

Annual Global Climate and Catastrophe Report

Impact Forecasting — 2012

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Executive Summary: 2012 – Surprisingly Normal

Global natural disasters¹ in 2012 combined to cause economic losses of USD200 billion, just above the ten year average of USD187 billion. All told there were 295 separate events, compared to an average of 257. The disasters caused insured losses of USD72 billion, about 36 percent above the ten year run-rate of USD53 billion. 2012 represented a welcome return to a normal level of losses after the extreme economic and insured losses of 2011 – an outcome reflected in the very strong reinsurer and strong insurer results posted during the year. In contrast to 2011, when the largest events occurred in the Asia-Pacific region, the two largest global events of 2012 occurred in the US: Hurricane Sandy and a year-long drought. These two events accounted for nearly half of economic losses but, owing to higher insurance penetration in the U.S., 67% of insured losses globally. The drought, however, also contributed to lower U.S. tornado and severe weather losses than 2011. The U.S. accounted for nearly 90% of all insured losses in 2012.

The most deadly event of 2012 was Super Typhoon Bopha, which left more than 1,900 people dead after making landfall in the Philippines. A total of 14 tropical cyclones made landfall globally in 2012, below the long run average of 16. Two earthquakes struck Italy causing considerable damage in the Emilia-Romagna region. Major flooding affected China and the United Kingdom, with other floods recorded elsewhere in Asia, Europe and Oceania. Finally, 2012 ended as the eighth warmest year in world history since global land and ocean temperature records began in 1880.

Hurricane Sandy was the costliest single event of the year causing an estimated USD28.2 billion insured loss for Sandy, combining private insurers and government-sponsored programs, and approximately USD65 billion in economic losses across the United States, the Caribbean, the Bahamas, and Canada. These losses remain subject to change.

Europe, Asia and North America (outside the U.S.) all sustained aggregate insured losses above USD1 billion due to flooding, earthquakes and tropical cyclones. The losses in Asia and Oceania were well below their recent 10-year averages, while Europe was slightly below its average. The top 10 insured loss events in 2012 were six U.S. severe weather outbreaks, two tropical cyclones (hurricanes Sandy and Isaac), the U.S. drought, and a nine-day stretch of earthquakes in Italy.

A new addition to this year's report, Global Catastrophe Losses and Economic Activity, features analysis on historical catastrophe losses as a percent of global GDP. Despite the building "new normal" view of rapidly escalating global catastrophe losses, our analysis shows that on an economic basis, loss to GDP has increased only modestly since 1980.

Alongside the report, we are excited to provide access to relevant catastrophe data and insight on Impact Forecasting's website. Please visit www.aonbenfield.com/catastropheinsight and send us your feedback.

¹ An event must meet at least one of the following criteria to be classified as a natural disaster: economic loss of USD50M, insured loss of USD25M, 10 fatalities, 50 injured, or 2,000 homeless or displaced.

Global Catastrophe Losses and Economic Activity

In recent years, global economic and insured losses have increased substantially in nominal terms: economic losses trending up by 7.8 percent and insured losses by 11.3 percent annually since 1980. These increases reflect the impacts of inflation, increased human population and economic activity as well as increased insurance penetration and growth in more exposed areas of the globe. To separate the economic and population impacts from the insurance and risk impacts, and try to understand whether the world is really becoming a more dangerous place, the graphs below compare economic and insured losses to GDP on a global basis. Analyzing losses to GDP removes the need for any inflation adjustment and also adjusts for changes in the level of human population and economic activity.

On an economic basis loss to GDP has increased by only 1.9 percent per year, showing that the majority of the increase in losses is not caused by increased hazard or population shifts. Insured loss to GDP has increased by a more substantial 5.3 percent per year, driven in part by increased insurance penetration, especially outside the U.S. and Western Europe. Property premium has increased by 4.7 percent annually since 2007. Over the last five years, natural disasters accounted for less than 0.1 percent of global GDP compared to total property-casualty premiums of 1.9% of GDP and property premium of 0.6% of GDP – a “catastrophe loss ratio” of 17% of property premium.

Exhibit 1: Global Economic Losses as a Percentage of Global GDP (1980-2012)

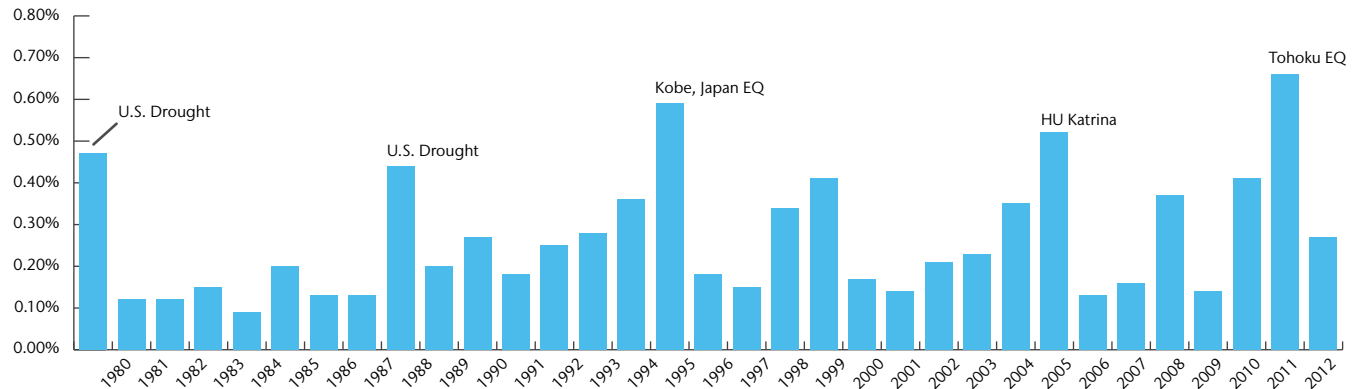
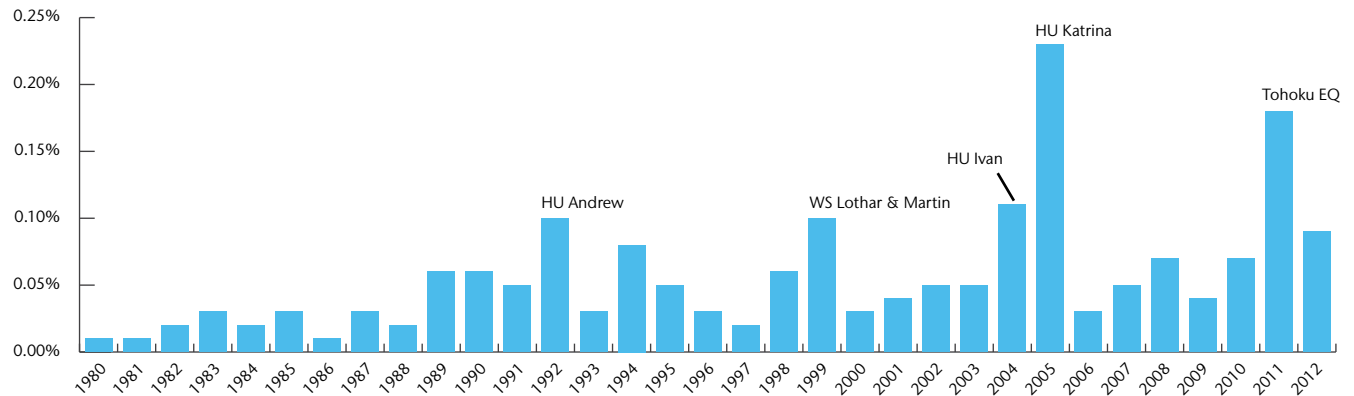


Exhibit 2: Global Insured Losses as a Percentage of Global GDP (1980-2012)



Global Economic Losses

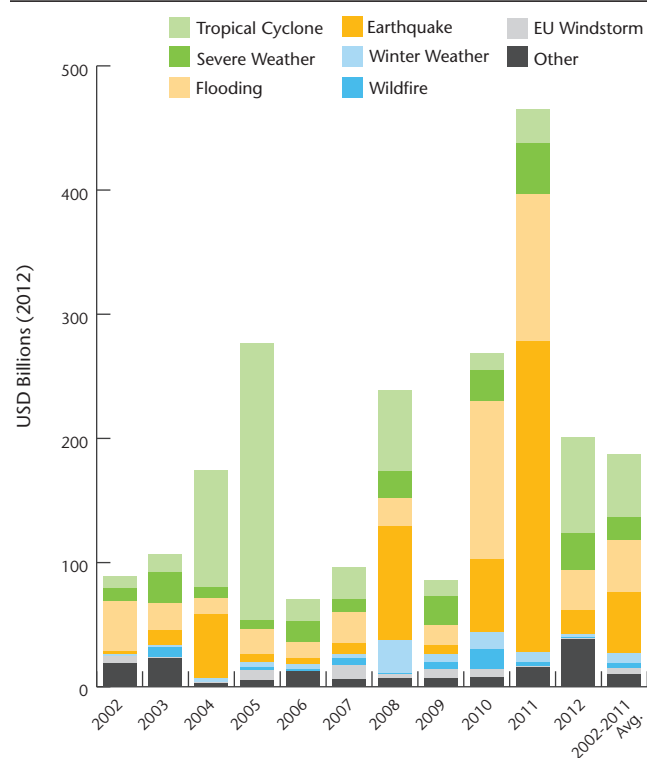
Exhibit 3: Top 10 Global Economic Loss Events

Date(s)	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)	Insured Loss (USD)
Oct. 23-29	HU Sandy	U.S., Caribbean, Bahamas	254	1,800,000	65.00 billion ¹	28.20 billion ^{1,2}
Jan. 1-Dec. 31	Drought/Heatwave	United States	123	Unknown	35.00 billion ¹	20.00 billion ^{1,2}
May 20 & 29	Earthquake	Italy	25	10,000	15.80 billion	1.30 billion
Sept. 7-13	Flooding	China	21	100,000	4.92 billion	148.00 million
July 20-24	Flooding	China	147	175,000	4.80 billion	234.00 million
Aug. 28-30	Flooding	China		35,000	4.63 billion	144.00 million
Apr. 28-29	Severe Weather	United States	1	355,000	4.25 billion	2.40 billion
Mar. 2-3	Severe Weather	United States	40	280,000	4.25 billion	2.40 billion
June 28-July 2	Severe Weather	United States	28	430,000	3.75 billion	2.00 billion
Aug. 1-3	TY Damrey	China	14	300,000	3.28 billion	104.00 million
All Other Events					55.30 billion	15.20 billion
Totals					200 billion¹	72 billion^{1,2}

¹ Subject to change as loss estimates are further developed

² Includes losses sustained by private insurers and government-sponsored programs

Exhibit 4: Global Economic Losses by Peril



Economic losses in 2012 were largely driven by Hurricane Sandy and the prolonged drought in the United States. The two events combined to cause nearly half of all global losses during the year. Several severe weather events also combined to cause more than USD25 billion in economic damages in the U.S. The costliest events outside of the U.S. in 2012 were two earthquakes in Italy’s Emilia-Romagna region during May that struck within nine days of each other and caused significant damage. Flood events in China, typhoon landfalls in Asia and flooding in the United Kingdom were additional notable economic loss events in 2012.

Total losses in 2012 were only slightly above the ten year mean of USD187 billion on an inflation adjusted basis. (Global losses during this period are skewed due to the losses seen in 2011.) 2012 becomes the fifth-costliest year since 2002, and the sixth-costliest year on record since 1950.

There were 27 billion-dollar-plus economic loss events in 2012, which is close to the 10-year average of 26. However, this total was well below the 37 seen in 2011 and even further below the record of 46 experienced in 2010. The United States endured the most billion-dollar-plus events in 2012 with 11 separate instances, the second highest total since 1980. The only region of the globe to see an increase in such events was Europe, which saw a slight uptick to four. Asia sustained 10 events, which marked a slight decrease from 2011. Oceania and North America (outside of the U.S.) each saw one billion-dollar-plus economic loss event, while South America and Africa did not record any.

Exhibit 5: Global Billion-Dollar-Plus Economic Loss Events

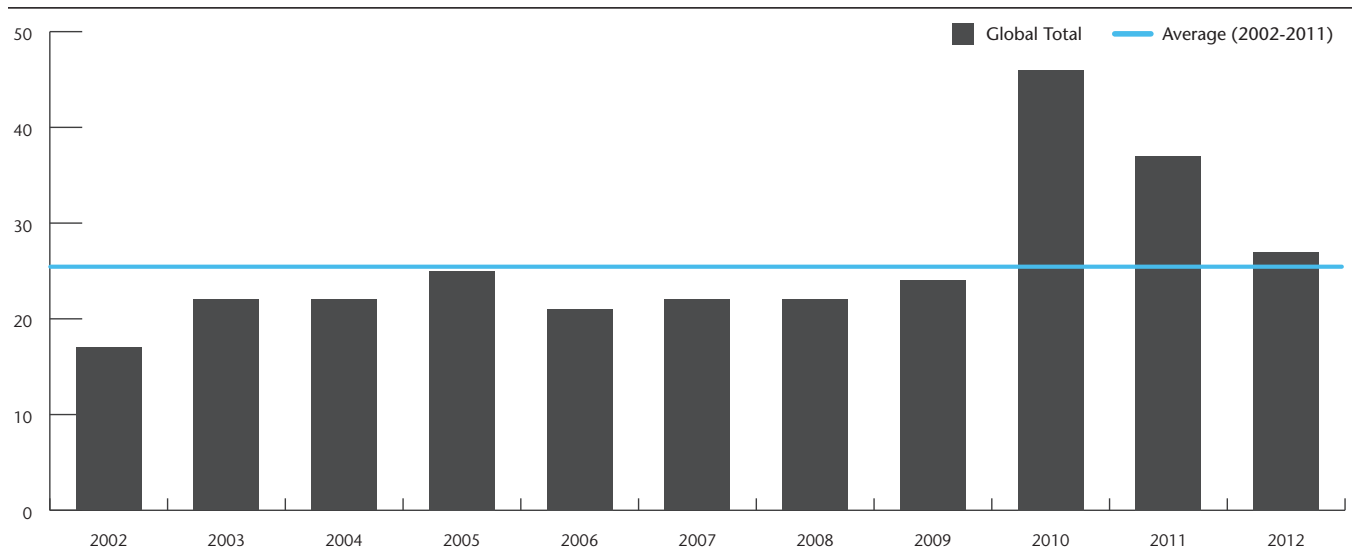
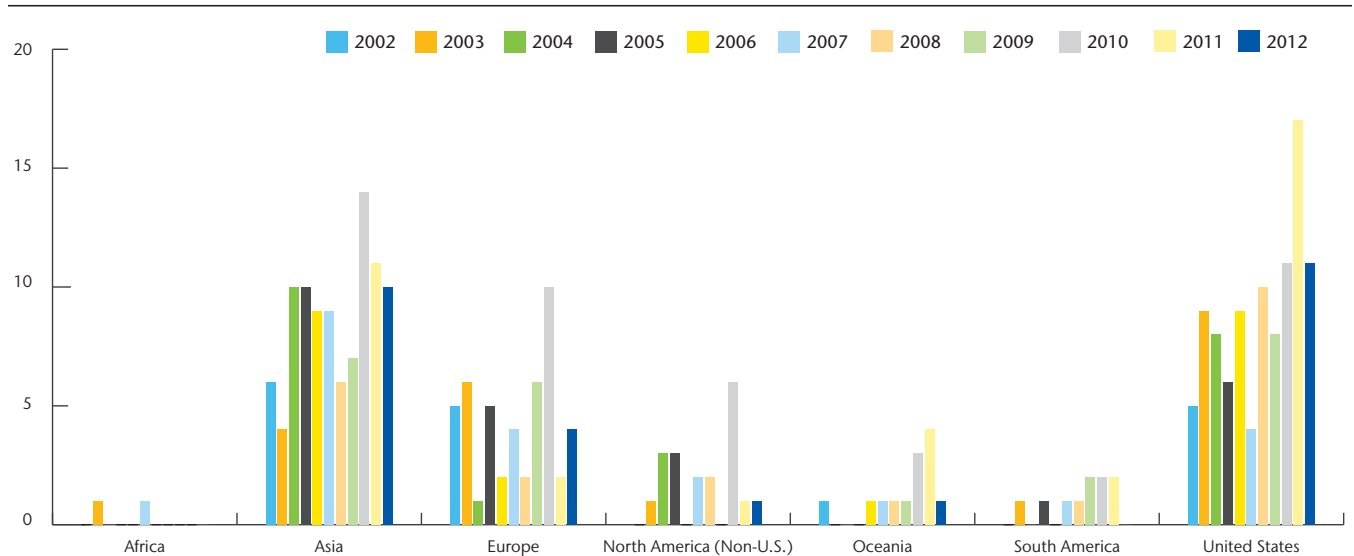


Exhibit 6: Global Billion-Dollar-Plus Economic Loss Events by Region



Note: Exhibits 5 & 6 include events which reached the billion-dollar-plus (USD) threshold after being adjusted for inflation based on the 2012 U.S. Consumer Price Index.

Global Insured Losses

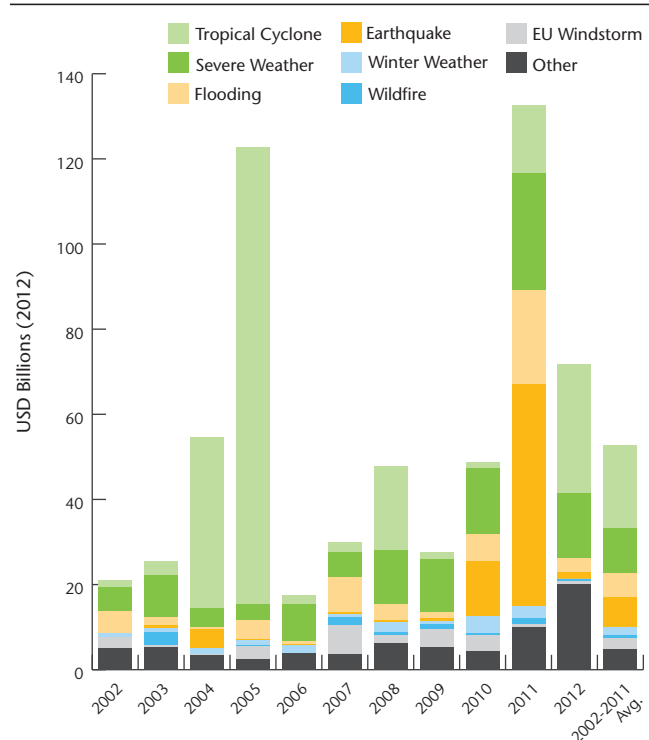
Exhibit 7: Top 10 Global Insured Loss Events

Date(s)	Event	Location	Deaths	Structures/Claims	Economic Loss (USD)	Insured Loss (USD)
Oct. 23-29	HU Sandy	U.S., Caribbean, Bahamas	254	1,800,000	65.00 billion ¹	28.20 billion ^{1,2}
Jan. 1-Dec. 31	Drought/Heatwave	United States	123	Unknown	35.00 billion ¹	20.00 billion ^{1,2}
Apr. 28-29	Severe Weather	United States	1	355,000	4.25 billion	2.40 billion
Mar. 2-3	Severe Weather	United States	40	280,000	4.25 billion	2.40 billion
June 28-July 2	Severe Weather	United States	28	430,000	3.75 billion	2.00 billion
May 25-30	Severe Weather	United States	0	200,000	2.75 billion	1.60 billion
Aug. 26-31	HU Isaac	United States	5	180,000	2.00 billion	1.40 billion
May 20 & 29	Earthquake	Italy	25	10,000	15.80 billion	1.30 billion
June 11-13	Severe Weather	United States	0	135,000	1.75 billion	1.05 billion
June 6-7	Severe Weather	United States	0	120,000	1.75 billion	1.00 billion

¹ Subject to change as loss estimates are further developed

² Includes losses sustained by private insurers and government-sponsored programs

Exhibit 8: Global Insured Losses by Peril



Nine of the top ten insured loss events occurred in the United States during 2012, six related to severe weather, two were tropical cyclones and one was a drought. Hurricane Sandy, which made landfall in New Jersey as a post-tropical cyclone, was the costliest insured event of the year, though the prolonged drought in the U.S. also prompted a significant level of claims and crop insurance payments by the U.S. Department of Agriculture’s Risk Management Agency program. Both events combined accounted for nearly two-thirds of all global insured losses in 2012. Outside of the United States, the highest insured losses came from twin Italy earthquakes that occurred within days of each other in May. Additional notable insured loss events outside of the U.S. in 2012 were separate instances of flooding in the United Kingdom and a large hail storm in Calgary, Canada.

2012 insured losses were above the inflation-adjusted, 10-year average (2002-2011) of approximately USD53 billion. It becomes the third-costliest global insured loss year on record since 1950, following only 2011 (USD133 billion) and 2005 (USD123 billion).

There were 10 billion-dollar-plus insured loss events in 2012, nine of which occurred in the United States. This is a dramatic reduction from the 19 seen in 2011, but the same as the 10-year average. Europe endured one billion-dollar-plus insured loss event, and for the first time since 2008, Oceania did not sustain such an event. Asia, which saw three such events in 2011, did not see a billion-dollar-plus insured loss event for the seventh time since 2002. There has not been a billion-dollar-plus insured loss event in North America (outside of the United States) or Africa since at least 2002.

Exhibit 9: Global Billion-Dollar-Plus Insured Loss Events

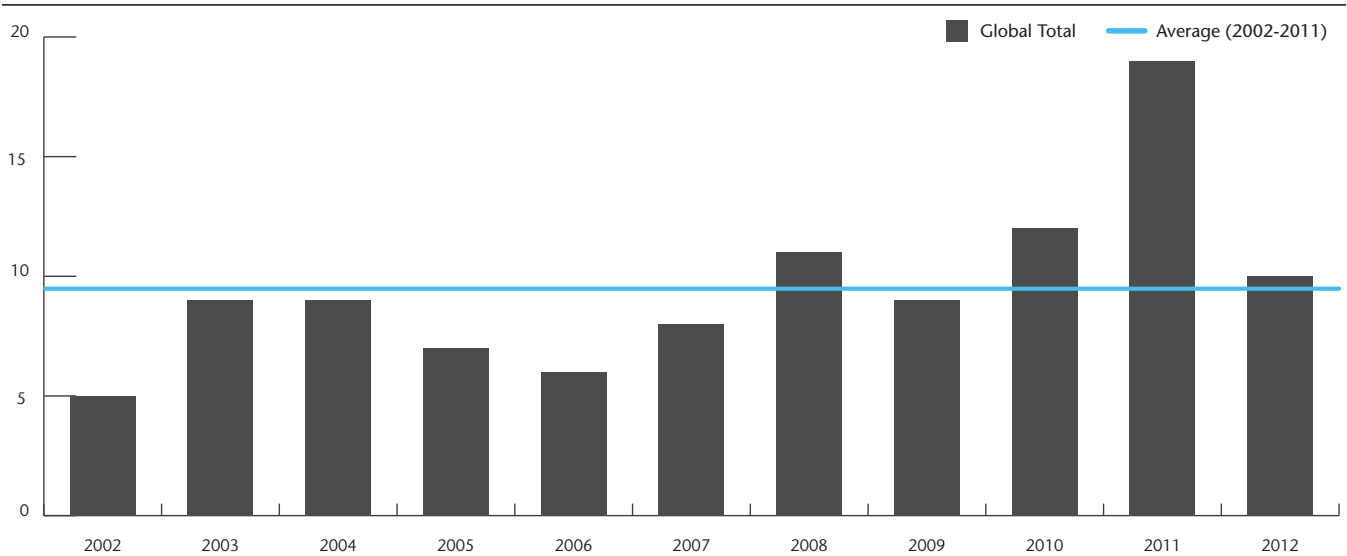
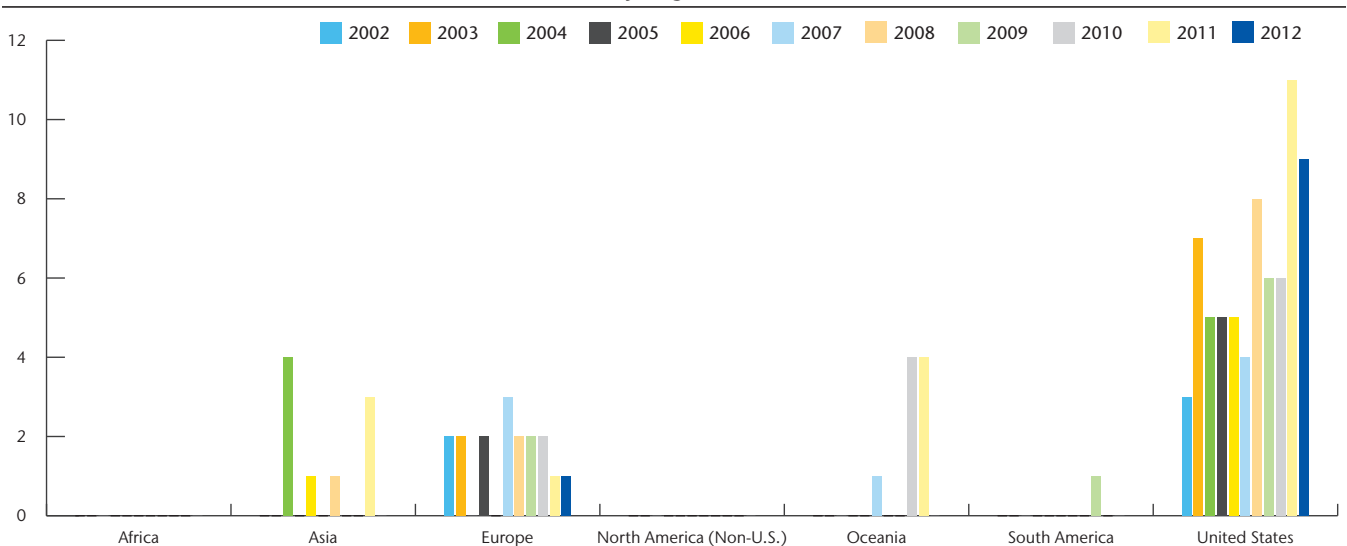


Exhibit 10: Global Billion-Dollar-Plus Insured Loss Events by Region



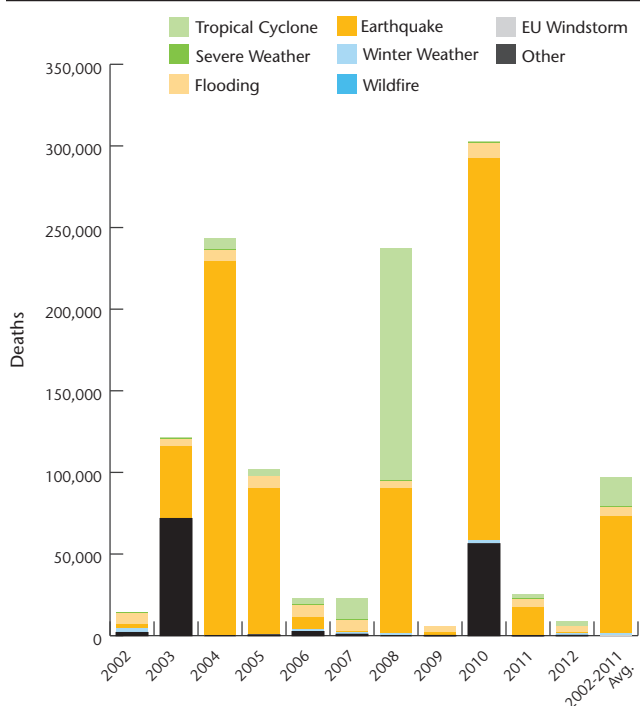
Note: Exhibits 9 & 10 include events which reached the billion-dollar-plus (USD) threshold after being adjusted for inflation based on the 2012 U.S. Consumer Price Index.

Global Fatalities

Exhibit 11: Top 10 Human Fatality Events

Date(s)	Event	Location	Deaths	Economic Loss (USD)
Dec. 2-5	STY Bopha	Philippines, Palau	1,901	1.04 billion
Jan. 24-Feb. 17	Winter Weather	Eastern Europe	824	800 million
Aug. 21-Nov. 10	Flooding	Pakistan	571	2.64 billion
July 22-Oct. 31	Flooding	Nigeria	363	636 million
Aug. 11	Earthquake	Iran	306	900 million
Dec. 7-31	Winter Weather	Central and Eastern Europe	277	25 million
Oct. 23-29	HU Sandy	U.S., Caribbean, Bahamas	254	65 billion
June 23-July 1	Flooding	India, Bangladesh	243	90 million
July 18-31	TS Khanun	North Korea, South Korea	175	11.4 million
July 7	Flooding	Russia	171	635 million

Exhibit 12: Global Human Fatalities by Peril



The number of human fatalities caused by natural disasters in 2012 was approximately 8,800, with nine of the top ten events occurring outside of the United States. The deadliest event of the year was Super Typhoon Bopha, which left more than 1,900 people dead in the Philippines after making landfall as a Category 5 cyclone in early December. Of the top ten deadliest events, four were flood-related (Pakistan, Nigeria, India/Bangladesh, and Russia), three were tropical cyclones (Super Typhoon Bopha, Hurricane Sandy and Tropical Storm Khanun), two were winter weather-related (Europe) and one was earthquake-related (Iran).

When comparing to recent history, 2012 saw the fewest natural disaster-related casualties since at least 2002. In recent years, earthquakes have been the primary driver of fatalities including Haiti in 2010, China in 2008, Pakistan & India in 2005, and Indonesia in 2004. Additional large non-earthquake peril fatalities were Cyclone Nargis' landfall in Myanmar in 2008 and an extensive heatwave in Europe in 2003.

Natural Disasters Defined and Total Events

An event must meet at least one of the following criteria to be classified as a natural disaster:

- Economic Loss: USD50 million
- Insured Loss: USD25 million
- Fatalities: 10
- Injured: 50
- Homeless or Displaced: 2,000

Based on this definition, there were at least 295 separate natural disaster events in 2012, above the 2002-2011 average of 257. The second and third quarters are typically the most active during the year, which was also the case in 2012. Asia sustained the highest number of events, but given the continent's large size and susceptibility to natural disaster events, this is to be expected. The United States was the second-most active region of the globe.

Exhibit 13: Total Events by Quarter

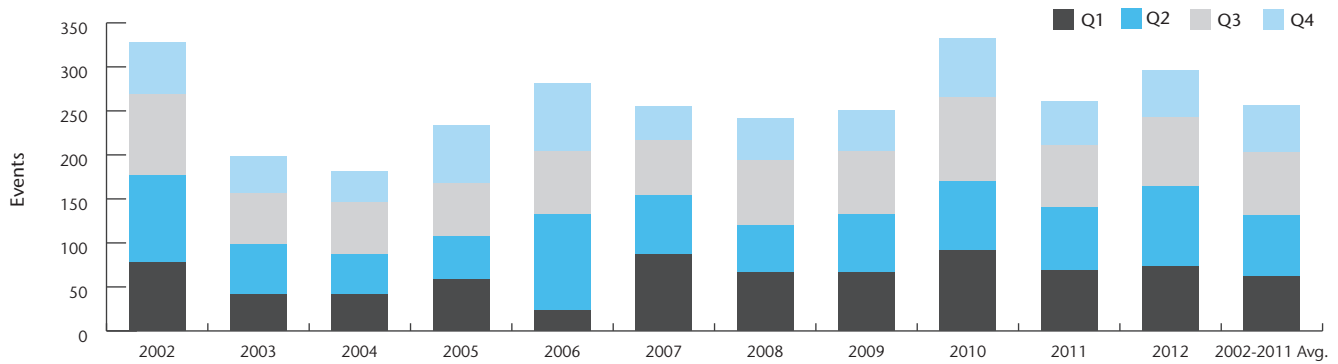
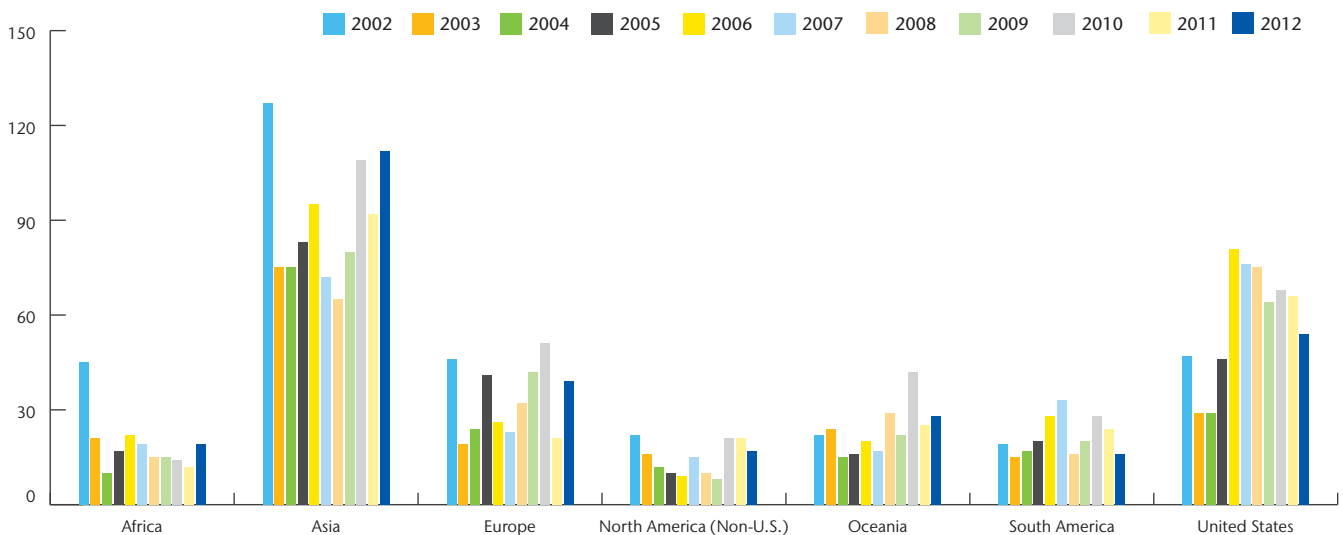


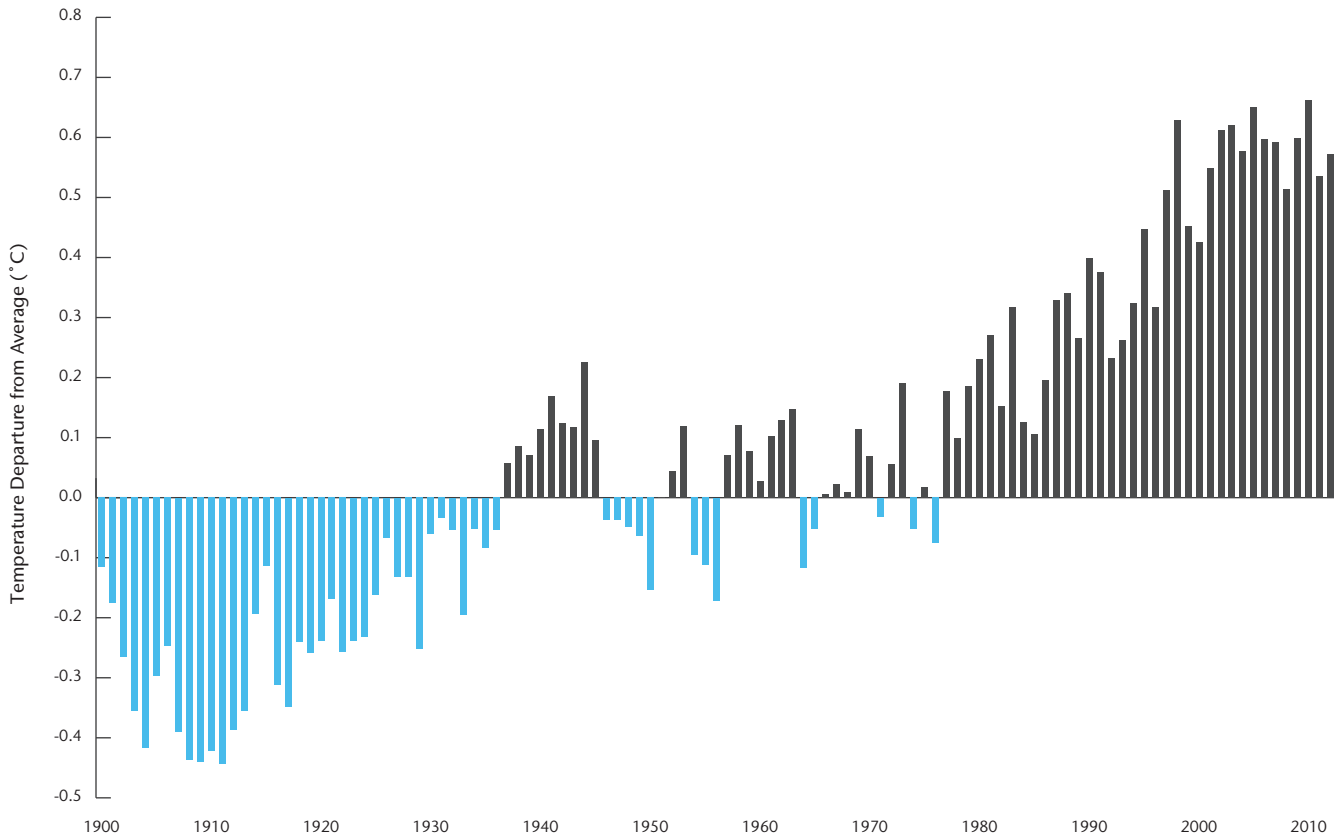
Exhibit 14: Total Events by Region



2012 Climate Review

2012 was the 36th consecutive year of above average global temperatures. Using official data provided by the National Climatic Data Center (NCDC), combined land and ocean temperatures for the earth in 2012 averaged 0.57°C (1.03°F) above the long-term mean, making 2012 the tenth warmest year ever recorded since official data on global temperatures began being kept back in 1880. The year 2010 remains the warmest on record, when the combined land/ocean global temperature was nearly 0.66°C (1.19°F) above NCDC’s 20th century average (1901-2000). The last below-average year for the globe occurred in 1976, when global temperatures registered 0.08°C (0.14°F) under the long-term average.

Exhibit 15: Global Land and Ocean Temperature Anomalies: 1900-2012



Various ocean oscillations influence the amount of warming or cooling that takes place in a given year. The El Niño/Southern Oscillation (ENSO) is a warming or cooling cycle of the waters across the central and eastern Pacific, leading to a drastic change in the orientation of the upper atmospheric storm track. Warming periods are noted as El Niño cycles, while cooling periods are known as La Niña cycles.

2012 started with a moderate La Niña phase that developed in September 2011. The La Niña phase quickly weakened during the first few months of 2012 after reaching peak intensity during the months of November and December 2011. As the

weakening continued, a full transition to an ENSO-neutral phase occurred in April. Despite the National Oceanic and Atmospheric Administration (NOAA) anticipating a possible shift to an El Niño phase during the late summer months (Northern Hemisphere) given the quick warming in the central and eastern Pacific, the observed warming trend unexpectedly eased and remained just below the minimum threshold for a weak El Niño. This allowed ENSO-neutral conditions to linger for the final eight months of 2012. The Niño-3.4 Index, which measures the temperature of the ocean waters in the central Pacific, is used to determine ENSO cycles.

2012 marked the fourth year in a row with below average tropical cyclone development across all global basins. Only 82 named storms were recorded. For the seventh consecutive year, the number of hurricanes, typhoons and cyclones (sustained winds of at least 74 mph (119 kph)) were also below average with a total of 44. Only 19 major storms (Category 3 with sustained winds of at least 111 mph (179 kph)) were recorded in 2012, which was the lowest total since 2009 and the second lowest since 1988. Based on data from the National

Hurricane Center and the Joint Typhoon Warning Center since 1980, the average number of named storms is 85 and the number of Category 1 and above storms is 47. Of those 47 storms, 23 normally strengthen to, or above, Category 3 status. In terms of global landfalls, 14 storms came ashore in 2012 at Category 1 strength or above. Only four of those made landfall at Category 3 strength or above. Landfall averages include 16 Category 1 and five Category 3 events.

Exhibit 16: Global Tropical Cyclone Activity (1980-2012)

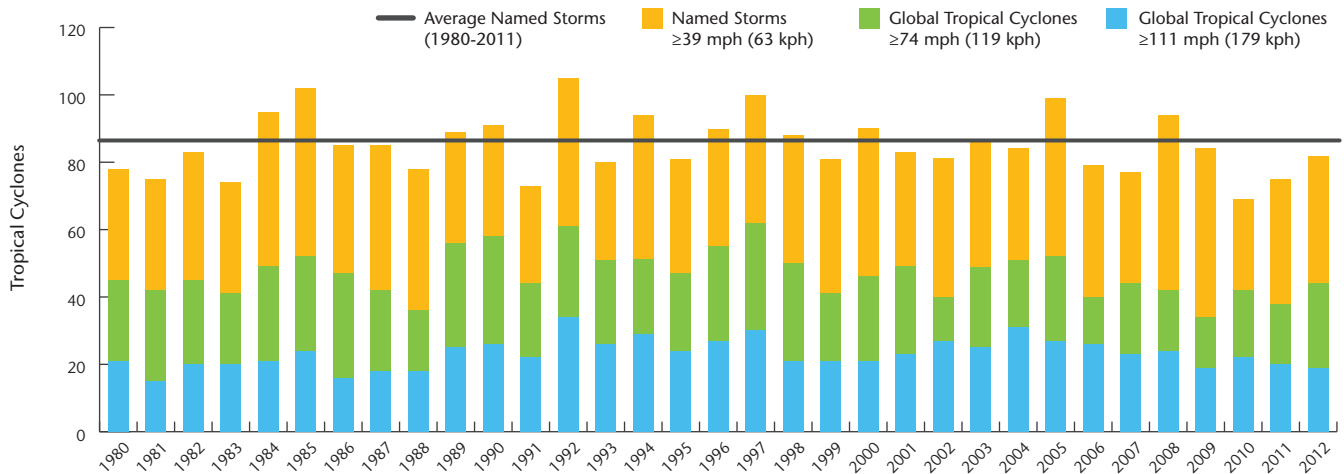
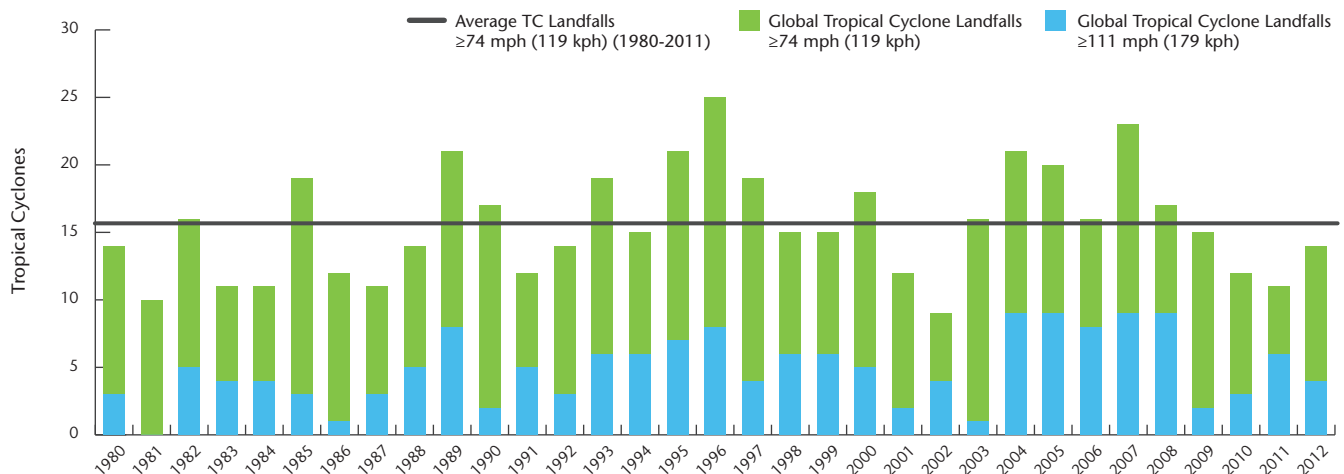


Exhibit 17: Global Tropical Cyclone Landfalls (1980-2012)



2012 Atlantic Ocean Hurricane Season Review

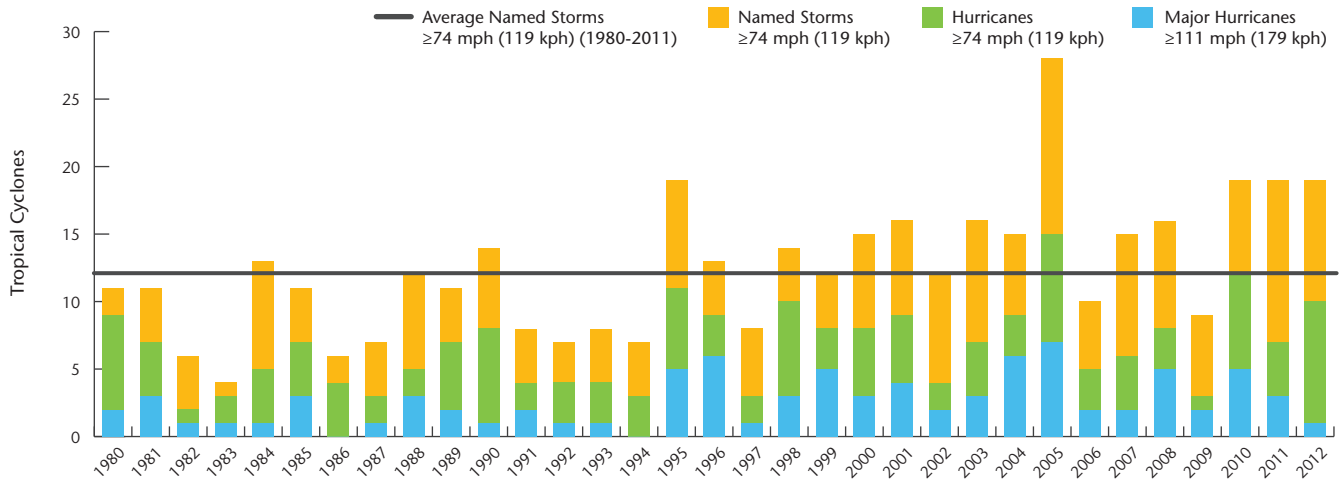
The 2012 Atlantic Hurricane Season was another active year for the basin. The season saw 19 named storms, 10 hurricanes (Category 1) and 1 major hurricane (Category 3) develop. 2012 became the third year in a row with 19 named storms, tying 1887, 1995, 2010, and 2011 as the third-busiest on record in the Atlantic Basin. The 1980-2011 average for named storms is 12.3. The 10 hurricanes marked only the sixth time since 1980 that 10 or more had occurred in a season. On average (1980-2011), 6.5 hurricanes form per year. It should be noted that 2005 holds the record for most hurricanes in a year when 15 formed. Despite the high number of hurricanes in 2012, only one strengthened to major hurricane status. This is below the 1980-2011 average of 2.7. 2012 became the seventh consecutive year in which the U.S. did not sustain a landfalling major hurricane.

The 2012 Atlantic Hurricane Season was influenced by generally ENSO-neutral conditions throughout the entire season, despite an initial assumption that a weak El Niño might develop during the peak development months between August and October. It was later determined that lingering La Niña conditions may have helped enhance named storm development during the season. (La Niña phases usually promote favorable conditions in the upper levels of the atmosphere for tropical cyclone development in addition to warm sea surface temperatures in the Atlantic’s Main Development Region (MDR).) See Appendix C for information on hurricane frequency as it relates to ENSO cycles.

The 2012 Atlantic Hurricane Season got off to an early start, as two named storms (Alberto and Beryl) developed during the second half of May. Chris became the first hurricane of the season in June in the open waters of the Atlantic and never posed a threat to land. Michael was the season’s strongest storm, reaching minimal Category 3 strength while remaining over the open waters of the Atlantic in September. Ernesto was the first landfalling hurricane of the season, coming ashore in Mexico’s Yucatan Peninsula during August as a Category 1 storm. Isaac became the first landfalling hurricane along the U.S. Gulf Coast since 2008 after it made two landfalls in southern Louisiana. The season’s most significant event was October’s Hurricane Sandy, which reached Category 2 strength while crossing the Caribbean Sea and later the Bahamas. Sandy made landfalls in Jamaica and Cuba before coming ashore in the U.S. near Atlantic City, New Jersey as a post-tropical cyclone with 80 mph (130 kph) sustained winds. A post-tropical cyclone is a system which has transitioned from having full tropical characteristics, including a purely warm core.

The Atlantic Hurricane Season officially runs from June 1 to November 30. For additional Atlantic Ocean Basin landfalling tropical cyclone data (including U.S.-specific info), see Appendix D.

Exhibit 18: Atlantic Basin Tropical Cyclone Activity (1980-2012)



2012 Eastern Pacific Ocean Hurricane Season Review

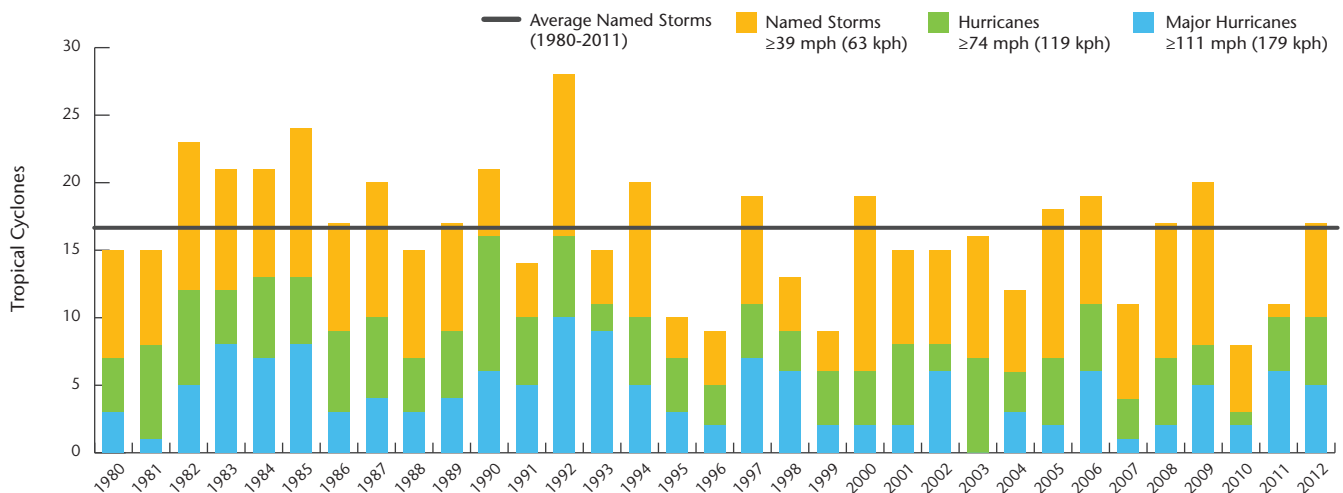
The 2012 Eastern Pacific Hurricane Season was the most active season since 2009 with 17 named storms (or approximately 4% above the 1980-2011 average of 16.4 named storms). Of the 17 named storms, 10 became hurricanes. This is 12% above the 32-year average of 8.9. The hurricane total was the same number as 2011, which had the highest number of hurricanes in the basin since 2006 (11). Five of 2012’s hurricanes strengthened to major hurricane status, or 16% above the 1980-2011 average of 4.3. Only one hurricane made landfall during the season.

ENSO likely played a role in this year’s heightened level of activity due to the transition from La Niña to ENSO-neutral conditions. The transition marked a noteworthy warming of waters in the central and eastern Pacific Ocean that was favorable for development. See Appendix C for information on hurricane frequency as it relates to the ENSO cycle.

While the Eastern Pacific Hurricane Season was rather active, the vast majority of the storms remained well offshore. Seven of the first nine storms became hurricanes, with Emilia becoming the strongest system of the season as a Category 4 with 140 mph (225 kph) winds during the month of July. Carlotta was the season’s only official landfalling system when it came ashore in southern Mexico as a Category 2 hurricane during the middle of June. As the season progressed, Hurricanes Bud, Daniel, Fabio, Gilma, Ileana, Lane and Miriam all developed but remained well offshore. In October, Hurricane Paul approached Baja California as a Category 3 storm but rapidly decayed while grazing the coastline.

The Eastern Pacific Hurricane Season officially runs from May 15 to November 30. For additional Eastern Pacific Ocean Basin landfalling tropical cyclone data, please see Appendix D.

Exhibit 19: Eastern Pacific Basin Tropical Cyclone Activity (1980-2012)



2012 Western Pacific Ocean Typhoon Season Review

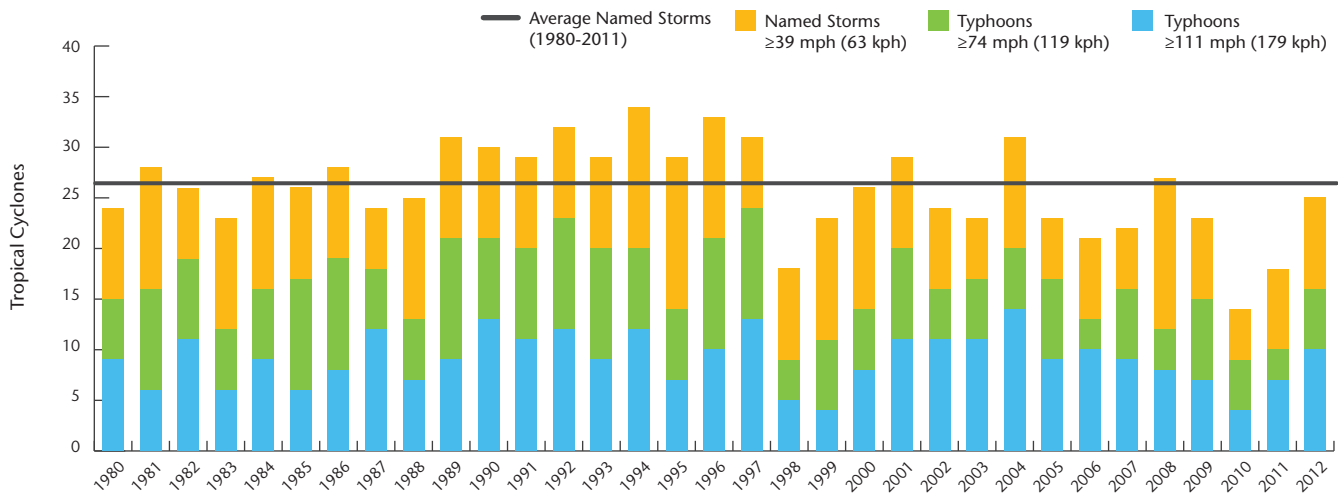
Typhoon activity across the Western Pacific Ocean Basin was below the 1980-2011 average for the fourth consecutive year in 2012, but had the most overall activity since 2008. A total of 25 named storms developed during the season, 4% percent below the 32-year average of 26.0. Of those storms, 16 typhoons formed, which was in line with the average of 16.5. Ten of the 16 typhoons reached Category 3 (or higher) strength, approximately 11% above the 1980-2011 average of 9.0. Of the 16 typhoons that developed, eight made landfall. This is near the 32-year average of 8.3.

The Western Pacific season was highlighted by Super Typhoon Bopha’s landfall in the Philippines after first crossing Palau in early December. Bopha came ashore in the Philippines’ Mindanao Island as a Category 5 with maximum sustained winds of 260 kph (160 mph) and caused catastrophic damage in addition to a high number of fatalities. The strongest typhoon of the season in the Western Pacific Basin was Super Typhoon Sanba, a Category 5 with winds of 280 kph (175 mph). The typhoon would eventually cross Japan’s Okinawa before significantly weakening and making landfall in South Korea as a Category 1 storm. The third Category 5 storm of the season was Super Typhoon Jelawat, which affected Japan’s Ryukyu Islands before weakening considerably and coming ashore on the mainland.

Other notable typhoons during the year included Super Typhoon Guchol, which also affected Japan’s Ryukyu Islands before making landfall as a tropical storm on the mainland. Typhoons Tembin and Saola were the only two systems to affect Taiwan. China endured multiple landfalling events, most notably Typhoon Vicente which came ashore as a Category 4 system. Additional landfalls in China were typhoons Damrey (Category 1) and Kai-tak (Category 1). Additional noteworthy typhoons were Super Typhoon Bolaven, which came ashore in North Korea as a transitioning cyclone, and Typhoon Son-tinh, which made landfall in Vietnam at Category 1 strength.

The Western Pacific Typhoon Season officially runs throughout the calendar year, though most activity occurs between the months of May and November. For additional Western Pacific Ocean Basin landfalling tropical cyclone data, please see Appendix D.

Exhibit 20: Western Pacific Basin Tropical Cyclone Activity (1980-2012)



2012 North Indian Ocean Cyclone Season Review

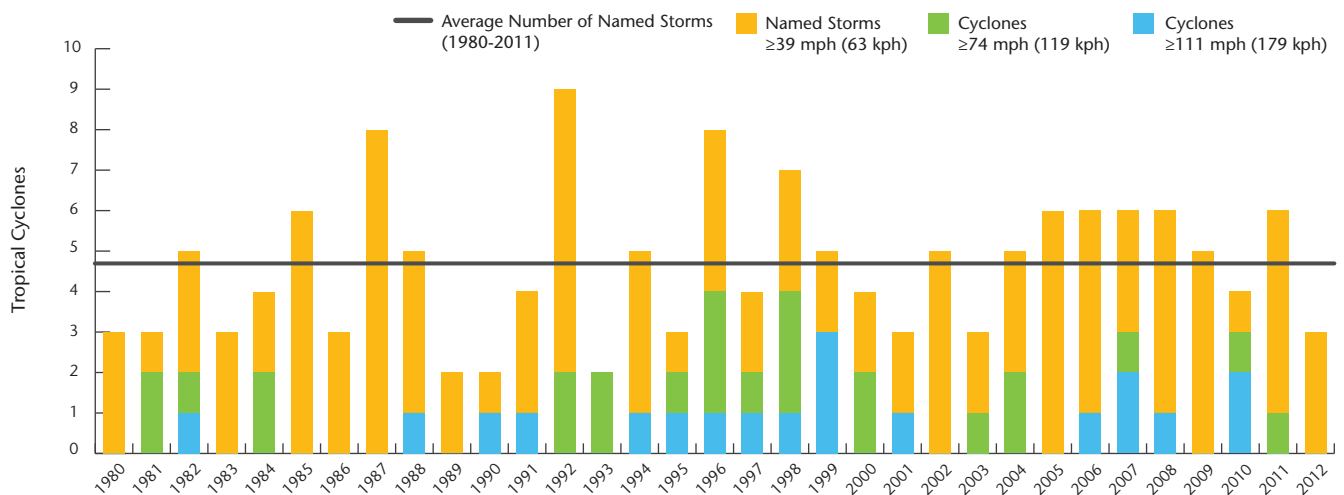
For the second time in three years, the North Indian Ocean Basin saw below average tropical cyclone activity. Only three named storms developed in the region, or 36% below the 1980-2011 average of 4.7. Of those storms, no cyclones formed, which was the first time since 2009 that no cyclones of at least Category 1 strength occurred. Based on the 32-year average, approximately 1.4 cyclones (Category 1) develop and 0.6 cyclones (Category 3) occur. In terms of overall cyclone landfalls, the 1980-2011 average is 1.0.

The most notable cyclonic event of the year in the North Indian Basin was Tropical Storm Nilam, which made landfall in southeast India in late October after first brushing by Sri Lanka. The system brought heavy rainfall that led to widespread damage and dozens of fatalities. Also in 2012, Tropical Storm

Murjan made landfall in Somalia with maximum sustained winds of 65 kph (40 mph). Murjan brought periods of heavy rainfall to the region, and became only the second named tropical cyclone to affect Somalia since at least 2000. Tropical Storm Bandu brushed the country in 2010. Tropical Storm Three briefly formed in the Bay of Bengal before dissipating.

The North Indian Ocean Cyclone Season officially runs throughout the calendar year, though most activity occurs between the months of April and December. For additional North Indian Ocean Basin landfalling tropical cyclone data, please see Appendix D.

Exhibit 21: North Indian Basin Tropical Cyclone Activity (1980-2012)



2012 Southern Hemisphere Cyclone Season Review

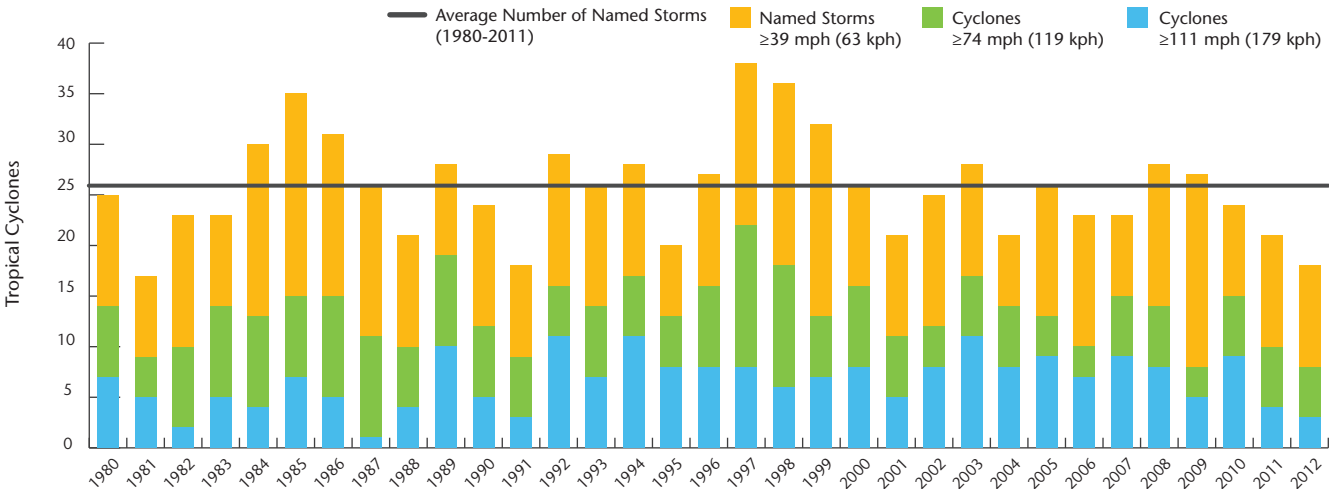
For the third consecutive year, the Southern Hemisphere Basin saw below average tropical cyclone activity. A total of 18 named storms developed in the region, or 31% below the average of 25.9 since 1980. Of those storms, eight cyclones formed, or 41% below the 1980-2011 average of 13.6. This ties 2009 as the fewest number of Category 1 systems in the Southern Hemisphere since at least 1980. Three cyclones reached Category 3 strength, which is approximately 55% below the 32-year average of 6.7. Out of the eight Category 1 cyclones, only two made landfall, or 20% below the 1980-2011 average of 2.5.

As was the case in 2011, there was only one landfalling tropical cyclone in Australia in 2012. However, unlike 2011, cyclone losses were largely minimal. Cyclone Lua made landfall as a 175 kph (110 mph) Category 2 system in Western Australia in a fairly rural region and impacts were temporarily closing ports. The rest of the tropical activity in the South Pacific and South Indian Ocean basins surrounding Australia generally remained over open waters and did not have any direct impacts. Tropical Storm Heidi made landfall in Western Australia in January, but no damage was reported. Cyclone Iggy, at one point with Category 1 winds, dissipated prior to coming ashore in Western Australia.

Outside of Australia, the most notable cyclonic activity occurred in Madagascar and Mozambique. Cyclone Giovanna made landfall in Madagascar as a Category 4 storm during the month of February and brought torrential rainfall and gusty winds to the island. Giovanna, with maximum sustained winds of 230 kph (145 mph), was the strongest cyclone in the Southern Hemisphere in 2012. While never officially making landfall, Cyclone Funso skirted the Mozambique coastline for several days in January and left dozens of people dead. The storm also reached Category 4 strength with sustained winds of 220 kph (140 mph). The rest of the tropical activity remained over open waters.

The Southern Hemisphere Cyclone Season officially runs from July 1 to June 30. (The 2012 season ran from July 1, 2011 to June 30, 2012.) For additional Southern Hemisphere landfalling tropical cyclone data, please see Appendix D.

Exhibit 22: Southern Hemisphere Tropical Cyclone Activity (1980-2012)



2012 United States Tornado Season Review

Following one of the most severe tornado years on record in the United States, 2012 reversed course and ended up as one of the least active seasons since the implementation of Doppler Radar in the early 1990s. A preliminary count from the Storm Prediction Center (SPC) tallied 936 tornadoes in 2012, a 45% drop from the 1,692 touchdowns in 2011 and 17% below the 1980-2011 average of 1,126. (Since the enactment of Doppler Radar in the early 1990s—which has led to markedly improved tornado detection—the annual average number of tornadoes is approximately 1,300.) There were 25 tornadoes rated EF-3 or greater in 2012, and no EF-5 tornadoes that touched down. For comparison sake, there were 84 EF-3 or greater tornadoes (including six EF-5) that struck the U.S. in 2011 and caused record levels of damage and fatalities.

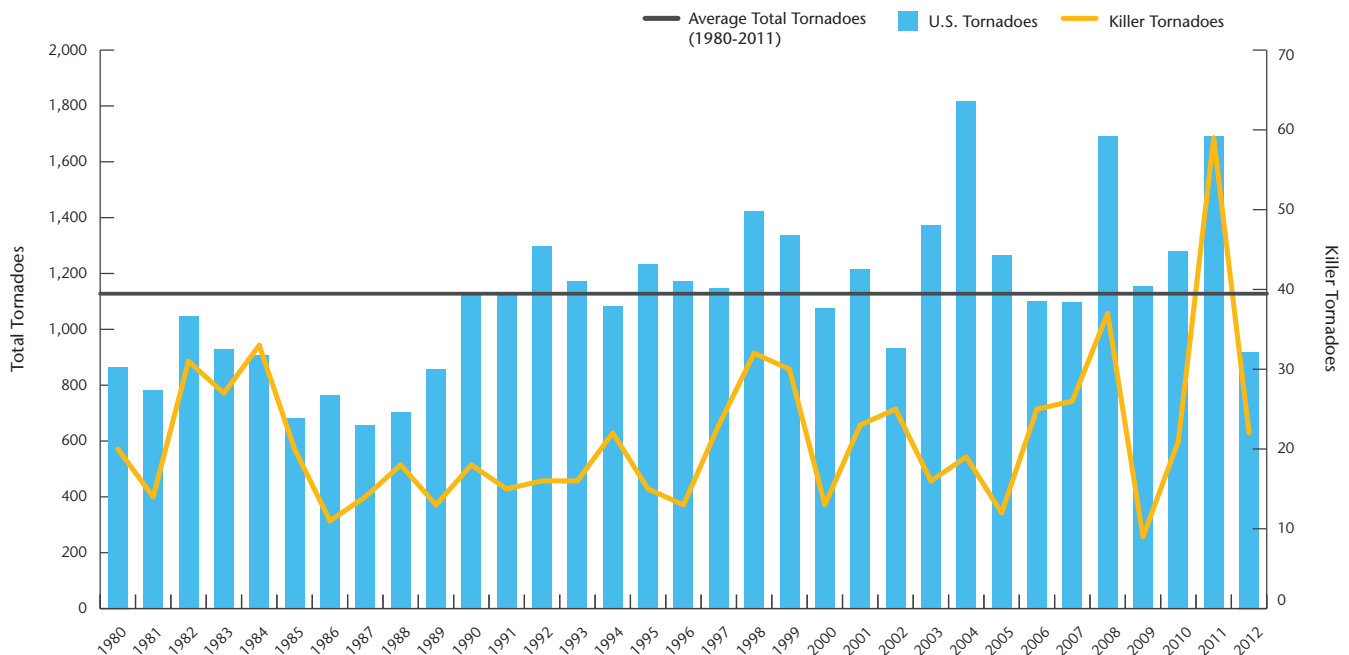
A total of 22 killer tornadoes (tornadoes that caused fatalities) occurred across the United States in 2012. This total represents a sharp decrease from 2011, when 59 were recorded. The killer tornadoes of 2012 caused 68 fatalities, which is close to the 32-year average of 71. Tornado-related fatalities in 2011 totaled 553, which was the deadliest year since official records began

being kept by the National Weather Service in 1950. The vast majority of the fatalities in 2012 occurred in the months of February and March (56), following multiple tornado outbreaks that affected parts of the Plains, Midwest and the Tennessee Valley. A tornado outbreak on Christmas Day saw dozens of tornadoes touch down in the Southeast.

The single-deadliest twister of the year also came on the most active day of the year in southern Indiana (40 people dead; March 2nd). At least 11 people were killed as an EF-4 tornado with maximum winds of 175 mph (280 kph) tracked from Washington County, Indiana to Trimble County, Kentucky and caused extensive damage in its path. The second deadliest tornado of the year also occurred on March 2nd, as an EF-3 with 140 mph (225 kph) winds left at least 10 people dead in the towns of West Liberty, Frenchburg and Blaine in Kentucky. All tornado fatalities occurred prior to July 1st.

For additional United States tornado data, including a look at tornado frequencies during ENSO cycles, please see Appendix E.

Exhibit 23: United States Tornado Activity (1980-2012)



2012 United States Wildfire Season Review

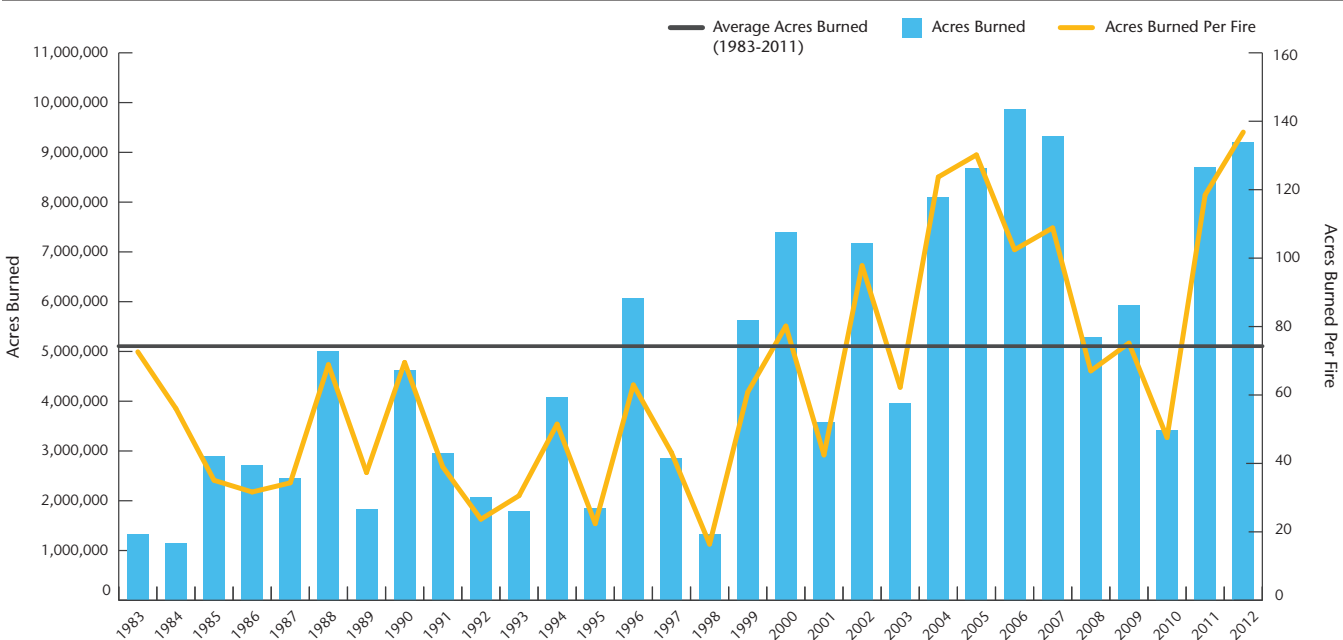
The number of wildfires in 2012 across the United States was below the 1983-2011 year average, while the number of acres burned per fire was the highest ever recorded since the current methodology of recording official data began being kept. The National Interagency Fire Center (NIFC) reported approximately 67,315 wildfires burning 9,211,281 acres (3,730,569 hectares), compared to 73,484 fires burning 8,706,852 acres (3,526,275 hectares) in 2011 and the 29-year average of 73,000 fires burning 4,553,438 acres (1,844,142 hectares). 2012 marked only the third time in history that more than 9,000,000 acres (3,462,000 hectares) have been burned in a season since 1983 and the first since 2007.

Exhibit 27 shows that the 2012 wildfire season burned an average of 136.84 acres (55.2 hectares) per fire, significantly above the long-term average of 62.48 acres (25.30 hectares) per fire. This surpasses the previous burn rate record set in 2005, when an average of 130.17 acres (52.72 hectares) occurred. The lowest burn rate occurred in 1998, when an average of 16.41 acres (6.64 hectares) burned within each fire, mainly due to excessive precipitation across California early in the year caused by a strong El Niño phase.

The most significant wildfire activity was found across western and central sections of the United States, as one of the most severe droughts since the 1950s enhanced fire conditions. Colorado sustained the majority of the major damage in 2012. The most notable fire was the Waldo Canyon Fire, which burned in the greater Colorado Springs region during June and July. The blaze, which became the costliest and most damaging wildfire in state history, destroyed at least 346 homes and damaged dozens more. The fire occurred only weeks after the High Park Fire briefly became the most damaging fire in Colorado history after destroying 259 homes just west of Fort Collins. Besides Colorado, the state of Oklahoma sustained a heightened wildfire year as well. During a multi-week stretch in August, dozens of fires damaged or destroyed hundreds of homes and other structures across the state. Other noteworthy wildfires in the U.S. during 2012 were recorded in parts of Washington, Oregon and California.

For additional United States wildfire data, please see Appendix F.

Exhibit 24: United States Wildfire Activity (1983-2012)



2012 Global Earthquake Review

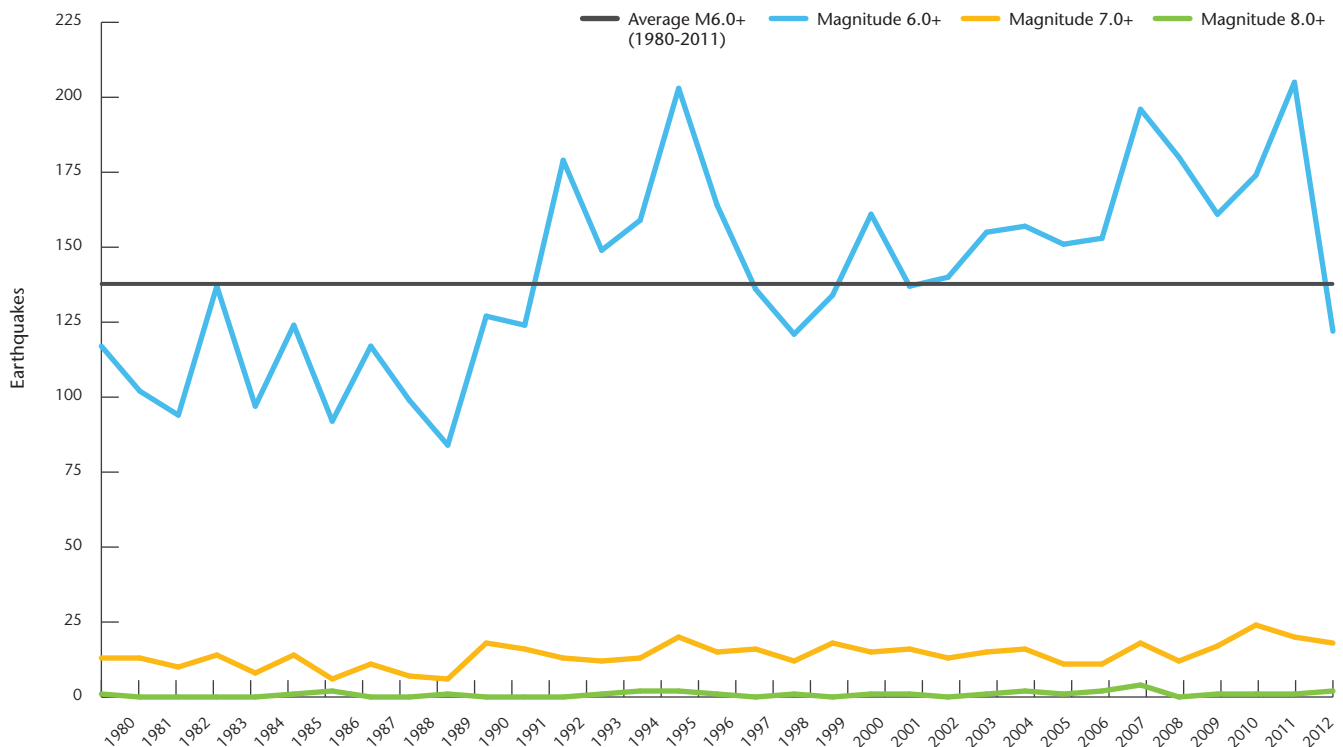
After an extremely active seismic year in 2011, which saw record earthquake losses and a heightened level of activity, the number of recorded global earthquakes ($\geq M6.0$) was significantly lower in 2012. Based on data from the United States Geological Survey's (USGS) National Earthquake Information Center (NEIC) and the Advanced National Seismic System (ANSS), there were 122 earthquakes with magnitudes greater than 6.0, 14 earthquakes with magnitudes greater than 7.0 and two earthquakes with magnitudes greater than 8.0. This compares to the 205 (M6.0), 21 (M7.0) and 1 (M8.0) seen in 2011, and the 1980-2011 averages of 142 (M6.0), 14 (M7.0) and 1 (M8.0).

The strongest earthquake of the year was a magnitude-8.6 tremor which struck off the coast of Indonesia's Banda Aceh in April. Unlike the massive tsunami that was spawned in this region following 2004's magnitude-9.1 subduction earthquake, the 2012 event was a strike-slip rupture and only a minimal

tidal rise was recorded. (Strike-slip events typically do not spawn significant tsunami waves given their horizontal tectonic motion. Subduction events are more prone to tsunamis since tectonic motions are vertical and can cause severe undulations in large bodies of water.) The deadliest earthquake(s) of the year came in August as two tremors (magnitudes 6.4 and 6.3) struck within 11 minutes of each other in northwestern Iran and killed at least 306 people.

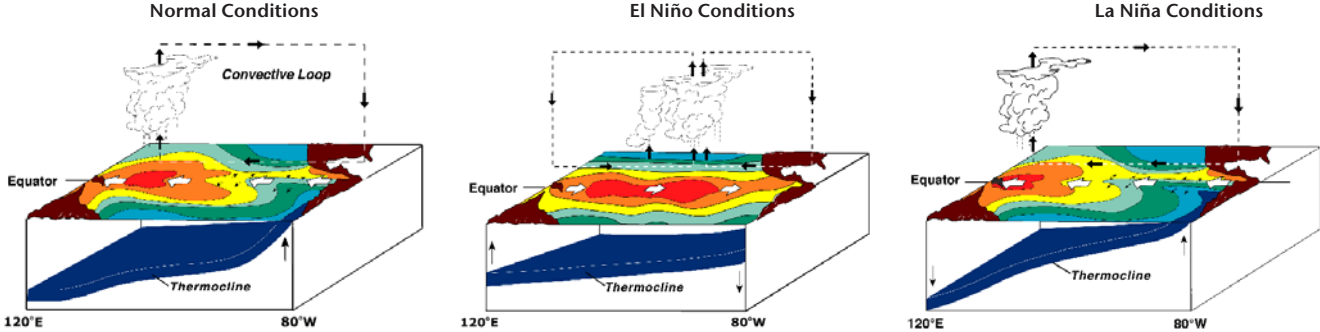
While Exhibit 25 may appear to indicate an increase in seismic activity since 1990, the USGS cites that a substantial increase in seismograph stations and continued improvements in global technology and communication has greatly strengthened the quality of earthquake data collection. It should also be noted that despite fluctuations in the number of total earthquakes since the early 1900s, the number of recorded major earthquakes (M7.0) have remained fairly constant.

Exhibit 25: Global Earthquake Activity $\geq M6.0$ (1980-2012)



El Niño/Southern Oscillation (ENSO) Background

Exhibit 26: Phases of the El Niño/Southern Oscillation (ENSO)



There are several atmospheric and oceanic dynamics that impact tropical cyclone development across the globe. One of the main driving climate factors for the globe’s weather activity is the El Niño/Southern Oscillation (ENSO), which is an anomalous warming or cooling of the central Pacific Ocean waters that generally occurs every three to seven years, mainly between August and February.

During neutral conditions, surface trade winds blow from the east and force cooler waters that are upwelled from the deeper depths of the Pacific Ocean to the surface across the western coast of South America. Because of the displacement of water flowing to the west, the ocean is up to 60 centimeters (two feet) higher in the western Pacific Ocean as it is in the eastern Pacific Ocean. The warmer waters are forced into the western portions of the ocean, allowing thunderstorm activity to occur across the western half of the Pacific Ocean.

During El Niño conditions, the surface trade winds that normally blow from east to west weaken and sometimes even reverse direction. This allows the warmer waters to remain or even traverse eastward, bringing more frequent thunderstorm activity to the central and eastern portions of the Pacific Ocean. Warm and very wet conditions typically occur across Peru, Ecuador, Brazil and Argentina from December through April. Portions of Central America, Colombia and the Amazon River Basin are dry, as are southeastern Asia and most of Australia. In Africa, El Niño’s effects range from wetter-than-average conditions across eastern portions to warmer and drier-than-average conditions across southern portions. In North America, the polar jet stream (the jet stream that is responsible for Arctic outbreaks) is usually pushed northward, keeping cold Arctic air

across the northern portions of Canada. Warmer-than-average temperatures typically occur across the northern United States and southern Canada. The subtropical jet stream, which usually sinks southward during the winter months, will drift northward and bring a succession of storm systems across the southern tier of the U.S. and northern Mexico.

During La Niña conditions, the surface trade winds will strengthen, promoting additional cooler water to be upwelled from the depths of the Pacific Ocean up to the surface and forced westward. This forces thunderstorm activity across the Pacific Ocean westward and often brings fewer tropical systems to the central and eastern Pacific regions. Because of the waters’ influence on the upper atmospheric jet stream, La Niña’s effects, like El Niño’s effects, are experienced worldwide. The main effects are usually noted across the western Pacific regions, where wetter conditions are expected, especially during the beginning months of the year. Wet and cool conditions are typical across southern Africa and eastern South America between December and February. With the polar jet stream displaced further south, cool and wet conditions occur across the northern half of the North America West Coast, while dry and mild conditions are experienced for the southern half of the United States into northern Mexico. If La Niña’s cycle continues into June, July and August, warm and wet conditions often occur across Indonesia and the southern half of Asia, while cool and wet conditions are found across the southern portions of the Caribbean Ocean.

See Appendix C for ENSO’s effects on tropical system frequency for all of the global basins.

Atlantic Hurricane Season Forecasts

Historical Predictions

Abundant media coverage is given to various organizations across the world that issue hurricane season predictions for the Atlantic Ocean Basin. These organizations utilize meteorological and climatic data obtained, in some instances, up to six months in advance to determine how active or inactive the Atlantic Hurricane Season will be in the upcoming year. Several different professional entities issue these forecasts, ranging from governmental agencies to universities to private companies. Three organizations which consistently make their forecasts available to the public are:

- Colorado State University (CSU), a forecast group sponsored by Colorado State University and private companies that is led by Dr. Philip Klotzbach and Dr. William Gray
- The National Oceanic and Atmospheric Administration (NOAA), the United States’ official governmental climatological and meteorological office
- Tropical Storm Risk (TSR), an Aon Benfield-sponsored forecast group based in London, England led by Professor Mark Saunders and Dr. Adam Lea

Some of these entities disclose in detail the parameters being used to derive these forecasts, while others cite general factors for the reasoning of their predictions. CSU and TSR provide specific numbers for each year’s forecasts, while NOAA provides a range of values.

The forecasts for the last five years made between the period of May 1st and June 10th along with the actual total number of named storms, hurricanes and major hurricanes are shown in the following tables. The May/June forecast was chosen due to the availability of forecasts from each organization. Additionally, a five-year cumulative forecast is shown to emphasize that long-term forecasting may yield more information on general frequency shifts than short-term forecasting.

Exhibit 27: 2012 Forecasts

Forecast Parameter	May/June Atlantic Hurricane Season Forecast				
	1980-2012 Average	CSU	NOAA	TSR	Season Total
Named Storms	12	13	9-15	14	19
Hurricanes	7	5	4-8	6	10
Major Hurricanes	3	2	1-3	3	1

Exhibit 28: 5-Year Average Forecasts

Forecast Parameter	May/June Atlantic Hurricane Season Forecast				
	1980-2012 Average	CSU	NOAA	TSR	5-Year Season Avg.
Named Storms	12	15	11-17	14	16
Hurricanes	7	7	6-10	7	8
Major Hurricanes	3	4	2-5	3	3

2013 Atlantic Hurricane Season Outlooks

CSU and TSR release forecasts for the following year's Atlantic Hurricane Season in early December, and these forecasts are shown below. This year CSU decided to suspend providing quantitative outlooks for specific numbers of named storms, hurricanes and major hurricanes (Category 3) in their December analysis.

Exhibit 29: CSU 2013 United States and Caribbean Landfall Probabilities (issued December 7th)

Region	Tropical Storm	Hurricanes (Category 1, 2)	Hurricanes (Category 3, 4, 5)
Entire U.S. Coastline	79%	84%	52%
U.S. East Coast including the Florida Peninsula	50%	61%	31%
Gulf Coast from the Florida Peninsula to Brownsville, Texas	59%	60%	30%
Caribbean Islands	82%	75%	42%

Exhibit 30: TSR 2013 Atlantic Basin Hurricane Season Forecast (issued December 5th)

Atlantic and Caribbean Overall Forecast	TSR Average Year	TSR Forecast
Named Storms	10.8 (± 4.4)	15.4 (± 4.3)
Hurricanes	6.3 (± 2.7)	7.7 (± 2.9)
Intense Hurricanes	2.7 (± 1.9)	3.4 (± 1.6)
ACE Index	103 (± 59)	134 (± 56)

Exhibit 31: TSR 2013 United States Landfall Forecast (issued December 5th)

U.S. Landfalling Storms Forecast	TSR Average Year	TSR Forecast
Named Storms	3.1 (± 2.0)	4.5 (± 2.2)
Hurricanes	1.4 (± 1.3)	2.0 (± 1.5)
ACE U.S. Landfall Index	2.4 (± 2.2)	3.2 (± 2.1)

The Accumulated Cyclone Energy Index is equal to the sum of the squares of 6-hourly maximum sustained wind speeds (in knots) for all systems while they are at least tropical storm strength. The ACE Landfall Index is the sum of the squares of hourly maximum sustained wind speeds (in knots) for all systems while they are at least tropical storm strength and over the United States mainland (reduced by a factor of 6).

2012 Monthly Catastrophe Review

United States

- Hurricane Sandy makes landfall as a Post-Tropical Cyclone in New Jersey; 2nd costliest storm in U.S. history
- Most extensive droughts since the 1930s affects more than 65% of the United States
- Six separate stretches of severe weather cause more than USD1 billion in insured losses

Exhibit 32: United States January Events

Date	Event	Location	Deaths	Structures/Claims	Economic Loss (USD)
1/8-1/12	Winter Weather	Plains, Southeast, Northeast	0	Thousands	Millions
1/12-1/13	Winter Weather	Midwest, Ohio Valley, Northeast	0	Thousands	Millions
1/16-1/17	Severe Weather	Midwest, Southeast, Northeast	0	Thousands	25 million
1/17-1/22	Winter Weather	Pacific Northwest	3	1,000	100 million
1/19-1/21	Wildfires	Nevada	0	29	9.1 million
1/22-1/23	Severe Weather	Southeast, Plains	3	10,000	175 million

A strong winter storm affected a wide swath of the eastern United States between the 8th and the 12th, spawning heavy snow, rain and isolated severe weather. In the greater Houston, Texas metropolitan area, excessive rains prompted flash flooding in addition to three tornado touchdowns. On the western edge of the system, the city of Midland saw record snow. The system later impacted parts of the Southeast, the Tennessee Valley, the Mid-Atlantic and New England. In North Carolina, tornadoes injured 15 people and damaged or destroyed nearly 100 structures.

The first major snowstorm of the season impacted parts of the Midwest, the Ohio Valley and New England on the 12th and 13th. Heavy snow accumulations, triggered by a quick-moving Alberta Clipper, led to extensive travel delays as on the roads and in the air, including the greater Chicago metro region.

A strong storm system brought severe weather and heavy snow to much of the eastern U.S. on the 16th and 17th. Strong thunderstorms accompanied the leading cold front, spawning hail and damaging winds in parts of Missouri, Illinois and Indiana. As the front pressed eastward, a long line of severe thunderstorms stretched from southern New England to the Gulf Coast. With 11 tornadoes touching down, the most notable damage occurred in portions of Indiana, Kentucky, Tennessee and Mississippi. Total economic losses were estimated in excess of USD25 million.

A series of powerful winter storms affected the Pacific Northwest between the 17th and the 22nd, leading to three fatalities. Areas from northern California to Washington sustained copious amounts of snowfall during the first storm, including Seattle and Portland. A second system brought freezing rain, ice and rain to Oregon and Washington, which prompted flooding due to a melting snowpack. Several rivers in Oregon crested at all-time heights. Total economic losses were estimated in excess of USD100 million, including USD38 million in damage from nine Oregon counties.

The Washoe Drive Fire destroyed at least 29 homes just outside of Reno, Nevada between the 19th and the 21st. The fire burned nearly 3,200 acres (1,300 hectares), and caused total economic losses of USD9.1 million.

A rare January severe weather outbreak spawned at least 25 tornado touchdowns across central and eastern sections of the United States on the 22nd and the 23rd, killing at least three people and injuring more than 120 others. Seven Alabama counties sustained the worst affects, with the most notable tornado being an EF-3 with 150 mph (240 kph) winds that ripped through Birmingham suburbs. Total economic losses were estimated at USD175 million, with various insurers receiving upwards of 10,000 claims with payouts listed at USD100 million.

Exhibit 33: United States February Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
2/17-2/18	Severe Weather	Plains, Southeast	0	Hundreds	Unknown
2/20	Severe Weather	Plains	1	Thousands	Millions
2/22	Severe Weather	Southeast	1	250	1.6 million
2/24	Severe Weather	Southeast, Mid-Atlantic	0	Hundreds	Millions
2/28-2/29	Severe Weather	Midwest, Plains, Southeast	14	25,000	500 million

Strong thunderstorms crossed portions of the southern Plains and the Southeast (primarily along the Gulf Coast) on the 17th and 18th, spawning damaging winds, large hail and isolated tornado touchdowns. The inclement weather led to downed trees and power lines onto homes and vehicles.

A squall line along an advancing frontal boundary in the Plains led to widespread damage across parts of Kansas and Oklahoma on the 20th. In Ottawa County, Kansas, local law enforcement noted that two inches (50 millimeters) of hail accumulated on Highway 81 while pelting vehicles. One person was killed in Oklahoma, as strong winds and hail affected the state (including throughout the Oklahoma City metropolitan region).

Severe thunderstorms led to a tornado touchdown in northern Georgia on the 22nd, killing at least one person. The EF-1 tornado damaged or destroyed at least 100 homes in Floyd County, with total damages listed at USD1.6 million. Additional storm damage was reported to homes in Tennessee and North Carolina.

Severe weather occurred on the 24th throughout the Southeast and the Mid-Atlantic States in association with a strong winter storm. At least five tornadoes touched down in South Carolina, Georgia and Virginia (including an EF-2 with 130 mph (210 kph) winds in Aiken County, SC). Damaging winds and hail was also recorded from Mississippi to Delaware. Total economic losses were estimated in the millions of dollars (USD).

A powerful winter storm spawned a severe weather outbreak across 10 central and eastern states on the 28th and 29th, killing at least 14 people and injuring more than 200 others. The SPC confirmed at least 42 tornado touchdowns in addition to hundreds of reports of hail and damaging winds. The most notable tornado came in Harrisburg, Illinois, where an EF-4 with 180 mph (285 kph) winds left substantial damage and six fatalities. Elsewhere, tornadoes caused damage in parts of Missouri, Kansas and Tennessee. Total economic losses were at least USD500 million while various insurers received more than 25,000 claims with payouts in excess of USD315 million.

Exhibit 34: United States March Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
3/2-3/3	Severe Weather	Midwest, Southeast	40	280,000	4.0 billion
3/4-3/9	Flooding	Hawaii	0	Hundreds	37.5 million
3/12	Flooding	Louisiana	0	1,500	2.0 million
3/14-3/15	Severe Weather	Great Lakes	0	20,000	275 million
3/18-3/25	Severe Weather	Plains, Midwest, Southeast	1	37,500	325 million
3/26-4/2	Wildfire	Colorado	3	25	1.3 million
3/26-4/30	Winter Weather	Michigan	0	Unknown	503 million
3/29-3/31	Severe Weather	Plains, Midwest, Southeast	0	35,000	400 million

A significant severe weather outbreak swept across parts of the Midwest, the Tennessee Valley and the Southeast in the United States on the 2nd and 3rd, killing at least 40 people and injuring more than 400 others. According to the SPC, there were at least 70 confirmed tornado touchdowns and nearly 900 additional reports of hail and damaging winds. The hardest-hit areas came in southern Indiana, Kentucky, Tennessee and southwest Ohio, where two EF-4 tornadoes touched down and caused extensive damage. Additional tornado damage occurred in Alabama, Mississippi, Georgia, Virginia and North Carolina. Total economic losses were estimated at USD4.0 billion, while various insurers reported that more than 280,000 claims had been filed with payouts in excess of USD2.4 billion.

Consecutive days of torrential rains and strong thunderstorms in Hawaii between the 4th and the 9th led to widespread flash flooding and isolated reports of mudslides. A disaster was declared for the islands of Oahu and Kauai after damage occurred to homes, businesses and vehicles. Total economic losses were estimated at USD37.5 million.

Torrential rains fell in southern Louisiana on the 12th, causing flash flooding in parts of five parishes. More than 1,500 homes and other structures were damaged after some areas registered as much as 15 to 20 inches (38 to 50 centimeters) of rain in only a few hours' time. The town of Carencro was amongst the hardest-hit, where city engineers labeled the floods as a 500-year event. Total economic losses were estimated at USD10 million.

Severe weather impacted the Great Lakes on the 14th and 15th, including at least three tornadoes that touched down across southeastern Michigan. The most significant damage came in the town of Dexter, where an EF-3 tornado with winds up to 140 mph (220 kph) damaged or destroyed at least 207 homes. Total economic losses were estimated at USD275 million, while various insurers received more than 20,000 claims with payouts in excess of USD150 million.

A slow-moving storm system brought heavy rain and periods of severe weather to a broad area of the central and southern U.S. between the 18th and the 25th, killing one person. Flooding to homes and businesses was reported in parts of Texas, Oklahoma, Arkansas, Louisiana, Missouri, and Mississippi. The system also spawned severe weather across the Plains, Midwest and the Southeast. At least 63 confirmed tornadoes touched down. Total economic losses were estimated at USD325 million, while various insurers received more than 37,500 claims with payouts in excess of USD175 million.

A wildfire burned an area in the greater Denver, Colorado region between March 26th and April 2nd, killing at least three people. The blaze, called the Lower North Fork Fire, was sparked from a controlled burn reigniting due to high winds. The fire burned 4,100 acres (1,659 hectares) of land, and destroyed at least 25 homes in the mountainous community of Conifer. The state government granted USD1.3 million for recovery efforts.

A hard freeze throughout the Upper Midwest and Great Lakes on March 26th was followed by a prolonged cool spell during the month of April. With most of March being exceptionally warm, crops began to grow unexpectedly early in the region. The freeze and cold caused extensive damage to apple and cherry crops in Michigan, where total economic impacts were listed at USD503 million.

Rounds of severe weather led to widespread hail, wind and flood damage across portions of the Plains, Midwest and the Southeast between the 29th and the 31st. The Rio Grande Valley in Texas sustained the most notable impacts, where baseball-sized hail and street flooding occurred. Total economic losses were estimated at USD400 million, while various insurers received more than 35,000 claims with payouts in excess of USD250 million.

Exhibit 35: United States April Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
4/2-4/4	Severe Weather	Texas	0	120,000	1.3 billion
4/11	Severe Weather	California	0	Unknown	79 million
4/13-4/15	Severe Weather	Plains, Midwest	6	50,000	1.75 billion
4/20	Severe Weather	Texas	0	15,000	90 million
4/28-4/29	Severe Weather	Midwest	1	355,000	4.25 billion

Severe weather impacted the southern Plains between the 2nd and the 4th, spawning 22 tornadoes. Most of the tornado damage occurred on the 3rd in the greater Dallas-Fort Worth metropolitan area with more than 1,100 homes sustaining damage. According to the SPC, the strongest tornado was an EF-3 with 150 mph (240 kph) winds that struck the town of Forney. Large hail and damaging winds also had widespread affects, including 110 planes damaged by hail at Dallas-Fort Worth International Airport. Total economic losses were estimated at approximately USD1.3 billion, while various insurers received at least 120,000 claims with payouts in excess of USD750 million.

Strong thunderstorms struck parts of California's San Joaquin Valley on the 11th, prompting quarter-sized hail. At least four counties (Kings, Tulare, Fresno and Madera) sustained widespread crop damage. Agricultural losses throughout the region were listed at USD79 million.

A major severe weather outbreak swept across the central U.S. between the 13th and the 15th, killing at least six people and injuring dozens more. The SPC confirmed 114 tornado touchdowns and more than 400 reports of hail and damaging winds. The most active day came on the 14th, with the state of Kansas enduring the worst affects. Just outside the city of Wichita, an EF-3 tornado damaged or destroyed at least 777 homes and 165 businesses. Southwest Iowa and northwest Oklahoma (where all six fatalities occurred) also sustained severe tornado damage. Total economic losses were estimated at USD1.75 billion, with various insurers receiving more than 50,000 claims with payouts in excess of USD900 million.

Explosive thunderstorm development affected Texas's Rio Grande Valley on the 20th, spawning hail ranging from golf ball to grapefruit-sized. The system left affected the cities of McAllen, Edinburg, Pharr and Mission. Total economic losses were listed at USD90 million, while various insurers received more than 15,000 claims with payouts in excess of USD55 million.

Rounds of severe thunderstorms struck the Midwest and Plains on the 28th and 29th, killing at least one person and injuring more than 100 others. Golf ball to softball-sized hail and winds gusting to 90 mph (150 kph) were recorded that caused significant damage to personal and commercial properties and automobiles. The greater St. Louis, MO metro area was heavily affected. Total economic losses were estimated at USD4.25 billion, while various insurers received more than 345,000 claims with payouts in excess of USD2.4 billion.

Exhibit 36: United States May Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
5/2-5/6	Severe Weather	Midwest, Plains, Mid-Atlantic	0	30,000	275 million
5/25-5/30	Severe Weather	Plains, Midwest, Northeast	0	190,000	2.5 billion
5/28	TS Beryl	Southeast	4	Unknown	10 million

Strong thunderstorms led to widespread damage in the Midwest, Plains, Ohio Valley and the Mid-Atlantic between the 2nd and the 6th. Storm reports from the Dakotas to Maryland included isolated tornado touchdowns, hail (up to golf ball-sized), damaging winds and flooding. Hail was the primary cause of damage. Total economic losses were estimated at approximately USD275 million, while various insurers recorded more than 30,000 claims with payouts in excess of USD150 million.

Rounds of severe weather impacted a wide swath of the central and eastern United States between the 25th and the 30th. Tornado activity was limited, though hail and damaging wind impacts were felt extensively from the Plains to New England. The SPC recorded more than 1,515 local storm reports during

the period. The most notable damage occurred in Oklahoma, Texas, Kansas and the Northeast. Total economic losses were estimated at approximately USD2.75 billion, while various insurers recorded more than 200,000 claims with payouts in excess of USD1.6 billion.

Tropical Storm Beryl made landfall in the southeastern United States early on the 28th, bringing heavy rains and periods of gusty winds. Four people were killed. The storm made landfall near Jacksonville Beach, Florida at approximately 12:10 AM (4:10 UTC) at its peak intensity of 70 mph (110 kph). Beryl did not cause any significant damage in Florida or the rest of the Southeast. Total economic losses were less than USD10 million.

Exhibit 37: United States June Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
5/13-6/30	Wildfires	West, Midwest	0	375	50 million
6/2-6/4	Severe Weather	Plains, Midwest, Ohio Valley	3	Hundreds	Millions
6/6-6/7	Severe Weather	Colorado, Wyoming	0	120,000	1.75 billion
6/9-6/11	Flooding	Southeast	2	1,000	174 million
6/9-6/30	Wildfire	Colorado	1	850	136 million
6/11-6/13	Severe Weather	Texas, New Mexico	0	130,000	1.75 billion
6/17-6/18	Severe Weather	Upper Midwest	0	12,500	115 million
6/19-6/20	Flooding	Minnesota	0	15,000	170 million
6/23-6/27	TS Debby	Florida	7	20,000	310 million
6/23-7/10	Wildfire	Colorado	2	10,000	500 million
6/28-7/2	Severe Weather	Midwest, Mid-Atlantic, Plains	28	425,000	3.75 billion

The combination of hot temperatures, drought-like conditions and gusty winds fueled wildfires throughout parts of the West during the month of June (after several began in May). In New Mexico, the Little Bear Fire burned 44,330 acres (18,000 hectares) of land and destroyed 242 homes and businesses. The Whitewater Baldy Complex Fire, becoming the largest fire in state history, charred 297,000 acres (120,200 hectares).

The Wood Hollow Fire in Utah destroyed 56 structures and 46,190 acres (18,700 hectares) of land; while in Montana, the Dahl Fire destroyed at least 60 homes and nearly 19,000 acres (7,700 hectares). Officials in the West spent USD50 million to fight the fires. In Michigan's Luce County, the Duck Lake Fire destroyed at least 115 structures.

Widely scattered severe weather impacted central and eastern sections of the U.S. between the 2nd and the 4th. The SPC recorded nearly 400 reports of hail, winds and isolated tornadoes from Colorado to the Ohio Valley. The hardest-hit area came in Scott County, Missouri, where an EF-2 tornado tore through the small village community of Diehlstadt. At least three people were killed.

Portions of Colorado and Wyoming were inundated with hail, damaging winds and isolated tornadoes on the 6th and 7th. According to local reports, while tornadoes affected dozens of homes, the vast majority of the damage sustained was due to hail (up to golf ball-sized). In Douglas County, CO, snowplows were used to clear up to eight inches (20 centimeters) of hail accumulation. Total economic losses were estimated at approximately USD1.75 billion, while various insurers recorded at least 120,000 claims with payouts listed at nearly USD1.0 billion.

Significant rainfall was recorded across parts of the Florida panhandle, Alabama, Mississippi and Louisiana between the 9th and 11th, leaving at least two people dead. Extensive flooding was prevalent in several counties, with Florida's Escambia County being hit the hardest. Damage was widespread to homes, businesses, vehicles, the county jail and roads. Property damage was listed at USD150 million by the University of West Florida's Office of Economic Development and Engagement, while infrastructure costs were at least USD24 million.

Colorado's High Park Fire temporarily became the state's most destructive wildfire in history, after the blaze destroyed 259 homes and left one person dead. The fire, which was ignited on the 9th just to the west of Fort Collins by a lightning strike, charred 87,284 acres (35,300 hectares) of land. Total economic losses were approximately USD136 million, while at least 850 insurance claims were filed with payouts listed at USD97.1 million.

Strong thunderstorms pelted parts of New Mexico and Texas between the 11th and the 13th. The greater Dallas-Fort Worth, Texas metropolitan area sustained significant hail damage as up to baseball-sized hail was recorded in east Dallas and Grand Prairie. Damage occurred to car windshields, roofs, golf courses, museums and businesses. According to the Insurance Council of Texas, more than 135,000 claims were filed and total insured losses were estimated to exceed USD1.0 billion in the state. New Mexico sustained approximately USD50 million in insured loss.

Severe thunderstorms tracked across the Upper Midwest on the 17th and 18th. Hail (up to golf ball-sized) and damaging winds (nearly 80 mph (130 kph)) led to widespread impacts in Minnesota, Wisconsin and the Dakotas. Total economic losses were estimated at USD115 million, while various insurers received at least 12,500 claims with payouts in excess of USD70 million.

Record rainfall on the 19th and 20th across northern Minnesota led to the worst flooding since at least 1972 in the greater Duluth metropolitan region. Three people were killed as flash floods and overflowing rivers damaged more than 1,700 homes in addition to businesses and vehicles. Damage to public infrastructure was listed at USD108.7 million and state officials overall granted USD170 million for recovery efforts. At least 15,000 insurance claims were filed with payouts in excess of USD75 million.

Tropical Storm Debby brought multiple days of torrential rainfall, flooding and a coastal surge to Florida between the 23rd and the 27th, leading to the deaths of at least seven people. The system led to significant infrastructure damage and flooded nearly 10,000 homes and businesses across the state after as much as 26 inches (635 millimeters) of rain fell in the Tampa, Jacksonville and Tallahassee metropolitan areas. Isolated severe weather also spawned damaging tornadoes. Total economic losses were listed at USD310 million, while various insurers received at least 20,000 claims with payouts in excess of USD100 million. Total NFIP payouts were listed at USD38 million.

The Waldo Canyon Fire became the most damaging and costliest wildfire in Colorado's history, after being ignited on the 23rd in the Colorado Springs metro region. The blaze, which burned 18,247 acres (7,380 hectares), damaged or destroyed at least 397 homes. Two people were killed. Total economic losses were estimated at USD500 million, while various insurers received at least 10,000 claims with payouts listed in excess of USD450 million.

Waves of severe weather impacted central and eastern sections of the U.S. between June 28th and the first few days of July, killing at least 28 people. The stretch was highlighted by a violent derecho event that caused extensive damage from Chicago, Illinois to the Delmarva Peninsula on June 29th. More than 4.2 million customers lost electricity while the country was in the midst of a prolonged heat wave. According to the SPC, there were 1,179 storm reports received from the derecho—including 1,113 damaging wind reports. Total economic losses were estimated at USD3.75 billion, while various insurers received more than 430,000 claims with payouts in excess of USD2.0 billion.

Exhibit 38: United States July Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
6/1-12/31	Drought	United States	0	Unknown	35 billion
6/30-7/19	Heatwave	United States	123	Unknown	Unknown
7/2-7/4	Severe Weather	Midwest, Ohio Valley, Northeast	1	60,000	500 million
7/26-7/27	Severe Weather	Northeast	2	15,000	175 million

The worst drought in decades deepened throughout much of the United States during the month of July and through the rest of 2012 as the country coped with a severe lack of rainfall and record temperatures. According to the National Climatic Data Center (NCDC), the drought was the country's most extensive in decades with up to 64% of the contiguous U.S. minimally in a moderate drought. At least 1,820 U.S. counties were declared drought disaster areas. The U.S. Department of Agriculture (USDA) also reported that half of the nation's corn crop and soybeans were in poor to very poor condition. Total economic losses (primarily to crops) were estimated in excess of USD35 billion, while total insured losses were listed at more than USD20.0 billion.

A significant heatwave covered a large portion of the United States from June 30th through most of July, leading to the deaths of at least 123 people. The fatalities occurred as an extended period saw daytime temperatures exceeding 100°F (38°C) over most of the nation. According to the National Oceanic and Atmospheric Administration (NOAA), more than 4,313 separate high temperature records were established during the month. The heat also caused main roads and highways to buckle and rail tracks to expand, prompting delays in the Mid-Atlantic and the Northeast.

Rounds of severe thunderstorms affected parts of the Midwest, Ohio Valley and the Northeast between the 2nd and the 4th. At least one person was killed. The storms triggered a high volume of damaging wind and hail reports in 12 states, as downed trees and power lines onto homes, businesses and vehicles were the main causes of damage. Total economic losses were approximately USD500 million, while various insurers received more than 60,000 claims with payouts in excess of USD325 million.

Widespread severe weather covered a broad section of the central and eastern U.S. on the 26th and 27th, killing at least two people. As daytime heating unfolded, a line of powerful thunderstorms stretching from Texas to Connecticut prompted at least 471 local storm reports to the SPC. Damage was widespread in as many as 15 states—particularly in the Northeast—which primarily resulted from downed trees and power lines. Total economic losses were listed at USD175 million, while various insurers received more than 15,000 claims with payouts in excess of USD100 million.

Exhibit 39: United States August Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
8/3-8/9	Wildfires	Oklahoma-	1	1,000	200 million
8/9-8/10	Severe Weather	Great Lakes	0	Thousands	175 million
8/13-8/31	Wildfires	West	1	300	115 million
8/26-8/31	HU Isaac	Gulf Coast	7	28,000	2.0 billion

Dozens of fires were ignited that caused damage in Oklahoma's Cleveland, Creek, Oklahoma and Payne counties between the 3rd and the 9th, killing one person. The most notable blaze was the Freedom Hill Fire in Creek County which charred at least 58,500 acres (23,670 hectares) and destroyed 213 homes and structures. In total, fires burned 110,000 acres (44,515 hectares)

of land and destroyed 603 homes. The Oklahoma Insurance Department reported that more than 1,000 claims were filed with payouts in excess of USD30 million. The agency stated that total economic losses would reach the hundreds of millions (USD) given that 85% of the home damage was uninsured.

A powerful cluster of thunderstorms crossed parts of Illinois and Indiana on the 9th and 10th, causing widespread damage to homes, businesses and vehicles. Large hail (up to softball-sized), damaging winds and flooding rains were recorded. No major injuries or fatalities were reported. Total economic losses were estimated at USD175 million, while various insurers received more than 15,000 claims with payouts in excess of USD110 million.

Wildfires burned across many parts of the West during the latter half of August, with the most notable event occurring in central Washington. The Taylor Bridge Fire, which burned 23,500 acres (9,510 hectares), damaged or destroyed at least 57 homes and 26 other structures near the town of Cle Elum. Total damages were listed at USD8.3 million, while an additional USD7.2 million was spent to fight the fire. Elsewhere, the Ponderosa Fire burned in California's Shasta County, destroying 52 homes and 81 outbuildings (one home and five outbuildings were also damaged). In Idaho, one firefighter was killed. Western states spent a combined USD100 million to fight the fires.

Hurricane Isaac became the first landfalling U.S. hurricane along the Gulf Coast since 2008 on the 28th and 29th, bringing multiple days of torrential rainfall, gusty winds, up to a 15-foot (4.57-meter) storm surge and inland flooding. The Category 1 storm was blamed on at least seven deaths. Isaac made two landfalls in Louisiana as officials noted that at least 59,000 homes were damaged in the state. Suburban areas surrounding New Orleans sustained the worst effects as significant flooding and storm surge overtopped levees. Southern sections of Mississippi also endured major impacts to personal and commercial property and infrastructure. Alabama and Florida were affected well, with the storm's remnants later entering the Great Lakes and Ohio Valley. Total economic losses were at least USD2.0 billion. Various insurers received at least 180,000 claims, with payouts approaching USD1.0 billion. Total NFIP payouts were preliminarily listed at USD407 million.

Exhibit 40: United States September Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
9/7-9/8	Severe Weather	Plains, Northeast, Mid-Atlantic	4	35,000	225 million
9/10-9/11	Flooding	Desert Southwest	0	500	10 million
9/21-9/22	Severe Weather	Great Lakes, Plains	0	20,000	175 million
9/23	Wildfire	California	1	38	Unknown

Strong thunderstorms spawned damage from the Central Plains to New England on the 7th and the 8th, killing at least four people in Oklahoma. The initial focus was the Plains, Midwest and Tennessee Valley, where up to baseball-sized hail was recorded. As the front shifted eastward, two tornadoes (an EF-0 and an EF-1) touched down in the New York City metropolitan area. Winds gusting in excess of 60 mph (95 kph) also led to damage from the Carolinas to Maine. Total economic losses were estimated at USD225 million, with various insurers receiving at least 35,000 claims with payouts in excess of USD125 million.

The combination of monsoonal moisture and an upper level disturbance prompted unusually heavy rainfall across parts of the Desert Southwest on the 10th and the 11th. The hardest-hit locations came in the greater Las Vegas, Nevada area and also California's Coachella Valley after more than entire years' worth of rainfall fell. Hundreds of homes and vehicles were damaged. In Utah, a dike burst in the city of Santa Clara which into the downtown area. Additional flooding was reported in northeastern Arizona. Regional flood damage was in excess of USD10 million.

Rounds of severe weather impacted parts of the central and eastern United States between the 21st and the 26th, causing damage in several states. The most notable storms came on the 21st and 22nd in Indiana, Ohio and Pennsylvania, where up to quarter-sized hail and winds gusting in excess of 65 mph (100 kph) occurred. The vast majority of the damage was caused by hail and fallen trees and power poles. Total economic losses were estimated at USD175 million, with various insurers receiving at least 20,000 claims with payouts in excess of USD100 million.

A wildfire in rural San Diego County destroyed 11 homes, 14 outbuildings and 11 vehicles between the 23rd and the 27th, killing at least one person. Two additional homes were damaged. The Shockey Fire charred 2,556 acres (1,034 hectares) of land.

Exhibit 41: United States October Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
10/17-10/18	Severe Weather	Mississippi Valley, Midwest	0	Thousands	Millions
10/27-10/30	HU Sandy	Northeast, Mid-Atlantic, Southeast, Ohio Valley	132	1.5 million	62 billion

Powerful thunderstorms crossed parts of the Mississippi Valley and the Midwest on the 17th and 18th, injuring at least seven people. Tornadoes, hail and damaging winds were all recorded by the SPC. The hardest-hit areas came in Mississippi, where at least ten counties cited heavy structural damage after nine confirmed tornadoes (including an EF-3 with 140 mph (220 kph) winds in Scott and Newton counties) and straight-line winds struck the region. Additional damage occurred along the leading edge of the cold front which stretched from Illinois to Louisiana.

Hurricane Sandy made landfall in New Jersey as a post-tropical cyclone on the 29th, causing exceptional damage in the state and also in New York City. Heavy rainfall, record storm surge, high winds, inland flooding, fires and heavy snow were all

recorded in association with Sandy. Impacts were felt along the entire Atlantic coastline from Florida to Maine, before the storm’s remnants later affected the Mid-Atlantic, Ohio Valley and the Midwest. At least 132 people were killed. Select effects included more than 8.5 million power outages, 21,000 flight cancellations, extensive infrastructure damage, a two-day shutdown of the New York Stock Exchange and NASDAQ, and nuclear reactor shutdowns. More than 642,000 homes and businesses were damaged in New York and New Jersey alone. State-released government estimates indicated that total economic losses were at least USD62 billion. Total insured losses were estimated at USD28 billion, which includes losses sustained by private insurers and NFIP. Sandy becomes the second-costliest storm in U.S. history.

Exhibit 42: United States November Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
11/6-11/8	Winter Weather	Northeast	4	Unknown	Unknown
11/18-11/24	Winter Weather	Pacific Northwest	1	Hundreds	Millions

A Nor’easter brought periods of rain, heavy snow, gusty winds, and a minor coastal surge along areas of the Mid-Atlantic and the Northeast between the 6th and the 8th. At least four fatalities were attributed to the storm. The storm did not cause much damage, but knocked out electricity for more than 350,000 customers in New York and New Jersey who were still recovering from Post-Tropical Cyclone Sandy. The Nor’easter also forced the cancellation of more than 1,300 flights.

A series of strong Pacific storm systems came ashore across the U.S. Northwest between the 18th and the 24th, killing at least one person. The storms brought periods of heavy rainfall, gusty winds, flooding, landslides and multiple feet (meters) of snow in the higher elevations of the Cascades. Seattle, Washington broke a 50-year-old rainfall record during the stretch and several rivers in western Oregon and Washington swelled above flood stage. Hundreds of homes and other structures reported inundation damage as infrastructure was heavily affected as well.

Exhibit 43: United States December Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
12/8-12/10	Winter Weather	Midwest, Southeast, Southwest	2	5,000	10 million
12/19-12/21	Winter Weather	Midwest, Southeast, Northeast	7	5,000	Millions
12/24-12/28	Winter Weather	Midwest, Southeast, Northeast	17	10,000	100 million

A winter storm affected parts of the Upper Midwest, Southeast and the Mississippi Valley between the 8th and the 10th, killing at least one person. Heavy snow fell across portions of Minnesota, the Dakotas and western Wisconsin, where major travel disruption was recorded. Along the main cold front, severe weather affected several states in the Southeast. At least nine tornadoes touched down, with the most notable coming in Volusia County, Florida, where an EF-1 twister damaged or destroyed at least 90 homes. Total losses were USD1.7 million. Also, wintry weather affected New Mexico, where one person was killed.

A powerful winter storm crossed central and eastern sections of the U.S. between the 19th and the 21st, killing at least seven people. In the Plains and parts of the Midwest, the storm brought snow accumulations of nearly 20 inches (50 centimeters) and winds gusting in excess of 50 mph (80 kph). Portions of Nebraska, Kansas, Iowa and Wisconsin were among the hardest-hit, as holiday travel on the ground and in the air was severely disrupted. Along the southern branch of the cold front, severe weather was recorded from Texas to Florida. At least four tornadoes touched down, including an EF-1 in Grant County, Arkansas and an EF-1 in Mobile, Alabama.

A powerful winter storm spawned dozens of tornado touchdowns, damaging winds and excessive snowfall across the eastern half of the United States between the 24th and the 28th. Severe weather caused the most damage, with at least 28 tornadoes recorded in the Southeast. The Mobile, Alabama metro region was hardest-hit after an EF-2 twister touched down. Parts of Mississippi and Louisiana were heavily affected as well by storms. Elsewhere, blizzard conditions and snow accumulations beyond 18 inches (45 centimeters) affected an area from Arkansas to Maine. All 17 fatalities from the storm were non-tornado related. Total economic losses were anticipated to exceed USD100 million.

Remainder of North America (Canada, Mexico, Bermuda, Caribbean Islands)

- Hurricane Sandy affects the Caribbean Islands, the Bahamas and Canada; Damage tops USD2.5 billion
- Severe hail event causes extensive damage in the greater Calgary, Canada metro region in July
- Magnitude-7.4 earthquake damages more than 44,000 homes and structures in Mexico

January

No significant natural disaster events occurred in this region during the month of January.

Exhibit 44: Remainder of North America February Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
2/11-2/12	Flooding	Canada	0	238	Unknown

Heavy rains on the 11th and 12th led to reports of flooding across portions of Canada’s Newfoundland and Labrador. More than 238 homes were damaged in the Goulds and Kilbride sections of St. John’s after rain fell on top of a deep snowpack. The majority of the damage was confined to flooded basements.

Exhibit 45: Remainder of North America March Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
3/15-3/22	Flooding	Canada	0	500	34 million
3/20	Earthquake	Mexico	2	44,000	815 million

Heavy rains prompted flooding across portions of Canada’s New Brunswick between the 15th and the 22nd. At least 500 homes were damaged in the northwestern village of Perth-Andover. Total damages were listed at CAD25 million (USD25.5 million), plus an additional CAD8 million (USD8.5 million) for damage assistance.

A magnitude-7.4 earthquake struck central and southern Mexico on the 20th, causing damage in areas closest to the epicenter and killing at least two people. The tremor struck at 12:02 PM local time (18:02 UTC) with an epicenter 25 kilometers (15 miles) east of Ometepec, Mexico. The hardest-hit areas came in the states of Guerrero and Oaxaca, where a combined 44,000 homes, businesses, hospitals and schools were damaged or destroyed. Total economic losses were estimated at MXN10.5 billion (USD815 million). The Mexican Association of Insurance Institutions (AMIS) reported insured losses at approximately MXN2.07 billion (USD163 million).

Exhibit 46: Remainder of North America April Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
4/23-4/25	Flooding	Hispaniola	10	3,000	Unknown
4/28-4/29	Winter Weather	Canada	0	Unknown	100 million

Heavy rainfall impacted Hispaniola between the 23rd and the 25th, prompting flooding and landslides in Hispaniola. At least 10 people were killed in southern and western Haiti after landslides and rivers overflowed. In the Dominican Republic, government officials noted that more than 3,000 homes were flooded after rivers burst their banks in the province of Puerto Plata. In total, more than 11,150 residents were left homeless.

An early spring frost in Canada's Ontario Province led to significant crop damage on the 28th and 29th. According to local officials, the frost destroyed nearly 80% of the provincial apple crop and up to 30% of peaches, cherries, pears, plums and nectarines. Total economic losses were listed at CAD100 million (USD100 million).

Exhibit 47: Remainder of North America May Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
5/15-5/31	Flooding	Nicaragua	9	5,900	Unknown
5/24-5/27	Flooding	Cuba	2	1,200	Unknown
5/25-5/29	Flooding	Canada	0	25,000	400 million

Excessive rainfall between the 15th and the 31st across northern Nicaragua prompted flash floods and river flooding. At least nine people were killed, including the capital city of Managua. Nicaragua's Civil Defense agency noted that more than 5,900 homes were damaged or destroyed.

Consecutive days of heavy rainfall between the 24th and the 27th led to widespread flooding across Cuba's Sancti Spiritus province. At least two people were killed after more than 580 millimeters (22.8 inches) of rainfall fell. At least 1,200 homes were damaged in addition to nearly 3,500 hectares (8,650 acres) of cropland.

Multiple days of heavy rain fell across central and eastern Canada between the 25th and the 29th, prompting widespread flooding in several areas. Floods first impacted parts of Thunder Bay, Ontario, where at least 1,100 homes were damaged in addition to businesses and infrastructure. Two days later, heavy rainfall affected Montreal, Quebec. Flooding swept across homes, businesses, subway stations and infrastructure, while also overwhelming the city's sewer system. The Insurance Bureau of Canada (IBC) noted that combined claims were at least CAD260 million (USD264 million). Economic losses were even higher.

Exhibit 48: Remainder of North America June Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
6/1	Flooding	Canada	0	Unknown	Unknown
6/5-6/6	Severe Weather	Canada	0	Hundreds	10 million
6/9-6/10	Severe Weather	Canada	0	2,500	Millions
6/15	HU Carlotta	Mexico	7	31,500	105 million
6/26-6/30	Severe Weather	Canada	0	Unknown	9.0 million

The combination of near-record rainfall and construction work led to the flooding of Toronto, Canada's Union Station on the 1st, causing a substantial disruption in subway service. According to Environment Canada, up to 50 millimeters (1.96 inches) of rain fell in the metro region. The excessive water overflowed a sewer in the midst of being reconstructed, which flooded rail tracks and the station itself.

Strong thunderstorms swept across the greater Calgary, Canada metropolitan area on the 5th and 6th. No injuries or fatalities were recorded, though damage was widespread in some areas. The provincial government allocated CAD9.4 million (USD10 million) for recovery efforts.

Powerful thunderstorms crossed southern Manitoba on the 9th and 10th, spawning large hail (up to golf ball-sized) and heavy rainfall. The hardest-hit areas came in the greater Winnipeg

metropolitan region, where hail damaged a number of homes and vehicles. According to Manitoba Public Insurance (MPI), more than 2,500 claims were filed. Total insured losses were estimated to reach well into the millions of dollars (CAD).

Hurricane Carlotta developed and made landfall in southern Mexico on the 15th, leading to the deaths of at least seven people. The storm officially made landfall as a 150 kph (90 mph) hurricane near Puerto Escondido, Mexico in Oaxaca state. In terms of damage, flooding and high winds affected at least 29,000 homes and 2,500 businesses. Economic losses were listed at MXN1.44 billion (USD105 million).

Inclement weather swept across portions of Canada's Alberta province between the 26th and the 30th. Widespread damage was recorded in multiple areas, with the government allocating CAD8.6 million (USD9.0 million) for clean-up assistance.

Exhibit 49: Remainder of North America July Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
7/1-7/23	Flooding	Guatemala	0	1,010	Unknown
7/11-7/12	Severe Weather	Canada	0	10,000	175 million
7/22-7/23	Severe Weather	Canada	0	10,000	150 million
7/23-7/31	Flooding	Central America	1	4,150	Unknown
7/26	Severe Weather	Canada	0	7,500	125 million

Seasonal rainfall prompted widespread flooding in Guatemala throughout much of July. According to local officials, at least 1,010 homes were damaged or destroyed in the hardest-hit departments of Petén, Zacapa, Guatemala, Quiché and Suchitepéquez. No injuries or fatalities were reported.

Severe thunderstorms pelted the greater Edmonton, Canada region on the 11th and the 12th, causing major damage in several areas. The storms brought flooding rains, gusty winds and large hail that affected thousands of homes and vehicles. According to the IBC, total insured losses were at least CAD106 million (USD108 million). Total economic losses were even higher.

An elongated band of severe thunderstorms caused widespread damage across parts of Canada's Ontario Province on the 22nd and 23rd. Damage was recorded from Hamilton to the Ottawa metropolitan area, as the storms brought damaging winds, hail (up to golf ball-sized), torrential rains and flash flooding. The IBC reported that total insured losses were in excess of CAD90 million (USD92 million). Total economic losses were even higher.

Heavy rains impacted central and eastern Costa Rica between the 23rd and the 31st, leading to flash floods, landslides and rivers overflowing their banks. At least one person was killed

and more than 1,550 homes were damaged. In Panama and Ecuador, an additional 2,600 homes were affected as intense rains prompted rivers to swell. Infrastructure and agriculture sustained major damage.

Severe weather swept across southern Alberta on the 26th, as fast moving storms prompted hail from the towns of Cardston to Nanton. The IBC reported that total insured losses were at least CAD74 million (USD75 million). Total economic losses were even higher.

Exhibit 50: Remainder of North America August Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
8/3-8/10	HU Ernesto	Caribbean, Mexico	12	5,000	303 million
8/12	Severe Weather	Canada	0	75,000	650 million
8/17-8/18	TS Helene	Mexico, Caribbean	2	Hundreds	17 million
8/22-8/26	HU Isaac	Caribbean	34	25,000	300 million

Hurricane Ernesto made two landfalls in Mexico after tracking through the Caribbean between the 3rd and the 10th. At least 12 people were killed. The system's gusty winds and heavy rains damaged thousands of homes and businesses across the Mexican states of Tabasco, Quintana Roo, Puebla, Oaxaca and Veracruz. There was no damage to any of Mexico's oil refineries. Total economic losses were listed at MXN3.9 billion (USD303 million).

Severe weather caused extensive damage in parts of Calgary, Canada on the 12th. The storm spawned hail larger than golf balls as tens of thousands of homes, businesses, vehicles, power lines and trees were damaged. The hardest-hit area of Calgary came in the metro region's northeast as the IBC reported that claims payouts were in excess of CAD552 million (USD560 million). Total economic losses were even higher.

Tropical Storm Helene made landfall in Mexico on the 18th after initially bringing heavy rainfall to parts of the Caribbean. At least two people were killed. Limited damage was reported in parts of the Windward and Leeward Islands, though officials in Trinidad and Tobago noted TTD109 million (USD17 million) in damages. Mexico reported isolated instances of flooding.

Hurricane Isaac tracked across the Caribbean Sea between the 22nd and the 26th before later making landfall in the United States. The system brought periods of torrential rains and gusty winds to many of the Caribbean Islands, particularly Hispaniola and Cuba. Isaac crossed southwestern Haiti on the 25th as a strong tropical storm before later skirting Cuba and entering the Gulf of Mexico. At least 34 people were killed in the Caribbean, with upwards of 25,000 homes and structures sustaining damage. Total combined economic losses were listed at USD300 million.

Exhibit 51: Remainder of North America September Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
9/5	Earthquake	Costa Rica	3	500	45 million
9/8-9/11	HU Leslie	Canada, Bermuda	0	Hundreds	10 million

A magnitude-7.6 earthquake struck Costa Rica on the 5th, killing at least three people and injuring 30 others. The tremor occurred at 8:42 AM local time (14:42 UTC) with an epicenter located 10 kilometers (6 miles) northeast of Hojanca, Costa Rica. Damage was generally limited to areas closest to the epicenter, with approximately 250 structures affected on the Nicoya Peninsula. Roads and bridges were also impacted. Total economic losses were listed at CRC22.5 billion (USD45 million).

Hurricane Leslie made landfall in Canada's Newfoundland on the 11th after initially brushing by Bermuda, where damage was limited to scattered power outages and fallen tree branches. In Canada, winds gusting to nearly 140 kph (85 mph) downed trees and power lines as heavy rains caused isolated flooding. However, damage was largely minimal. Total economic losses were listed at approximately CAD10 million (USD10.1 million).

Exhibit 52: Remainder of North America October Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
10/13-10/18	HU Rafael	Caribbean, Bermuda, Canada	1	500	2.0 million
10/16-10/17	HU Paul	Mexico	0	600	15.5 million
10/23-10/27	HU Sandy	Caribbean, Hispaniola, Bahamas	122	300,000	2.5 billion
10/27	Earthquake	Canada	0	Unknown	Unknown

Hurricane Rafael affected portions of the Caribbean and Bermuda between the 13th and the 17th before its remnants brought large swells to Atlantic Canada on the 18th. Rafael triggered periods of flooding rains and tropical storm-force winds to Bermuda and the Eastern Caribbean though governments cited generally minimal damage. At least one person was killed in Guadeloupe. In Canada's Newfoundland, surf damage totaled CAD2.0 million (USD2.0 million).

A weakened Hurricane Paul grazed Mexico's Baja California on the 16th and the 17th before rapidly dissipating. Approximately 600 homes were damaged by floodwaters in the towns of Comondu and Loreto. The city of La Paz tallied MXN200 million (USD15.5 million) in damage to infrastructure.

Hurricane Sandy tracked through the Caribbean and the Bahamas between the 23rd and the 27th prior to heading towards the United States. The storm officially made separate landfalls in Jamaica (Category 1) and Cuba (Category 2). In Jamaica, one person was killed as extensive wind and flood damage occurred to agriculture, infrastructure and homes. Total economic losses were listed at JMD5 billion (USD55 million). In Cuba, at least 11 people were killed as storm surge, high winds

and flooding damaged or destroyed at least 215,000 homes and another 3,000 buildings. Most of the damage occurred in Santiago de Cuba, where economic losses were expected to top CUP53 billion (USD2 billion). In Haiti, 104 people were killed and as many as 75,000 homes were damaged by widespread flooding. In the Dominican Republic, two people were killed and 3,500 homes were destroyed. Puerto Rico saw one flood-related fatality. Shifting to the Bahamas, two people were killed as local officials estimated total economic damages of USD300 million. Total insured losses were nearly USD100 million. Two people were also later killed in Canada, where the IBC listed insured losses at CAD100 million (USD108 million). Total economic losses were even higher.

Canada's second-strongest recorded earthquake since 1700 struck far western sections of the country on the 27th. The magnitude-7.7 earthquake occurred at 8:04 PM local time (3:04 UTC on the 28th) with an epicenter 139 kilometers (86 miles) south of Masset, Canada. Despite the large size of the earthquake – and tsunami warnings being issued for parts of the Pacific Basin – damage was largely minimal as the tremor occurred in a rather sparsely populated region within Canada's Haida Gwaii archipelago.

Exhibit 53: Remainder of North America November Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
11/7	Earthquake	Guatemala	52	30,870	102 million
11/10-11/11	Flooding	Haiti	17	1,573	Unknown
11/24-11/25	Flooding	Panama	5	1,600	Millions

A strong earthquake struck just offshore Guatemala on the 7th, killing at least 52 people. The magnitude-7.4 earthquake occurred at 10:35 AM local time (16:35 UTC) with an epicenter 24 kilometers (14 miles) south of Champerico, Guatemala. Of the 21 departments reporting damage, the hardest-hit included San Marcos, Quetzaltenango and Sololá. At least 30,870 homes were damaged or destroyed in addition to thousands of other structures. Infrastructure and the electrical grid were impacted as well. More than GTQ800 million (USD102 million) was made available for recovery.

Torrential rains deluged parts of northern and northeastern Haiti on the 10th and 11th, prompting floods that killed at least 17 people. Local emergency management officials noted that at least 1,573 homes were damaged, along with crops and public buildings.

Excessive rainfall inundated much of Panama on the 24th and the 25th, killing at least five people. More than 1,600 homes were damaged or destroyed after overflowing rivers and landslides impacted many areas. Local officials reported that the provinces of Colón and Panamá were hardest-hit, which prompted state of emergency declarations.

Exhibit 54: Remainder of North America December Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
12/27-12/28	Winter Weather	Canada	0	Unknown	Unknown

A broad winter storm originating in the United States prompted record snowfall across portions of Canada's provincial areas of Ontario, Quebec, Nova Scotia and the Maritimes on the 27th and the 28th. More than 45 centimeters (17.7 inches) of snow fell during a 24-hour stretch in Montreal, breaking a one-day

record set in 1971. The heavy snows combined with gusty winds and ice to snap power lines and trees, causing widespread power outages and isolated instances of residential and commercial damage.

South America

- Multiple prolonged major flood events sweep across parts of Brazil, Colombia and Peru
- Magnitude-7.1 earthquake strikes Chile; total damages less than USD100 million
- Severe weather events leave trail of damage and fatalities in several countries

Exhibit 55: South America January Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
12/24-1/6	Wildfires	Chile	7	Hundreds	200 million
1/1-1/10	Flooding	Brazil	39	25,000	Millions
1/30	Earthquake	Peru	0	858	Unknown

Dozens of wildfires burned across southern sections of Chile between the end of December 2011 and the first week of January 2012, killing at least seven people. According to Chilean officials, nearly 50 fires burned more than 50,000 hectares (123,000 acres) of woodland and brush during a two-week period. The most damaging fire came in the greater Bio Bio region, where the blaze charred 24,800 hectares (62,000 acres) and destroyed 160 homes. Total economic losses to forestry and tourism were estimated in the hundreds of millions of dollars (USD).

Persistent heavy rainfall spawned flooding and mudslides in southeastern Brazil between the 1st and the 10th. The states of Minas Gerais and Rio de Janeiro were the most impacted, where at least 39 people were killed. Officials in Minas Gerais declared

a state of emergency after homes and businesses in 127 towns sustained structural damage. Widespread effects were also prevalent to the transportation and electrical infrastructures. Similar impacts were felt in Rio de Janeiro where entire neighborhoods were underwater. In total, an estimated 25,000 homes were damaged.

A magnitude-6.3 earthquake struck near the coast of southern Peru on the 30th, injuring at least 145 people. The tremor occurred at 12:11 AM local time (5:11 UTC) with an epicenter 15 kilometers (9 miles) southeast of Ica. According to the Civil Defense Institute, 277 homes were destroyed and 581 other buildings were damaged across the cities of Ica, Chincha, Canete and Pisco.

Exhibit 56: South America February Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
2/8-2/9	Flooding	Peru	14	11,000	Unknown
2/10-2/29	Flooding	Brazil, Bolivia	1	37,300	10 million

Torrential rains on the 8th and 9th led to significant river flooding across all 22 of Peru's provinces, killing at least 14 people and injuring 29 others. According to the National Civil Defense Institute, more than 10,000 families were left homeless and an additional 669 schools and medical centers were damaged or destroyed. Widespread agricultural and infrastructure damage to more than 800 kilometers (500 miles) of roads was reported as well.

Heavy seasonal rainfall fell across parts of Brazil and Bolivia between the 10th and the 29th, prompting the Acre River to overflow its banks. One person was killed after 12,300 homes in Bolivia and 25,000 homes in Brazil were damaged or destroyed by the floods. In Bolivia, a state of emergency was declared as the capital (Cobija) of the northern province of Pando was underwater. In Brazil, Acre state was heavily impacted as the capital city of Rio Braco saw 45 neighborhoods submerged. Total combined economic impacts were estimated in excess of USD10 million.

Exhibit 57: South America March Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
1/1-3/25	Flooding	Ecuador	30	4,000	Unknown
3/11-3/16	Flooding	Chile	0	6,500	3.1 million
3/24-3/31	Flooding	Colombia	5	5,000	170 million
3/25	Earthquake	Chile	0	Hundreds	100 million

Excessive rainfall throughout much of Ecuador prompted state of emergency declarations for five provinces (El Oro, Manabi, Guayas, Los Rios and Loja). The rains, which occurred between early January and the end of March, led to flooding that damaged 4,000 homes. At least 30 people died.

Heavy rainfall prompted flooding and widespread damage across extreme northern and southern sections of Chile between the 11th and the 16th. No injuries or fatalities were reported. In the northern regions of Arica, Parinacota and Tamarugal, more than 2,500 residents were rendered homeless after the San Jose River overflowed its banks. In the southern province of Magallanes, at least 4,000 residents were left homeless after the Las Minas River swelled and flooded homes, businesses and schools. Clean-up costs were listed at CHP1.5 billion (USD3.1 million).

Periods of heavy rainfall swept across 25 separate departments in Colombia during the last week of March, killing at least five people. The rains prompted multiple rivers to overflow their banks as more than 5,000 homes were damaged or destroyed. Additional damage was reported to dozens of bridges and roads in the Andean Region. The government allocated COP305 billion (USD170 million) for damage recovery.

A magnitude-7.1 earthquake central Chile on the 25th, with an epicenter located 27 kilometers (16 miles) north-northwest of Talca. Damage was largely minimal, though there were widespread reports of cracked walls and fallen ceilings in some homes, businesses and churches in Santiago and also the regions of Maipu and Bio Bio. Total economic losses were less than USD100 million.

Exhibit 58: South America April Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
4/2-4/30	Flooding	Paraguay	0	15,589	Unknown
4/4	Severe Weather	Argentina	18	32,000	10 million
4/5-4/27	Flooding	Colombia, Peru	19	25,000	170 million

Three weeks of persistent rainfall across central sections of Paraguay led to multiple rivers overflowing their banks. According to government officials, at least 15,589 homes were destroyed after the Pilcomayo River burst its banks in two districts (Boquerón and Presidente Hayes) in the Central Chacon region. Some of the hardest-hit communities included Paz del Chaco, Nueva Vida, San Carlos, El Estribo and Villa Alegre. No injuries or fatalities occurred.

At least 18 people were killed and 20 others injured as a severe thunderstorm struck the Argentine capital of Buenos Aires and surrounding towns on the 4th. Local officials reported that a tornado, high winds and hail affected the region, causing

extensive damage to 32,000 homes and also businesses, schools, vehicles and infrastructure. Economic losses were estimated at ARS44 million (USD10 million).

Weeks of heavy seasonal rains fell across portions of Colombia and Peru, killing at least 19 people. More than six rivers overflowed their banks in several Colombian provinces, damaging more than 20,000 homes and inundating infrastructure and agriculture. In neighboring Peru, flooding in the Amazon region left 5,000 homes and wide swaths of crops being submerged. A combined USD170 million was allocated by both countries for recovery efforts.

Exhibit 59: South America May Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
5/1-5/20	Flooding	Brazil	0	75,000	226 million
5/8-5/11	Flooding	Venezuela	0	2,200	93 million

Heavy rainfall throughout the month of May led to significant flooding along the Black River in Brazilian state of Amazonas. At the height of the event, 83% of the state's counties were declared in a state of emergency as floodwaters partially submerged more than 75,000 homes and businesses. Brazilian officials allocated BRL450 million (USD226 million) for relief and recovery.

Heavy rainfall, which fell between the 8th and the 11th, led to flooding in multiple sections of Venezuela. Government officials noted that more than 2,200 homes were damaged in the states of Bolívar, Sucre and Táchira. Total economic impacts were listed at VEF400 million (USD93 million).

June

No major natural disaster events occurred in South America during the month of June.

Exhibit 60: South America July Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
7/15-7/30	Flooding	Colombia	0	15,000	Millions

As many as 15,000 homes were damaged or destroyed in the Colombian department of Putumayo between the 15th and the 30th due to flooding from excessive rainfall. The floods were aided by several rivers (including the Guamuez, Orito, Putumayo and Guineo) bursting their banks.

August

No major natural disaster events occurred in South America during the month of August.

Exhibit 61: South America September Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
9/19	Severe Weather	Paraguay, Uruguay, Bolivia	9	6,000	Millions

A strong storm system affected several South American countries on the 19th, killing at least nine people and injuring more than 100 others. The hardest-hit country was Paraguay, where the National Emergency Response Center noted that more than 5,000 homes were destroyed in the towns of Roque Alonso, Neembucu and Encarnacion. In Uruguay, high winds blew out windows in highrise buildings in Montenegro and Punta del Este, while also forcing the closure of ports, airports and three main highways. Additional impacts were recorded in Bolivia and Argentina.

Exhibit 62: South America October Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
10/5-10/19	Flooding	Colombia	12	3,500	Unknown
10/29-10/31	Flooding	Argentina	1	1,500	Millions

Heavy rainfall between the 5th and the 19th prompted widespread flooding and mudslides across southwestern sections of Colombia. At least 12 people died and 18 others were injured, primarily in the department of Huila. More than 3,500 homes were damaged or destroyed.

Torrential rainfall impacted multiple sections of Argentina between the 29th and the 31st, killing at least one person. Much of the flooding was concentrated in the greater Buenos Aires metropolitan region, including the towns of Luján, Olivera, Jáuregui, and Pueblo Nuevo, after several rivers overflowed their banks. More than 1,500 homes were damaged or destroyed as the floods also inundated or submerged subways and rail lines.

November

No major natural disaster events occurred in South America during the month of November.

Exhibit 63: South America December Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
12/26-12/31	Flooding	Colombia, Peru	5	1,000	Unknown

Heavy rains fell across portions of Colombia and Peru between the 26th and the 31st, leading to widespread flooding and landslides. In Colombia, large landslide collapsed near the city of Neiva and killed five people while destroying several buildings, cars and blocking the main thoroughfare. In Peru,

heavy rains inundated the region of Huanoco as hundreds of homes were destroyed. The floodwaters, which were as high as three meters (9.84 feet), were enhanced by overflowing Amazonian rivers.

Europe

- Two strong earthquakes strike Italy in May, killing at least 25 people and causing billions (USD) in damage
- Excessive flooding rains prompt the costliest insured flood year in the United Kingdom since 2007
- Significant flash flood event kills at least 171 people in southern Russia’s Krasnodar Region

Exhibit 64: Europe January Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
1/3-1/4	WS Ulli	UK, Scandinavia	2	5,000	450 million
1/4-1/5	WS Andrea	UK, Northern Europe	0	Thousands	650 million
1/24-2/17	Winter Weather	Eastern/Central Europe	824	Unknown	800 million

Windstorm Ulli came ashore across portions of the United Kingdom and Scandinavia on the 3rd and 4th, killing at least two people and causing widespread damage. According to the UK MetOffice, Ulli first struck Scotland before later affecting Scandinavia. Damage reports resulted from high winds downing trees onto homes, businesses, public structures and vehicles across parts of Scotland, England, Wales, Germany and Denmark. Travel was also severely disrupted. Thousands of claims were filed throughout the UK and Scandinavia, with total insured losses estimated at approximately GBP200 million (USD306 million). Total economic losses were even higher.

Windstorm Andrea affected the United Kingdom and portions of Northern Europe on the 4th and 5th, causing widespread effects. Impacts primarily included downed trees and power poles onto vehicles, homes, businesses and other structures across parts of the UK, Belgium, France, Germany, Denmark, Sweden, Amsterdam, and the Netherlands. Reports of flooding also occurred along the Rhine and Meuse rivers in the Netherlands. Total insured losses were listed by PerilsAG at EUR337 million (USD450 million). Total economic losses were even higher.

Bitter cold and snow engulfed Eastern Europe between January 24th and the first half of February, leading to the deaths of at least 824 people and the hospitalization of more than 7,000 others. Nearly all of the fatalities were blamed on hypothermia across two-dozen countries. Total combined economic losses from the event (including business interruption from a closed Danube River) were estimated at EUR625 million (USD800 million).

Exhibit 65: Europe February Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
2/1-2/13	Winter Weather	France	7	Unknown	648 million
2/7-2/8	Winter Weather	Ukraine	0	Unknown	2.0 million
2/7-2/9	Flooding	Bulgaria, Greece	12	Hundreds	4.4 million

An extended stretch of bitter cold and wintry weather engulfed much of France during the first two weeks of February. At least seven people were killed after temperatures dropped to as low as -18°C (0°F), marking the coldest episode in the country since January 1987. High winds, which led to dangerous wind chill temperatures, led to additional impacts and damage. Total economic losses were listed at EUR480 million (USD648 million), while insurers noted losses of EUR385 million (USD520 million).

A fierce winter storm impacted the Yalta and Alusta regions of Ukraine on the 7th and 8th, causing widespread damage to building construction and beaches. Total economic losses were listed at UAH16 million (USD2.0 million).

Heavy rainfall, in combination with melting snow, led to many rivers overflowing their banks in parts of Bulgaria and Greece between the 7th and the 9th. At least 12 people were killed. In Bulgaria, the cities and villages of Svilengrad, Bisser and Generalovo were all damaged by flooding after dike and dam failures. In Greece, villages in the northeast were flooded after the Evros River burst its banks. Total economic losses in Bulgaria were listed at BGN6.5 million (USD4.4 million).

Exhibit 66: Europe March Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
3/26	Earthquake	Turkey	0	Hundreds	Unknown

A magnitude-5.2 earthquake rattled eastern Turkey's Mus province on the 26th, damaging hundreds of mud-brick homes and other outbuildings in the villages of Sultani and Bulanik. No injuries or fatalities were recorded.

Exhibit 67: Europe April Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
4/20	Wildfire	Russia	2	84	Unknown
4/22-4/27	Flooding	Russia	0	3,957	17 million

A wildfire left at least two people dead and 346 others injured on the 20th in the Russian region of Amur. According to the Ministry of Emergencies, the fire destroyed at least 84 homes in the town of Tygda.

The combination of melting snow and spring rains prompted flooding across central Russia's Ryazan and Volgograd regions between the 22nd and the 27th. The Ministry of Emergencies noted that at least 3,957 homes were damaged in 10 separate towns after floods were exacerbated by the Moksha River overflowing its banks. No injuries or fatalities were recorded. Total economic damage to infrastructure was listed at RUB500 million (USD17 million).

Exhibit 68: Europe May Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
5/7	Earthquake	Azerbaijan	0	3,124	Unknown
5/12	Flooding	Georgia	5	5,000	4.9 million
5/18	Earthquake	Azerbaijan	0	7,000	Unknown
5/20	Earthquake	Italy	7	5,000	15.8 billion
5/29	Earthquake	Italy	18	5,000	

A magnitude-5.6 earthquake struck Azerbaijan on the 7th, causing widespread damage across southwestern sections of the country. Local officials noted that at least 3,124 homes and public buildings were damaged or destroyed in the areas of Zaqatala and Gakh. No injuries or fatalities were reported.

Torrential rainfall on the 12th fell across eastern and western sections of Georgia, prompting flooding and mudslides. At least five people were killed. The hardest-hit area was the capital city of Tbilisi. More than 3,200 homes were flooded in addition to a prison, Guala Square and the former Interior Ministry building. Additional flood damage was recorded in several western villages. Total economic losses were listed at GEL8 million (USD4.9 million).

A magnitude-4.8 earthquake rattled southwestern Azerbaijan on the 18th. More than 7,000 homes and other buildings were damaged or destroyed in the areas of Zaqatala and Gakh. No injuries or fatalities were reported.

A magnitude-6.0 earthquake struck northern Italy on the 20th, killing at least seven people, injuring more than 50 others and causing extensive damage in some areas. According to the United States Geological Survey (USGS), the main tremor occurred at 4:03 AM local time (2:03 UTC) with an epicenter 36 kilometers (22 miles) north-northwest of Bologna, Italy. The earthquake caused significant damage to agriculture, business, personal property and the cultural heritage of the Emilia-Romagna region. Some of the hardest-hit towns included San Felice Sul Panaro, Ferrara, Finale Emilia, Sant'Agostino di Ferrara, Ponte Rodoni do Bondeno and Tecopress di Dosso.

A magnitude-5.8 earthquake struck northern Italy's Emilia-Romagna region on the 29th, killing at least 18 people, injuring more than 350 others and causing additional widespread damage. The USGS stated that the main earthquake occurred at approximately 9:00 AM (7:00 UTC) with an epicenter 40 kilometers (24 miles) north-northwest of Bologna, Italy. The hardest-hit areas came near the epicenter in the province of Modena. The towns of Cavezzo, Mirandola and Medolla were particularly affected, where many historical buildings, factories and homes that were weakened during the May 20th tremor fully collapsed. Parts of the provinces of Ferrara, Reggio Emilia, Rovigo and Mantua also saw fresh rounds of damage. Italy's state-financing body Cassa Depositi e Prestiti (CDP) allocated a combined EUR12 billion (USD15.8 billion) to help in the rebuilding process. Insured losses were estimated at approximately EUR1.0 billion (USD1.30 billion).

Exhibit 69: Europe June Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
6/4	Severe Weather	Ukraine	0	150	Unknown
6/10	Earthquake	Turkey, Greece	0	Hundreds	Unknown
6/10-6/11	Flooding	United Kingdom	0	20,000	450 million
6/11	Severe Weather	Italy	0	Hundreds	12.6 million
6/23-6/24	Flooding	United Kingdom	1	48,000	800 million

A series of thunderstorms impacted much of Ukraine on the 4th, leading to the injuries of at least six people. According to the Ministry of Emergencies, most of the injuries occurred in the greater Kiev metro area after trees fell onto homes and vehicles. More than 150 homes were damaged in the northern Chemigov region by high winds.

An earthquake struck Greece's Dodecanese Islands (located near the border with Turkey) on the 10th, causing reports of damage in the Turkish city of Fethiye. The magnitude-5.8 tremor occurred with an epicenter 63 kilometers (39 miles) east of Rodos, Greece. At least 59 people were injured, as the tremor damaged hundreds of homes and other structures primarily in Turkey. No significant impacts occurred on the Greek island of Rhodes.

More than one months' worth of rainfall fell across portions of the United Kingdom during a 12-hour stretch on the 10th and the 11th, prompting widespread flooding in the South East, Midlands, Northeast, Southwest and mid-Wales. Flash floods and overflowing rivers caused damage to a large number of homes, schools, businesses and vehicles. Several main roadways were forced to close as well due to high water levels. In Ceredigion County, the local council leader declared the floods a 100-year event.

A rare tornado touched down just outside Venice, Italy on the 11th, causing widespread damage to agriculture, trees and a large number of homes on multiple islands (including Sant'Erasmus, Certosa, Lido and Sant'Elena). Local officials noted that the twister, with winds up to 140 kph (85 mph), also downed a wall at the Venezia soccer stadium and the Morosini naval academy. Total economic losses were estimated at EUR10 million (USD12.6 million).

An active weather pattern on the 23rd and 24th led to flash flooding and river flooding across parts of the United Kingdom, killing at least one person. Flooding was recorded in central/northern England, Scotland and Northern Ireland as homes, schools, businesses and vehicles were damaged. A number of roadways were submerged as well and landslides blocked both main rail lines that connect Scotland and England. The Association of British Insurers (ABI) reported that at least 68,000 claims were filed due to flooding during the month of June, with payouts in excess of GBP500 million (USD785 million). Combined total economic losses were even higher.

Exhibit 70: Europe July Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
6/30-7/8	Severe Weather	Central Europe	9	23,000	150 million
7/7	Flooding	Russia	171	7,000	635 million
7/11	Severe Weather	Slovenia	0	Thousands	5.0 million
7/14	Severe Weather	Poland	1	100	5.9 million
7/19	Severe Weather	Georgia	0	20,000	91 million
7/22-7/27	Wildfire	Spain, Greece	4	Unknown	Unknown

Strong thunderstorms affected parts of Central Europe between June 30th and July 8th as gusty winds, egg-sized hail and localized flooding were all recorded. Nine people were killed in Turkey after the Mert River overflowed its banks and caused floods in the Canik district of Samsun. In Austria, the regions of Steiermark and Kärnten were the hardest-hit; while in the Czech Republic, much of the western half of the country was affected. More than 23,000 insurance claims were filed in the Czech Republic, with payouts listed at CZK1.2 billion (USD62 million).

The worst flooding in decades struck southern Russia's Krasnodar Region on the 7th, killing at least 171 people and injuring 584 others. Nearly all of the casualties occurred due to a nearly 7-meter (23-foot) surge of water that swept through homes after 304 millimeters (12 inches) of rain fell in less than 24 hours. The Emergencies Ministry confirmed that at least 7,000 homes were damaged or destroyed. The hardest-hit cities included Krymsk, Kuban, Gelendzhik and Novorossiysk. Significant infrastructure damage was also prevalent. Total economic damages were listed at RUB20 billion (USD635 million).

Severe thunderstorms crossed parts of northwestern and central Slovenia on the 11th. Extensive damage was reported in some areas, after walnut-sized hail pelted the cities of Ljubljana and Bovec. According to local insurers, the hail led to EUR2.5 million (USD3.1 million) in damage to automobiles and EUR1.5 million (USD1.9 million) to property. Agriculture also sustained millions of euros (EUR) worth of damage.

Multiple tornadoes struck northern and western Poland on the 14th, leaving at least one person dead and 10 others injured. The hardest-hit areas came in the Baltic region of Pomerania and two neighboring provinces, where at least 100 homes were damaged or destroyed by an EF-2 tornado in the village of Wycinki. Damage to trees alone was listed at PLN20 million (USD5.9 million).

Powerful thunderstorms swept through much of Georgia on the 19th as hail pelted homes, vehicles, agriculture and damaged the electrical and transportation infrastructures. No injuries or fatalities were reported. As many as 20,000 homes and 22,000 hectares (54,400 acres) of cropland were damaged in the Kakheti region. Other regions affected included Samtskhe-Javakheti and Mtskheta-Mtianeti. Total economic damages were GEL150 million (USD91 million).

A wildfire in Spain left at least four people dead and six others injured during the week of the 22nd, prompting the evacuation of more than 1,400 residents. The fire was ignited in the Catalonia region and charred at least 14,000 hectares (32,000 acres) of land. Fires also burned in Greece during the period, with one particular blaze destroying at least five homes in the Athens suburb of Keratea.

Exhibit 71: Europe August Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
6/1-9/30	Drought	Italy	0	Unknown	1.23 billion
6/1-9/30	Drought	Russia	0	Unknown	1.14 billion
8/10-8/31	Wildfires	Spain, France, Croatia, Greece	3	Unknown	Unknown
8/13	Severe Weather	Ukraine	0	Hundreds	Unknown

Extended drought conditions persisted across Italy during the month of August, as farmers and agricultural agencies reported that extensive losses had occurred to corn, wine grapes, olives, tomatoes, sugar beets, and soybeans. Total losses were estimated at EUR1 billion (USD1.23 billion), with the farm-industry organization Confagricoltura noting that most of the losses were uninsured.

Drought conditions persisted throughout 21 separate regions of Russia during the month of August as more than 5.56 million hectares (13.7 million acres) of crops were lost. Some of the lost crops included grain, wheat, barley, and forage. Total losses were estimated at RUB36.5 billion (USD1.14 billion).

The combination of very warm temperatures and gusty winds spawned wildfires across parts of Europe during the month of August. In Spain, at least two firefighters died in the province of Alicante and a third fatality occurred in the city of Marbella. Additional fires were recorded in the town of Valle Gran Rey on La Gomera Island and on the Canary Islands. In France, wildfires burned in the Lacanau region. Elsewhere in Europe, fires were recorded in Croatia's southern Skradin and Komin regions, Bosnia's Mostar and Konjic region, and Greece's Chios Island.

Strong thunderstorms struck parts of Ukraine on the 13th, causing sporadic damage. According to the Emergencies Ministry, 10 separate regions were directly affected by storms that brought damaging winds and torrential rainfall. In the eastern region of Donetsk, two people were injured and 345 villages were left without electricity.

Exhibit 72: Europe September Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
6/1-9/30	Drought	Slovenia	0	Unknown	162 million
9/9	Winter Weather	Iceland	0	Hundreds	2.43 million
9/24-9/25	Flooding	United Kingdom	3	570	81 million
9/27-9/29	Flooding	Spain	10	28,879	300 million

A severe summer drought continued to linger across Slovenia during the month of September, with the Chamber of Agriculture and Forestry citing economic damages of EUR128 million (USD162 million). The combination of a lack of rainfall and hot temperatures led to losses in maize, corn, grain, vegetable and apple orchard crops. The Pomurje and Primorsko regions sustained the worst effects.

A strong winter storm struck northern and northeastern sections of Iceland on the 9th. According to the Iceland State

Electricity operations center, extensive damage occurred to the electrical infrastructure as the combination of high winds and heavy snow brought down power lines and power poles. Total economic damages were listed at ISK300 million (USD2.43 million).

A slow-moving storm system brought torrential rainfall and periods of gusty winds across northern sections of the United Kingdom on the 24th and 25th, killing at least three people. Many areas received twice its monthly rainfall average, as

floods damaged at least 570 homes and businesses in an area from north Wales to Northumberland. Among the hardest-hit locations came in Morpeth, Newburn, Cheshire, Rothbury and Gilling West. Overflowing rivers also prompted the closure of major roads, railways and bridges. Officials in the UK’s Northeast region estimated damages beyond GBP50 million (USD81 million). Local insurers reported a 52% increase in storm claims.

Heavy rainfall caused widespread flooding in southern Spain between the 27th and 29th, killing at least 10 people. The

province of Malaga sustained the worst effects, where the Guadalahorce River overflowed its banks and damaged a large number of homes in the town of Alora. Damage also occurred in the provinces of Granada, Sevilla, Almeria, Valencia and Cordoba. A tornado touched down in the town of Gandia as well, injuring 35 people. The Insurance Compensation Commission noted that at least 28,879 property, commercial and auto claims were filed with payouts in excess of EUR183 million (USD240 million). Total economic losses were even higher.

Exhibit 73: Europe October Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
10/7	Flooding	Sweden	0	Hundreds	Unknown
10/22-10/25	Flooding	Turkey	6	Hundreds	Millions
10/26	Earthquake	Italy	1	Hundreds	Unknown
10/27-11/15	Flooding	Italy	0	Thousands	Millions

Torrential rains on the 7th across northern Sweden prompted the Åby River to overflow its banks. The floods damaged dozens of homes in the province of Västerbotten, while also forcing the closure of at least nine main roadways due to submersion and damage. No injuries or fatalities occurred.

Torrential rains inundated Turkey’s western region of Thrace on the 22nd and 23rd, spawning flash floods that killed six people. The provinces of Kirklareli, Tekirdağ, Çanakkale, Balıkesir and Istanbul sustained the brunt of the damage as multiple meters (feet) of floodwaters damaged or destroyed hundreds of homes. Total economic losses were expected to reach well into the millions of dollars (USD).

A magnitude-5.3 earthquake struck southern Italy on the 26th, killing at least one person. The tremor occurred at 1:05 AM local time (23:05 UTC October 25th) with an epicenter 5 kilometers (3 miles) west of Morano Calabro, Italy. Local officials in the towns of Mormanno, Laino Borgo and Santa Maria della Consolazione reported that hundreds of homes, churches and medical buildings had sustained cracking. No widespread structural damage was evident.

The combination of heavy rainfall, gusty winds and the start of the ‘aqua delta’ (high water) season led to nearly 70% of Venice, Italy being underwater. The floods, which began on in late October and spread into November, inundated a large number of homes and businesses throughout the city center. High tides from the Adriatic Sea only added to the depth of the floodwaters, which were recorded at 150 centimeters (4.92 feet) during the peak.

Exhibit 74: Europe November Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
11/5-11/6	Flooding	Slovenia, Croatia	0	4,500	265 million
11/21-28	Flooding	United Kingdom	0	1,100	1.0 billion
11/28	Severe Weather	Italy	0	Dozens	Unknown

Significant rainfall led to major flooding along the Drava and Sava rivers in Slovenia on the 5th and 6th. More than 4,000 homes and other buildings were damaged in the hardest-hit towns of Duplek, Dravograd, Bohinj and Kranj, after water swept through neighborhoods and industrial areas. Roads and rail tracks were also submerged. Damage was listed at EUR209 million (USD265 million). In Croatia, up to residents were forced to evacuate their homes in the capital city of Zagreb after the Sava River swelled. Officials noted that as many as 500 homes had been damaged.

An active weather pattern inundated much of the United Kingdom between the 21st and the 28th, leading to the deaths of at least four people. Torrential rains affected Britain, Scotland, and Wales, as more than 1,100 homes were damaged

or destroyed. Several rivers (including the Thames, Ouse, Derwent, Cree and Ruchill) overflowed their banks, which also caused major infrastructure damage and the shutdown of hundreds of roads and railways. Gusty winds led to further damage due to downed trees and power lines. According to PricewaterhouseCoopers, the floods cost insurers as much as GBP500 million (USD800 million). Total economic losses were even higher.

A rare tornado struck the city of Taranto, Italy on the 28th, injuring at least 20 people. The EF-2 rated, multiple-vortex tornado caused widespread damage, most notably to a local steel plant which was the largest in Europe. Several nearby buildings and vehicles were severely damaged as well.

Exhibit 75: Europe December Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
12/1-12/2	Flooding	Turkey	1	Hundreds	Millions
12/7-12/31	Winter Weather	Eastern Europe	277	10,000	25 million

Heavy rains swept across Turkey's western provinces of Balikesir, Çanakkale and Bursa on the 1st and 2nd, prompting widespread flooding. At least one person was killed. Government officials reported that hundreds of homes and businesses had been damaged or destroyed due to flash floods and overflowing rivers. Damage to infrastructure was severe as well, leading to the closure of several main highways.

An active winter weather pattern engulfed much of Central and Eastern Europe between the 7th and the 24th, bringing more than one meter (three feet) of snow and temperatures as low as -22°C (-8°F). At least 227 fatalities were recorded in Ukraine (133), Russia (56), Poland (49), Switzerland (11), Czech Republic (7), Serbia (6), Lithuania (6), Croatia (4), Bulgaria (3), and Germany (2). More than 1,000 people were hospitalized as well. Widespread damage was reported in more than 15 countries as high winds caused trees to fall and roofs to collapse under the weight of heavy snow and ice. Hundreds of roads were closed and shipments along the Danube River were suspended after parts of the river froze.

Africa

- More than 560 people killed in summer Central Africa floods
- October severe weather leads to more than USD114 million in insured losses across South Africa
- Cyclones Funso, Giovanna and Irina leave more than 150 dead in Madagascar, Mozambique and Malawi

Exhibit 76: Africa January Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
1/16-1/17	Flooding	Mozambique, South Africa	10	5,000	Unknown
1/20-1/26	CY Funso	Mozambique, Malawi	40	10,000	100 million

Multiple days of heavy rainfall from a tropical disturbance led to widespread flooding across portions of Mozambique and South Africa on the 16th and 17th, leaving at least 10 people dead. According to government officials in Mozambique, more than 5,000 homes were damaged in the southern provinces of Maputo, Gaza and Inhambane. Swollen rivers also led to further damage to infrastructure, power poles and coal mines.

Excessive rains from a slow-moving Cyclone Funso led to widespread flash flooding throughout Mozambique and Malawi between the 20th and the 26th, killing at least 30 people. The hardest-hit areas of Mozambique came in central and northern provinces, where the National Disaster Management Institute reported that more than 8,000 homes were lost. Agriculture and infrastructure were also severely impacted. In Malawi, torrential rains from Funso led to multiple rivers and lakes overflowing their banks. More than 5,000 people were forced to flee their homes. Total combined economic losses were estimated at USD100 million. Insured losses were near USD13 million.

Exhibit 77: Africa February Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
2/13	Severe Weather	Nigeria	15	3,000	1.0 million
2/14	CY Giovanna	Madagascar	35	50,000	100 million

A powerful thunderstorm struck the Nigerian city of Lagos on the 13th, bringing extremely gusty winds and torrential rains. At least 15 people were killed as damage occurred across multiple sections of the city. More than 3,000 homes were damaged or destroyed across 100 city blocks. Additional damage from the storm was recorded in Ikoyi and Victoria Island. Total economic damages were listed at NGN158 million (USD1 million).

Cyclone Giovanna made landfall in central Madagascar on the 14th, killing at least 35 people and injuring 81 others. According to the National Office of Disaster Management, more than 50,000 homes and other structures were damaged or destroyed in addition to impacts to infrastructure and agriculture across 686 separate districts. Total economic losses were estimated at MGA220 billion (USD100 million).

Exhibit 78: Africa March Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
2/26-3/7	CY Irina	Madagascar, Mozambique	84	35,000	Millions

Excessive rainfall from Cyclone Irina led to the deaths of at least 84 people across parts of Madagascar, Mozambique and South Africa between February 26th and March 7th. According to the Madagascar government, at least 72 people were killed, more than 78,000 were left homeless and wide swaths of agriculture were submerged by Irina's rains and winds. In Mozambique and South Africa, a combined 12 people died due to storm-related incidents.

Exhibit 79: Africa April Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
4/12	Flooding	Rwanda	5	2,232	Unknown
4/20-4/28	Flooding	Comoros	0	9,338	3.8 million

Portions of western Rwanda sustained major flood damage after heavy rains occurred on the 12th. At least 2,232 homes were damaged or destroyed in addition to swaths of agriculture. Five fatalities were recorded.

Persistent rainfall between the 20th and the 28th prompted flooding across the islands of Comoros, damaging at least 9,338 homes. Additional damage occurred to the electrical and transportation infrastructures. No injuries or fatalities were recorded and damage costs were listed at USD3.8 million.

Exhibit 80: Africa May Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
4/24-5/15	Flooding	Kenya	50	50,000	130 million

Widespread flooding occurred throughout Kenya between April 24th and May 15th, killing at least 50 people. Government officials reported that extensive damage had occurred to property (up to 50,000 homes), infrastructure and agriculture after several rivers burst their banks. Total economic damage to infrastructure alone was listed at KES11 billion (USD130 million).

Exhibit 81: Africa June Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
6/23-6/25	Flooding	Uganda	30	100	Unknown

Heavy rainfall on the 23rd and 24th prompted a massive landslide in the eastern Uganda district of Bududa. At least 30 people were killed and up to 100 others remained listed as missing after the landslide (measured at 200 meters (656 feet) wide) buried dozens of homes in the village of Bunukasala. Additional landslides occurred in nearby villages, damaging an unknown number of homes.

July

No major natural disaster events occurred in Africa during the month of July.

Exhibit 82: Africa August Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
8/1-10/31	Flooding	Chad	34	94,000	20 million
8/1-8/12	Flooding	Sudan	35	30,000	Unknown
8/1-10/31	Flooding	Niger	91	50,000	2.75 million
8/15-10/31	Flooding	Senegal	19	11,400	10 million
8/25-10/31	Flooding	Cameroon	15	22,000	Millions

Weeks of heavy rainfall affected central and southern sections of Chad, triggering floods that lingered through October. At least 34 people were killed. Among the hardest-hit areas came in the regions of Kanem, Sila and Guera, where more than 94,000 homes and other structures were damaged or destroyed by flash floods and overflowing rivers. A report from the United Nations cited more than USD20 million necessary for recovery efforts.

The worst flooding in 100 years swept across Niger between the months of August and October, leaving at least 91 people dead. According to government officials, tens of thousands of homes and buildings were destroyed in hundreds of villages after heavy rainfall prompted substantial flash flooding and caused rivers to overflow their banks (including the Niger). More than XOF1.4 billion (USD2.75 million) was released for immediate aid and recovery.

Two weeks of heavy rains between the latter half of August through October affected western Senegal, spawning floods that killed at least 19 people. Many of the deaths came in the capital of Dakar after the city's drainage system failed, allowing floodwaters to damage more than 11,400 homes. Significant damage was reported to infrastructure as well. Total economic losses were estimated at XOF5.2 billion (USD10 million).

Tremendous rainfall totals led to some of the worst flooding since 1958 across northern Cameroon between the end of August through October. At least 15 people were killed in the hardest-hit areas of Lamurde, Numan, Yola North, Yola South, Fufore, Demsa, Girei, Mayo Belwa, Guyuk and Shelleng after the Benoue River burst its banks. More than 22,000 homes were damaged or destroyed. Total economic losses were expected to reach the millions (USD).

The heaviest rainfall since 1988 swept across a large portion of Sudan between the 1st and the 12th, leaving at least 35 people dead and an additional 135 people injured. The rains spawned flooding that destroyed at least 15 villages after the Atbara River overflowed its banks. Elsewhere in the country, government officials noted that more than 27,000 homes, 854 public facilities, 172 warehouses, 13 schools, and several health centers were damaged in multiple states. Flooding in many of these areas was caused by overflowing rivers, including the Nile and the Gash.

Exhibit 83: Africa September Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
9/27-9/28	Flooding	Somalia	25	3,500	Unknown

A year's worth of rainfall fell across central Somalia's Hiiraan Region on the 27th and the 28th, causing widespread flooding. At least 25 people were killed in the town of Beletweyne after the Shabelle River overflowed its banks. More than 3,500 homes were damaged or destroyed.

Exhibit 84: Africa October Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
7/22-10/31	Flooding	Nigeria	363	500,000	636 million
9/1-10/31	Flooding	Benin	4	12,000	Unknown
10/20-10/22	Severe Weather	South Africa	13	25,000	200 million

Torrential rains prompted widespread flooding across much of Nigeria between mid-July and October. The floods affected at least 30 separate states, as government officials confirmed the deaths of 363 people and more than 18,000 injuries. The floods were enhanced after several large rivers overflowed their banks. As many as 500,000 homes were damaged, displacing 2.1 million residents. The government sought NGN100 billion (USD636 million) for reconstruction and aid to cover the extensive damage.

Periods of heavy rainfall during September and October prompted the Niger River to burst its banks in northern and central Benin. At least four people were killed. According to government officials, as many as 55,000 people from 12,000 homes were affected as the floods caused major damage. The hardest-hit areas included Karimama and Malanville, where floodwaters also destroyed roads, bridges and large swaths of agriculture.

Powerful thunderstorms spawned a severe hailstorm and flooding rains throughout parts of South Africa between the 20th and the 22nd. The province of Gauteng (including the city of Johannesburg) was amongst the hardest-hit, as golf ball-sized hail shattered windows and dented roofs in homes and vehicles. Local insurers received up to 25,000 home and auto claims with payouts expected to reach ZAR1 billion (USD114 million). Also, flooding rains affected the provinces of Western Cape, Eastern Cape and KwaZulu-Natal as rivers overflowed their banks. At least 13 people were killed as hundreds of homes, businesses and vehicles were damaged or destroyed.

Exhibit 85: Africa November Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
11/17-11/18	Flooding	Congo	5	2,000	Unknown

Torrential rains caused severe flooding in Congo's Pointe Noire on the 17th and the 18th, killing at least five people. More than 2,000 homes were destroyed as floodwaters and landslides submerged multiple neighborhoods in the city. Infrastructure was heavily affected as well.

December

No major natural disaster events occurred in Africa during the month of December.

Asia

- Super Typhoon Bopha leaves at least 1,900 people dead or missing in the Philippines
- China endures extensive summer flooding
- Two strong earthquakes in Iran kill at least 306 people during August

Exhibit 86: Asia January Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
1/1-1/5	Flooding	Indonesia	0	11,000	Millions
1/1-1/31	Winter Weather	Japan	134	1,925	171 million
1/1-2/7	Winter Weather	China	0	10,000	2.1 million
1/5	Landslide	Philippines	42	100	Unknown
1/5	Severe Weather	Indonesia	0	500	30 million
1/8	Earthquake	China	0	9,000	Unknown
1/16-1/17	Winter Weather	Afghanistan	46	Unknown	Unknown
1/21	Earthquake	Indonesia	0	450	1.3 million
1/21-1/24	Winter Weather	China	0	1,000	4.4 million
1/25	CY Iggy	Indonesia	16	2,300	1.0 million

Excessive rainfall caused three levees to fail in Indonesia's Central Java province during the first few days of January. No fatalities were recorded, though more than 11,000 homes were damaged in the Brebes region. Severe infrastructure damage was reported as well.

Heavy snowfall in association with a persistent series of winter storms affected parts of northern and western Japan throughout the month of January. At least 134 people were killed and 1,991 others were injured after more than 3.04 meters (10 feet) of snow fell in isolated locations. The hardest-hit prefectures included Akita, Niigata, Nagano, Kyoto and Aomori. More than 1,925 homes and structures were damaged or destroyed, in addition to parts of the transportation infrastructure. Damage to agriculture alone was listed at JPY13.7 billion (USD171 million).

An extended period of cold weather engulfed parts of northern China throughout the month of January and early February, leading to the damage of nearly 10,000 homes. The Inner Mongolia autonomous region was particularly affected, where renovation costs were listed at CNY13 million (USD2.1 million).

Days of persistent rainfall led to a massive landslide in the Philippines' Compostela Valley Province on the 5th, killing at least 42 people and seriously injuring 16 others. The slide occurred in the Napnapan Village after a mountainside collapsed in the middle of the night, which destroyed at least 60 homes and dozens of other buildings.

A severe thunderstorm swept through parts of Jakarta, Indonesia on the 5th, causing widespread damage to homes, businesses and vehicles primarily due to downed trees and power poles. Total economic losses were estimated at IDR270 billion (USD30 million). Indonesian insurers reported only minimal losses.

A moderate magnitude-5.0 earthquake struck China's Xinjiang Province at 2:20 PM local time on the 8th (6:20 UTC), with an epicenter 106 kilometers (65 miles) east-northeast of the city of Korla. No injuries or fatalities were recorded, though more than 9,000 homes were damaged.

Heavy snowfall led to a series of avalanches in the mountainous terrain of northeastern Afghanistan on the 16th and 17th. At least 46 people were killed and 60 others injured as the avalanches struck remote areas in Badakhshan province. With several roads and highways being closed, as many as 12 districts were unreachable.

A magnitude-6.3 earthquake rattled Indonesia's West Manggarai region on the 21st, damaging at least 450 homes and other structures. The tremor struck at 5:32 AM local time (20:32 UTC on the 20th) with an epicenter located approximately 48 kilometers (29 miles) southwest of West Manggarai. No injuries or fatalities were reported. Total economic losses were listed at IDR11.6 billion (USD1.3 million).

Heavy snow and freezing rain affected more than 256,000 people in central China's Hunan Province between the 21st and the 24th. No injuries or fatalities were reported, though 1,000 homes were damaged and more than 5,100 hectares (12,600

acres) of crops were affected. According to the Ministry of Civil Affairs (MCA), total economic losses were estimated at CNY28 million (USD4.4 million).

Thunderstorms associated with Tropical Cyclone Iggy spawned a tornado on Indonesia's Java Island on the 25th, killing at least 16 people and injuring 60 others. According to local officials, the tornado ripped through 23 regencies and cities in the provinces of Jakarta, Central Java, East Java and West Java. More than 2,000 homes were damaged or destroyed. Total damages were listed in excess of IDR8.9 billion (USD1 million).

Exhibit 87: Asia February Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
2/6	Earthquake	Philippines	113	15,787	9.5 million
2/7-2/9	Winter Weather	China	0	10,000	20.2 million
2/15-2/16	Winter Weather	China	0	1,000	4.0 million
2/18	Landslide	India	6	Unknown	Unknown
2/19	Flooding	Philippines	0	5,000	Unknown
2/22	Winter Weather	India	16	Unknown	Unknown
2/25	Severe Weather	Indonesia	5	100	Unknown

A strong magnitude-6.7 earthquake struck the central Philippines on the 6th, leaving at least 113 people dead and injuring 112 more. The main tremor occurred at 11:49 AM local time (3:49 UTC) with an epicenter 72 kilometers (44 miles) north of Dumaguente, Philippines. The central province of Negros Oriental on Central Visayas sustained the brunt of the damage. According to the National Disaster Risk Reduction and Management Council (NDRRMC), more than 15,787 homes were damaged or destroyed as well as infrastructure and agriculture. Total economic losses were estimated at PHP383 million (USD9.5 million).

Heavy snowfall struck China's Tibetan between the 7th and the 9th. At least 650 people were injured, 10,000 homes were damaged. Total economic losses were estimated at CNY127 million (USD20.2 million) by the MCA.

A blizzard affected China's Tibetan region on the 15th and 16th, with the locales of Nyalam and Burang in Xigaze prefecture sustaining the worst effects. No injuries or fatalities were recorded. According to the MCA, nearly 1,000 homes were damaged or destroyed. Total economic damages were listed at CNY25 million (USD4 million).

At least six people were killed in Indian-controlled Kashmir on the 18th after heavy rains triggered a landslide. The slide occurred on a main highway at Khooni Nalla near Ramsoo in Ramban district.

More than 5,000 homes were damaged in the southern Philippine provinces of Sultan Kudarat, Agusan del Norte and Surigao del Norte after torrential rains spawned flash flooding on the 19th. No injuries or fatalities occurred.

Two large avalanches struck India's Kashmir region on the 22nd, killing at least 16 soldiers. The incidents occurred in the mountainous area of Sonamarg.

A tornado struck parts of Indonesia's South Sulawesi and North Sumatra provinces on the 25th, killing at least five people. The tornado left four people dead and 59 homes destroyed in Sidrap regency and one person dead and 39 homes destroyed in Pakpak Barat regency.

Exhibit 88: Asia March Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
3/4	Winter Weather	Afghanistan	56	100	Unknown
3/9	Earthquake	China	0	114,400	83 million
3/12	Winter Weather	Afghanistan	45	50	Unknown
3/15-3/18	Severe Weather	Thailand	0	200	Unknown
3/16-3/20	Severe Weather	Indonesia	0	12,000	Unknown
3/17	Flooding	China	0	578	32 million
3/20	Flooding	India	3	15,862	1.0 million
3/27	Flooding	Philippines	11	10,000	2.1 million

A large avalanche buried an entire village in northeastern Afghanistan's Badakhshan province on the 4th, killing at least 56 people. Rescue officials noted that every home in the Dasty village of 200 residents had been destroyed.

A magnitude-5.8 earthquake struck China's Xinjiang region on the 9th, causing widespread damage in 16 counties though no injuries or fatalities were recorded. The tremor struck at 6:50 AM local time (22:50 UTC Thursday) with an epicenter 214 kilometers (132 miles) south-southeast of Aksu, China. According to the MCA, the earthquake damaged or destroyed at least 114,400 homes. Total economic losses were CNY518 million (USD83 million).

At least 45 people were killed in eastern Afghanistan's Nuristan Province after a large avalanche struck the region on the 12th. According to local officials, the avalanche crushed dozens of homes and blocked roads leading into the affected district of Mandol.

Strong thunderstorms affected multiple provinces in Thailand provinces between the 15th and the 18th. In Surin Province, storms destroyed at least 87 homes; while multiple southern provinces reported that inclement weather led to more than 100 homes being destroyed. Twenty people sustained injuries.

At least three tornadoes struck Indonesia between the 16th and the 20th as storm damage was recorded in the provinces of East Nusa Tenggara, West Nusa Tenggara and South Kalimantan. A combined 12,000 homes were damaged or destroyed and at least 17 people were injured.

Heavy rains combined with melting snow in northwest China's Xinjiang Province to cause flooding on the 17th. At least 578 homes and swaths of farmland were damaged in Ili Prefecture. Total economic losses were listed at CNY200 million (USD32 million).

At least three people were killed in India's Kashmir region on the 20th, after strong winds and heavy rains prompted flooding and avalanches. An additional 17 injuries were recorded as the inclement weather also damaged 15,862 homes and other structures in the city of Srinagar. Total economic losses were listed at INR47 million (USD1 million).

Heavy rainfall on the 27th led to widespread flooding across central and southern sections of the Philippines. At least 11 people were killed as floods impacted 19 municipalities in six provinces. More than 10,000 homes were damaged or destroyed as well as parts of the transportation infrastructure. Total economic losses were listed at PHP89.5 million (USD2.1 million).

Exhibit 89: Asia April Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
4/1	Severe Weather	Sri Lanka	0	1,200	Unknown
4/1	TY Pakhar	Vietnam	2	5,000	Unknown
4/3-4/5	Severe Weather	Japan	4	Hundreds	Unknown
4/5	Severe Weather	China	0	20,000	120 million
4/11-4/18	Flooding	Saudi Arabia, Oman	18	Thousands	Millions
4/20-4/25	Severe Weather	China	12	25,400	84 million
4/20-4/25	Severe Weather	Vietnam	2	4,780	5.0 million
4/22	Flooding	Afghanistan	20	1,140	Unknown
4/23-4/29	Flooding	Kyrgyzstan	0	1,886	Unknown

A strong thunderstorm on the 1st damaged or destroyed at least 1,200 homes in northern Sri Lanka. The storm caused 14 injuries and cut electricity and telecommunication.

Typhoon Pakhar became the first landfalling cyclone of 2012 in the Northwest Pacific Basin on the 1st. The system had sustained winds of 65 kph (40 mph) as it came ashore in southern Vietnam. At least two people were killed and nine others were injured as the storm brought periods of heavy rainfall and gusty winds. More than 5,000 homes, infrastructure and agriculture were damaged.

A powerful spring storm system brought high winds across much of Japan between the 3rd and the 5th, killing at least four people and injuring 372 others. The highest recorded wind gust came in the city of Sado, Niigata Prefecture, at 157 kph (98 mph). More than 520,000 Tohoku Electric Power Company customers lost electricity across Akita and Niigata prefectures, which led to widespread mobile phone disruption. Transportation was also impacted as flights and rail service was delayed or cancelled.

Severe thunderstorms brought hail to China's Guizhou and Guangdong provinces on the 5th, damaging at least 20,000 homes and hundreds of thousands of hectares (acres) of farmland. No injuries or fatalities were reported. The inclement weather also led to telecommunication and electricity disruptions. The MCA cited economic damages of CNY750 million (USD120 million).

Heavy rainfall fell across portions of eastern Saudi Arabia and western Oman between the 11th and the 18th, prompting widespread flooding that left at least 18 people dead. The floods damaged thousands of homes and businesses, while also submerging swaths of infrastructure.

Rounds of severe thunderstorms swept across four eastern and central provinces of China between the 20th and the 25th, killing at least 12 people. According to the MCA, a combined 25,400 homes were damaged or destroyed in addition to at least 461,000 hectares (1.1 million acres) of cropland. Total economic losses were listed at CNY530 million (USD84 million).

Severe weather impacted four northern Vietnam provinces between the 20th and the 25th, leading to the deaths of two people and causing widespread damage. More than 4,780 homes were destroyed after high winds and hail struck. Total economic losses were listed at VND104 billion (USD5 million).

Torrential monsoonal rains prompted flash floods across northern and eastern Afghanistan on the 22nd, killing at least 20 people. Northern Balkh Province was particularly impacted, where at least 840 homes and businesses were swept away. In the eastern province of Ghazni, an additional 300 homes were washed away.

Excessive rainfall fell across southern Kyrgyzstan between the 23rd and the 29th, causing widespread damage to property and infrastructure. Local officials reported that 1,886 homes were damaged or destroyed by flooding and mudslides, particularly in the regions of Osh, Batken, Jalalabad and Naryn.

Exhibit 90: Asia May Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
4/28-5/15	Severe Weather	China	102	143,000	2.68 billion
5/5	Flooding	Nepal	60	1,000	Unknown
5/6	Severe Weather	Japan	3	1,904	Millions
5/6-5/11	Flooding	Afghanistan	47	1,000	Unknown
5/9	Flooding	Indonesia	5	200	Unknown
5/19	Flooding	Afghanistan	24	2,800	Unknown
5/20-5/24	Flooding	China	16	25,000	378 million
5/27-5/30	Flooding	China	7	16,000	119 million

Flooding rains and strong thunderstorms affected at least 22 Chinese provinces between April 28th and May 15th, killing at least 102 people. Gansu, Hunan and Jiangxi provinces were most affected, where flooding, landslides and hail damaged or destroyed at least 143,000 homes. The MCA noted that 949,400 hectares (2.34 million acres) of cropland were also affected. Total economic losses were listed at CNY16.88 billion (USD2.68 billion).

Flash floods swept through the western Nepal district of Kaski on the 5th after the Seti River burst its banks. At least 60 people were killed. The most significant damage came in the resort town of Pokhara, where a large number of homes were destroyed, plus two temples and a community building. The water supply system was also damaged.

Powerful thunderstorms struck eastern Japan on the 6th, spawning multiple tornadoes and other reports of damaging winds. At least three people were killed and 59 others were injured. The most notable tornado was an F-2 that struck the town of Tsukuba in Ibaraki Prefecture, which damaged or destroyed 827 homes and other structures. Japan's Fire and Disaster Management Agency (FDMA) cited that more than 1,904 total buildings were damaged in six prefectures.

Heavy rains in the mountainous terrain of northern Afghanistan prompted separate flooding events between the 6th and the 11th. The first event occurred in Sari Pul Province, where at least 30 people were killed and more than 200 homes were destroyed in Dhy Marda village. The second flash flood event swept through Takhar Province, killing at least 17 people.

Several villages in Ishkamish district were washed away after floodwaters burst through a dam.

Heavy rainfall on the 9th led to floods carrying volcanic debris in eastern Indonesia. At least five people were killed and 20 others were injured. According to local officials, the rains prompted two rivers to burst their banks and sweep through 11 villages in North Maluku Province's Ternate City. Nearly 200 homes and two bridges were washed away.

Torrential rains in northern Afghanistan's Saripul Province on the 19th led to widespread flooding in the provincial capital of Saripul City. At least 24 people were killed after floods damaged at least 2,800 homes.

Flooding swept across parts of six southwestern Chinese provinces between the 20th and the 24th, killing at least 16 people. According to the MCA, a combined 25,000 homes were damaged or destroyed in addition to tens of thousands of hectares (acres) of crops and also infrastructure. Total economic losses were listed at CNY2.4 billion (USD378 million).

Periods of heavy rainfall impacted at least seven Chinese provinces between the 27th and the 30th, killing seven people and injuring dozens more. The rains prompted flash flooding, river flooding and landslides. According to the MCA, a combined 16,000 homes were damaged or destroyed in addition to more than 500,000 hectares (1.24 million acres) of cropland being submerged. Total economic losses were listed at CNY1.29 billion (USD207 million).

Exhibit 91: Asia June Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
6/1-6/3	Flooding	Philippines	3	Unknown	Unknown
6/3-6/5	Flooding	Thailand	3	5,000	1.0 million
6/5-6/12	Flooding	Taiwan	6	7,000	16.9 million
6/8-6/12	Flooding	China	23	53,000	393 million
6/11	Earthquake	Afghanistan	100	50	Unknown
6/12	Earthquake	China	0	1,900	112 million
6/12-6/13	Flooding	Philippines	13	283	Unknown
6/15-6/19	STY Guchol	Japan, Philippines	2	1,000	100 million
6/18-6/20	Severe Weather	China	0	200	82 million
6/20-6/24	Severe Weather	China	5	4,500	124 million
6/20-6/29	Flooding	China	50	123,000	1.62 billion
6/22	Flooding	Afghanistan	37	500	Unknown
6/23-7/1	Flooding	India, Bangladesh	243	710,000	90 million
6/24	Earthquake	China	4	119,541	300 million
6/30	Earthquake	China	0	71,500	Millions

The passage of Typhoon Mawar to the east of the Philippines combined with a southwest monsoonal flow to spawn torrential rainfall across Luzon between the 1st and the 3rd. At least three people were killed and seven others were injured after the heavy rains prompted flash flooding that destroyed homes, bridges and other infrastructure.

Heavy monsoonal rainfall fell across multiple southern provinces in Thailand between the 3rd and the 5th, spawning isolated flash flooding. At least three fatalities were recorded as floods struck parts of Chumphon, Ranong, Trang, Krabi and Mae Hong Son provinces. Thousands of residents were left homeless by the flash floods and high winds, which also damaged infrastructure. Total economic losses were listed at THB31.5 million (USD1 million).

Torrential rains between the 5th and the 12th spawned flooding and mudslides across much of Taiwan. Up to 700 millimeters (27 inches) of rain fell during the stretch, leading to flooding and mudslides that killed at least six people. As many as 7,000 homes damaged or destroyed, and agricultural losses were TWD504 million (USD16.9 million).

Heavy rainfall swept across eight Chinese provinces between the 8th and the 12th, killing at least 23 people. Local governments reported that a combined 53,000 homes were damaged after some of the main tributaries associated with the Yangtze River rose above flood stage. According to the MCA, more than 500,000 hectares (1.24 million acres) of cropland were also damaged. Total economic losses were listed at CNY2.5 billion (USD393 million).

A magnitude-5.7 earthquake struck the Hindu Kush region of northern Afghanistan on the 11th. The tremor struck at 9:59 AM local time (5:29 UTC) with an epicenter 161 kilometers (100 miles) southwest of Faizabad. At least 100 people were killed in Baghlan Province, after the jolt triggered a massive landslide that destroyed dozens of houses.

A slow moving area of low pressure led to significant flooding and landslides in six Philippine provinces on the 12th and 13th. At least 13 people were killed after more than 283 homes were washed away. The transportation infrastructure and agriculture were both damaged as well.

A magnitude-4.7 earthquake struck near the border of Sichuan and Yunnan provinces on the 12th, with an epicenter located 74 kilometers (45 miles) south-southwest of the city of Yibin. According to the MCA, the tremor damaged or destroyed at least 1,900 homes – primarily in Yanjin County. Total economic losses were listed at CNY700 million (USD112 million).

Super Typhoon Guchol developed and made landfall in Japan as a weakened cyclone on the 19th, killing at least two people and injuring 80 others. Guchol also brought torrential rainfall to parts of the Philippines while skirting the archipelago. The system officially made landfall in Japan's southern Wakayama Prefecture as a 100 kph (65 mph) tropical storm before making a final landfall in Aichi Prefecture shortly thereafter. The Cabinet Office reported that damage (primarily due to flooding) had occurred to at least 868 homes and other structures. The system also impacted transportation and electricity. Total economic losses were listed at nearly JPY8 billion (USD100 million).

Strong thunderstorms between the 18th and the 20th affected China's Shaanxi and Gansu provinces. Hail and damaging winds affected nearly 200 homes, though more than 56,000 hectares (138,300 acres) of agriculture was also destroyed. The MCA noted economic losses at CNY528 million (USD83 million).

Rounds of severe weather struck China's Gansu, Shaanxi and Shanxi provinces and Inner Mongolia between the 20th and the 24th. At least five people were killed due to periods of hail and damaging winds. The storms damaged more than 4,500 homes and nearly 92,000 hectares (227,000 acres) of cropland. The MCA listed total economic losses at CNY790 million (USD124 million).

Heavy rains between the 20th and the 29th affected 17 separate Chinese provinces, killing at least 50 people. Extensive flood and landslide damage occurred to homes, businesses, agriculture and infrastructure as Guizhou, Hubei and Jiangxi provinces were among the hardest-hit. According to the MCA, a combined 123,000 homes were damaged or destroyed and 828,000 hectares (2.05 million acres) of cropland was submerged. Total economic losses were listed at CNY10.1 billion (USD1.62 billion).

Flash flooding left at least 37 people dead and 24 others injured in the Afghanistan provinces of Ghor and Badakhshan on the 22nd. According to officials from the United Nations, floods and landslides destroyed 500 homes and other structures in addition to large swaths of agriculture.

The heaviest monsoonal rains in a decade devastated southern sections of Bangladesh and eastern India between June 23rd and early July. A combined 243 people were killed due to substantial flooding and landslides. In Bangladesh, government officials reported that 360,000 homes were destroyed in addition to large swaths of agriculture and infrastructure. The state of Assam in India reported that nearly 350,000 households were displaced due to an overflowing Brahmaputra River. The Indian government allocated INR5 billion (USD90 million) for clean-up.

A magnitude-5.5 earthquake rattled China's Sichuan-Yunnan border region on the 24th. The tremor occurred at 3:59 PM local time (7:59 UTC) with an epicenter 53 kilometers (32 miles) west-southwest of Qiaowa, China. At least four people were killed and 152 others injured. The MCA noted that 119,541 homes were damaged or destroyed and total economic losses were CNY1.9 billion (USD300 million).

A magnitude-6.3 earthquake struck China's Xinjiang Province on the 30th, injuring at least 52 people. The tremor occurred at 5:07 AM Saturday morning local time (21:07 UTC Friday) with an epicenter 99 kilometers (61 miles) south of Dushanzi, China. The MCA reported that at least 71,500 homes were damaged or destroyed and that additional damage had occurred to infrastructure. Total economic losses were listed in the millions of dollars (USD).

Exhibit 92: Asia July Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
6/28-7/10	Flooding	China	70	188,400	1.19 billion
7/3-7/5	Flooding	Japan	1	460	Millions
7/11-7/16	Flooding	Japan	30	16,045	Millions
7/11-7/17	Flooding	China	30	76,000	600 million
7/18-7/31	TS Khanun	North Korea, South Korea	175	53,000	11.4 million
7/19	Flooding	Nepal	0	2,200	Unknown
7/20-7/24	Flooding	China	149	175,000	4.8 billion
7/24	Flooding	Indonesia	8	125	Unknown
7/24	TY Vicente	China, Vietnam	11	13,000	329 million
7/27-8/2	Flooding	China	76	36,000	1.69 billion
7/31	Flooding	Indonesia	8	754	Unknown

Persistent rainfall fell across ten Chinese provinces between June 28th and July 10th, leading to the deaths of at least 70 people. Flooding and landslides caused widespread damage to personal property, infrastructure and agriculture. According to the MCA, at least 188,400 homes were damaged or destroyed and more than 694,000 hectares (1.71 million acres) of cropland were submerged. Total economic losses were listed at CNY7.6 billion (USD1.19 billion).

Record rainfall from a seasonal weather pattern impacted Japan's southwestern island of Kyushu between the 3rd and the 5th, prompting flooding and mudslides. At least one person was killed and 74 others were injured. The prefectures of Fukuoka, Oita and Nagasaki were primarily impacted, with more than 25,000 people evacuated from their homes. The Cabinet Office reported that 460 homes had been damaged or destroyed.

Consecutive days of torrential rainfall deluged southern Japan's Kyushu Island between the 11th and the 16th, leading to the deaths of at least 30 people. The intense rains prompted widespread flash flooding, rivers to overflow their banks and 870 landslides. The prefectures of Fukuoka, Oita, Kumamoto and Saga sustained the brunt of the impacts, with the city of Aso recording 817 millimeters (32.17 inches) of rain. Japan's FDMA reported that 16,045 homes and other structures had sustained varying levels of flood inundation. Infrastructure (800 roads and 20 bridges) and agriculture were also widely affected. Total economic losses were estimated well into the millions of dollars (USD).

An active weather pattern brought periods of heavy rain to central and southern China between the 11th and the 17th, leading to the deaths of at least 30 people. According to the MCA, at least 76,000 homes were damaged or destroyed and more than 478,500 hectares (1.18 million acres) of cropland were submerged. Total economic losses were listed at CNY3.82 billion (USD600 million).

Tropical Storm Khanun made landfall in Korea and prompted two weeks of significant flooding, particularly throughout North Korea during the second half of the month. At least 175 people were killed and dozens of others were injured. According to a state-released report, floods damaged or destroyed nearly 53,000 homes and public buildings. The transportation infrastructure was also heavily impacted as floodwaters wiped out wide swaths of roadways and rail lines. Total economic losses were listed at KPW1.5 billion (USD11.4 million).

A torrential rainstorm on the 19th led to flash flooding and river flooding in Nepal's district of Dang. No fatalities were recorded, though several people were hospitalized with injuries. According to local officials, more than 2,200 homes were destroyed in the village of Deukhuri after the Rapti River overflowed its banks.

The heaviest rains in 61 years fell across the greater Beijing metropolitan area on the 21st, prompting widespread significant flooding and leaving at least 79 people dead. Floods swept through the city limits and surrounding areas as drainage

systems were unable to handle the high volume of water. Elsewhere, extensive flooding affected 17 provinces between the 20th and the 24th. More than 70 additional fatalities occurred. According to the MCA, a combined 175,000 homes were affected and more than 300,000 hectares (741,000 acres) of cropland were submerged. Total economic losses were listed at CNY30.73 billion (USD4.8 billion), with at least CNY11.6 billion (USD1.8 billion) occurring in the greater Beijing area. The China Insurance Regulatory Commission (CIRC) reported that insured losses in Beijing were in excess of CNY1 billion (USD157 million) with more than 47,000 claims filed. An additional CNY486 million (USD77 million) in insured losses were recorded in Chongqing and Sichuan provinces.

Excessive rainfall led to flash flooding in Indonesia's West Sumatra region on the 24th, killing at least eight people. Chest-deep high water from an overflowing river in Padang damaged more than 125 homes, mosques, bridges and health clinics. Infrastructure damage was severe in many areas.

Typhoon Vicente made landfall on the 24th near the city of Taishan in southern China (near Hong Kong) at peak strength as a 215 kph (135 mph) cyclone. Eight people were killed.

According to the MCA, a combined 11,700 homes were damaged in Guangdong, Guangxi and Fujian provinces by the system's high winds and heavy rains. Up to 80,000 hectares (198,000 acres) of cropland were also submerged. Total economic losses were listed at CNY2.1 billion (USD329 million). Vicente's remnants later reached Vietnam, where flooding left another 11 people dead.

An active weather pattern spawned additional heavy rainfall throughout much of China, as flooding and mudslides led to the deaths of at least 76 people between July 27th and August 2nd. The hardest-hit provinces and regions included Shanxi, Heilongjiang and Inner Mongolia. According to the MCA, at least 36,000 homes and buildings were damaged or destroyed in addition to more than 188,600 hectares (466,000 acres) of farmland. Total economic losses were listed at CNY11 billion (USD1.69 billion).

Flash floods and a large landslide struck the eastern Indonesian province of Maluku on the 31st, killing at least eight people. According to disaster officials in the region, at least 754 homes were damaged or destroyed as the floods and landslide tore through the capital city of Ambon.

Exhibit 93: Asia August Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
7/29-8/3	TY Saola	China, Philippines, Taiwan	82	25,000	161 million
8/1-8/3	TY Damrey	China	14	300,000	3.28 billion
8/3-8/9	Flooding	India	34	Thousands	110 million
8/5-8/8	Flooding	Philippines	109	12,962	239 million
8/7-8/9	TY Haikui	China	6	48,250	2.04 billion
8/11	Earthquake	Iran	306	50,000	900 million
8/15-8/18	TY Kai-tak	Philippines, China, Vietnam	40	33,635	272 million
8/18	Earthquake	Indonesia	6	1,108	Unknown
8/21-8/23	Flooding	India	37	7,500	Unknown
8/23-8/30	TY Tembin	Taiwan, Korea	10	Hundreds	8.3 million
8/25-8/28	STY Bolaven	Korea, Japan	88	35,000	536 million
8/28-8/30	Flooding	China	0	35,000	4.63 billion
8/29-8/30	Flooding	India	26	1,892	16 million
8/31	Earthquake	Philippines	1	300	Unknown

Typhoon Saola made separate landfalls in Taiwan and China, while also causing impacts throughout the Philippines. The storm, which affected Southeast Asia between July 29th and August 3rd, led to at least 82 fatalities. In the Philippines, more than 8,443 homes were damaged as infrastructure and agriculture losses were listed at PHP412 million (USD10 million). In Taiwan, exceptional rainfall totals fell across northern sections of the country. Agricultural losses alone were listed at TWD813 million (USD27 million). A weakened Saola came ashore in China, with Fujian and Zhejiang provinces most affected. The MCA reported economic losses of CNY790 million (USD124 million).

Typhoon Damrey made landfall in China's Shandong Province on the 2nd, killing at least 14 people in flood-related accidents. Among the hardest-hit areas came in Shandong's Rizhao region, where heavy rainfall and gusty winds from the system brought impacts to property, transportation and agriculture. The MCA reported that upwards of 300,000 homes and buildings were damaged or destroyed. Total economic losses were listed at CNY20.86 billion (USD3.28 billion), and the CIRC noted insured losses of CNY660 million (USD104 million).

Heavy rainfall prompted widespread flash flooding and landslides throughout the northern Indian states of Uttarakhand and Uttar Pradesh between the 3rd and the 9th. At least 34 people were killed. According to Indian officials, excessive rains

prompted several major rivers in the region (including the Ghaghra, Rapti and Saryu) to overflow their banks in low-lying villages. Thousands of homes were destroyed. Property damage was listed at INR6.09 billion (USD110 million).

Torrential monsoon rains pummeled the Philippines' Luzon Island (including the greater Manila metropolitan region) between the 5th and the 8th, killing at least 116 people. Extensive flooding and landslides were recorded, as the Southwest Monsoon was enhanced by the passage of Typhoon Haikui. At least 44 provinces, cities and municipalities were declared under a state of calamity, and at the peak of the event, as much as 60 to 90% of Metro Manila was inundated by varying levels of flooding. Some flood areas were enhanced by the intentional release of water from at least five dams. The NDRRMC reported that at least 14,280 homes had been damaged or destroyed. Economic losses to agriculture and infrastructure alone were PHP3.2 billion (USD78 million), but the overall losses—including those sustained by the private sector—were PHP10 billion (USD238 million).

Typhoon Haikui became China's third landfalling cyclone in less than a week, making landfall in Zhejiang Province on the 8th. The cyclone and its remnants brought gusty winds and heavy rainfall across Zhejiang, Jiangsu and Anhui provinces as well as in Shanghai. At least six people were killed. According to the MCA,

at least 48,250 homes were listed as damaged or destroyed in addition to more than 251,000 hectares (620,000 acres) of cropland. Total economic losses were estimated at CNY13 billion (USD2.04 billion). The CIRC noted that 45,681 claims were filed with payouts covering CNY1.46 billion (USD230 million).

Two strong earthquakes struck northwestern Iran on the 11th, killing at least 306 people and injuring more than 3,000 others primarily in the province of East Azerbaijan. According to the United States Geological Survey (USGS), the first earthquake (magnitude-6.4) occurred at 3:53 PM local time (12:23 UTC) with an epicenter located 20 kilometers (12 miles) west-southwest of Ahar, Iran. The second tremor (magnitude-6.3) struck just 11 minutes later in almost the same location. Forty-six villages were completely destroyed, and more than 425 others sustained significant damage to at least 50% of all homes and structures. At least 157,000 people were left homeless. Economic losses were listed by the government at IRR11 trillion (USD900 million).

Typhoon Kai-tak made separate landfalls in the Philippines, China and Vietnam between the 15th and the 18th, leaving at least 40 people dead. In the Philippines, Kai-tak brought torrential rainfall across northern sections of the country, with the NDRRMC reporting agriculture and infrastructure damages at PHP125 million (USD3 million). In China, the MCA cited that 21,500 homes in Guangdong and Guangxi provinces were damaged or destroyed. Total economic losses were listed at CNY1.65 billion (USD262 million). Officials in Vietnam reported that 12,093 homes were damaged or destroyed in addition to 23,221 hectares (57,380 acres) of cropland. Total damages were listed at VND142 billion (USD6.8 million).

A magnitude-6.3 earthquake struck Indonesia's Sulawesi Island on the 18th, killing at least six people and injuring 43 others. The tremor occurred at 5:41 PM local time (9:41 UTC) with an epicenter 56 kilometers (34 miles) south-southeast of Palu, Indonesia. Reports from Indonesia's Regional Disaster Mitigation Agency (RDMA) noted that the hardest-hit areas occurred in the districts of Parigi Moutong, Lindu and Sigie. More than 1,097 homes were damaged or destroyed, in addition to seven churches, three schools and one government office.

Some of the heaviest rains in at least 30 years struck India's northern state of Rajasthan between the 21st and the 23rd, leading to the deaths of 37 people. Officials reported that more than 7,500 homes were destroyed (including some in the capital of Jaipur) after floods swept through residential areas. Infrastructure was also heavily impacted as regional officials used 45 water pumps to drain the hardest-hit areas

Typhoon Tembin was a long-lived system that made an initial landfall in Taiwan on the 24th and a final landfall in South Korea on the 30th before dissipating. In Taiwan, Tembin came ashore in Pingtung County as a 205 kph (125 mph) typhoon, killed eight people and caused more than TWD240 million (USD8.3 million) in damage to agriculture. In South Korea, two people were killed as a much weakened Tembin triggered landslides and flooding.

Super Typhoon Bolaven developed and made landfall as a weakened system in South Korea on the 25th after first skirting Japan's southern Ryukyu Islands. In South Korea, the National Emergency Management Agency (NEMA) reported that at least 20 people were killed after Bolaven caused extensive damage to personal property, agriculture, infrastructure and the electrical grid. Economic losses were expected to exceed KRW500 billion (USD450 million), and local insurers estimated agriculture and auto claim payouts would be at least KRW120 billion (USD106 million). North Korea's Central News Agency noted that 68 people were killed in addition to 21,000 homes destroyed. In Japan, the prefectures of Okinawa and Kagoshima were hardest-hit as thousands of homes and other structures were damaged. Losses to agriculture and public facilities were listed at JPY6.7 billion (USD86 million).

Moisture from a passing Typhoon Bolaven combined with an advancing trough to bring torrential rains and gusty winds to eastern portions of China between the 28th and the 30th. The inclement weather (which spawned flooding) affected the provinces of Shandong, Jilin, Liaoning and Heilongjiang. According to the MCA, at least 35,000 homes and structures were damaged or destroyed and 1.89 million hectares of crops (4.67 million acres) were submerged. Total economic damages were estimated at CNY29.4 billion (USD4.63 billion), with the CIRC citing insured losses of CNY910 million (USD144 million).

Torrential monsoonal rains affected India's northern state of Himachal Pradesh on the 29th and 30th, triggering flash floods and landslides. At least 26 people were killed. Local officials reported that at least 1,892 homes were destroyed as well as infrastructure and agriculture. Total damages were listed at INR844 million (USD16 million).

A magnitude-7.6 earthquake struck off the Eastern Samar coast of the Philippines on the 31st, killing at least one person. The tremor occurred at 8:47 PM local time (12:47 UTC) with an epicenter 94 kilometers (58 miles) east of Sulangan, Philippines. The NDRRMC reported that more than 300 homes and other structures had been damaged. A Tsunami Warning was initially issued, but later cancelled after a minimal tidal rise was recorded.

Exhibit 94: Asia September Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
8/15-9/30	Flooding	Thailand	0	88,438	Unknown
8/21-11/10	Flooding	Pakistan	571	636,438	2.64 billion
8/31-9/6	Flooding	China	5	38,700	151 million
9/4-9/11	Flooding	Vietnam	32	10,180	22 million
9/7	Earthquake	China	81	452,700	552 million
9/7-9/13	Flooding	China	21	100,000	4.92 billion
9/11	Earthquake	China	0	17,200	17 million
9/14	Flooding	India	47	500	20 million
9/14	Earthquake	China	0	1,600	127 million
9/15-9/17	STY Sanba	South Korea, Japan	6	6,000	380 million
9/17-9/26	Flooding	Cambodia	14	14,300	Unknown
9/21-9/28	Flooding	India, Bangladesh	56	475,000	98 million
9/23	Winter Weather	Nepal	10	Unknown	Unknown
9/29-9/30	STY Jelawat	Japan	2	6,015	27.4 million

Seasonal monsoon rains continued to fall across parts of Thailand during September, after initially beginning in mid-August. At least 14 northern and central provinces were impacted, with the Disaster Prevention and Mitigation Department reporting that 88,438 homes were affected by flood inundation. One of the most affected areas came in the city of Sukhothai, where a series of levee failures occurred along the Yom River. Elsewhere, government officials released water from the Chao Phraya Dam in a precautionary move to minimize a larger flood threat.

Torrential rainfall continued to fall across several sections of Pakistan during the month of September (and through early November), killing at least 571 people and injuring 2,902 others. The monsoonal rains, which began in mid-August, affected provincial and regional areas of Khyber Pakhtunkhwa, Azad Jammu & Kashmir, Punjab, Sindh, Balochistan, Gilgit-Baltistan, and Islamabad. Pakistan's National Disaster Management Authority (NDMA) reported that flooding had damaged or destroyed at least 636,438 homes while also inundating vast areas of commercial property and more than 444,580 hectares (1.1 million acres) of cropland. Damage to agriculture and infrastructure alone was listed at PKR250 billion (USD2.64 billion).

Periods of heavy rainfall prompted flooding and landslides in multiple sections of China between August 31st and September 5th, killing at least five people. Among the hardest-hit provinces included Shaanxi, Yunnan, Inner Mongolia, Henan, and Hunan. According to the MCA, at least 38,700 homes and structures were damaged or destroyed and 55,000 hectares (136,000 acres) of crops were submerged. Total economic damages were listed at CNY955 million (USD151 million).

Heavy monsoonal rains inundated central and northern Vietnam between the 4th and the 11th, leaving at least 32 people dead and 38 others injured. The provinces of Ha Tinh, Nghe An and Thanh Hoa were most affected after excessive rainfall prompted landslides, flash flooding and rivers to overflow their banks. More than 10,180 homes were damaged or destroyed and at least 50,000 hectares (123,550 acres) of crops were submerged. Economic losses to agriculture and infrastructure were listed at VND459 billion (USD22 million).

Two magnitude-5.6 earthquakes struck China's mountainous southwest on the 7th, killing at least 81 people and injuring 821 others. The first was reported with an epicenter located 127 kilometers (79 miles) northwest of Liupanshui, China at 11:19 AM local time (3:19 UTC); while the second occurred two kilometers (one mile) southwest of Jiaokui, China nearly an hour later. Reports from the MCA noted that in Yunnan Province alone, more than 436,600 homes had been damaged or destroyed. An additional 16,100 homes were affected in Guizhou Province. Economic losses were listed at CNY3.4 billion (USD552 million). The China Insurance Regulatory Commission (CIRC) noted insured losses of CNY300 million (USD48 million).

Heavy rains inundated at least six Chinese provinces between the 7th and the 13th, killing at least 21 people. A combined 100,000 homes were damaged or destroyed, with farmers reporting more than 150,000 hectares (370,650 acres) of cropland submerged. Total economic losses were listed at CNY31.1 billion (USD4.92 billion).

A magnitude-5.0 earthquake struck China's Yunnan Province on the 11th, causing widespread damage. The tremor occurred with an epicenter 11 kilometers (6 miles) east-southeast of Dianyang, China at 11:21 AM local time (3:21 UTC). The MCA reported that at least 17,200 homes were damaged or destroyed in Shidian County, with total economic losses listed at CNY110 million (USD17 million).

A series of rain-spawned landslides struck the Indian state of Uttarakhand on the 14th, killing at least 47 people. The districts of Rudraprayag and Bageshwar were most affected. Government officials allocated INR1.08 billion (USD20 million) for relief and recovery efforts.

A magnitude-5.0 earthquake struck China's Xinjiang Province on the 14th, with the MCA noting that at least 1,600 homes were damaged or destroyed. The tremor occurred with an epicenter 95 kilometers (59 miles) east-southeast of Yining Xian, China at 11:21 AM local time (3:21 UTC). Total economic losses were listed at CNY800 million (USD127 million).

A weakened Super Typhoon Sanba made landfalls in South Korea and Japan between the 15th and the 17th, bringing periods of very gusty winds and heavy rainfall. At least two people were killed. Impacts were first felt across Japan's Ryukyu Islands, including Okinawa and Ishigaki. In total, more than 5,050 homes and structures were damaged in the country. Economic losses were JPY2.4 billion (USD31 million). In South Korea, impacts were felt on the mainland and also the island of Jeju. According to the NEMA, damage occurred to at least 624 homes and 107 roads, bridges and tunnels. Total economic losses were listed at KRW389 billion (USD349 million), including costs to infrastructure, public buildings and agriculture.

Monsoon rains spawned flash floods in at least five provinces in Cambodia between the 17th and the 26th, killing 14 people. The floods destroyed more than 14,300 homes and submerged 29,200 hectares (72,150 acres) of crops.

Torrential monsoonal rains affected northeastern India and Bangladesh between the 21st and the 28th, as widespread flooding and landslides left at least 56 people dead. In India, the hardest-hit areas came in the states of Assam, Sikkim, Arunachal Pradesh and the island of Majuli. According to local officials, more than 400,000 homes were reportedly inundated. In Assam alone, 2,600 villages and more than 400,000 hectares (988,400 acres) of crops were submerged. At least INR5.36 billion (USD98 million) was allocated for relief. In Bangladesh, government authorities noted that 250,000 people were trapped in their homes due to an overflowing Brahmaputra River.

A massive avalanche near the peak of the Himalayan's 8,156-meter (26,759-foot) Mount Manaslu on the 23rd left at least 10 people dead and four others missing.

A weakened Super Typhoon Jelawat made landfall in Japan's Aichi Prefecture on the 30th after first tracking very near the southern islands of Okinawa. At least two people were killed and 180 others were injured. The storm also knocked out power to more than 50% of the island's homes. On Japan's mainland, Jelawat brought periods of gusty winds and heavy rains to Honshu Island. In total, at least 6,015 homes and structures were damaged. Economic losses were listed at JPY2.15 billion (USD27.4 million).

Exhibit 95: Asia October Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
10/4	Landslide	China	19	Unknown	Unknown
10/4-10/7	TS Gaemi	Vietnam, Philippines	3	5,300	2.0 million
10/10	Severe Weather	Bangladesh	36	23,380	Unknown
10/21	Flooding	Indonesia	0	500	Unknown
10/24-10/29	TY Son-tinh	Philippines, Vietnam, China	36	63,774	537 million
10/29-10/31	TS Nilam	India, Sri Lanka	75	50,000	57 million

A large landslide in the Chinese village of Zhenhe in Yunnan Province on the 4th left at least 19 people dead. Nearly all of the fatalities occurred after the landslide buried a school building with students inside.

Tropical Storm Gaemi made landfall in Vietnam after first crossing the Philippines during the first week of October. At least three people were killed and more than 5,300 homes were damaged or destroyed as flooding rains and periods of gusty winds accompanied the system. Total combined economic losses were listed at USD2.0 million.

A monsoonal storm brought inclement weather along Bangladesh's coastline on the 10th, killing at least 36 people. More than 24,380 mud-built homes were destroyed in the districts of Noakhali, Bhola, Cox's Bazaar, and Chittagong – including many by tornado touchdowns and flooding. The storms also damaged agriculture.

Excessive rainfall struck eastern Indonesia's Papua region on the 21st, prompting significant flooding in multiple districts. In the district of Panja, the Eranouli River overflowed its banks and damaged at least 500 homes and other structures in Eranouli village alone. No injuries or fatalities were reported.

Typhoon Son-tinh made landfall in Vietnam on the 29th after initially crossing the Philippines and later entering China. At least 36 people were killed. Officials in the Philippines noted that flooding and landslides killed 27 people and damaged at least 2,794 homes. Economic losses were listed at PHP155 million (USD4 million). In Vietnam, at least eight people were killed and 43 others were injured across the provinces of Thai Binh, Nam Dinh, Ninh Binh, Quang Ninh and Hai Phong. More than 55,680 homes were destroyed and 90,000 hectares (222,000 acres) of crops were damaged. Total economic losses were listed at VND7.0 trillion (USD336 million). China's Ministry of Civil Affairs noted that 5,300 homes were damaged or destroyed and 65,400 hectares (152,000 acres) of cropland were affected in the provinces of Hainan and Guangxi. Total economic losses were CNY1.13 billion (USD197 million).

Tropical Storm Nilam made landfall in southern India on the 31st after first brushing by Sri Lanka. At least 75 people were killed. According to state authorities in India's Andhra Pradesh and Tamil Nadu, Nilam's torrential rainfall and a 1.5-meter (5-foot) storm surge left more than 150,000 people homeless. Severe crop damage and power outages occurred as well. In Sri Lanka, the nation's Disaster Management Center reported that more than 69,000 people were left homeless by flooding. Total economic losses were listed at INR3.1 billion (USD57 million).

Exhibit 96: Asia November Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
11/1-11/8	Flooding	Indonesia	13	3,042	Unknown
11/2-11/4	Winter Weather	China	2	1,000	138 million
11/7	Earthquake	Iran	0	500	Unknown
11/10-11/14	Winter Weather	China	0	2,500	100 million
11/11	Earthquake	Myanmar	26	5,000	1.17 million
11/27	Winter Weather	Japan	0	Hundreds	Unknown
11/30	Winter Weather	Pakistan	18	Unknown	Unknown

Excessive rains affected Indonesia's North Sumatra and Sulawesi Island regions between the 1st and the 8th, killing at least 13 people. According to officials from the Regional Disaster Mitigation Agency (RDMA), several rivers (including the Batu Ginging, Kuala Namu, Pekong and Ular) overflowed their banks and caused significant damage in several districts. High water levels flooded at least 3,042 homes, while also damaging infrastructure.

Accumulating snow and freezing rain affected northern China between the 2nd and the 4th. At least two people were killed. Hebei Province, Inner Mongolia and Beijing were all affected with transportation and the electrical grid sustaining disruptions. Official statistics from the MCA noted that nearly 1,000 homes were damaged or destroyed and that total economic losses were CNY860 million (USD138 million).

A magnitude-5.5 earthquake struck northwestern Iran on the 7th, injuring at least 55 people. The tremor occurred at 9:56 AM local time (6:26 UTC) with an epicenter 40 kilometers (24 miles) west of Ahar, Iran. According to Iran's Fars News Agency, damage from the earthquake was primarily concentrated in East Azabaijan Province. The town of Varzaqan was worst affected, though most damage to homes and other buildings was confined to cracking.

Winter storms impacted northeast China between the 10th and the 14th, leading to widespread damage in the provinces and regions of Inner Mongolia, Liaoning, Hebei and Heilongjiang. Heavy snow and gusty winds brought down power lines and damaged nearly 2,500 homes. Total economic losses were CNY622 million (USD100 million).

A magnitude-6.8 earthquake struck northern Myanmar on the 11th, killing at least 26 people and injuring more than 231 others. The tremor occurred at 7:42 AM local time (1:12 UTC) with an epicenter 56 kilometers (34 miles) north-northeast of Shwebo, Myanmar. At least 5,000 homes and other structures were damaged or destroyed in ten townships, and the government allocated MMK1 billion (USD1.17 million) in disaster relief.

A strong area of low pressure left at least three people injured in Japan's northern island of Hokkaido on the 27th. Winds gusting in excess of 150 kph (90 mph) and blizzard conditions led to hundreds of homes and other structures being damaged due to fallen trees. Transportation was severely disrupted and 56,000 power outages were recorded.

Two large avalanches struck the remote mountainous region of Neelum Valley in Pakistan on the 30th, killing at least 18 people. The avalanches were spawned by excessive snowfall and gusty winds.

Exhibit 97: Asia December Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
12/2-12/5	STY Bopha	Philippines, Palau	1,901	225,000	1.04 billion
12/5	Earthquake	Iran	8	1,000	Unknown
12/7	Earthquake	Japan	0	Dozens	Unknown
12/7	Earthquake	China	0	1,100	96 million
12/17-12/19	Flooding	Sri Lanka	46	33,753	1.2 million
12/22-12/26	Winter Weather	India	133	Unknown	Unknown
12/24-12/25	Flooding	Indonesia	3	2,100	Unknown
12/24-12/27	Flooding	Malaysia	0	5,000	Unknown
12/25-12/26	Flooding	Iraq	4	5,000	Unknown
12/25-12/27	TS Wukong	Philippines	24	6,439	5.5 million

Super Typhoon Bopha made landfall on the southern Philippine island of Mindanao the 4th as a 260 kph (160 mph) Category 5 typhoon after first crossing Palau. The cyclone left 1,901 people dead or missing and injured 2,666 others. According to the NDRRMC, Bopha caused catastrophic damage in the provinces of Davao Oriental and Compostela Valley. Nationwide, more than 216,817 homes were damaged or destroyed across 318 municipalities in 34 provinces. Economic losses included agriculture (PHP26.5 billion (USD646 million)), infrastructure (PHP7.6 billion (USD185 million)) and private property (PHP2.9 billion (USD71 million)). The Philippines Banana Growers and Exporters Association reported that 25% of the country's banana crop was destroyed and that PHP5 billion (USD122 million) would be needed for the rehabilitation of farms. In Palau, Bopha caused severe damage on the eastern coasts of the southern islands of Anguar, Peleliu and Babeldaob. Total damages were estimated at USD20 million.

An earthquake struck eastern Iran on the 5th, killing at least eight people and injuring 23 others. The magnitude-5.6 tremor occurred at 8:38 PM local time (17:08 UTC) with an epicenter 42 kilometers (26 miles) east-southeast of Qayen, Iran. As many as 20 villages sustained damage to more than 60% of its homes and other structures in South Khorasan Province.

An offshore magnitude-7.3 earthquake rattled Japan on the 7th, injuring at least 13 people. The tremor occurred at 6:18 PM local time (8:18 UTC) with an epicenter located 245 kilometers (152 miles) southeast of Kamaishi, Japan. Japan's Fire and Disaster Management Agency (FDMA) noted only scattered reports of damage—none of which were substantial in nature—and that the country's nuclear power plants were not affected. Only minor infrastructure damage and scattered power outages were reported.

A magnitude-5.3 earthquake struck China's Xinjiang Province on the 7th, damaging or destroying at least 1,100 homes. The tremor occurred at 10:08 PM local time (14:08 UTC) with an epicenter 234 kilometers (145 miles) east-northeast of Qiemo, China. The Ministry of Civil Affairs (MCA) noted economic losses of at least CNY600 million (USD96 million).

Three days of torrential rainfall affected nearly every section of Sri Lanka between the 17th and the 19th, killing at least 42 people and injuring 21 others. According to officials from the Disaster Management Center, flooding and landslides damaged or destroyed at least 29,321 homes after as much as 315 millimeters (12.4 inches) of rain fell. In addition to residential damage, up to 15,000 hectares (37,000 acres) of paddy fields were submerged and transportation via road and rail was disrupted as well. The government allocated more than LKR142 million (USD1.2 million) for recovery efforts.

A prolonged cold snap engulfed much of northern India between the 22nd and the 31st, killing at least 133 people. All of the fatalities were recorded in the states of Uttar Pradesh, Rajasthan, Punjab and Haryana after temperatures dropped to as low as 7°C (45°F).

Heavy rainfall affected several regions of Indonesia on the 24th and 25th, causing flash floods and landslides. In West Sumatra, at least three people were killed in the district of Solok Selatan after a large landslide struck. Damage was reported to nearly 2,100 homes in Dompu district following flood inundation. Elsewhere, floodwaters were also recorded in sections of Jakarta.

Heavy rains and flooding forced nearly 14,000 residents to evacuate their homes in three northeastern Malaysian states between the 24th and the 27th. More than 5,000 homes were damaged in Terengganu, Pahang and Kelantan states after multiple rivers overflowed their banks. No serious injuries or fatalities were reported.

The heaviest rains in at least 30 years fell in the Iraqi capital of Baghdad on the 25th, which prompted severe flooding on the 26th. At least four people were killed as 6.75 centimeters (2.56 inches) of rain led to extensive damage to thousands of homes, businesses, hospitals and to the transportation infrastructure.

Tropical Storm Wukong tracked across central sections of the Philippines between the 25th and the 27th, bringing periods of heavy rainfall and a minor storm surge. At least 24 people were killed. Six provinces sustained damage, as 6,439 homes were affected and infrastructure was submerged. The NDRRMC reported losses to agriculture and infrastructure at PHP225 million (USD5.5 million).

Oceania (Australia, New Zealand and the South Pacific Islands)

- January and February floods inundate parts of Australia's Queensland, New South Wales and Victoria
- Cyclone Evan causes extensive damage across the Samoan Islands, Fiji and Tonga
- December EF-2 tornado becomes New Zealand's deadliest in 60 years

Exhibit 98: Oceania January Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
1/12	TC Heidi	Australia (Western Australia)	0	Unknown	Unknown
1/22-1/31	Flooding	Fiji	7	Thousands	17 million
1/24	Landslide	Papua New Guinea	40	Unknown	Unknown

Tropical Cyclone Heidi developed and made landfall in Western Australia's Pilbara region on the 12th, bringing periods of heavy rains and gusty winds. No injuries or fatalities were recorded, and damage reports were minor. According to the Joint Typhoon Warning Center (JTWC), the cyclone came ashore at approximately 4:30 AM local time (20:30 UTC on the 11th) as an 85 kph (50 mph) storm just east of Port Hedland. The vast majority of the damage reports were confined to downed trees, partial roof collapses and minor flash flooding.

More than a week of heavy rainfall led to widespread flooding and landslides in Fiji, killing at least seven people. According to government officials, the worst-hit areas came on the islands of Viti Levu and Vanua Levu as floodwaters reached as high as 1.22 meters (4 feet) in some locations. A natural disaster was declared as more than 3,500 people were left homeless. Extensive crop damage, primarily to the sugar industry, was recorded. Total economic damages were listed at FJD30 million (USD17 million).

A large landslide struck the Southern Highlands region of Papua New Guinea on the 24th, killing at least 40 people. According to the National Disaster Office, the landslide destroyed an area nearly 2 kilometers (1.24 miles) long in the Komo area. At least two villages reportedly were completely engulfed.

Exhibit 99: Oceania February Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
1/24-2/15	Flooding	Australia (NSW, Queensland)	1	6,408	920 million

Persistent rounds of rainfall fell across portions of southern Queensland and northern New South Wales during the end of January through the middle of February, leading to widespread river flooding. At least one fatality was reported. Swollen rivers damaged homes in the communities of Moree (600), Roma (416), Mitchell (288), St. George (50) and Charleville. In terms

of economic costs, total combined impacts in NSW and QLD were estimated by the state governments at AUD860 million (USD920 million). The Insurance Council of Australia declared an insurance catastrophe, and noted that 6,408 claims had been filed with payouts listed at AUD131 million (USD136 million).

Exhibit 100: Oceania March Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
2/24-3/16	Flooding	Australia (NSW, Victoria)	2	8,914	1.58 billion
3/3	Severe Weather	New Zealand	0	1,250	7.5 million
3/17	CY Lua	Australia (WA)	0	Hundreds	230 million
3/20	Severe Weather	Australia (Queensland)	0	150	21 million

Flooding affected portions of Australia's New South Wales and Victoria between February 24th and March 16th, leading to the deaths of at least two people. Flash flooding and rivers overflowing their banks were the biggest causes of damage, and natural disaster declarations were made for dozens of regions and shires. Total combined economic losses were estimated by various state officials at upwards of AUD1.5 billion (USD1.58 billion), including costs to personal property, infrastructure and agriculture. The Insurance Council of Australia declared a catastrophe for NSW Riverina, NSW Central West and northern Victoria as at least 8,914 claims were filed and payouts were listed at AUD132 million (USD137 million).

A strong storm system brought gale-force winds to New Zealand's South Taranaki and Wanganui regions on the 3rd, causing widespread damage. According to various insurers, more than 1,250 claims were filed with payouts in excess of NZD6 million (USD5 million). Total economic losses were slightly higher.

Cyclone Lua made landfall in Western Australia on the 17th, bringing periods of heavy rain and gusty winds. No injuries or fatalities were recorded, and damage reports were largely minimal. The cyclone came ashore close to Pardoo Roadhouse, Tavern and Caravan Park, with the vast majority of impacts coming from shutdowns of mining fields and oil production in the Pilbara region. The Port of Dampier and Port Hedland were also temporarily closed. The total economic impact from lost business during the temporary shutdown at Port Hedland was listed at AUD217 million (USD230 million).

An EF-2 tornado damaged the Queensland, Australia community of Townsville on the 17th, causing widespread damage and injuring at least 13 people. A natural disaster was declared for the region after it was determined that more than 115 homes (plus several businesses) were damaged or destroyed in the Garbutt area. Total economic damages were listed at AUD20 million (USD21 million).

Exhibit 101: Oceania April Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
3/29-4/3	Flooding	Fiji	7	15,000	71.3 million

Multiple days of torrential rainfall between the end of March and early April led to flooding across the Western, Central and Eastern Divisions of Fiji's Viti Levu Island and prompting a natural disaster declaration. At least seven people were killed as several towns saw floodwaters reach up to 2.1 meters (7.0 feet) in height. Both flash flooding and river flooding were

blamed for causing damage to personal property and farms in the hardest-hit areas of Cuvu, Nadi and Sigatoka in the Western Division. According to United Nations officials, total economic damages from the flood event were estimated at FJD128 million (USD71.3 million).

May

No major natural disaster events occurred in Oceania during the month of May.

Exhibit 102: Oceania June Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
6/3-6/6	Severe Weather	Australia (NSW, Victoria)	0	1,500	Unknown
6/10-6/12	Severe Weather	Australia (Western Australia)	1	450	Millions
6/19	Earthquake	Australia (Victoria)	0	880	Unknown

A meandering storm system brought periods of very heavy rainfall and winds gusting to 128 kph (79 mph) across parts of the Australian states of New South Wales and Victoria between the 3rd and the 6th. In NSW, the State Emergency Service (SES) responded to 1,472 damage calls in Sydney and the Central Coast due to fallen trees and flash flooding in low lying areas. Victoria was affected as well with flood warnings issued for 21 rivers. Floods also prompted a leak at the Yallourn Power Station, forcing the plant to run at reduced capacity.

Two strong storm systems affected Western Australia's Perth metropolitan area and also the state's Southwest between the 10th and the 12th, bringing winds gusting in excess of 110 kph (70 mph) and also heavy rainfall. The Western Australia SES responded to more than 450 calls for damage assistance in the hardest-hit areas including Perth, Mandurah, Rockingham,

Bunbury, Busselton and Nedlands. Most of the damage was confined to roofs and also from fallen trees onto homes, cars and fences. Nearly 200,000 Western Power customers lost electricity after more than 800 power lines and streetlight wires were snapped. A disaster was declared for the region, and officials noted that total economic damages would reach into the millions of dollars (AUD).

A magnitude-5.2 earthquake rattled Australia's Victoria state on the 19th; occurring at 8:53 PM local time (10:53 UTC) with an epicenter located 10.0 kilometers (6.2 miles) southwest of Moe, Australia. No injuries or fatalities were recorded. The Victoria SES reported that only 30 homes and buildings (including 19 in Gippsland) had sustained minor structural damage. There were 850 other reports of damage, primarily consisting of minor cracking in walls or fallen indoor contents.

July

No major natural disaster events occurred in Oceania during the month of July.

August

No major natural disaster events occurred in Oceania during the month of August.

Exhibit 103: Oceania September Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
9/1-9/20	Flooding	Papua New Guinea	5	Thousands	27 million

Weeks of heavy rainfall prompted flooding and landslides across the Southern Highlands region of Papua New Guinea between the 1st and the 20th. At least five people were killed after floodwaters damaged thousands of homes and washed away sections of roads and bridges. As many as 200,000 residents were affected. Total damages were estimated at AUD26 million (USD27 million).

October

No major natural disaster events occurred in Oceania during the month of October.

Exhibit 104: Oceania November Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
11/17-11/18	Severe Weather	Australia (NSW, QLD)	0	10,700	105 million
11/28-11/29	Severe Weather	Australia (WA)	1	500	Millions

Strong thunderstorms prompted large hail, torrential rain and damaging winds across portions of southeast Queensland and northern New South Wales in Australia on the 17th and 18th. The hardest-hit areas included the councils of Brisbane, Ipswich, Sunshine and Lockyer in QLD and the Woodburn and Ballina areas in NSW after softball-sized hail damaged roofs and vehicles. Local insurers noted that at least 10,700 home and auto claims had already been filed, yet note was made that these were generally related to minor damage levels. Losses were anticipated to exceed AUD100 million (USD105 million).

Strong storms associated with a cold front brought winds gusting beyond 117 kph (73 mph) across the greater Perth metropolitan region and Western Australia’s southern coast on the 28th into the 29th. At least one person was killed. The inclement weather ripped off roofs, downed trees and power lines, and damaged infrastructure in areas including Perth’s Central Business District, Wanneroo, Stirling, Rockingham, Mandurah and Cockburn. Economic losses were estimated to reach into the millions of dollars (USD).

Exhibit 105: Oceania December Events

Date	Event	Location	Deaths	Structures/ Claims	Economic Loss (USD)
12/6	Severe Weather	New Zealand	3	150	9.1 million
12/13-12/18	CY Evan	Samoa Islands, Fiji, Tonga	14	5,000	141 million

New Zealand’s deadliest tornado in 60 years struck the west Auckland suburb of Hobsonville on the 6th, killing at least three people and injuring seven others. The EF-2 twister with 200 kph (125 mph) winds damaged or destroyed at least 150 homes in an area near Whenuapai Air Force Base. New Zealand’s Ministry of Civil Defense estimated total damages at NZD11 million (USD9.1 million).

Cyclone Evan crossed the Samoan Islands, Fiji, Tonga and other small islands in the South Pacific Basin between the 13th and the 18th, killing at least 14 people. In Samoa, extensive damage occurred as high winds, flooding rains and a 4.5-meter (14.8-foot) storm surge decimated coastal areas. Thousands of homes and other structures were damaged or destroyed in addition to infrastructure, the electrical grid and agriculture. Total economic losses in Samoa were estimated at WST300 million (USD133 million). Elsewhere, Evan also caused considerable damage in Fiji, where the cyclone grazed the main island of Viti Levu. Agriculture damage alone was listed at FJD15 million (USD8.4 million). Other damage was recorded on the islands of Tonga and Wallis and Futuna.

Appendix A: Natural Disaster Loss Data (2002-2012)

Please note that Exhibits 106-109 have been adjusted for inflation (2012 USD) using the U.S. Consumer Price Index. Insured losses include those sustained by private industry and government-sponsored insurance programs.

Exhibit 106: United States Economic Losses by Peril (2002-2012 (2012 USD))

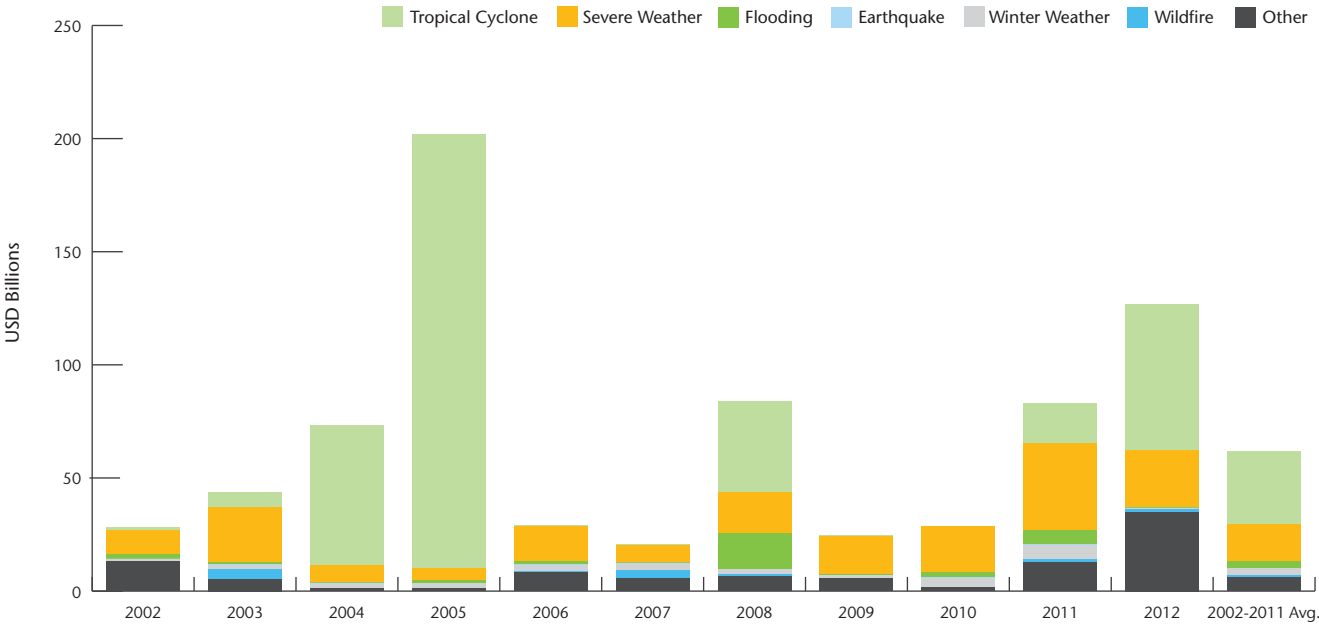


Exhibit 107: United States Insured Losses by Peril (2002-2012 (2012 USD))

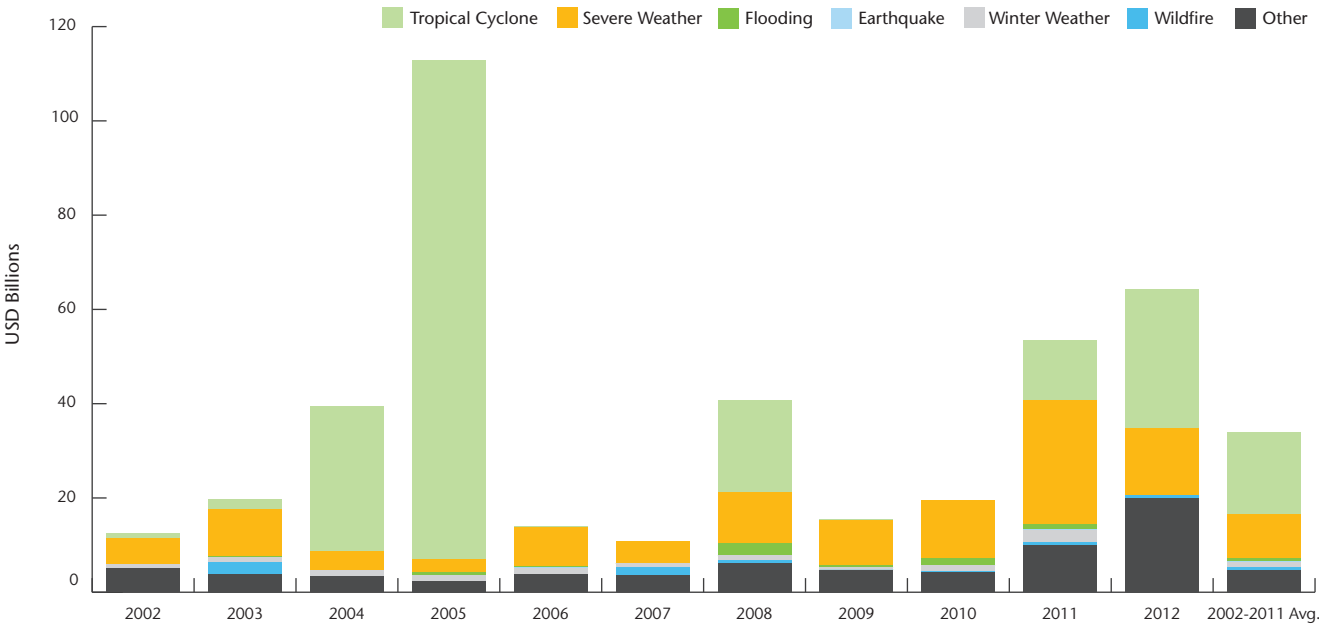


Exhibit 108: Non-U.S. Economic Losses by Region (2002-2012 (2012 USD))

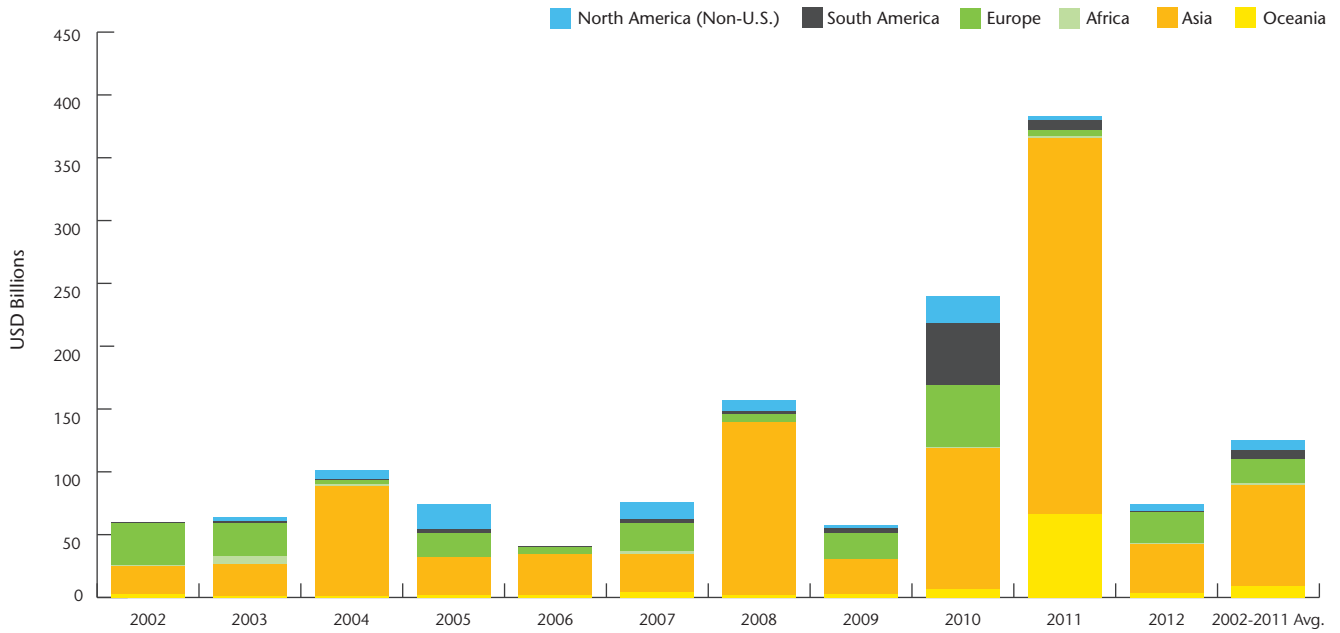
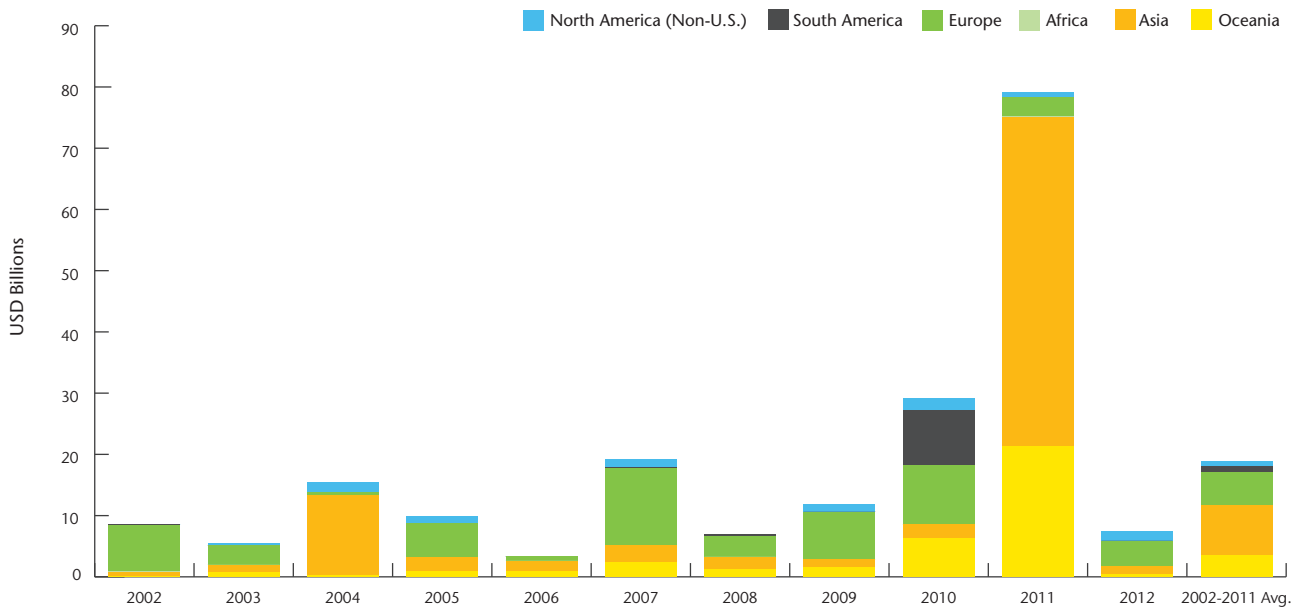


Exhibit 109: Non-U.S. Insured Losses by Region (2002-2012 (2012 USD))



Appendix B: Historical Natural Disaster Events

The following tables provide a look at specific global natural disaster events since 1950. (* Denotes preliminary losses for 2012 and subject to change.) Please note that the adjusted for inflation (2012 USD) totals were converted using the U.S. Consumer Price Index. Insured losses include those sustained by private industry and government entities such as the U.S. National Flood Insurance Program.

Exhibit 110: Top 15 Costliest Global Economic Loss Events ((1950-2012) (Actual))

Date(s)	Event	Country/Region	Deaths	Economic Loss (USD)	Insured Loss (USD)
March 2011	EQ/Tsunami	Japan	15,879	210,000,000,000	35,000,000,000
August 2005	HU Katrina	U.S., Bahamas	1,833	125,000,000,000	66,900,000,000
January 1995	Earthquake	Japan	5,502	102,500,000,000	3,075,000,000
May 2008	Earthquake	China	87,587	85,000,000,000	366,000,000
July/Dec. 2011	Flooding	Thailand	813	45,000,000,000	15,500,000,000
October 2012	HU Sandy	U.S., Caribbean, Bahamas	254	*65,000,000,000	*28,200,000,000
November 1994	Earthquake	United States	60	44,000,000,000	15,300,000,000
Summer 1988	Drought/Heatwave	United States	7,500	40,000,000,000	935,000,000
Yearlong 2012	Drought/Heatwave	United States	123	*35,000,000,000	*20,000,000,000
September 2008	HU Ike	U.S., Caribbean	153	33,520,000,000	15,600,000,000
Summer 1998	Flooding	China	3,656	30,500,000,000	1,000,000,000
Dec. 2010/Feb. 2011	Flooding	Australia	38	30,000,000,000	2,420,000,000
Summer 2011	Flooding	Pakistan	1,985	30,000,000,000	200,000,000
October 2005	HU Wilma	U.S., Caribbean, Bahamas	63	29,000,000,000	12,500,000,000
October 2004	Earthquake	Japan	40	28,000,000,000	750,000,000

Exhibit 111: Top 15 Costliest Global Economic Loss Events ((1950-2012) (2012 USD))

Date(s)	Event	Country/Region	Deaths	Economic Loss (USD)	Insured Loss (USD)
March 2011	EQ/Tsunami	Japan	15,854	217,000,000,000	36,000,000,000
January 1995	Earthquake	Japan	5,502	156,500,000,000	4,700,000,000
August 2005	HU Katrina	U.S., Bahamas	1,833	146,100,000,000	78,200,000,000
May 2008	Earthquake	China	87,587	90,100,000,000	400,000,000
Summer 1988	Drought/Heatwave	United States	7,500	79,400,000,000	1,900,000,000
January 1994	Earthquake	United States	60	69,100,000,000	24,000,000,000
October 2012	HU Sandy	U.S., Caribbean, Bahamas	254	*65,000,000,000	*28,200,000,000
Summer 1980	Drought/Heatwave	United States	10,000	59,000,000,000	700,000,000
November 1980	Earthquake	Italy	4,689	53,700,000,000	540,000,000
July/Dec. 2011	Flooding	Thailand	813	45,800,000,000	15,800,000,000
August 1992	HU Andrew	U.S., Bahamas	26	44,400,000,000	25,500,000,000
Summer 1998	Flooding	China	3,656	42,900,000,000	1,400,000,000
September 2008	HU Ike	U.S., Caribbean	153	35,200,000,000	16,400,000,000
Yearlong 2012	Drought/Heatwave	United States	123	*35,000,000,000	*20,000,000,000
October 2004	Earthquake	Japan	40	33,700,000,000	915,000,000

Exhibit 112: Top 15 Global Human Fatality Events ((1950-2012) (2012 USD))

Date(s)	Event	Country/Region	Deaths	Economic Loss (USD)	Insured Loss (USD)
November 1970	Tropical Cyclone	Bangladesh	300,000	500,000,000	N/A
July 1976	Earthquake	China	242,769	22,500,000,000	N/A
December 2004	EQ/Tsunami	Indonesia	227,898	16,900,000,000	6,000,000,000
January 2010	Earthquake	Haiti	222,570	8,500,000,000	105,000,000
April 1991	CY Gorky	Bangladesh	138,866	3,000,000,000	170,000,000
May 2008	CY Nargis	Myanmar	138,366	10,600,000,000	N/A
August 1971	Flooding	Vietnam	100,000	N/A	N/A
May 2008	Earthquake	China	87,587	90,100,000,000	400,000,000
October 2005	Earthquake	Pakistan	86,000	7,100,000,000	5,800,000
Summer 2003	Drought/Heatwave	Europe	70,000	16,800,000,000	1,400,000,000
May 1970	Earthquake	Peru	70,000	3,100,000,000	N/A
Summer 2010	Heatwave	Russia	55,736	420,000,000	N/A
June 1990	Earthquake	Iran	50,000	14,100,000,000	180,000,000
May 1965	Tropical Cyclone	Bangladesh	36,000	420,000,000	N/A
December 2003	Earthquake	Iran	31,000	620,000,000	25,000,000

Exhibit 113: Top 20 Costliest United States Natural Disaster Events ((1950-2012) (2012 USD))

Date(s)	Event	U.S. Region	Deaths	Economic Loss (USD)	Insured Loss (USD)
August 2005	HU Katrina	Southeast	1,833	146,000,000,000	78,200,000,000
Summer 1988	Drought/Heatwave	Nationwide	7,500	79,400,000,000	1,900,000,000
January 1994	Earthquake	California	60	69,100,000,000	24,000,000,000
October 2012	HU Sandy	Eastern U.S.	132	*62,000,000,000	*28,000,000,000
Summer 1980	Drought/Heatwave	Nationwide	10,000	59,000,000,000	700,000,000
August 1992	HU Andrew	Florida, Louisiana	26	44,000,000,000	25,500,000,000
Yearlong 2012	Drought/Heatwave	Nationwide	123	*35,000,000,000	*20,000,000,000
Summer 1993	Flooding	Midwest	50	33,400,000,000	2,000,000,000
September 2008	HU Ike	Texas, Midwest	112	31,000,000,000	15,800,000,000
October 2005	HU Wilma	Florida	36	24,200,000,000	12,300,000,000
September 2004	HU Ivan	Eastern U.S.	54	22,800,000,000	10,400,000,000
September 2005	HU Rita	Texas, Southeast	120	18,500,000,000	7,100,000,000
August 2004	HU Charley	Southeast	10	18,300,000,000	9,100,000,000
October 1989	Earthquake	California	63	18,300,000,000	1,800,000,000
September 1989	HU Hugo	Southeast, PR, VI	35	16,500,000,000	8,400,000,000
August 2011	HU Irene	Northeast, Mid-Atlantic	47	16,000,000,000	11,700,000,000
Summer 2008	Flooding	Midwest	17	15,800,000,000	2,600,000,000
Summer 2002	Drought	Nationwide	0	13,000,000,000	3,600,000,000
Yearlong 2011	Drought/Heatwave	Southwest, Plains	95	12,500,000,000	5,300,000,000
September 2004	HU Frances	Southeast	6	11,500,000,000	5,800,000,000

Appendix C: Tropical Cyclone Frequency Comparisons

The following shows how the El Niño/Southern Oscillation (ENSO) affects global tropical cyclone frequencies and also how the Atlantic Multidecadal Oscillation (AMO) affects activity in the Atlantic Ocean Basin. Note that data for the Atlantic and Western Pacific Basins in this section extend to 1950 given the level of quality data as provided by NOAA's IBTrACS historical tropical cyclone database. All other basins include data to 1980.

Atlantic Ocean Basin

Exhibit 114: Atlantic Basin Hurricane Frequency by ENSO Phase (1950-2012)

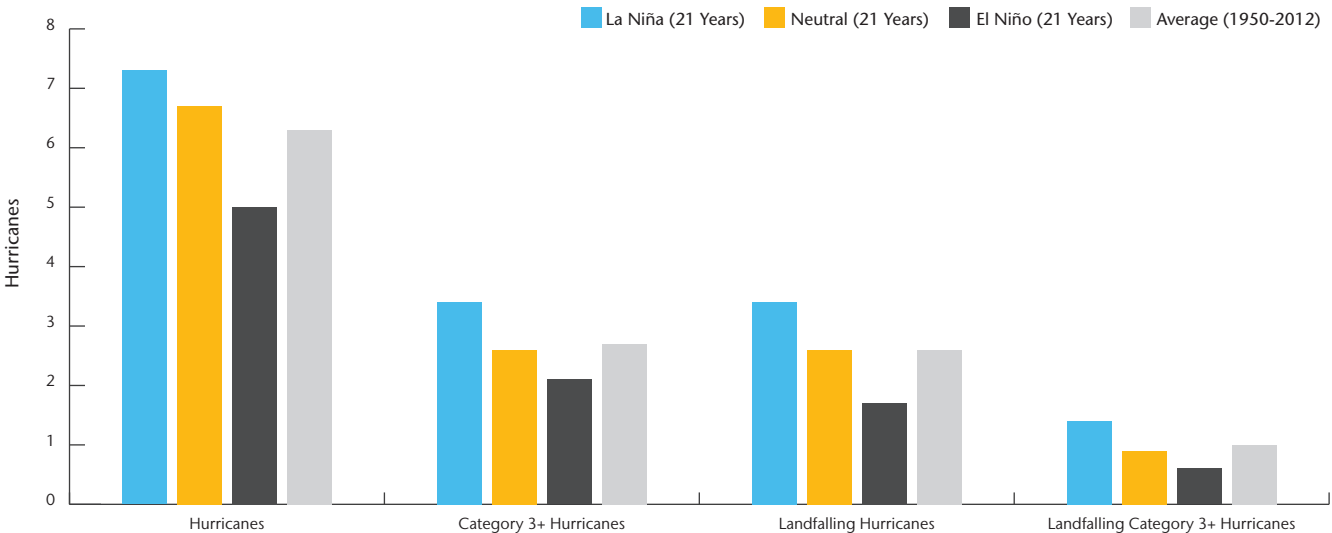


Exhibit 115: Atlantic Basin Hurricane Frequency by AMO Phase (1950-2012)

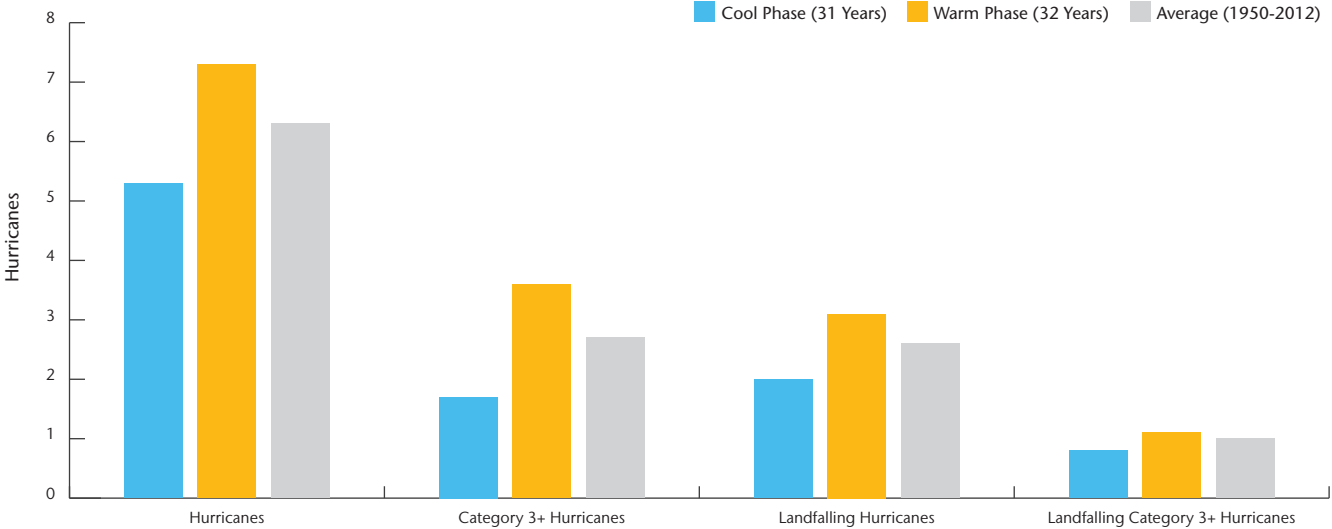


Exhibit 116: United States Hurricane Landfall Frequency by ENSO Phase (1950-2012)

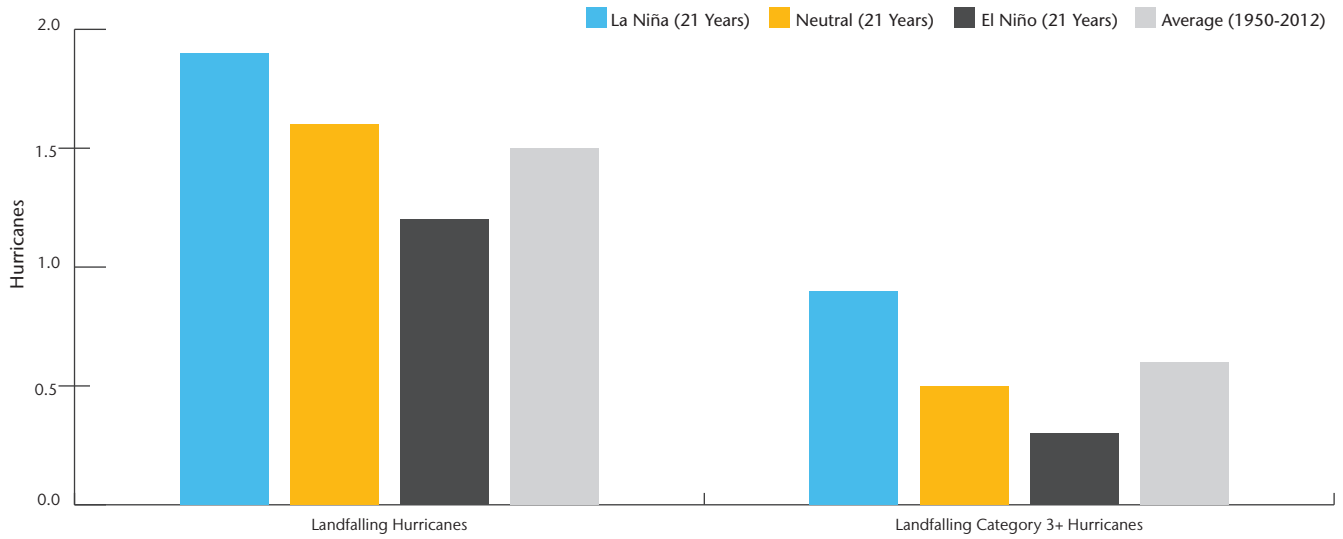
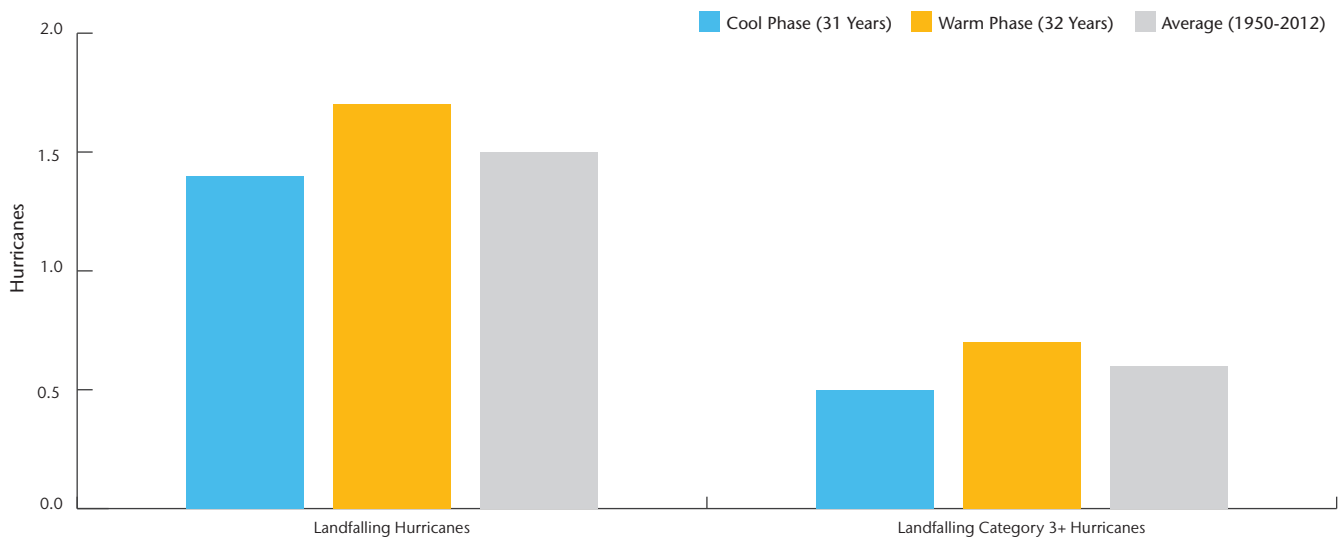
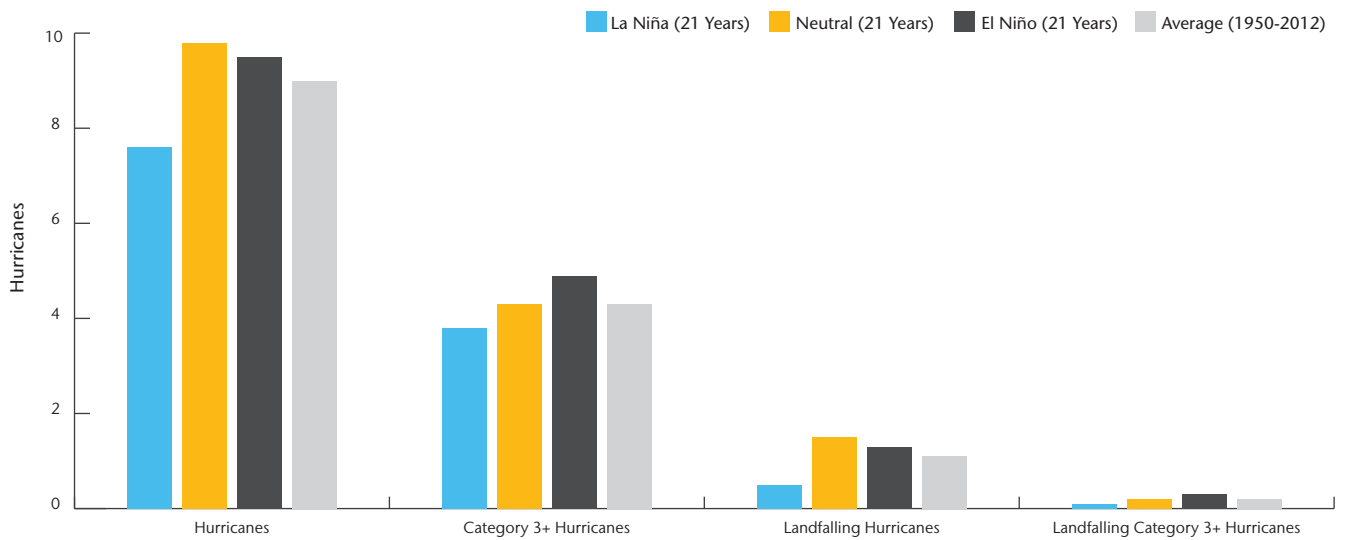


Exhibit 117: United States Hurricane Landfall Frequency by AMO Phase (1950-2012)



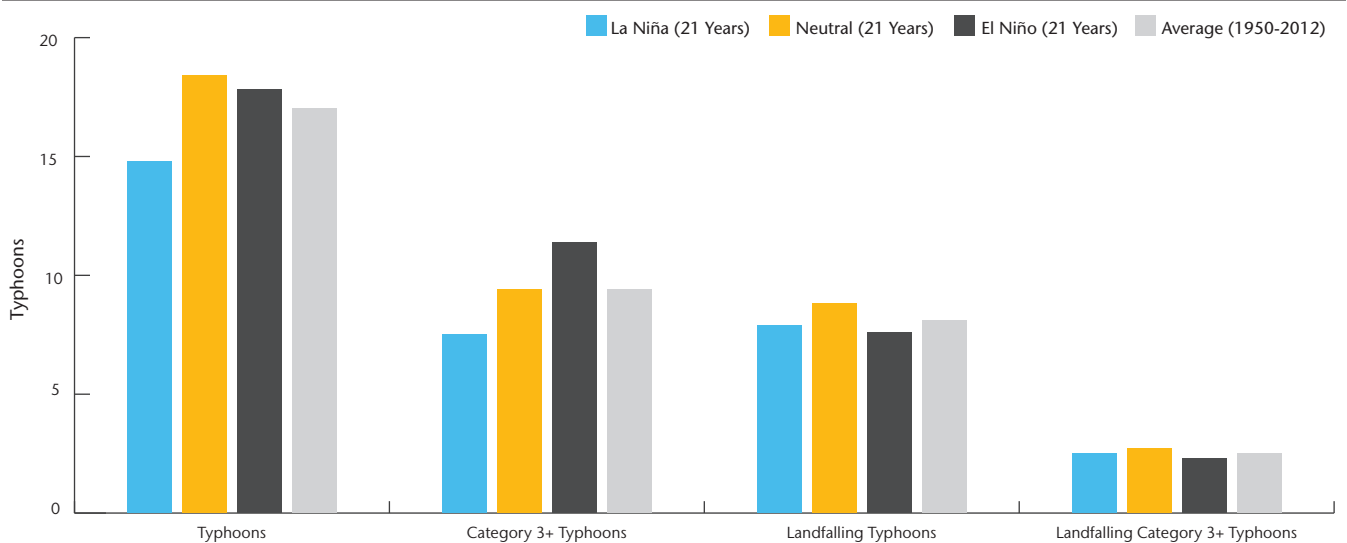
Eastern Pacific Ocean Basin

Exhibit 118: Eastern Pacific Basin Hurricane Frequency by ENSO Phase (1980-2012)



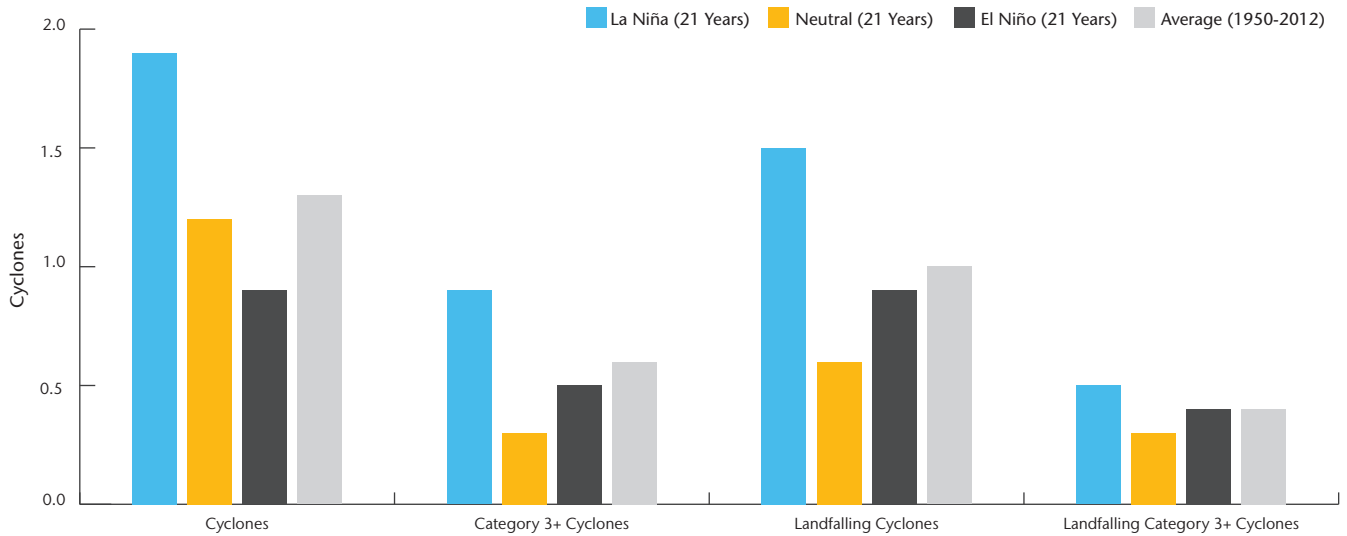
Western Pacific Ocean Basin

Exhibit 119: Western Pacific Basin Typhoon Frequency by ENSO Phase (1950-2012)



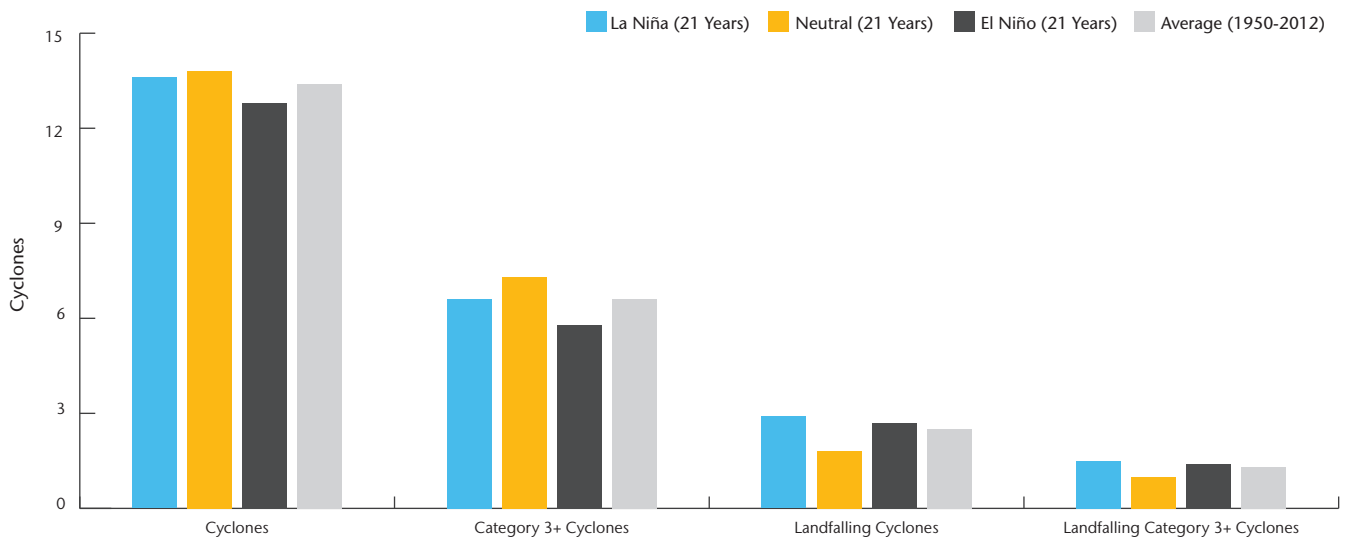
North Indian Ocean Basin

Exhibit 120: North Indian Basin Cyclone Frequency by ENSO Phase (1980-2012)



Southern Hemisphere

Exhibit 121: Southern Hemisphere Cyclone Frequency by ENSO Phase (1980-2012)



Appendix D: Tropical Cyclone Landfall Data by Basin

The following shows a breakdown of historical tropical cyclone landfall data by basin. Note that data for the Atlantic and Western Pacific Basins in this section extend to 1950 given the level of quality data as provided by NOAA's IBTrACS historical tropical cyclone database. All other basins include data to 1980.

Exhibit 122: Atlantic Ocean Basin Hurricane Landfalls (1950-2012)

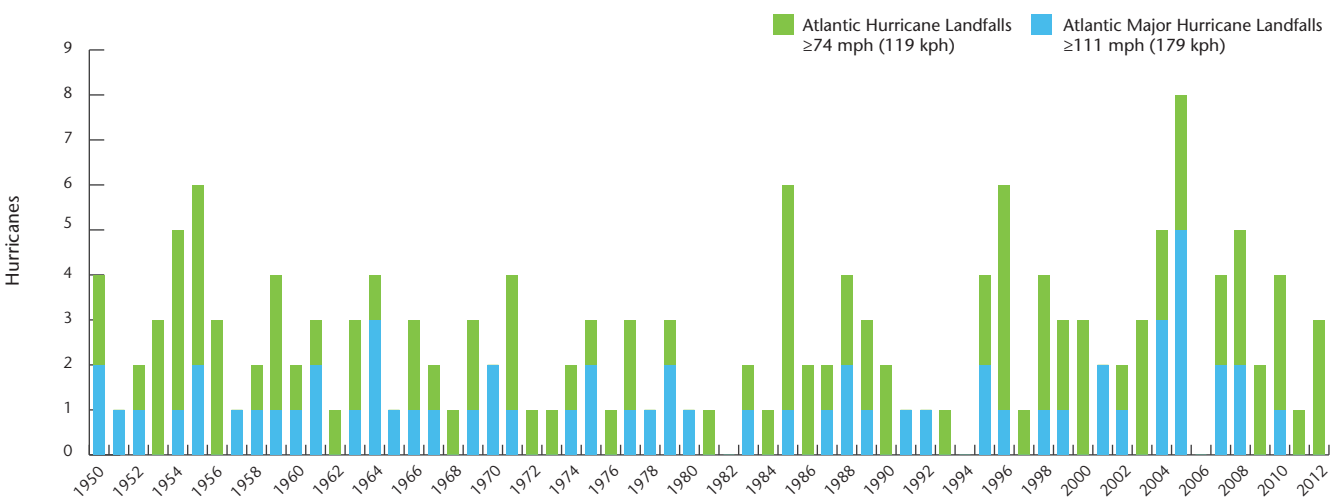


Exhibit 123: United States Hurricane Landfalls (1950-2012)

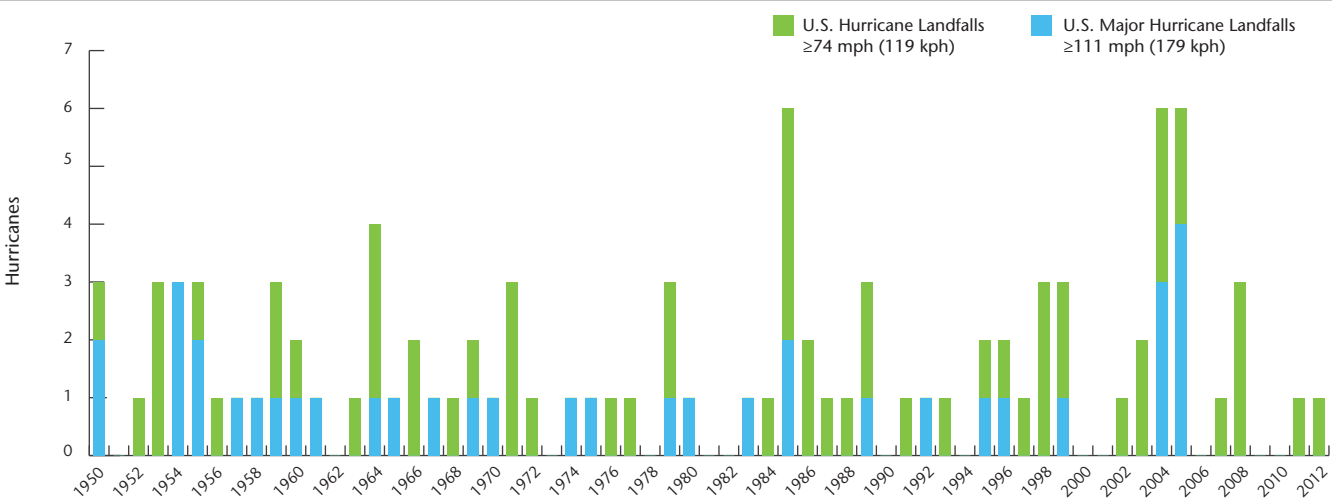


Exhibit 124: Eastern Pacific Ocean Basin Hurricane Landfalls (1980-2012)

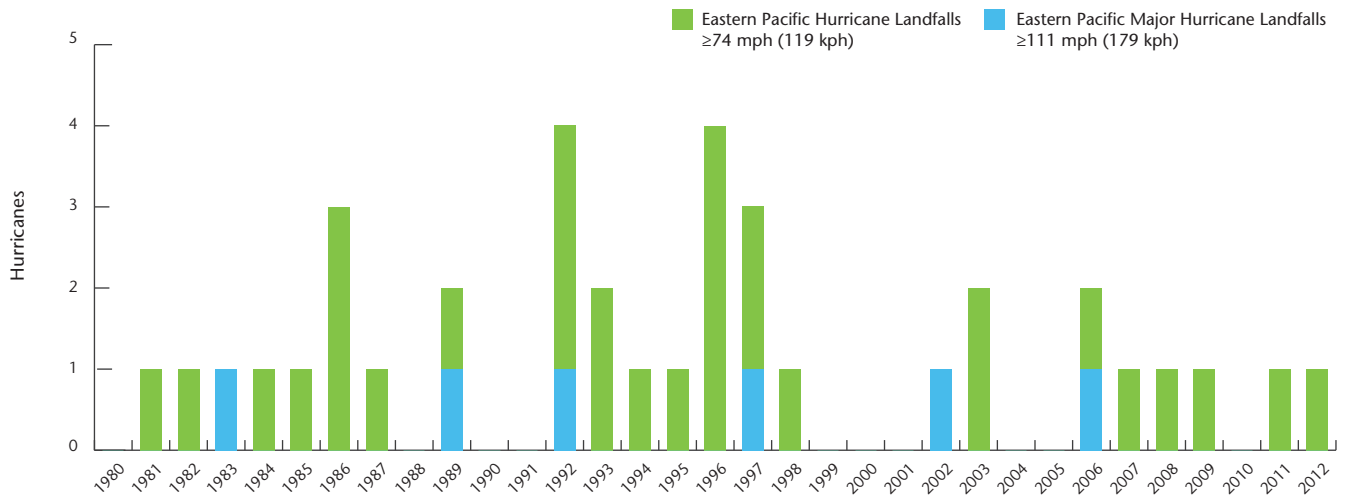


Exhibit 125: Western Pacific Ocean Basin Typhoon Landfalls (1950-2012)

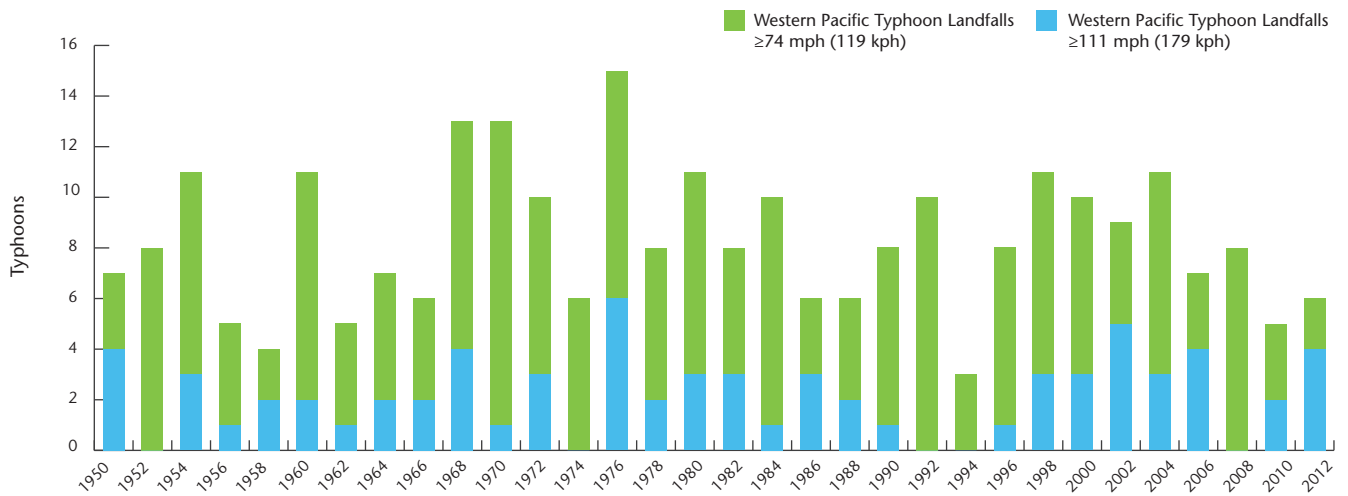


Exhibit 126: North Indian Ocean Basin Cyclone Landfalls (1980-2012)

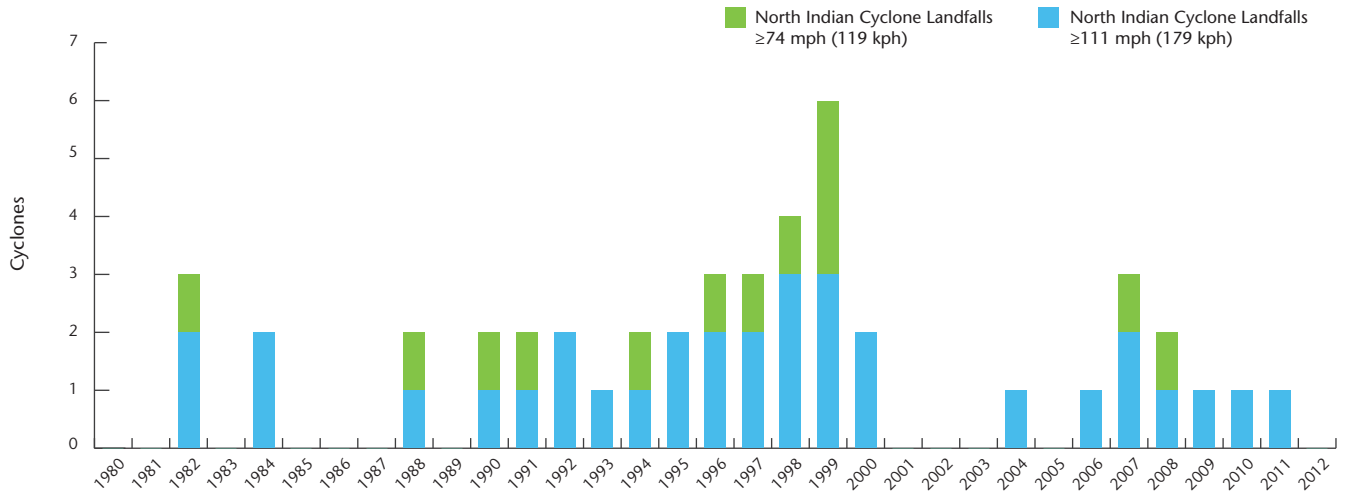
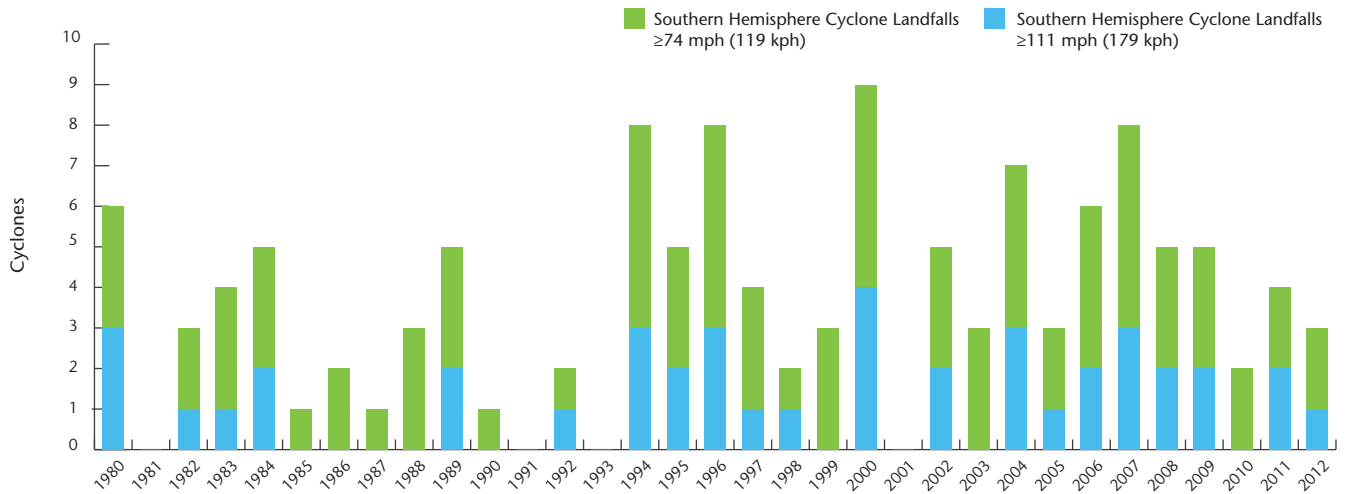


Exhibit 127: Southern Hemisphere Cyclone Landfalls (1980-2012)



Appendix E: United States Tornado Frequency Data

The following shows a breakdown of U.S. tornado frequency activity since 1950 as provided by data from the Storm Prediction Center. Also included is the total number of tornado-related fatalities. Please note that advances in technology, particularly the implementation of Doppler Radar, have resulted in more precise tornado detection rates—particularly with F0/EF-0 tornadoes—since the early 1990s. Data sets prior to this time are typically considered incomplete, especially in regards to the number of tornadoes below F3/EF-3 strength.

Exhibit 128: U.S. Tornadoes (1950-2012)

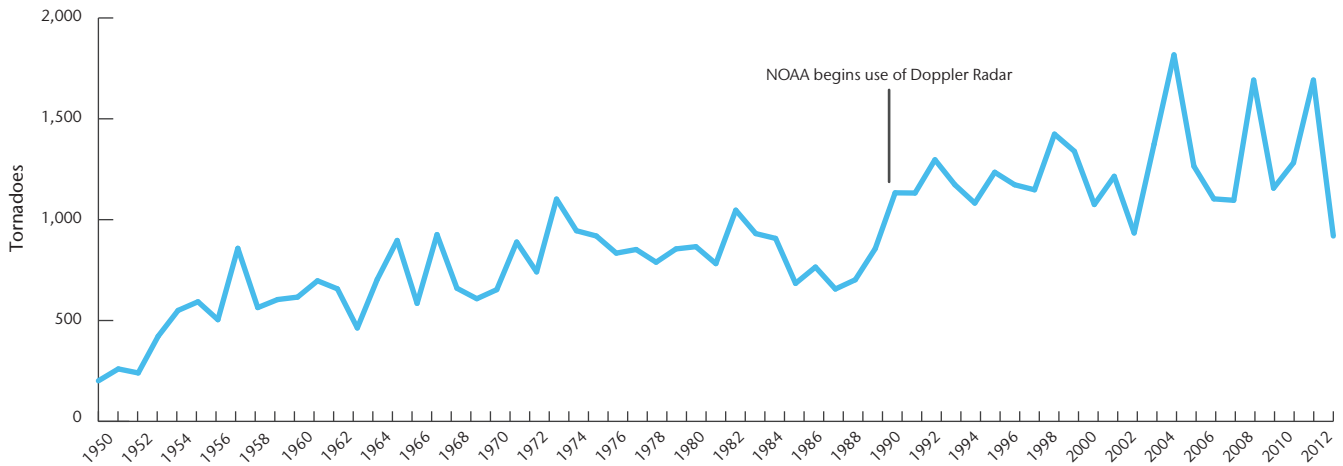


Exhibit 129: U.S. Tornado Fatalities (1950-2012)

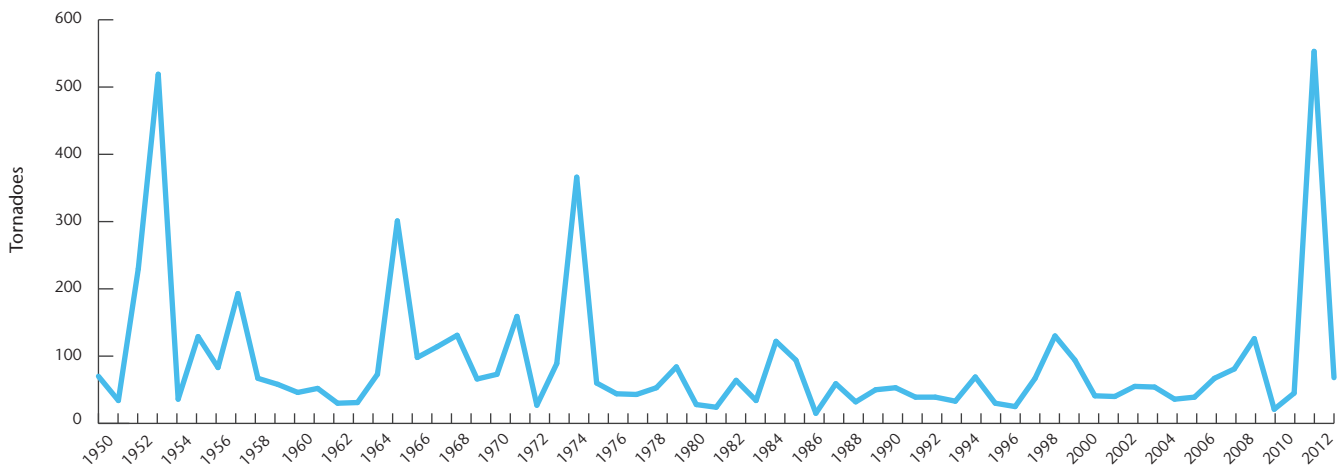


Exhibit 130: U.S. Tornadoes by Rating ((F0/EF-0, F1/EF-1, F2/EF-2) (1950-2012))

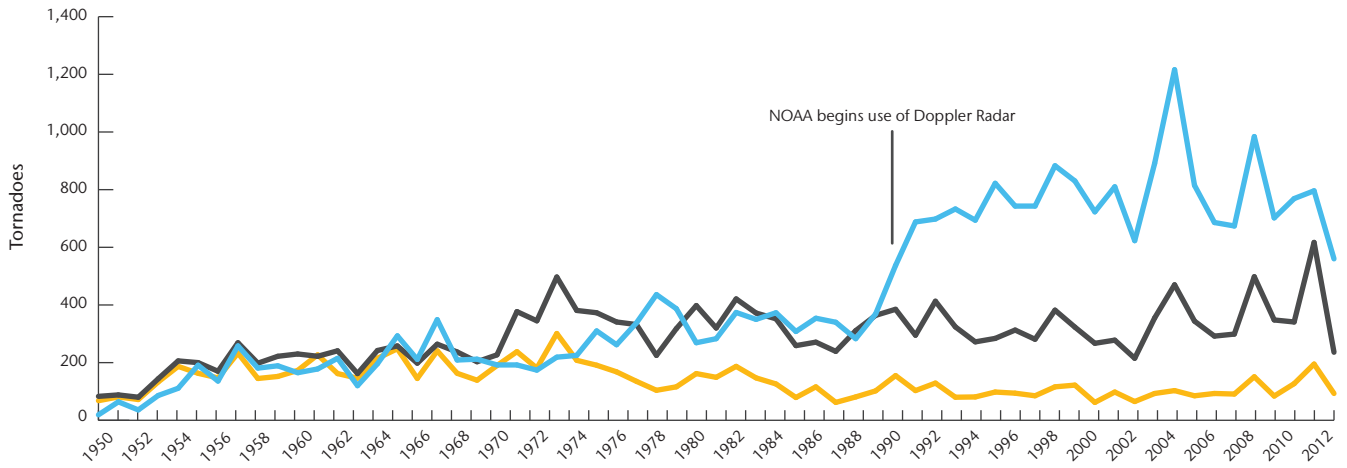
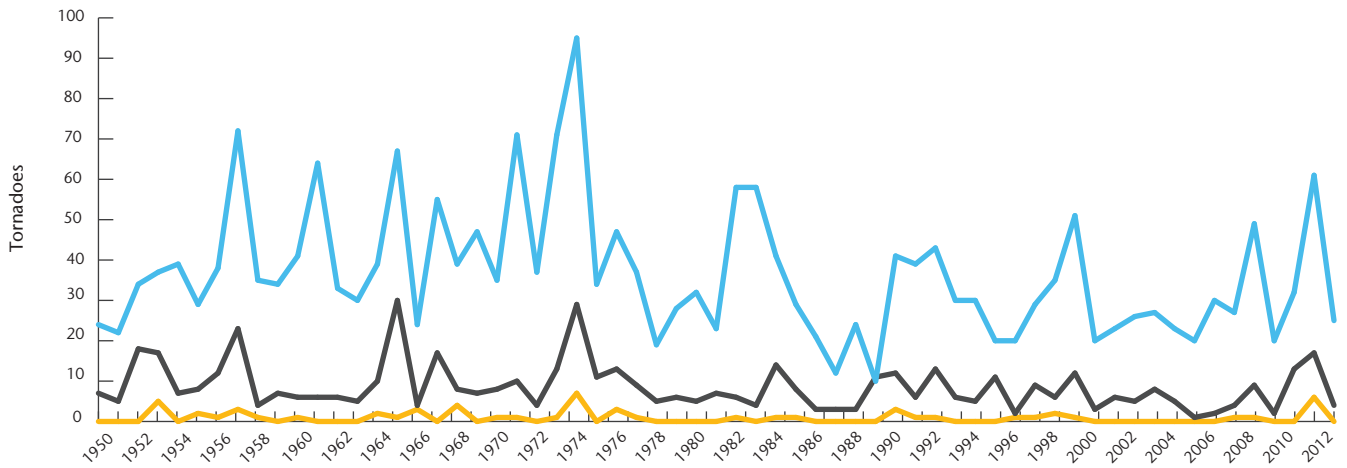


Exhibit 131: U.S. Tornadoes by Rating ((F3/EF-3, F4/EF-4, F5/EF-5) (1950-2012))



Given the level of tornadic activity in recent years across the United States, there has been an increased interest in attempting to determine whether certain atmospheric phases can be used to correlate seasonal patterns. The following exhibits analyze U.S. tornado frequencies in relation to ENSO phases. Based on data from the Storm Prediction Center since 1950, it appears that tornadic activity is elevated during La Niña phases, especially higher-end tornadoes with ratings at or above F3/EF-3 strength. However, the number of tornadoes during ENSO-neutral conditions is near the long-term average, and the totals from El Niño phases are below average. Similar trends are found in relation to the number of killer tornadoes, in that such instances are most elevated during La Niña phases. Both ENSO-neutral and El Niño phases are slightly below the long-term average.

Exhibit 132: U.S. Tornado Frequency by ENSO Phase (All Tornadoes (1950-2012))

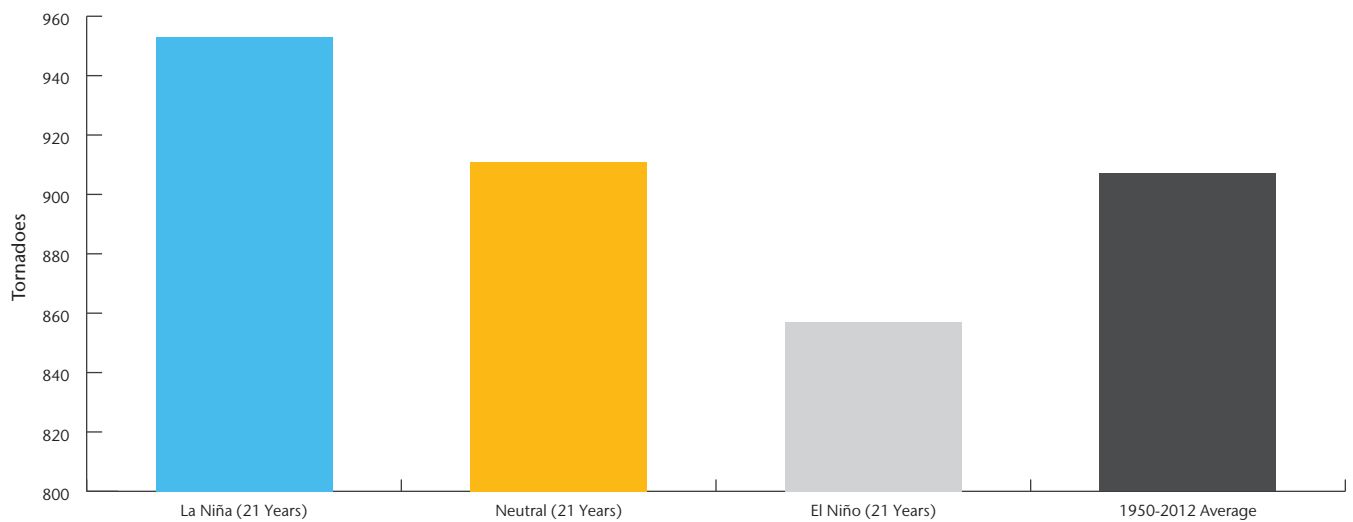


Exhibit 133: U.S. Tornado Frequency by ENSO Phase (Killer Tornadoes (1950-2012))

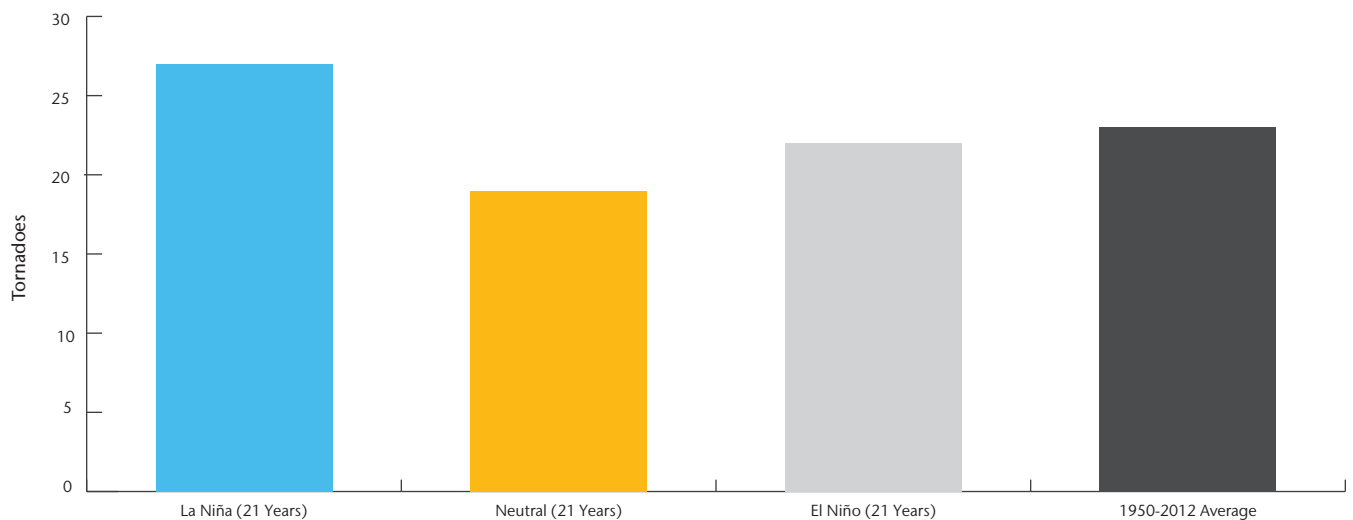


Exhibit 134: U.S. Tornado Frequency by ENSO Phase ((F0/EF-0, F1/EF-1, F2/EF-2) (1950-2012))

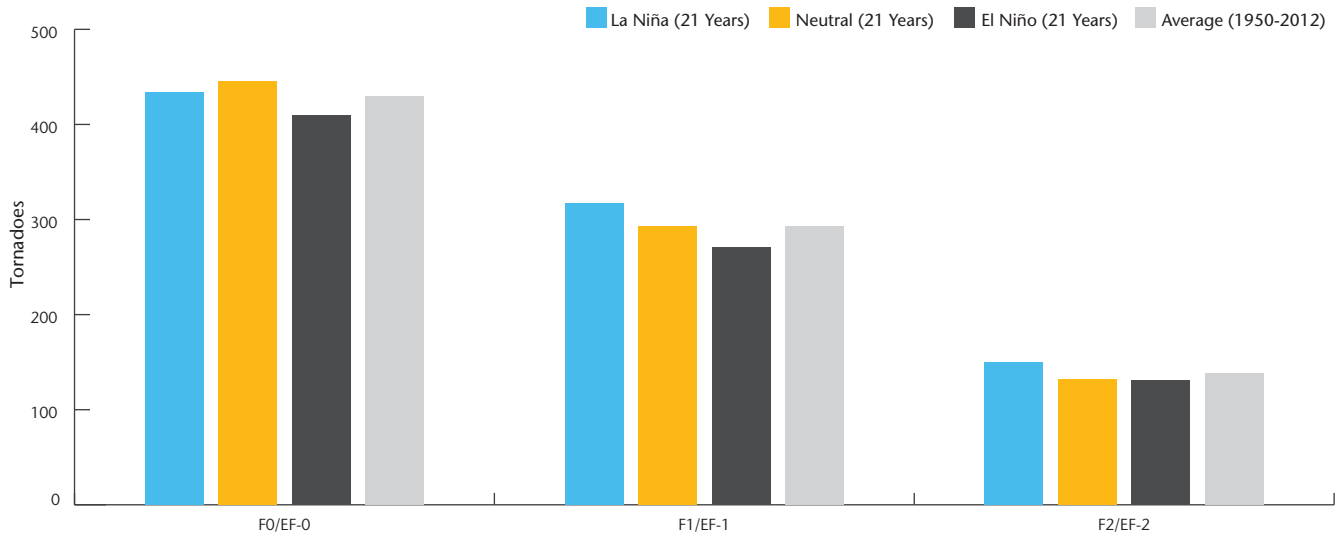
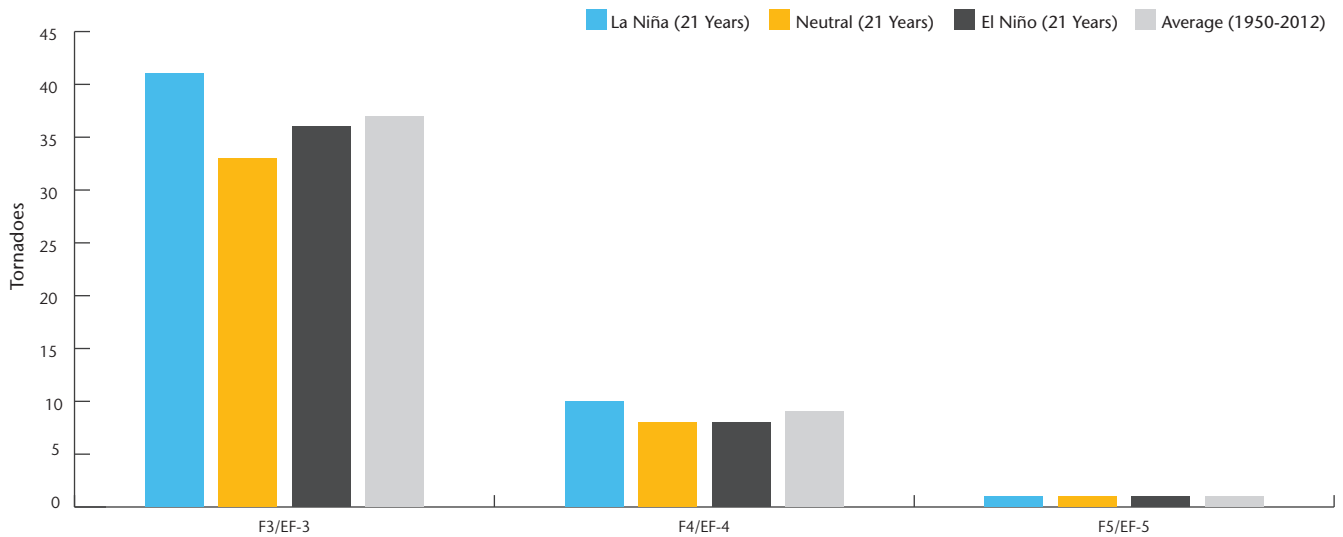


Exhibit 135: U.S. Tornado Frequency by ENSO Phase ((F3/EF-3, F4/EF-4, F5/EF-5) (1950-2012))



Appendix F: United States Wildfire Frequency Data

The following provides a breakdown of United States wildfire frequency activity since 1960 as provided by data from the National Interagency Fire Center (NIFC) and the National Interagency Coordination Center (NICC). As to be expected, the West region of the country frequently endures the largest amount of burn acreage with the Southwest also seeing regular elevated burn totals. Please note that the NICC maintained wildfire records from 1960 to 1982 before the NIFC began their current method of data compilation from states and other agencies in 1983.

Exhibit 136: U.S. Wildfire Burn Frequency (1960-2012)

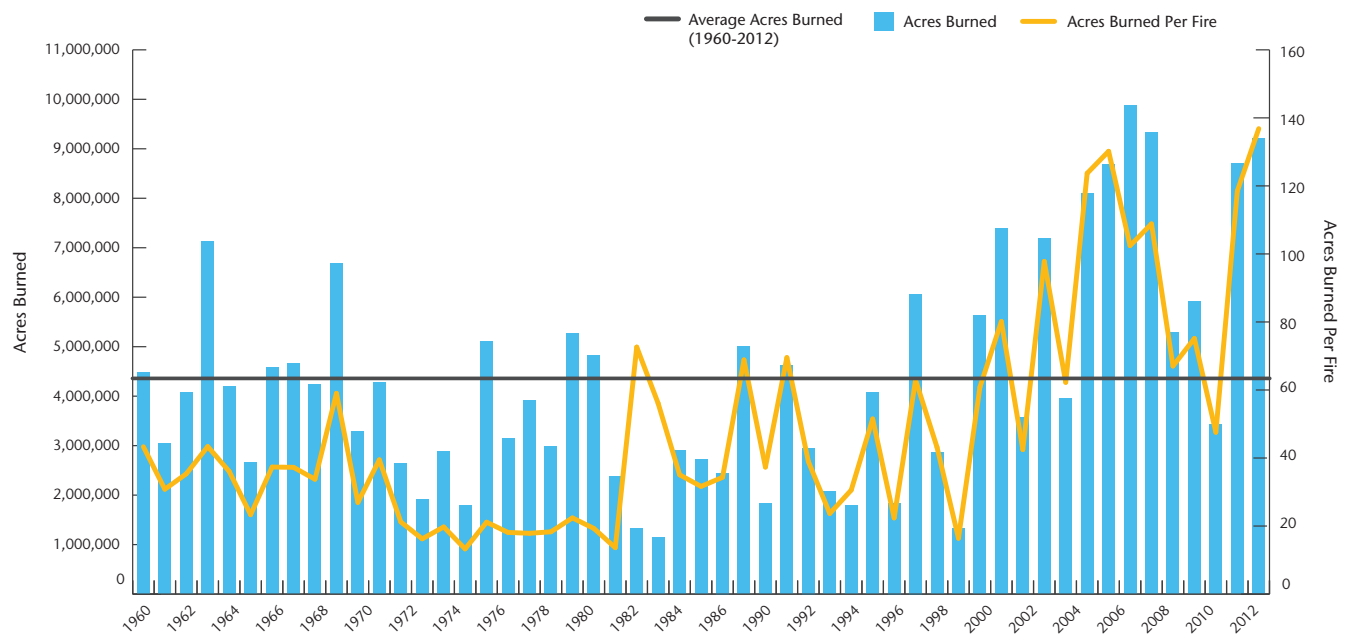
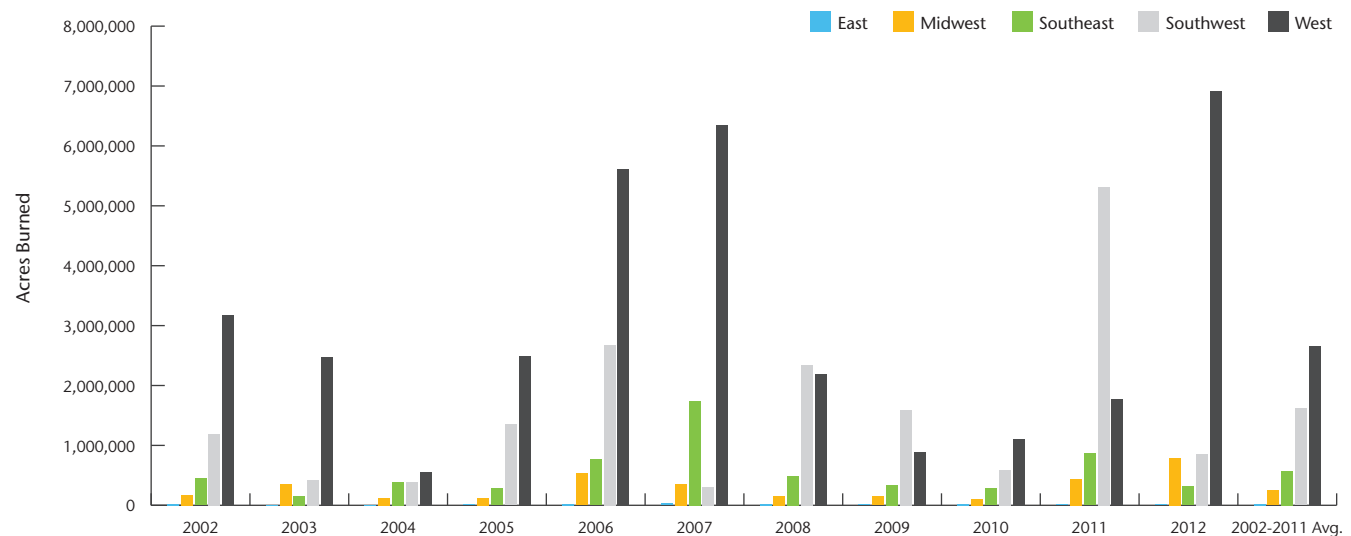


Exhibit 137: Contiguous U.S. Wildfire Burn Frequency by Region (2002-2012)



Additional Report Details

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 insurance companies 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. Economic loss totals include any available insured loss estimates, which can be found in the corresponding event text.

Contact Information

Bryon Ehrhart

Chairman of Aon Benfield Analytics
Chairman of Aon Benfield Securities
1.312.381.5350
bryon.ehrhart@aonbenfield.com

Stephen Mildenhall

Chief Executive Officer
Aon Benfield Analytics
1.312.381.5880
stephen.mildenhall@aonbenfield.com

Steve Jakubowski

President
Impact Forecasting
1.312.381.5890
steven.jakubowski@aonbenfield.com

Adam Podlaha

Head of International
Impact Forecasting
44.0.20.7522.3820
adam.podlaha@aonbenfield.com

Steve Bowen

Senior Scientist/Meteorologist
Impact Forecasting
1.312.381.5883
steven.bowen@aonbenfield.com

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Impact Forecasting

200 E. Randolph Street

Chicago, Illinois 60601

t +1.312.381.5300

f +1.312.381.0160

impactforecasting.com

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#10875 - 1/2013

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