82, exactly half of last year's ACE — 164. Bolstering the below-average activity theme in the basin was the lack of any named storm for nearly the first two months of the season. In fact, the first tropical system (Aletta) formed on July 4, which was the latest first named storm ever for the basin in the satellite era (since 1966).

Despite low activity overall, the 2024 season still featured multiple notable storms. Hurricane Kristy was the strongest Pacific tropical cyclone with peak winds of 160 mph (260 kph). While Kristy did not affect land, it was the only Category 5 storm in the basin this year. Hurricane Gilma was the only other hurricane to reach at least Category 4 intensity.

The most destructive system, by far, in the eastern Pacific was Hurricane John. Much of western Mexico, especially the state of Guerrero, saw extensive rainfall over multiple days after John made two landfalls. Notably, the city of Acupaluco was impacted less than a year after the devastating impacts from Hurricane Otis.

West Pacific

The 2024 Western Pacific season was fairly in line with most of its climatological average metrics. Compared to 2023, this year saw an increase in the number of named storms — 23; hurricanes — 15; and major hurricanes — nine. However, this year's ACE value of approximately 210 was far below the long-term average of 301.

Typhoon Yagi proved to be the Western Pacific's most destructive storm in 2024. Much of Southeast Asia, especially Vietnam, China, Myanmar and Thailand, suffered extensive damage. In fact, Yagi now ranks as the costliest typhoon on record in Vietnam with over $3 billion in economic losses. Over 800 people were killed and thousands more were injured across several countries.

The Philippines experienced a very active season as roughly a dozen tropical systems impacted the nation. Remarkably, half of these storms affected Luzon Island alone within just a 30-day span between late October and mid-November. Five of these storms (Trami, Yinxing, Toraji, Usagi, and Man-yi) made landfall while another (Kong-Rey) brushed the island with strong winds and storm surge.

The Western Pacific basin also saw two other destructive typhoons. Gaemi made direct landfall over Taiwan and China while enhancing monsoon rains in the Philippines, while Shanshan impacted much of southern Japan.

North Indian Ocean

Despite no cyclones reaching at least Category 3-equivalent intensity, the 2024 North Indian Ocean season saw near-average cyclone activity overall with four named storms. The strongest of these storms, Cyclone Remal, generated large material losses in Bangladesh and India's West Bengal state. Other notable storms include cyclones Asna, Dana, and Fengal.

Southern Hemisphere

Overall tropical cyclone activity in the southern hemisphere, outside of the Southern Pacific Ocean basin, was near- or above-average. While Australia and Oceania did not experience any major storms in 2024, a number of strong tropical cyclones did impact parts of Eastern Africa. Notably, Cyclone Chido caused widespread devastation across Mayotte, Comoros, Mozambique, and a number of other countries. In fact, Chido is considered the strongest cyclone to impact the island of Mayotte in nearly a century. Tropical Cyclone Belal was another strong storm in the southern hemisphere, causing damage across the island nations of Reunion and Mauritius.

Atlantic Ocean

- Five hurricanes made landfall in the mainland U.S. in 2024, which is tied with 1893, 2004 and 2005 for the second-most landfalling hurricanes in a season.
- After Helene's landfall in September, eight Category 4-plus hurricanes have now made landfall in the U.S. (by states and territories) in the past eight years (2017 – 2024). All but one of these storms (Maria in 2017) have struck the U.S. mainland.
- Hurricane Helene is now the strongest storm ever to make landfall in Florida's Big Bend region, a mark previously held by Hurricane Idalia (2023).
- Hurricane Beryl became the earliest Category 5 hurricane on record within the Atlantic Basin, reaching peak winds of 165 mph (265 kph) by July 2nd.
- Hurricane Milton was the fifth-strongest hurricane ever in the Atlantic by minimum central pressure (897 mb). Milton also exhibited the third-largest 24-hour rapid intensification for the Atlantic basin after strengthening by 95 mph (153 kph).
- Hurricanes Beryl and Milton both produced prolific tornado outbreak. At least 65 tornadoes were attributed to Beryl, while Florida experienced its largest single-day tornado outbreak ever (46) due to Milton.
- Seven hurricanes formed after September 25, which is the most on record for this late part of the Atlantic hurricane season.
- Hurricane Rafael is the second major hurricane ever recorded in November in the Gulf of Mexico, joining Hurricane Kate (1985).
- The season's first named storm, Tropical Storm Alberto, formed in the western Gulf of Mexico on June 19, setting the slowest start to hurricane season since 2014.
- Hurricanes Kirk, Leslie and Milton in early October marked the first time with three simultaneously active hurricanes in the basin after September.

Pacific Ocean

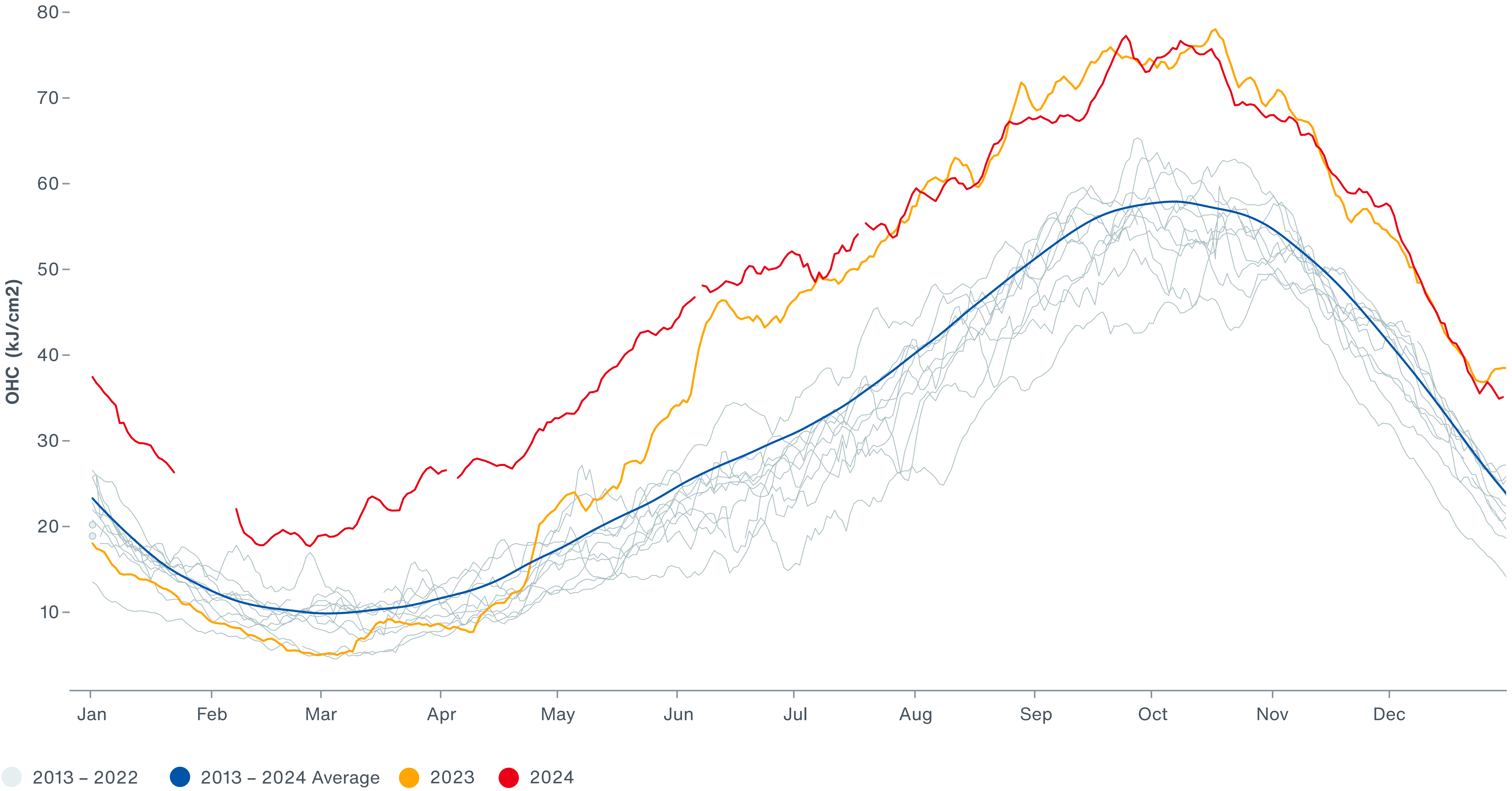
- Luzon Island in the Northern Philippines was struck by four typhoons and one tropical storm in the span of 30 days in October and November of 2024.
- Typhoon Yagi and its remnants caused extreme devastation across Southeast Asia in early September 2024. Over 800 people were killed, primarily across Northern Vietnam and Myanmar.
- Hurricane John produced nearly four days of continuous rainfall over portions of Mexico's Guerrero state, with the highest rain totals exceeding 1,400 mm (55 inches).
- Hurricane Hone was the first tropical cyclone to develop in the central Pacific basin in nearly five years, since Tropical Storm Ema (2019).
- The first tropical system, Aletta, formed on July 4, and became the latest first named storm ever for the eastern Pacific basin in the satellite era (since 1966).
- Hurricane Kristy, the strongest storm of the season, became the first Category 5 hurricane to occur in non-El Niño conditions since Hurricane Celia (2010).

Indian Ocean

- Cyclone Chico, a Category-4 equivalent storm, is the most powerful cyclone to make landfall on the island of Mayotte in nearly a century.

Atlantic Hurricane Season Ends as Hyperactive After a Slow Start

Exhibit 42: Oceanic Heat Content in the Main Development Region*



Data: Brian McNoldy (Upper Ocean Dynamics Laboratory, University of Miami – Rosenstiel School)

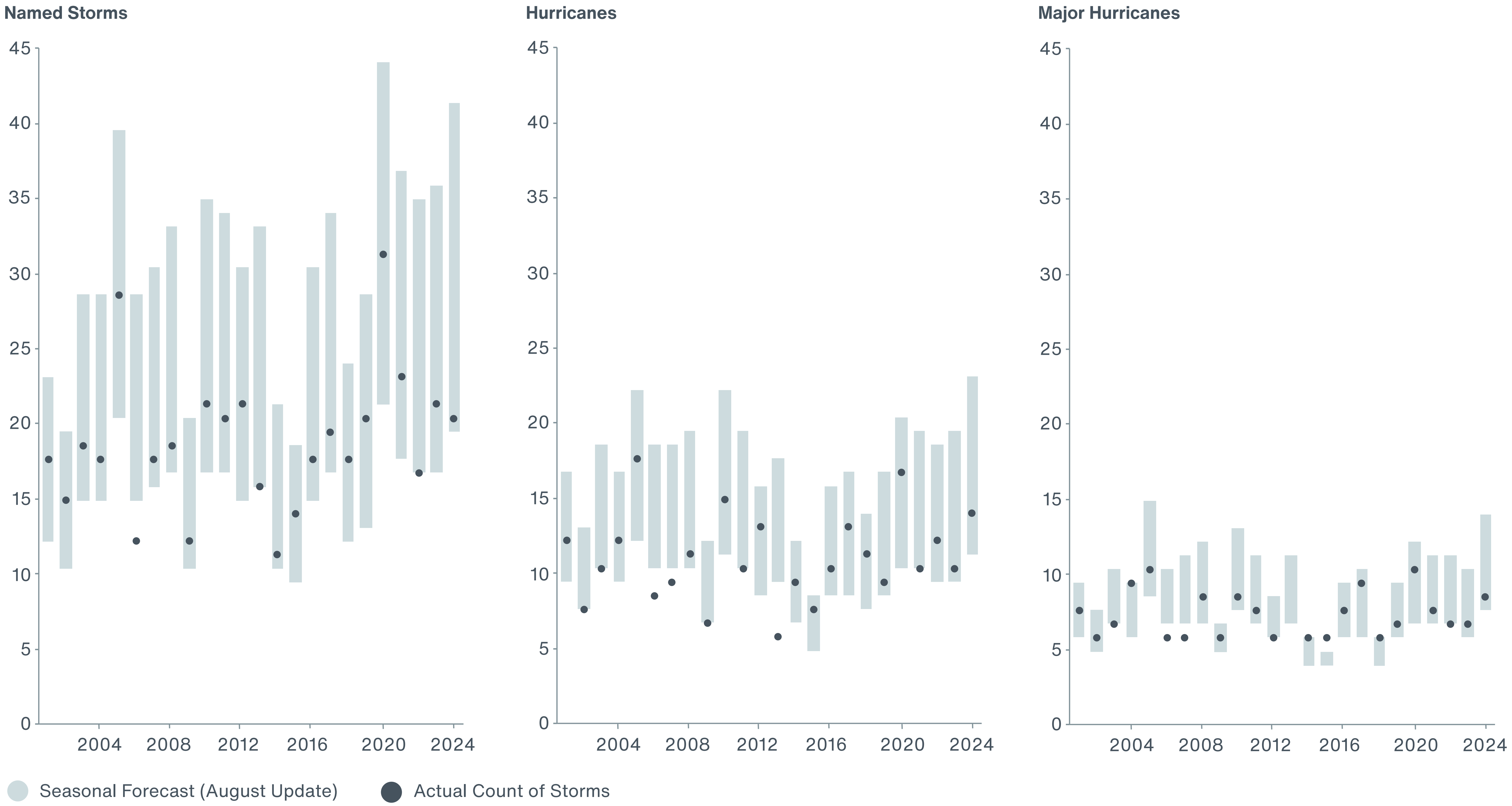
*Main Development Region is designated as the region of the Atlantic Ocean between 10°N – 20°N and 20°W – 85°W

Prior to the start of every Atlantic hurricane season, which officially runs from June 1 to November 30, a number of different science and meteorological agencies produce forecasts of hurricane activity for the upcoming season. Many of these well-renowned agencies, including the National Oceanic and Atmospheric Administration (NOAA) and Colorado State University (CSU), will also update their initial predictions through the middle of the season based on evolving circumstances.

Remarkably, virtually all of the most prominent Atlantic hurricane forecasts, both prior to and during the season, consistently and explicitly called for well-above-average hurricane activity. Most agencies predicted over 20 named storms, over 10 hurricanes, and at least five major (Category 3-plus hurricanes. These figures far exceeded their 1991 – 2020 averages of 14 named storms, seven hurricanes and three major hurricanes.

The basis for these aggressive forecasts was primarily driven by two important factors. Near-record high sea-surface temperatures (SST) over much of the Atlantic meant exceptionally high oceanic heat content, or ample fuel for tropical cyclones to develop and intensify.
The other factor, a predicted ENSO phase transition to La Niña, meant that Atlantic storms were less likely to encounter strong wind shear, an atmospheric parameter detrimental to tropical cyclones.

Exhibit 43: Atlantic Hurricane Seasonal Forecast by NOAA Versus Reality



Data: NOAA

After much anticipation, the 2024 Atlantic hurricane season eventually proved an above-average season. After a fierce start to the season with Category 5 Hurricane Beryl, a surprising pattern emerged.

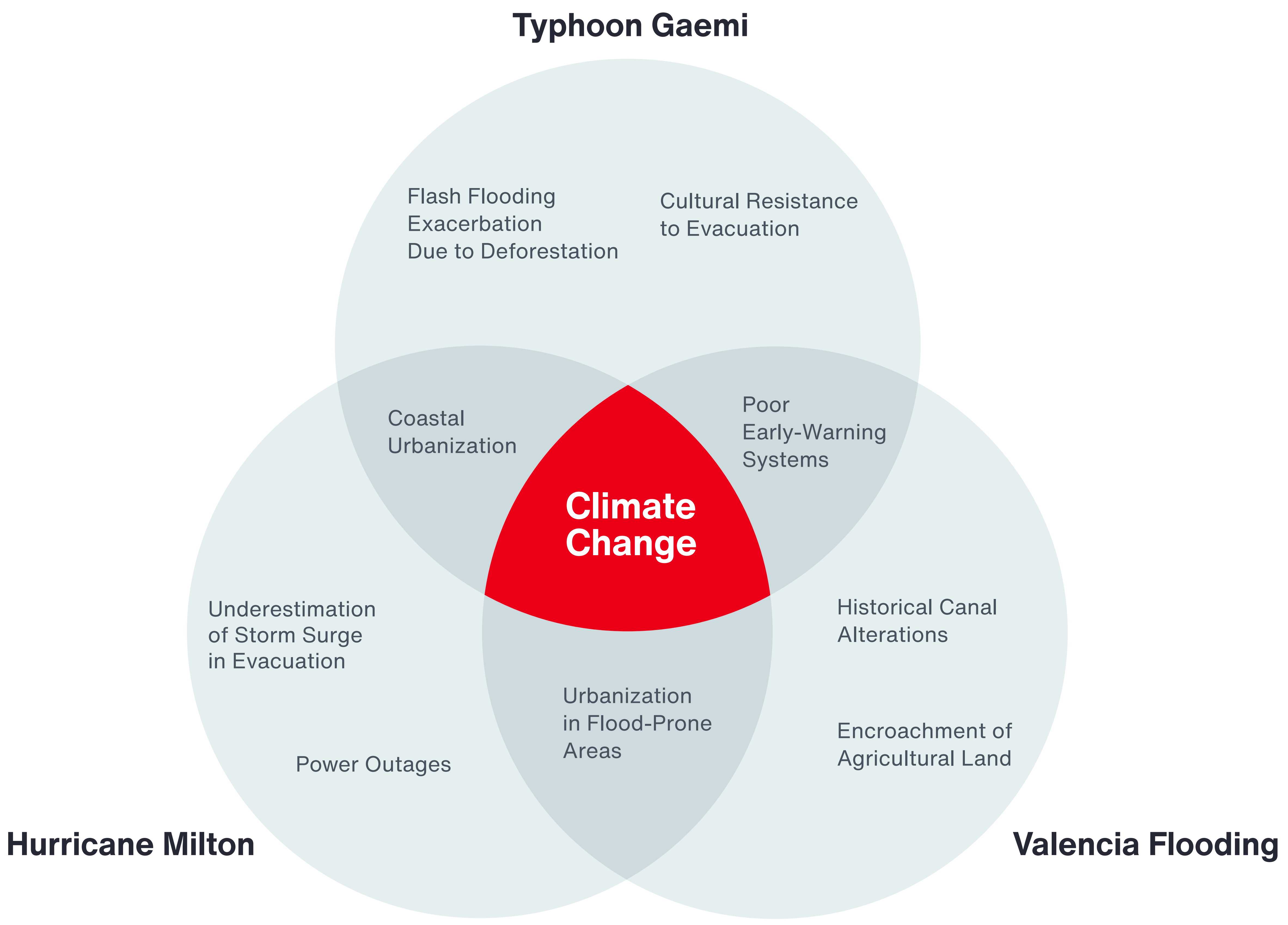
Tropical cyclone activity paused in late August to mid-September, a period considered the seasonal peak. Despite near-record warm ocean temperatures and cooler ENSO-neutral conditions, other factors reduced hurricane activity.

The African monsoon, which often seeds hurricane formation, progressed further north than normal across the Sahara Desert. It pulled dry air into the Atlantic and fueled high wind shear that hindered tropical development. The Madden-Julian Oscillation briefly promoted stable, sinking air over the Atlantic Ocean. This opposes the ascending, unstable air motions necessary for thunderstorms within a hurricane. An increase in upper-air temperatures across the Atlantic also hindered air ascent.

A hyperactive season finally began with Hurricane Helene in late September. The factors that initially limited tropical cyclone development soon reversed and aided storm formation. The complex interactions of these large-scale climate features highlight the difficulty in creating seasonal hurricane forecasts.

Climate Attribution Studies Emphasize the Role of Adaptation

Exhibit 44: Showcasing the Individual and Shared Vulnerability Factors Between Case Studies



Attribution studies are now increasingly performed to help answer questions around the increased likelihood of a disaster event with the influence of climate change. However, it is important to note that many other factors that contribute to an event's severity are highlighted by these studies and often considered equally important.

For example, the total loss from Hurricane Milton might have been compounded by disruption of port terminals and power outages (18), as well as over-reliance on traditional evacuation zones in some areas that did not account for the rapid storm surge (19). Some damage was also related to urban expansion in coastal areas, as was the case in the Philippines during Typhoon Gaemi, where previous deforestation (20), and possibly even general reluctance of the local population to evacuate, might have led to greater impacts. The areas affected by the typhoon also suffered from underdeveloped early warning systems, as did the Valencian region during the October floods (21). The damage in this Spanish province was also exacerbated by changes in land use and ineffective water channel improvements (22). Lastly, rapid urbanization in flood-prone areas were a damage factor in Valencia and in the U.S. during Hurricane Milton.

In conclusion, while climate change plays a significant role, there are many man-made factors that contribute to overall damage and should be considered in adaptation efforts.

Appendices

Appendix A: 2024 Global Disasters

Footnote: The list below includes notable global events that meet, or are expected to meet, at least one of the following criteria to be classified as a natural disaster in Aon's Catastrophe Insight Database: **$50+ million in economic loss, $25+ million in insured losses, 10+ fatalities, 50+ injured, or 2,000+ structures damaged or claims filed.** Economic losses provided here are inflation-adjusted (using the US CPI), rounded to tens and are subject to future development.

United States (1/5)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
01/01 – 12/31	Drought	United States	N/A	7,000
01/08 – 01/10	Severe Convective Storm	Nationwide	5	2,850
01/10 – 01/14	Winter Weather	Nationwide	0	1,750
01/12 – 01/15	Winter Weather	West	7	1,750
01/12 – 01/21	Winter Weather	Southeast, Plain, Midwest	73	1,850
01/16 – 01/18	Winter Weather	West	6	670
01/19 – 01/23	Flooding	West	5	510
01/22 – 01/28	Flooding	Nationwide	0	720
01/31 – 02/01	Flooding	West	0	150
02/04 – 02/06	Flooding	California	9	1,100
02/08 – 02/13	Severe Convective Storm	Midwest, Southeast	1	1,300
02/17 – 02/21	Flooding	California	0	150
02/26 – 02/29	Severe Convective Storm	Nationwide	0	1,650

United States (2/5)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
02/26 – 03/09	Wildfire	Texas	2	610
02/28 – 03/04	Winter Weather	West	2	200
03/07 – 03/11	Severe Convective Storm	Southwest, Midwest	0	760
03/11 – 03/15	Winter Weather	California, Colorado	0	150
03/12 – 03/16	Severe Convective Storm	Northeast	3	5,950
03/21 – 03/23	Severe Convective Storm	Nationwide	0	660
03/23 – 03/27	Severe Convective Storm	California, Southeast	2	250
03/29 – 04/05	Severe Convective Storm	California, Midwest	5	2,650
04/06 – 04/12	Severe Convective Storm	Nationwide	1	2,700
04/14 – 04/16	Severe Convective Storm	Pennsylvania, Virginia	0	150
04/15 – 04/16	Severe Convective Storm	Texas, Missouri	0	150
04/17 – 04/20	Severe Convective Storm	Southeast	0	1,000
04/18 – 10/31	Heatwave	Arizona	657	N/A
04/19 – 04/21	Severe Convective Storm	Texas	0	400
04/25 – 04/29	Severe Convective Storm	Midwest, Southwest	5	2,200
04/30 – 05/02	Severe Convective Storm	Kansas, Oklahoma, Texas	4	500
05/03 – 05/05	Severe Convective Storm	Texas	0	600

United States (3/5)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
05/06 – 05/10	Severe Convective Storm	Nationwide	6	6,650
05/11 – 05/14	Severe Convective Storm	Southwest, Southeast	4	1,250
05/15 – 05/17	Severe Convective Storm	Southwest, Southeast	8	1,900
05/17 – 05/22	Severe Convective Storm	Nationwide	5	4,950
05/23 – 05/24	Severe Convective Storm	Midwest, Southwest	0	800
05/25 – 05/26	Severe Convective Storm	Nationwide	26	4,500
05/27 – 05/29	Severe Convective Storm	Southwest	2	3,250
05/30 – 06/01	Severe Convective Storm	Southwest, Southeast	2	3,200
06/02 – 06/05	Severe Convective Storm	Nationwide	1	700
06/06 – 06/10	Severe Convective Storm	Nationwide	0	800
06/08 – 06/10	Severe Convective Storm	Colorado	0	200
06/11 – 06/15	Flooding	Florida	2	400
06/12 – 06/13	Severe Convective Storm	Midwest, Southwest	0	1,000
06/14 – 06/18	Severe Convective Storm	Nationwide	0	250
06/17 – 06/27	Wildfire	New Mexico	2	1,500
06/19 – 06/20	Tropical Storm Alberto	Texas	0	150
06/19 – 06/23	Severe Convective Storm	Nationwide	0	900

United States (4/5)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
06/20 – 06/23	Flooding	Minnesota, Iowa, South Dakota	2	500
06/25 – 06/26	Severe Convective Storm	Nationwide	3	1,750
06/27 – 06/30	Severe Convective Storm	Nationwide	1	550
07/01 – 07/04	Severe Convective Storm	Southwest, Midwest	0	200
07/01 – 07/11	Hurricane Beryl	Nationwide	45	7,000
07/02 – 07/17	Heatwave	California, Oregon	28	N/A
07/06 – 07/07	Severe Convective Storm	Colorado, Iowa, Kansas	0	200
07/13 – 07/18	Severe Convective Storm	Nationwide	5	2,750
07/14 – 07/15	Severe Convective Storm	Arizona	0	200
07/19 – 07/20	Severe Convective Storm	Plains	0	250
07/20 – 07/24	Severe Convective Storm	Southeast	0	300
07/21 – 07/25	Severe Convective Storm	Arizona, California	0	250
07/24 – 08/01	Severe Convective Storm	Nationwide	0	1,100
07/24 – 08/20	Wildfire	California	0	650
08/01 – 08/03	Severe Convective Storm	Northeast, Southeast	0	250
08/03 – 08/05	Severe Convective Storm	Minnesota	0	130

United States (5/5)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
08/03 – 08/11	Hurricane Debby	Southeast	6	3,200
08/04 – 08/06	Severe Convective Storm	Northeast	0	950
08/12 – 08/19	Severe Convective Storm	Nationwide	0	1,200
08/17 – 08/19	Flooding	Connecticut	2	100
08/22 – 08/30	Severe Convective Storm	Nationwide	0	1,250
09/01 – 09/03	Severe Convective Storm	Texas	0	130
09/01 – 09/05	Flooding	Florida	0	200
09/10 – 09/15	Hurricane Francine	Southeast	0	950
09/15 – 09/16	Potential Tropical Cyclone No. 8	Carolinas	0	130
09/21 – 09/24	Severe Convective Storm	Midwest, Plains	0	950
09/25 – 09/28	Hurricane Helene	Southeast	243	75,000
10/08 – 10/11	Hurricane Milton	Florida	32	35,000
10/18 – 10/20	Flooding	New Mexico	2	300
11/02 – 11/05	Severe Convective Storm	Oklahoma, Montana, Arkansas	5	800
11/06 – 11/15	Wildfire	California	0	550
11/19 – 11/24	Flooding	California, Oregon, Washington	4	750
12/13 - 12/16	Severe Convective Storm	California, Oregon, Washington	0	200
12/26 - 12/29	Severe Convective Storm	Southeast	4	750

North America (non-U.S.) (1/2)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
01/12 – 01/21	Winter Weather	Canada	0	250
03/01 – 05/31	Heatwaves	Mexico	155	N/A
04/02 – 04/05	Severe Convective Storm	Canada	0	50
04/11 – 04/13	Severe Convective Storm	Canada	0	30
05/03	Landslide	Haiti	13	Negligible
05/15 – 05/31	Wildfire	Guatemala, Belize	0	Millions
05/16	Severe Convective Storm	Canada	0	60
05/21	Severe Convective Storm	Haiti	0	Millions
05/22	Severe Convective Storm	Mexico	9	Unknown
06/11 – 06/21	Flooding	Central America	24	Millions
06/14 – 06/18	Severe Convective Storm	Canada	0	40
06/19 – 06/20	Tropical Storm Alberto	Mexico	4	140
06/23	Severe Convective Storm	Canada	0	130
07/01 – 07/11	Hurricane Beryl	Caribbean, Mexico, Canada	25	640
07/15 – 07/16	Flooding	Canada	0	1,000
07/22 – 08/17	Wildfire	Canada	1	1,150

North America (Non-U.S.) (2/2)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
08/05 – 08/06	Severe Convective Storm	Canada	0	2,700
08/08 – 08/11	Remnants of Hurricane Debby	Canada	0	3,000
08/13 – 08/15	Hurricane Ernesto	Puerto Rico, Virgin Islands	0	520
08/17 – 08/19	Flooding	Canada	0	180
09/24 – 09/27	Hurricane John	Mexico	24	250
09/25 – 09/28	Hurricane Helene	Cuba, Mexico	0	Unknown
10/08 – 10/11	Hurricane Milton	Mexico	3	Unknown
10/18 – 10/20	Flooding	Canada	3	110
10/19 – 10/21	Hurricane Oscar	Cuba	7	50
11/03 – 11/06	Hurricane Rafael	Caribbean	8	330
11/10 – 11/18	Tropical Storm Sara	Caribbean, Central America	12	Millions
12/20 – 12/28	Flooding	Haiti	13	Unknown

South America (1/2)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
01/01 – 03/31	Flooding, Landslides	Bolivia	52	50
01/01 – 09/30	Wildfire	Brazil	0	180
01/01 – 12/31	Drought	Brazil	N/A	6,050
01/12	Landslide	Colombia	37	Negligible
01/13 – 01/14	Flooding	Brazil	12	120
01/16 – 01/18	Flooding	Brazil	0	20
01/29 – 02/29	Flooding, Landslides	Ecuador	8	100
02/02 – 02/09	Wildfire	Chile	131	1,000
02/21 – 03/02	Flooding	Brazil, Peru, Bolivia	2	190
03/01	Flooding	Brazil	0	80
03/21	Severe Convective Storm	Brazil	0	20
03/22 – 03/26	Flooding	Brazil	27	140
04/28 – 05/03	Flooding	Brazil	182	5,050
06/10 – 06/16	Severe Convective Storm	Chile	1	540

South America (2/2)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
06/14 – 06/17	Flooding	Ecuador	19	Unknown
07/01 – 09/30	Wildfire	Peru	21	190
08/24 – 08/30	Wildfire	Brazil	2	180
11/03 – 11/06	Hurricane Rafael	Colombia	1	150

Europe (1/4)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
01/01 – 03/31	Drought	Spain	N/A	110
01/02 – 01/04	Windstorm Henk	Western, Central Europe	3	560
01/17	Winter Weather	France, Germany, Czech Republic	0	Unknown
01/21 – 01/22	Windstorm Isha	Western, Central Europe	4	250
01/23 – 01/24	Windstorm Jocelyn	Western, Central Europe	1	240
01/31 – 02/01	Windstorm Ingunn	Norway	0	70
02/22 – 02/23	Windstorm Louis	Western, Northern Europe	1	430
03/01 – 09/30	Drought	Serbia	N/A	550
03/01 – 09/30	Drought	Italy	N/A	2,950
03/08 – 03/11	Flooding, Winter Weather	Southern, Western Europe	13	20
03/27 – 03/28	Windstorm Nelson	Western Europe	4	110
03/30 – 04/04	Flooding, SCS	Western, Central, Eastern Europe	7	50
04/06 – 04/10	WS Kathleen, WS Pierrick	Western Europe	2	30
04/15 – 04/16	Windstorm Renata	Western, Central Europe	0	30
04/18 – 04/24	Winter Weather	Western, Central Europe	0	820

Europe (2/4)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
05/14 – 05/17	Severe Convective Storm	Western, Central Europe	0	170
05/15 – 05/17	Flooding	Italy	1	380
05/17 – 05/18	Flooding	Germany, France, Belgium	0	550
05/19 – 05/20	Severe Convective Storm	Central Europe	0	20
05/19 – 05/22	Severe Convective Storm	Central, Southeastern Europe	1	30
05/27 – 05/28	Severe Convective Storm	Central Europe	0	30
06/01 – 06/07	Flooding	Germany	6	4,500
06/04	Flooding	Poland	0	20
06/06 – 06/10	Severe Convective Storm	Central Europe	2	660
06/10 – 06/12	Flooding	Spain	0	80
06/17 – 06/20	Severe Convective Storm	Central, Western Europe	1	490
06/21 – 06/23	SCS, Flooding	Central, Southeastern Europe	3	170
06/25 – 06/28	Severe Convective Storm	Central Europe	0	420
06/28 – 07/02	Severe Convective Storm	Central, Western Europe	9	360
07/06 – 07/08	Severe Convective Storm	Central, Western Europe	0	50
07/09 – 07/11	Severe Convective Storm	Central Europe	3	290
07/10 – 07/20	Heatwave	Greece, Italy	1,900	N/A

Europe (3/4)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
07/11 – 07/14	Severe Convective Storm	Europe	3	1,550
07/15 – 07/17	Severe Convective Storm	Europe	0	50
07/19 – 07/22	Severe Convective Storm	Europe	0	50
07/28 – 07/29	Windstorm Kirsti	Northern, Central Europe	2	10
07/31 – 08/03	Severe Convective Storm	Western, Central Europe	0	130
08/01 – 08/31	Drought	Austria	N/A	160
08/07	Severe Convective Storm	Central, Southern Europe	1	230
08/11 – 08/16	Wildfire	Greece	0	60
08/12 – 08/14	Severe Convective Storm	Western, Central Europe	0	830
08/23 – 08/24	Windstorm Lilian	Northern, Western Europe	0	30
08/26 – 08/28	Severe Convective Storm	Italy	0	110
09/02 - 09/05	Flooding	Western Europe	2	110
09/12 – 09/16	Flooding	Central, Southeastern Europe	29	7,500
09/13 – 09/30	Wildfire	Portugal	9	10
09/17 – 09/19	Flooding	Italy	1	150
10/02 – 10/04	Flooding	Bosnia and Herzegovina	24	10
10/09 – 10/10	Windstorm Ex-Kirk	Western Europe	1	110

Europe (4/4)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
10/17 – 10/21	Flooding	France, Italy	1	540
10/20 – 10/22	Windstorm Ashley	Ireland, United Kingdom, Norway	0	50
10/27 – 10/30	Flooding	Spain	231	16,100
10/31 – 11/02	Windstorm Jakob	Northern Europe	0	10
11/13	Flooding	Spain	0	50
11/23 – 11/25	Windstorm Bert	Western Europe	5	50
11/27	Windstorm Conall	Netherlands	1	50
12/06 – 12/08	Windstorm Darragh	Western Europe	4	320
12/30 - 12/31	Flooding	United Kingdom	0	150

Middle East (1/1)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
02/12 – 02/13	Flooding, SCS	United Arab Emirates, Oman	6	100
04/08 – 04/17	Flooding, SCS	Middle East	34	5,250
04/16 – 04/24	Flooding	Iran	10	Unknown
06/01 – 06/20	Heatwave	Saudi Arabia	1,300	N/A
06/18	Earthquake	Iran	4	Millions
08/01 – 08/15	Flooding	Yemen	57	Unknown
09/30	Flooding	Iran	15	Negligible
10/16	Earthquake	Turkey	0	Millions
12/14	Dust Storm	Iran, Iraq	0	Negligible

Africa (1/2)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
01/01 – 01/02	Tropical Storm Alvaro	Madagascar	19	Millions
01/07 – 01/20	Flooding	South Africa	41	Millions
01/11 – 01/20	Flooding	Congo, DRC	240	Millions
01/13	Landslide	Tanzania	22	Negligible
01/14 – 01/16	Tropical Storm Belal	Réunion, Mauritius	6	570
03/20 – 04/30	Flooding	Eastern Africa	576	90
03/26 – 03/29	Cyclone Gamane	Madagascar	19	50
04/13	Landslide	DRC	15	Negligible
06/01 – 06/03	Flooding	South Africa	22	Unknown
06/01 – 09/30	Flooding	Sudan	64	Unknown
06/01 – 09/30	Flooding	Niger	265	Unknown
06/01 – 09/30	Flooding	Senegal, Burkina Faso, Central African Republic	9	Unknown
06/04 – 06/06	Flooding	Algeria	15	Unknown
06/15 – 06/25	Flooding, Landslides	Ivory Coast	24	Negligible
07/01 – 09/30	Flooding	Nigeria	281	Unknown
07/04 – 07/12	Severe Convective Storm	South Africa	0	Millions
07/07 – 07/13	Winter Weather	South Africa	0	30

Africa (2/2)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
07/20 – 07/25	Heatwave	Morocco	21	N/A
07/21 – 07/22	Landslides, Flooding	Ethiopia	257	Negligible
07/29 – 07/30	Flooding	Guinea	0	Unknown
08/01 – 09/30	Flooding	Chad	576	Unknown
08/01 – 09/30	Flooding	Cameroon	38	Unknown
08/05	Landslide	Ethiopia	13	Negligible
08/09	Landslide	Uganda	35	Negligible
08/25	Flooding	Sudan	148	Unknown
09/01 – 09/16	Flooding	Mali	62	Unknown
09/06 – 09/09	Flooding	Morocco, Algeria	23	Unknown
09/08	Flooding	Nigeria	30	Unknown
10/21 – 10/25	Flooding	South Africa	10	Unknown
11/02	Severe Convective Storm	Uganda	14	Negligible
11/12	Landslide	Madagascar	16	Negligible
11/22	Landslide	DRC	11	Negligible
11/27 – 12/05	Landslide, Flooding	Kenya, Uganda	40	Unknown
12/01 – 12/10	Flooding	Malawi	11	Unknown
12/13 – 12/16	Cyclone Chido	Southeastern Africa	172	2,000

Asia (1/6)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
01/01	Earthquake	Japan	489	18,000
01/01 – 03/31	Winter Weather	China	0	430
01/01 – 09/30	Drought	China	N/A	970
01/01 – 05/31	Drought	Philippines	N/A	170
01/01 – 06/30	Drought	Vietnam	N/A	10
01/01 – 05/31	Drought	Philippines	N/A	165
01/14 – 01/22	Flooding	Philippines	18	Millions
01/17	Winter Weather	China	28	Negligible
01/19 – 01/23	Winter Weather	China	0	370
01/22	Earthquake	China, Kazakhstan	3	430
01/22	Landslide	China	44	Millions
01/22 – 02/03	Flooding	Philippines	22	70
01/24 – 02/09	Flooding	Indonesia	4	Millions
02/04 – 02/08	Winter Weather	China, Japan	11	2,600
02/06	Landslide	Philippines	98	Negligible
02/18 – 02/19	Avalanche	Afghanistan	27	Negligible

Asia (2/6)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
02/27 – 03/04	Flooding, Winter Weather	Pakistan, Afghanistan, Iran	105	Millions
03/01 – 03/19	Flooding	Indonesia	59	20
03/01 – 06/30	Heatwave	India	733	N/A
03/22	Earthquake	Indonesia	0	40
03/23 – 03/29	Flooding	India	6	Unknown
03/25	Severe Convective Storm	China	0	80
03/31	Severe Convective Storm	China	7	80
03/31	Severe Convective Storm	India	5	10
03/31 – 04/03	Severe Convective Storm	Pakistan	10	Unknown
04/01 – 04/30	Severe Convective Storm	China	12	310
04/01 – 04/10	Flooding	Russia, Kazakhstan	10	650
04/01 – 09/30	Heatwave	Japan	252	N/A
04/03	Earthquake	Taiwan	18	880
04/08 – 04/17	Flooding	Afghanistan, Pakistan	207	Unknown
04/13	Landslide	Indonesia	20	Negligible
04/16	Severe Convective Storm	Japan	0	440
04/19 – 04/25	Flooding	China	24	1,650

Asia (3/6)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
04/20 – 05/05	Heatwave	Southeastern Asia	1,571	N/A
04/25 – 04/26	Landslide	Indonesia	12	Negligible
04/27	Earthquake	Indonesia	0	10
04/28 – 04/29	Flooding	Pakistan	17	Unknown
04/30 – 05/01	Severe Convective Storm	Vietnam	1	10
05/01	Flooding	China	48	Millions
05/01 – 05/31	Flooding	China	3	170
05/01 – 05/31	Severe Convective Storm	China	13	140
05/03 – 05/05	Flooding	Indonesia	12	Unknown
05/05	Severe Convective Storm	India	1	Millions
05/10 – 05/11	Flooding	Afghanistan	347	Unknown
05/10 – 05/13	Severe Convective Storm	India	17	Unknown
05/10 – 05/15	Severe Convective Storm	Sri Lanka	10	Unknown
05/11	Landslide	Indonesia	67	Millions
05/14 – 05/15	Sand Storm	China	0	30
05/15 – 06/12	Flooding	Sri Lanka	37	Unknown
05/17 – 05/18	Flooding	Afghanistan	150	Unknown

Asia (4/6)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
05/18 – 05/27	Heatwave	India, Pakistan	219	N/A
05/20 – 09/30	Heatwave	South Korea	28	N/A
05/24 – 05/27	Typhoon Ewiniar	Philippines	6	20
05/25 – 05/28	Flooding	Armenia	4	50
05/26 – 05/27	Cyclone Remal	Bangladesh, India	84	620
06/01 – 08/31	Flooding	India	125	1,500
06/01 – 06/19	Flooding	Bangladesh	31	20
06/01 – 06/30	Severe Convective Storm	China	19	550
06/04 – 06/07	Flooding	Indonesia	6	Unknown
06/09 – 07/14	Flooding	China	470	15,750
06/20 – 06/30	Heatwave	Pakistan	568	N/A
06/23 – 06/24	Landslide	Afghanistan	12	Unknown
07/01 – 07/31	Severe Convective Storm	China	0	110
07/01 – 09/30	Flooding	Pakistan	347	Unknown
07/05	Severe Convective Storm	China	6	70
07/10 – 07/15	Flooding	South Korea	5	250
07/11 – 07/15	Landslide	Nepal	25	Unknown

Asia (5/6)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
07/12	Landslide	Vietnam	11	Unknown
07/15	Flooding	Afghanistan	58	Unknown
07/22 – 07/27	Typhoon Gaemi	China, Taiwan, Philippines	108	1,300
07/24 – 07/31	Flooding	China	45	1,200
07/25	Flooding	Japan	5	800
07/30	Landslide	India	420	140
08/01 – 08/31	Flooding	China	90	5,250
08/01 – 08/31	Severe Convective Storm	China	14	90
08/16 – 08/24	Flooding	Thailand	22	Unknown
08/19 – 08/24	Flooding	India, Bangladesh	71	1,800
08/25 – 08/26	Flooding	Indonesia	18	Unknown
08/25 – 08/27	Cyclone Asna	India, Pakistan	73	100
08/28 – 09/01	Typhoon Shanshan	Japan	8	500
08/30 – 09/09	Flooding	India	43	810
09/01 – 09/09	Typhoon Yagi	China, Southeast Asia	816	12,900
09/13 – 09/16	Typhoon Bebinca	China, Philippines	8	140
09/15 – 09/19	Tropical Storm Soulik	Philippines, Vietnam	29	20

Asia (6/6)

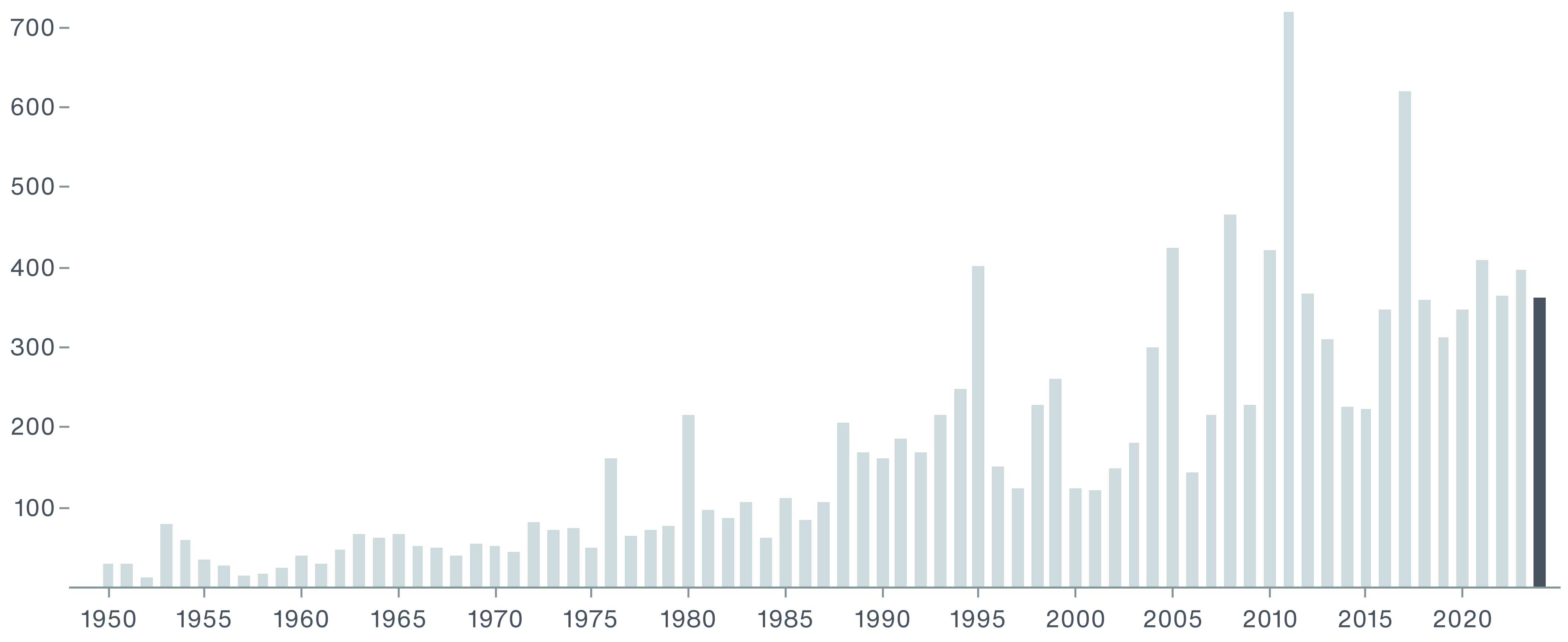
Date(s)	Event	Location	Deaths	Economic Loss ($M)
09/18	Earthquake	Indonesia	1	30
09/19	Severe Convective Storm	Japan	0	50
09/19 – 09/22	Tropical Storm Pulasan	China, Japan, South Korea	14	70
09/26	Landslide	Indonesia	13	Negligible
09/26 – 09/28	Flooding	Nepal	246	340
09/30 – 10/04	Typhoon Krathon	Philippines, Taiwan	7	30
10/23 – 10/27	Tropical Storm Trami	Southeastern Asia	166	230
10/25 – 10/26	Cyclone Dana	India, Bangladesh	6	Unknown
10/30 – 11/03	Typhoon Kong–rey	Southeastern Asia	15	200
11/03 – 11/15	Volcanic Eruption	Indonesia	9	Unknown
11/07 – 11/08	Typhoon Yinxing	Philippines	1	10s of millions
11/11 – 11/12	Typhoon Toragi	Philippines	2	10s of millions
11/14 – 11/16	Typhoon Usagi	Philippines, Taiwan	0	10s of millions
11/16 – 11/17	Typhoon Man-yi	Philippines	12	100
11/22 – 12/16	Flooding	Thailand, Malaysia	39	230
11/23 – 11/25	Landslide, Flooding	Indonesia	20	Unknown
11/25 – 11/30	Tropical Depression Fengal	Sri Lanka, India	37	Unknown
12/03 – 12/10	Flooding	Indonesia	10	Unknown

Oceania (1/1)

Date(s)	Event	Location	Deaths	Economic Loss ($M)
02/13 – 02/14	Severe Convective Storm	Australia	0	180
03/19	Flooding, Landslide	Papua New Guinea	23	60
04/03 – 04/08	Severe Convective Storm	Australia	0	260
12/17	Earthquake	Vanuatu	14	30
05/24	Landslide	Papua New Guinea	12	Negligible

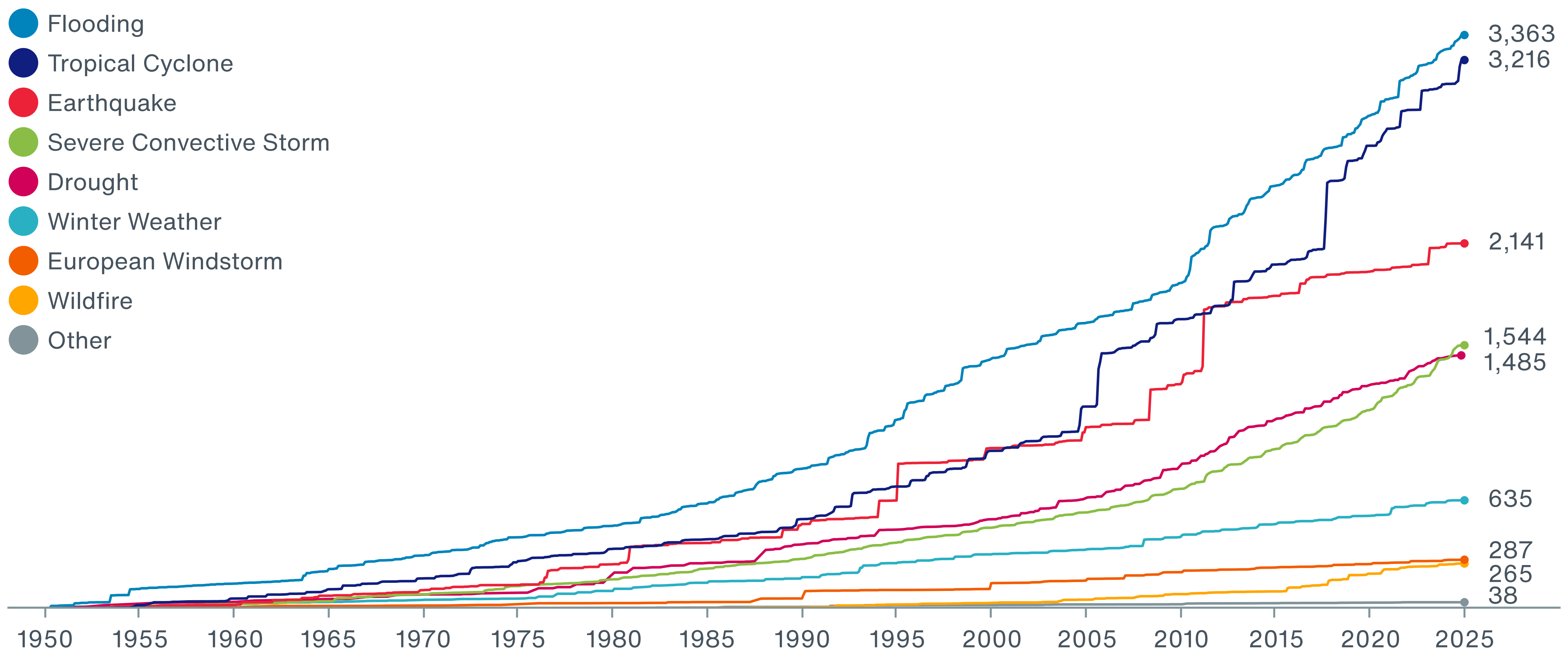
Appendix B: Long-Term Natural Disaster Trends

Exhibit 45: Global Economic Losses from Natural Disasters Since 1950 (2024 $B)



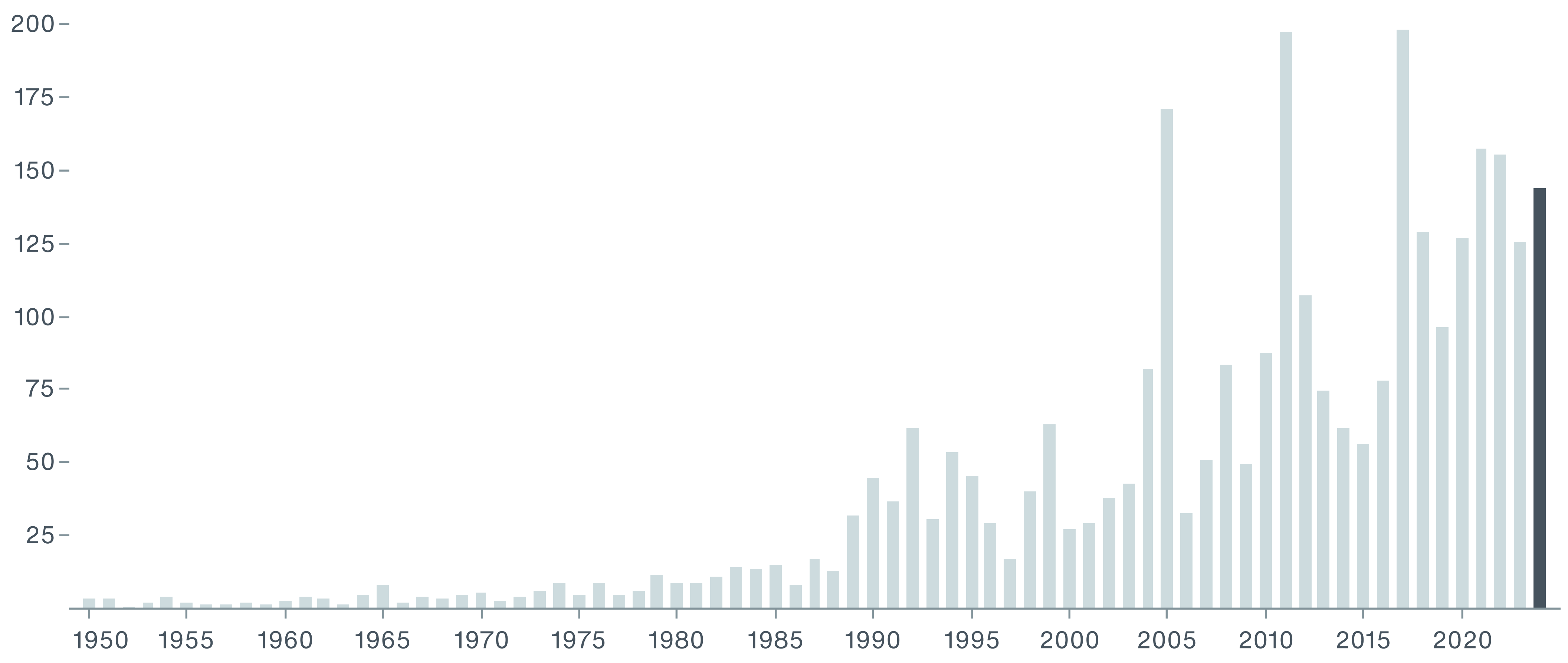
Data: Aon Catastrophe Insight

Exhibit 46: Cumulative Global Economic Losses by Peril Since 1950 (2024 $B)



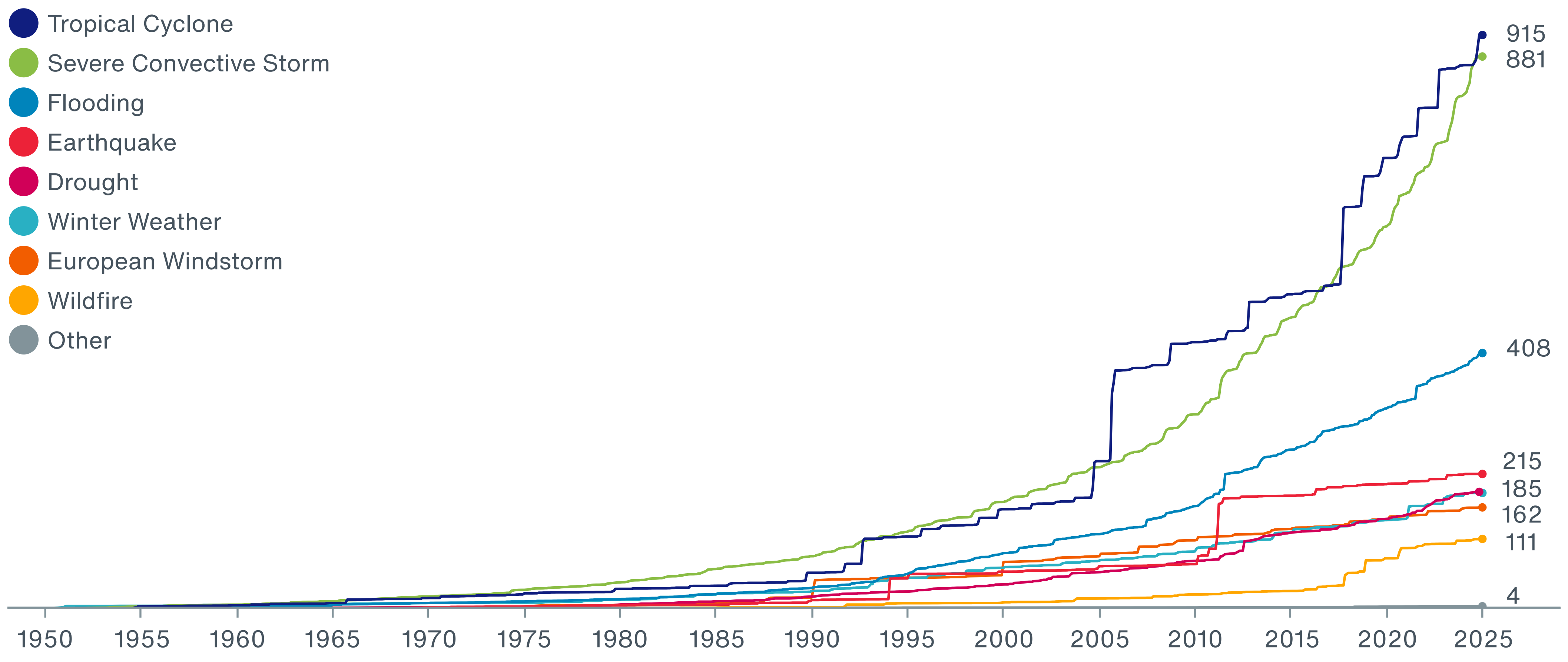
Data: Aon Catastrophe Insight

Exhibit 47: Global Insured Losses from Natural Disasters Since 1950 (2024 $B)



Data: Aon Catastrophe Insight

Exhibit 48: Cumulative Global Insured Losses by Peril Since 1950 (2024 $B)



Data: Aon Catastrophe Insight

Appendix C: Historical Natural Disaster Events

Footnote: The following tables provide a look at specific global natural disaster events since 1900. Please note that the adjusted-for-inflation totals in 2024 dollars) totals were converted using the U.S. Consumer Price Index (CPI). Insured losses include those sustained by private industry and government entities such as the U.S. National Flood Insurance Program (NFIP). Inflation-adjusted losses are used since they represent actual incurred costs in today's dollars. Normalized values, while very valuable for analyzing historical scenarios using today's population, exposure and wealth, are hypothetical. Please note that some of these values have been rounded to the nearest whole number; 2024 disaster events that ranked among the top 10 costliest are highlighted.

2024 disaster events that ranked among the Top 10 costliest events are highlighted.

Exhibit 49: Top 10 Costliest Global Economic Loss Events (1900 – 2024)

Date(s)	Event	Location	Economic Loss (Nominal $B)	Economic Loss (2024 $B)
March 11, 2011	Tohoku Earthquake and Tsunami	Japan	235	332
January 17, 1995	Great Hanshin Earthquake	Japan	103	215
August 2005	Hurricane Katrina	United States	125	201
May 12, 2008	Sichuan Earthquake	China	122	177
August 2017	Hurricane Harvey	United States	125	161
September 2017	Hurricane Maria	Puerto Rico, Caribbean	90	115
October 2012	Hurricane Sandy	U.S., Caribbean, Canada	77	105
September 2022	Hurricane Ian	U.S., Cuba	96	101
September 2017	Hurricane Irma	U.S., Caribbean	77	99
January 17, 1994	Northridge Earthquake	United States	44	95

Exhibit 50: Top 10 Costliest Global Insured Loss Events (1900 – 2024)

Date(s)	Event	Location	Insured Loss (Nominal $B)	Insured Loss (2024 $B)
August 2005	Hurricane Katrina	United States	65	104
September 2022	Hurricane Ian	U.S., Cuba	54	57
March 11, 2011	Tohoku Earthquake and Tsunami	Japan	35	49
September 2017	Hurricane Irma	U.S, Caribbean	33	43
August – September 2021	Hurricane Ida	U.S., Caribbean	36	42
October 2012	Hurricane Sandy	United States	30	41
August – September 2017	Hurricane Harvey	United States	30	39
September 2017	Hurricane Maria	Puerto Rico, Caribbean	30	38
August 1992	Hurricane Andrew	U.S., Bahamas	16	36
January 17, 1994	Northridge Earthquake	United States	15	33

Exhibit 51: Top 10 Costliest Tropical Cyclones: Economic Loss (1900 – 2024)

Date(s)	Event	Location	Economic Loss (Nominal $B)	Economic Loss (2024 $B)
August 2005	Hurricane Katrina	United States	125	201
August – September 2017	Hurricane Harvey	United States	125	161
September 2017	Hurricane Maria	U.S., Caribbean	90	115
October 2012	Hurricane Sandy	U.S., Caribbean	77	105
September 2022	Hurricane Ian	U.S., Cuba	96	101
September 2017	Hurricane Irma	U.S., Caribbean	77	99
August – September 2021	Hurricane Ida	U.S., Caribbean	75	87
September 2024	**Hurricane Helene**	**U.S., Mexico, Cuba**	**75**	**75**
August 1992	Hurricane Andrew	U.S., Bahamas	27	61
September 2008	Hurricane Ike	U.S., Caribbean	38	55

Exhibit 52: Top 10 Costliest Tropical Cyclones: Insured Loss (1900 – 2024)

Date(s)	Event	Location	Insured Loss (Nominal $B)	Insured Loss (2024 $B)
August 2005	Hurricane Katrina	United States	65	104
September 2022	Hurricane Ian	U.S., Cuba	54	57
September 2017	Hurricane Irma	U.S., Caribbean	33	43
August – September 2021	Hurricane Ida	U.S., Caribbean	36	42
October 2012	Hurricane Sandy	U.S., Caribbean, Canada	30	41
Augus – September 2017	Hurricane Harvey	United States	30	39
September 2017	Hurricane Maria	U.S., Caribbean	30	38
August 1992	Hurricane Andrew	U.S., Caribbean	16	36
September 2008	Hurricane Ike	U.S., Caribbean	18	27
October 2024	**Hurricane Milton**	**U.S., Mexico**	**20**	**20**

Exhibit 53: Top 10 Costliest Severe Convective Storm Events: Economic Loss (1900 – 2024)

Date(s)	Event	Location	Economic Loss (Nominal $B)	Economic Loss (2024 $B)
August 2020	Midwest Derecho	United States	14	17
April 2011	Super Tornado Outbreak	United States	10	14
May 2011	Joplin Tornado/SCS	United States	9.1	13
April 1965	Palm Sunday Outbreak	United States	1.2	12
April 1974	Super Outbreak	United States	1.5	10
March – April 1973	SCS Outbreak	United States	1.3	9.2
May 2003	SCS Outbreak	United States	4.5	7.7
July 2023	European Hailstorms	Europe	7.1	7.3
July 2013	Storm Andreas	Europe	5.3	7.1
April 1979	Texas Tornadoes, Flooding	United States	1.5	6.7

Exhibit 54: Top 10 Costliest Severe Convective Storm Events: Insured Loss (1900 – 2024)

Date(s)	Event	Location	Insured Loss (Nominal $B)	Insured Loss (2024 $B)
August 2020	Midwest Derecho	United States	9.2	11
April 2011	Super Outbreak	United States	7.6	11
May 2011	Joplin Tornado/SCS	United States	7.0	9.8
May 2003	SCS Outbreak	United States	3.3	5.7
May 2024	**SCS Outbreak**	**United States**	**5.2**	**5.2**
July 2013	Storm Andreas	Europe	3.8	5.1
March 2023	SCS Outbreak	United States	4.9	5.1
March 2024	**Central U.S. SCS Outbreak**	**United States**	**4.8**	**4.8**
March – April 2023	Tornado Outbreak	United States, Canada	4.3	4.5
May 2019	SCS Outbreak	United States	3.7	4.5

Exhibit 55: Top 10 Costliest Floods: Economic Loss (1900 – 2024)

Date(s)	Event	Location	Economic Loss (Nominal $B)	Economic Loss (2024 $B)
June – December 2011	Thailand Floods	Thailand	45	63
June – September 1998	Yangtze River Floods	China	31	61
June – August 2010	Yangtze River Floods	China	39	56
July 2021	Western Europe Floods (Bernd)	Europe	46	53
June – August 1993	Mississippi Floods	United States	21	46
June – September 2020	China Seasonal Floods	China	35	43
July – August 1931	Yangtze River Floods	China	2.0	42
June – August 1953	Japan Floods	Japan	3.2	38
May – August 2016	Yangtze River Floods	China	28	37
June – September 2021	China Seasonal Floods	China	31	36

Exhibit 56: Top 10 Costliest Earthquakes: Economic Loss (1900 – 2024)

Date(s)	Event	Location	Economic Loss (Nominal $B)	Economic Loss (2024 $B)
March 11, 2011	Tohoku Earthquake, Tsunami	Japan	235	332
January 16, 1995	Great Hanshin Earthquake	Japan	103	215
May 12, 2008	Sichuan Earthquake	China	122	177
January 17, 1994	Northridge Earthquake	United States	44	95
February 6, 2023	Turkey, Syria Earthquake	Turkey, Syria	90	95
November 23, 1980	Irpinia Earthquake	Italy	20	74
April 14, 2016	Kumamoto Earthquake	Japan	38	50
October 23, 2004	Chuetsu Earthquake	Japan	28	46
February 27, 2010	Chile Earthquake	Chile	30	44
December 7, 1988	Armenian Earthquake	Armenia (Present Day)	16	42

Exhibit 57: Top 10 Costliest Wildfires: Insured Loss (1900 – 2024)

Date(s)	Event	Location	Insured Loss (Nominal $B)	Insured Loss (2024 $B)
November 2018	Camp Fire	United States	10	13
October 2017	Tubbs Fire	United States	8.7	11
November 2018	Woolsey Fire	United States	4.2	5.3
August 2023	Maui/Hawaii Fire	United States	4.3	4.4
October 1991	Oakland Fire	United States	1.7	3.9
October 2017	Atlas Fire	United States	3.0	3.8
May 2016	Horse Creek Fire	Canada	2.9	3.7
August 2023	Maui/Hawaii Fire	United States	4.3	4.4
September – October 2020	Glass Fire	United States	3.0	3.6
August – September 2020	CZU Complex Fire	United States	2.5	3.0
December 2017	Thomas Fire	United States	2.3	2.9

Exhibit 58: Top 10 Global Human Fatality Events in the Modern Era, Excluding Drought and Heatwave Events (1950 – 2024)

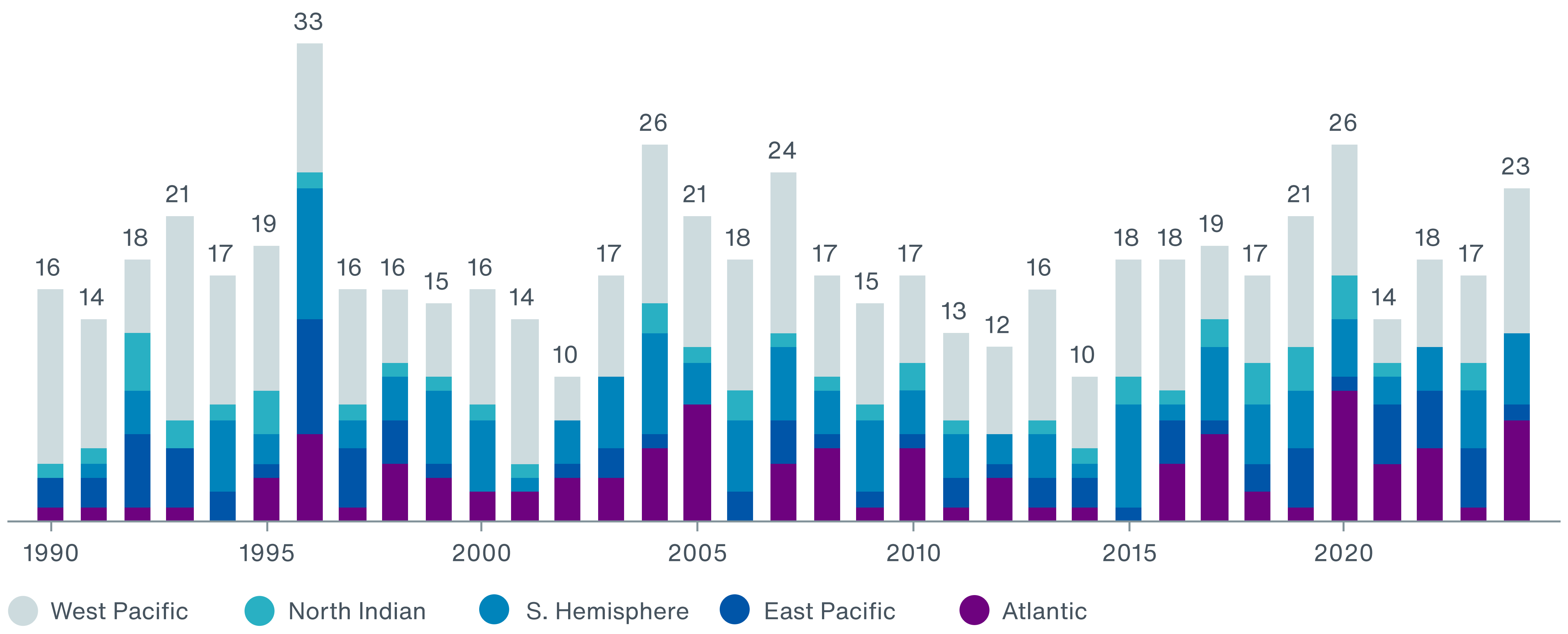
Date(s)	Event	Location	Economic Loss (2024 $B)	Deaths
November 12, 1970	Cyclone Bhola	Bangladesh	0.7	300,000
July 27, 1976	Tangshan Earthquake	China	37	242,769
July 30, 1975	Typhoon Nina	Taiwan, China	7.0	230,029
December 26, 2004	Indian Ocean EQ, Tsunami	Indian Ocean Basin	31	226,408
January 12, 2010	Port-au-Prince Earthquake	Haiti	12	160,000
April 1991	Cyclone Gorky	Bangladesh	4.2	139,000
May 2008	Cyclone Nargis	Myanmar	18.8	138,366
August 1971	Vietnam Floods	Vietnam	N/A	100,000
October 8, 2005	Kashmir Earthquake	Pakistan	10.6	88,000
May 12, 2008	Sichuan Earthquake	China	177	87,652

Appendix D: Global Tropical Cyclone Activity

Note that 1990 is generally considered the first year when global tropical cyclone (TC) data are best verified in every basin. Data from the Southern Hemisphere prior to 1990 is still subject to future reanalysis by official tropical cyclone agencies. The Southern Hemisphere statistics below include full calendar year 2024 events. TCs within all basins are classified based on the Saffir-Simpson hurricane wind scale. Multiple landfalls made by one TC are not included in the global statistics below.

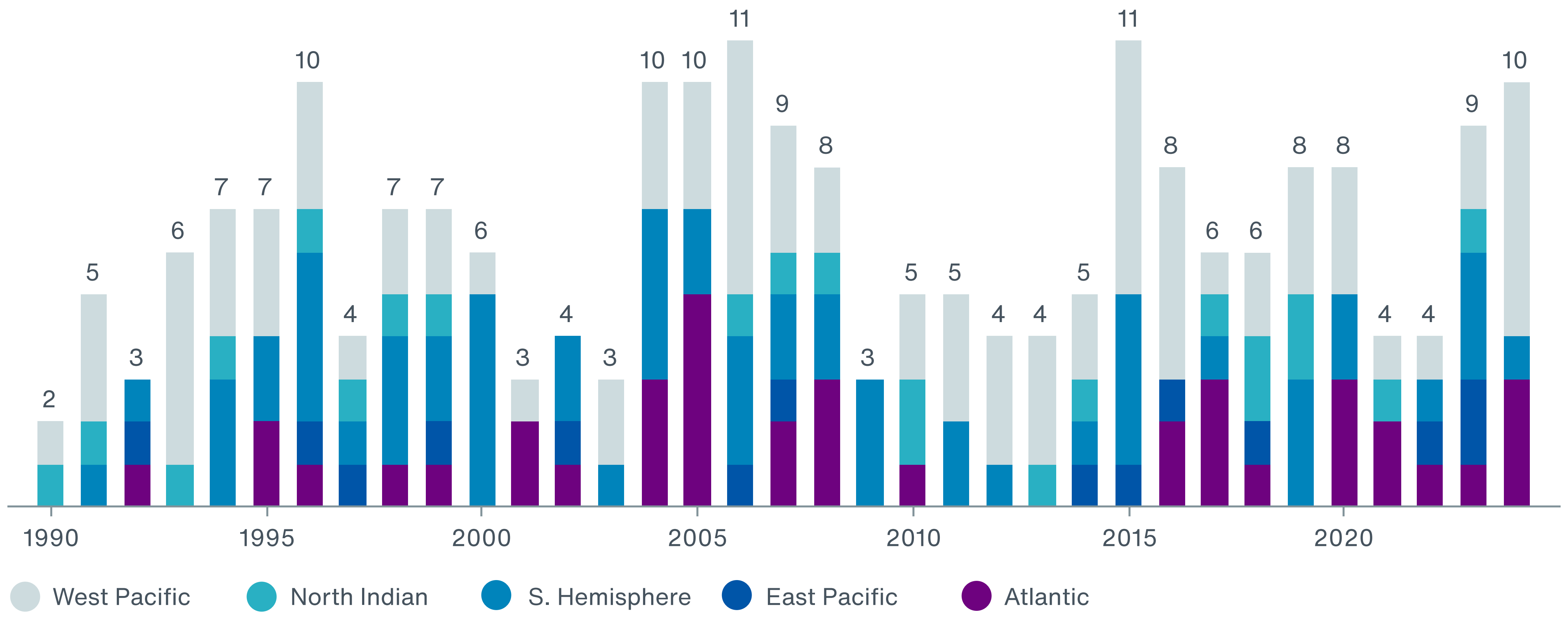
While there continue to be increasing instances of costlier and more impactful landfalling tropical cyclones, there has yet to be any obvious shift in landfall trends across the globe. This suggests that losses are largely being driven by the increased levels of population and exposure along vulnerable coastal locations. However, as thoroughly referenced elsewhere in this report, emerging trends indicate that tropical cyclones are intensifying at a faster rate and reaching the highest intensity levels for longer periods and near the point of landfall.

Exhibit 59: Global Cat 1+ Tropical Cyclone Landfalls



Data: NOAA

Exhibit 60: Global Cat 3+ Tropical Cyclone Landfalls

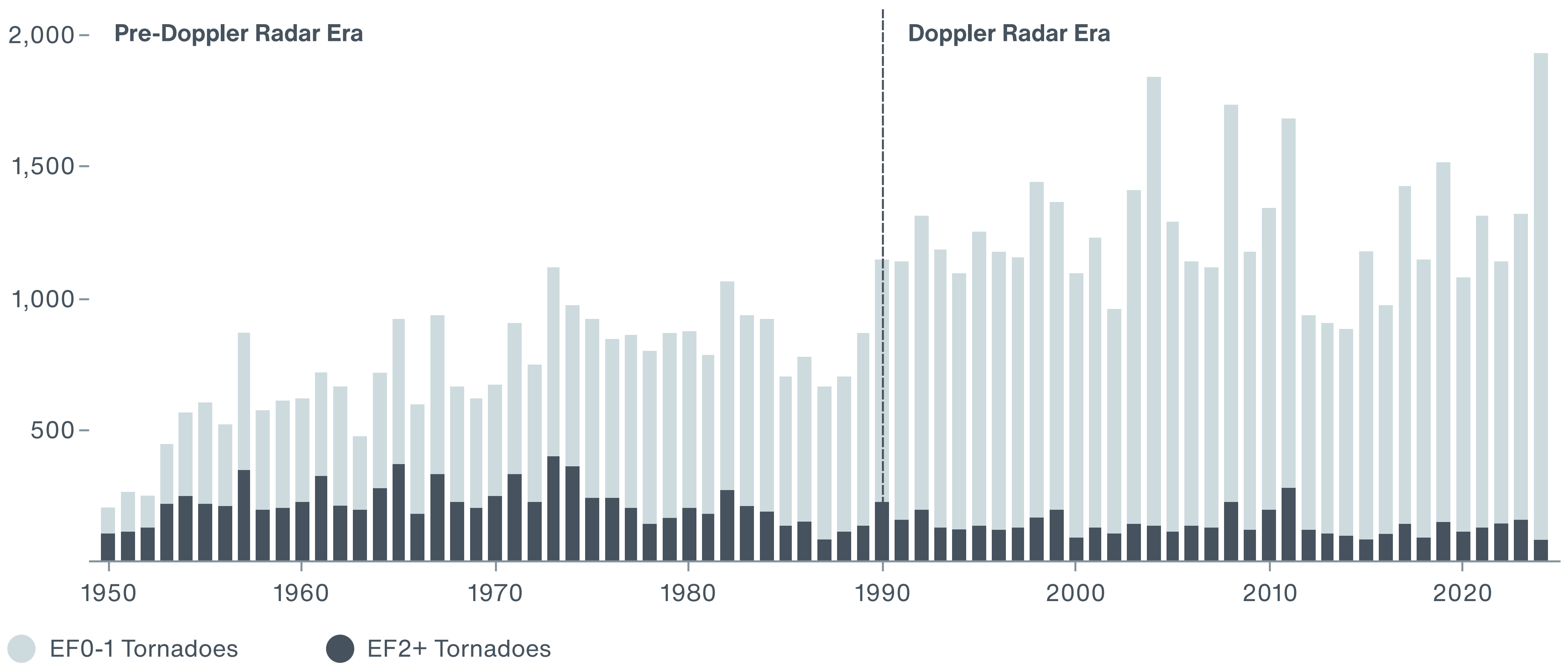


Data: NOAA

Appendix E: United States Storm Reports

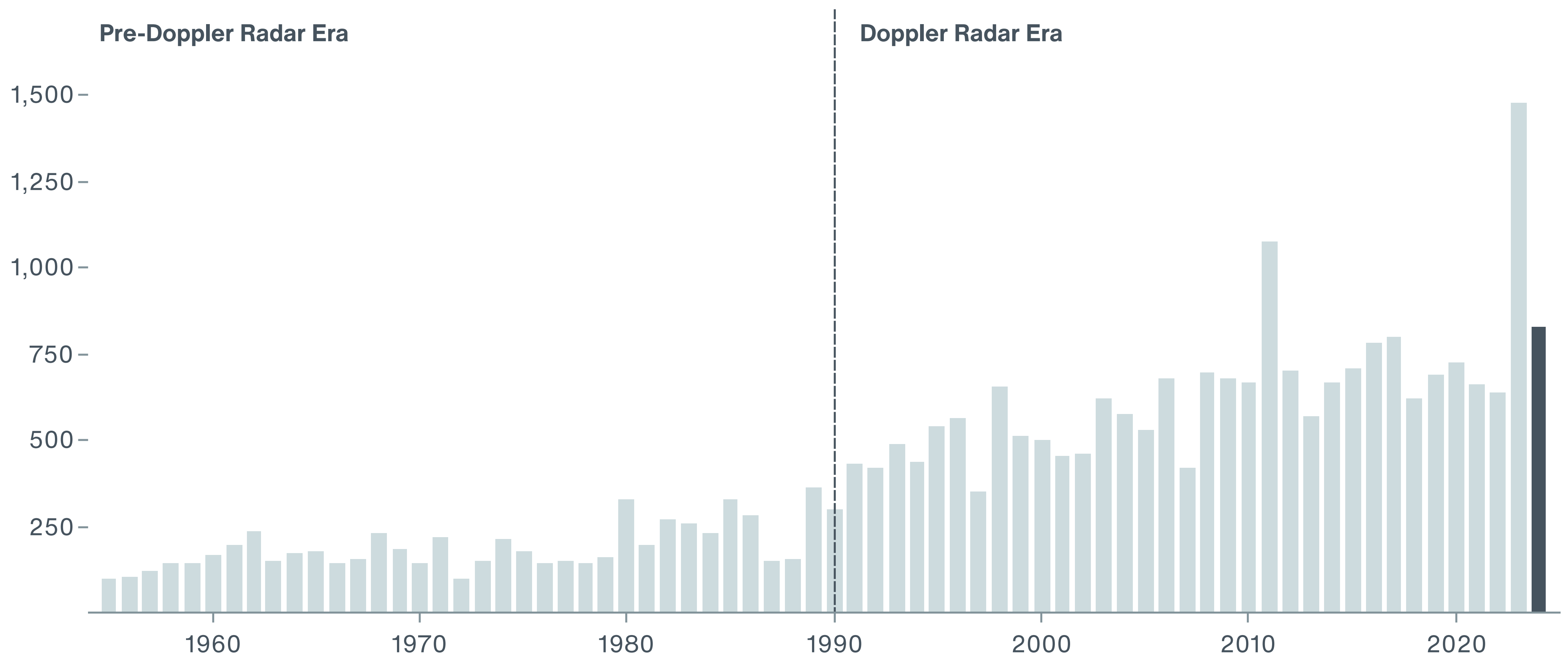
Given the increased cost of severe weather-related damage in the United States during the past decade for insurers, the following is a number of tornado and large hail reports. The data comes via NOAA's Storm Prediction Center. Please note that data prior to 1990 are often considered incomplete given a lack of reporting. The implementation of Doppler radar, greater social awareness and increased reporting has led to more accurate datasets in the last 35 years. Data from 2024 is to be considered preliminary.

Exhibit 61: U.S. EF0+ Tornado Reports Since 1950



Data: NOAA

Exhibit 62: U.S. 2+ Inches Hail Reports Since 1955

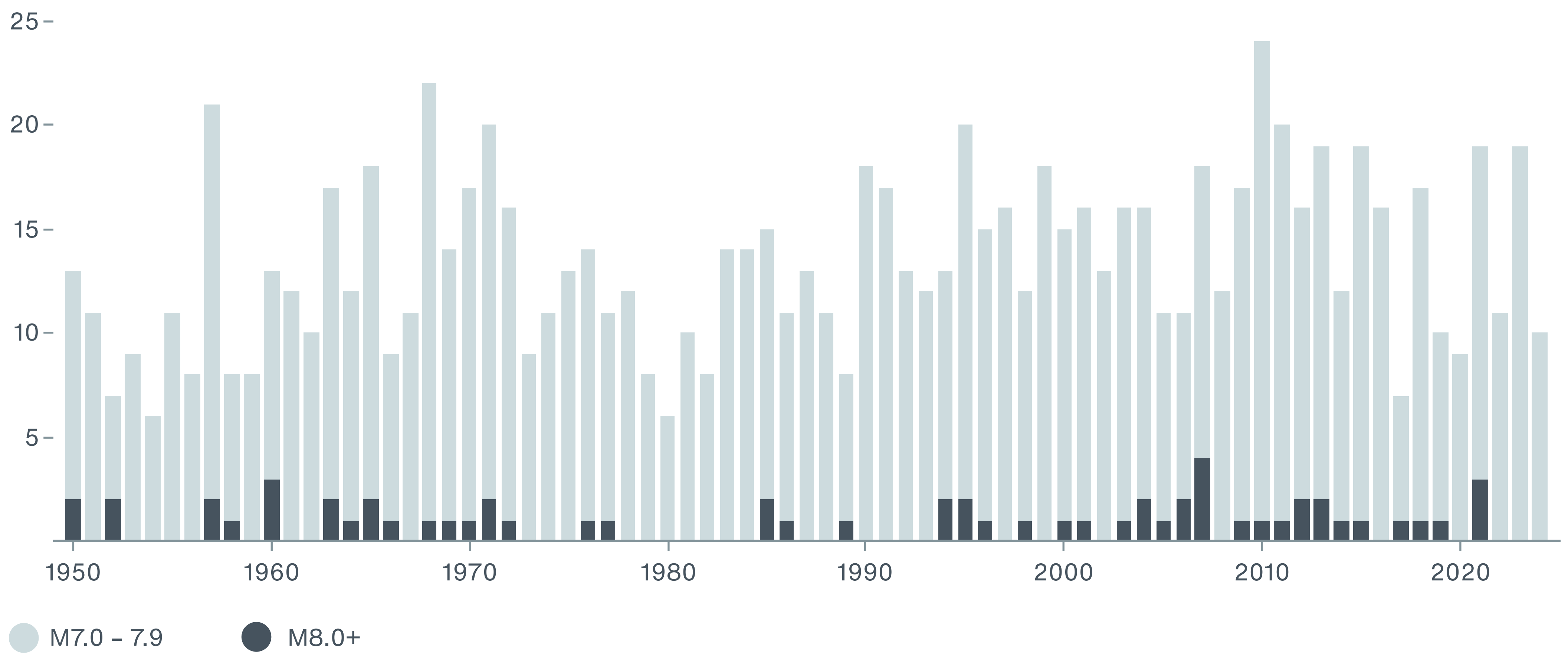


Data: NOAA

Appendix F: Global Earthquakes

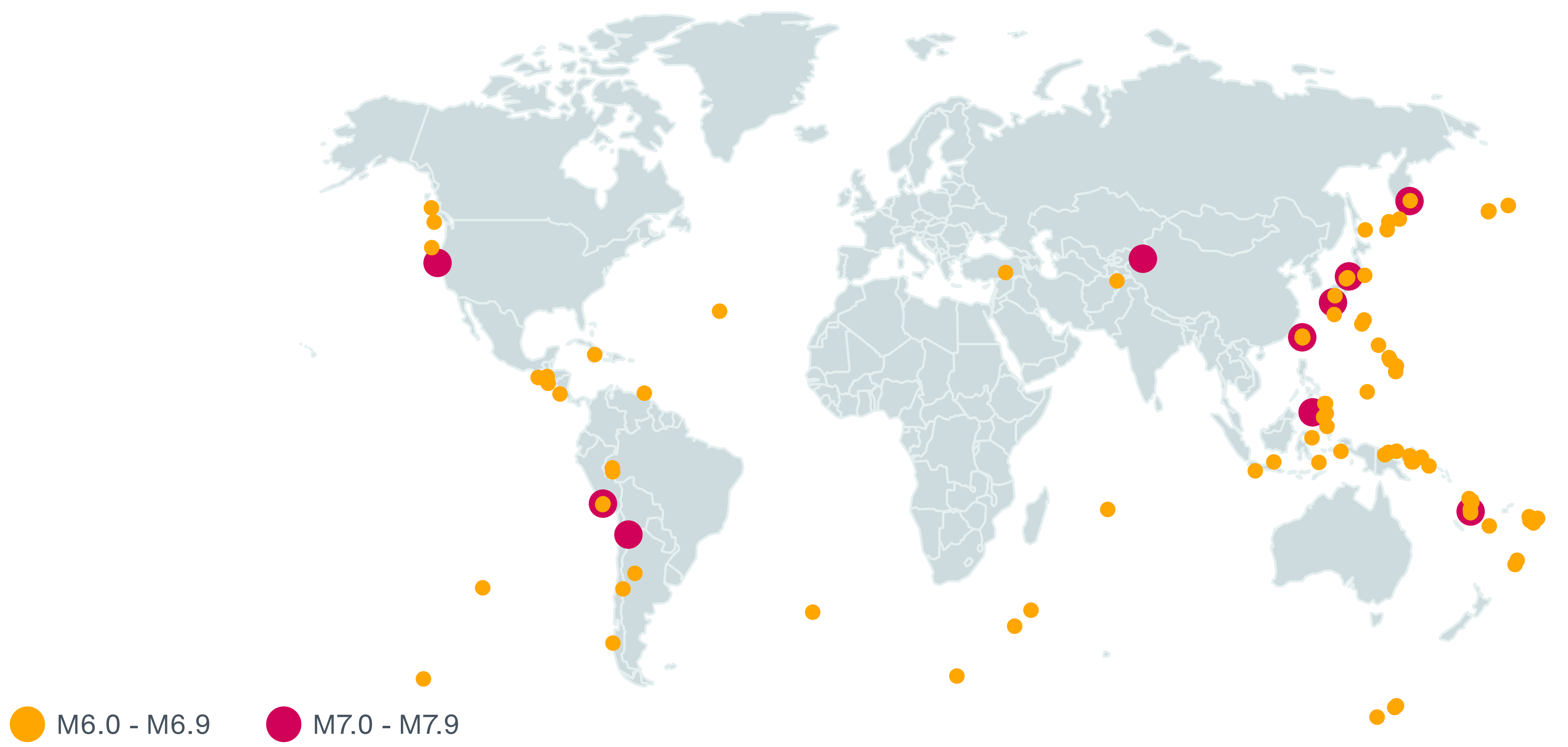
Based on the historical data from the United States Geological Survey (USGS), 2024 saw at least 100 earthquakes with magnitudes of 6.0 or greater, the lowest occurrence since 1982 and well below the 21st-century average (151). At least 10 earthquakes reached magnitude of 7.0 or greater. Overall earthquake activity does not often show large fluctuations on an annual basis. This is especially true given the extensive network of global seismograph stations that has led to an improved and more robust dataset in recent decades.

Exhibit 63: Global M7.0+ Earthquakes Since 1950



Data: USGS

Exhibit 64: Global M6.0+ Earthquakes in 2024

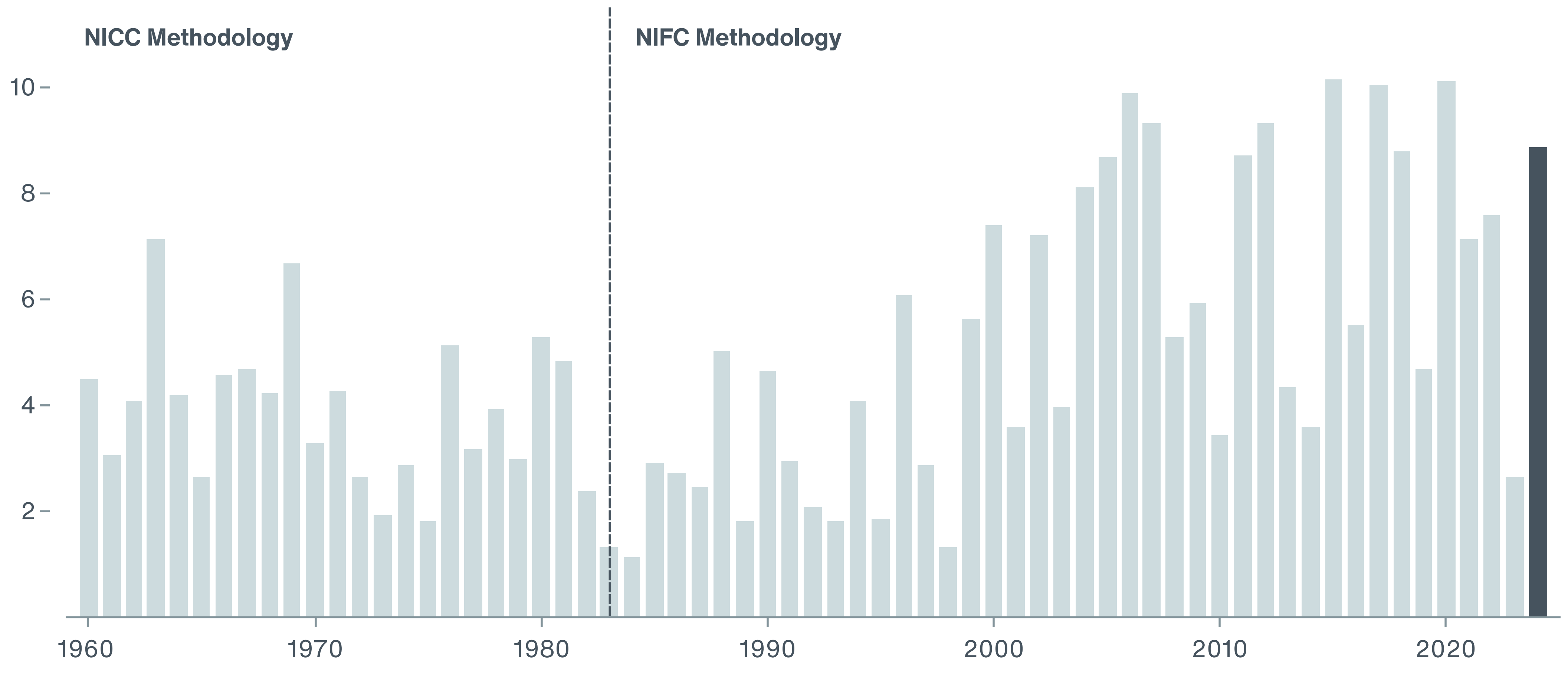


Data: USGS

Appendix G: United States Wildfires

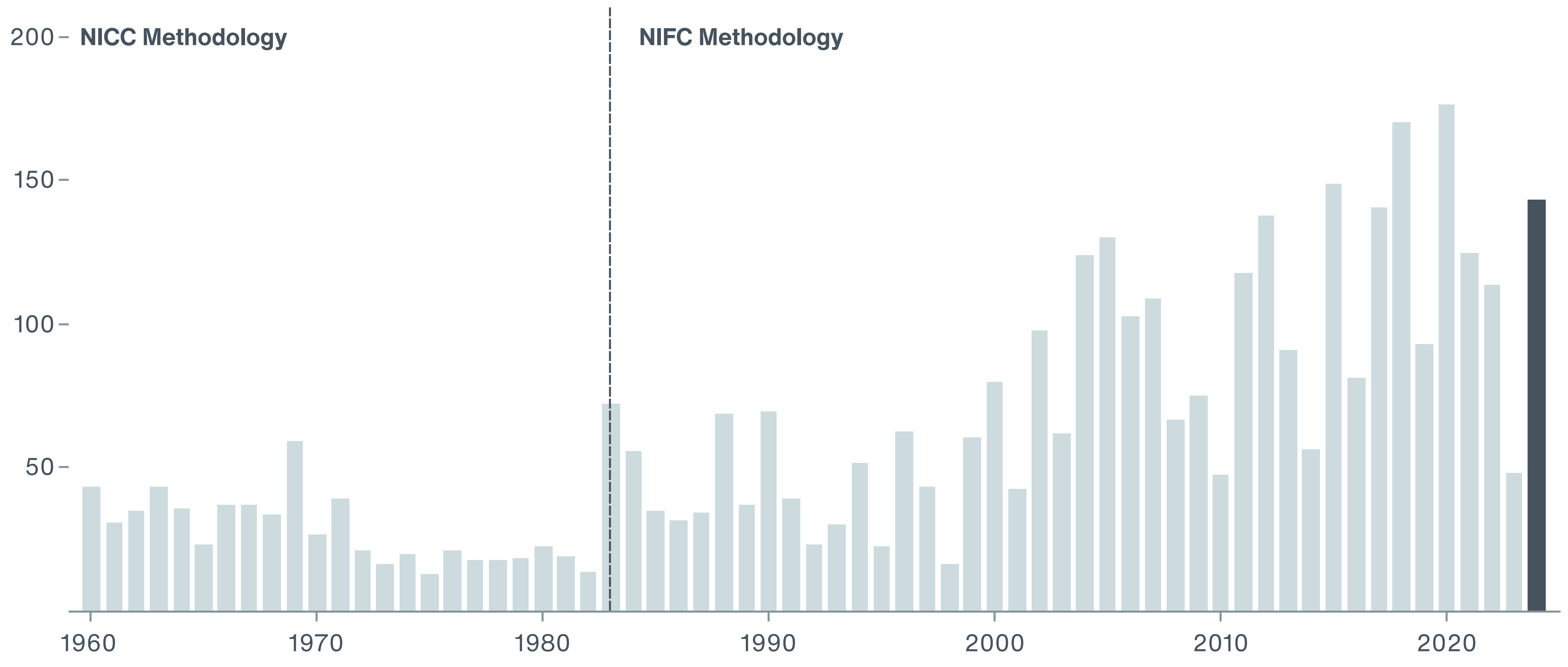
The following wildfire data in the United States is provided by the National Interagency Fire Center (NIFC), which began compiling statistics under its current methodology in 1983. Previous data was collected by the National Interagency Coordination Center (NICC) from 1960 to 1982, but used a different methodology. It is not advised to compare pre-1983 data to post-1983 data given these different data collection methods.

Exhibit 65: Area Burned by Wildfires in the United States Since 1960 (million acres)



Data: NIFC, NICC

Exhibit 66: Area Burned per Wildfire in United States Wildfires Since 1960 (acres)



Data: NIFC, NICC

Additional Report Details

All financial loss totals are in U.S. dollars ($) unless noted otherwise.

DR = Drought, EQ = Earthquake, WS = European Windstorm, FL = Flooding, SCS = Severe Convective Storm, TC = Tropical Cyclone, WF = Wildfire, WW = Winter Weather, VL = Volcano, HW = Heatwave, LS = Landslide

TD = Tropical Depression, TS = Tropical Storm, HU = Hurricane, TY = Typhoon, STY = Super Typhoon, CY = Cyclone

Fatality estimates as reported by public news media sources and official government agencies.

Structures defined as any building — including barns, outbuildings, mobile homes, single or multiple family dwellings and commercial facilities — that is damaged or destroyed by winds, earthquakes, hail, flood, tornadoes, hurricanes or any other natural-occurring phenomenon. Claims defined as the number of claims (which could be a combination of homeowners, commercial, auto and others) reported by various public and private insurance entities through press releases or various public media outlets.

Damage estimates are obtained from various public media sources, including news websites, publications from insurance companies, financial institution press releases and official government agencies. Damage estimates are determined based on various public media sources, including news websites, publications from insurance companies, financial institution press releases and official government agencies. Economic loss totals are separate from any available insured loss estimates. An insured loss is the portion of the economic loss covered by public or private insurance entities. In rare instances, specific events may include modeled loss estimates determined from utilizing Impact Forecasting's suite of catastrophe model products.

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