GUY CARPENTER

GC BRIEFING

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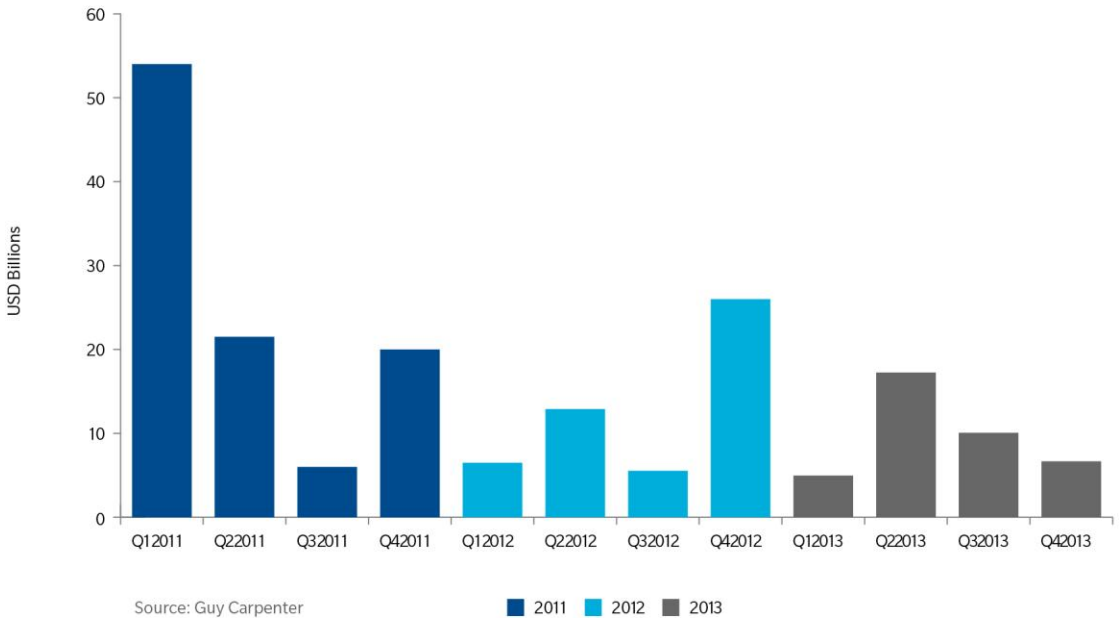
GLOBAL CATASTROPHE REVIEW - 2013

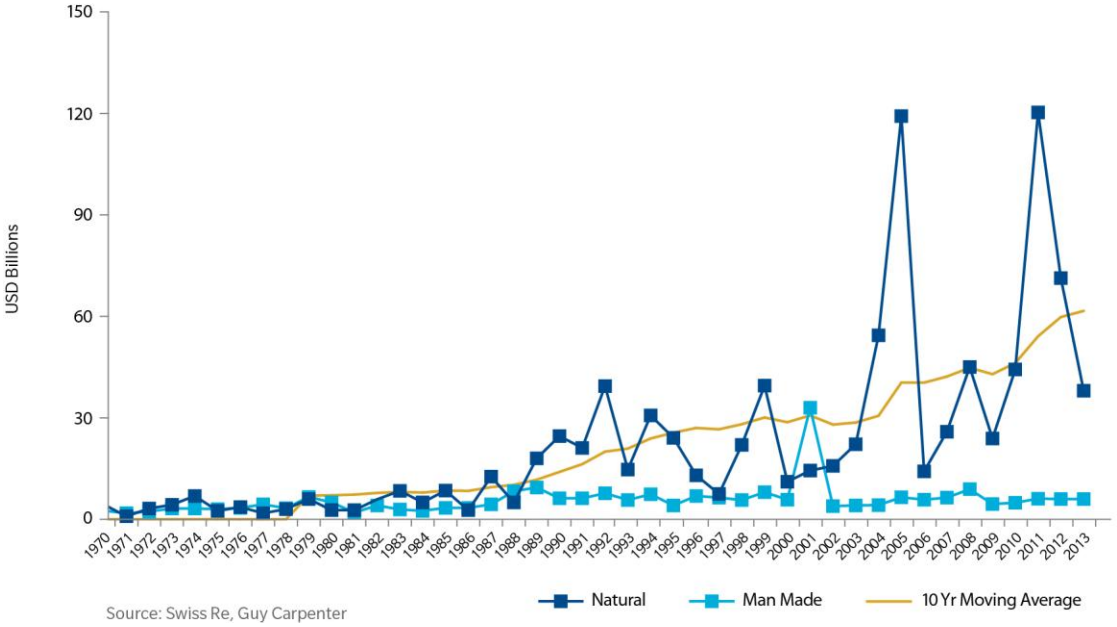
2013 provided a respite for the (re)insurance industry following above-average losses in 2011 and 2012, with insured losses from natural catastrophes and man-made disasters estimated at around USD40 billion, according to Guy Carpenter & Company (see Figure 1). This is considerably less than the ten-year average loss of approximately USD60 billion and well below the most significant years of 2005 and 2011 (see Figure 2 (Inflation adjusted)). This can be partly attributed to the unusually quiet 2013 Atlantic tropical season. About 47 percent of insured losses in 2013 were reported in the Americas, 31 percent in Europe and 20 percent in Asia and Australasia (see Figure 3).

It is likely that 2013 will be remembered as the "year of the flood," with significant flood events affecting Central Europe, Australia, the province of Alberta in Canada and Colorado in the United States. Other notable U.S. severe weather events included the outbreaks that produced the Moore, Oklahoma tornado, the El Reno, Oklahoma tornado and the late-season tornado outbreak affecting the Midwestern region. A series of severe weather events, including hail and windstorms, also affected Northern Europe during the second half of the year. Meanwhile, Typhoon Haiyan was established as perhaps the most powerful landfalling tropical cyclone on record, inflicting devastating impacts and loss of life in the Philippines, tragically with well over 7,000 fatalities.

F-1 | SIGNIFICANT INSURED LOSSES – 2011 TO YE 2013

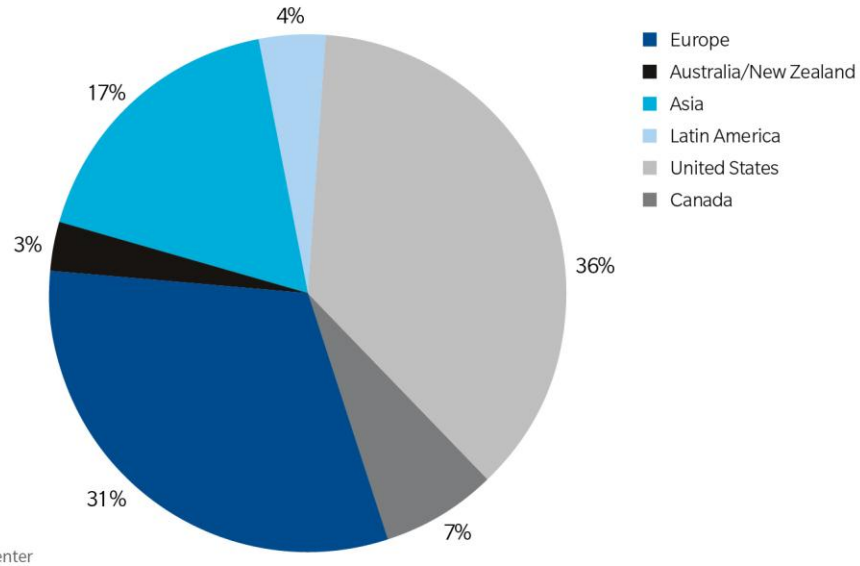


F-2 | GLOBAL CATASTROPHE INSURED LOSSES – 1970 TO 2013



Source: Swiss Re, Guy Carpenter

F-3 | DISTRIBUTION OF INSURED LOSSES IN 2013



Source: Guy Carpenter

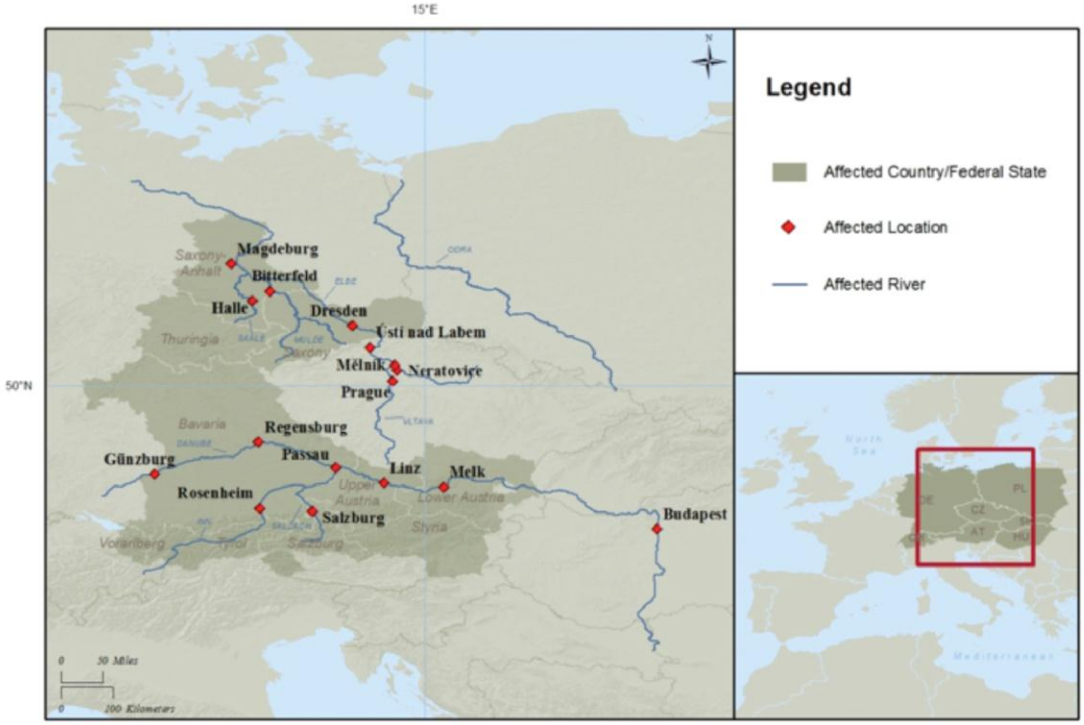
Europe /Middle East /Africa

2013 will be remembered in Europe in part as the year of the flood, with the worst flood event affecting several Central European countries in June. Estimated insured losses from this event were around USD4.1 billion, with economic losses of around USD18 billion.[1] Persistent heavy rain caused the Vltava, Elbe and Danube Rivers to overflow their banks and in some cases breach flood defenses. Countries affected included Germany, the Czech Republic, Slovakia, Austria, Switzerland, Hungary and Poland.

Germany was particularly badly affected as the floods inundated countless homes, businesses and crops, severed road and rail routes and cut power and drinking water supplies to thousands of people. Floodwaters surging down the Elbe reached a critical level in the state of Saxony-Anhalt as the river surpassed the highest water level seen during the last major flood event in 2002. More than 20,000 people were evacuated in the state capital of Magdeburg alone as the Elbe peaked at 7.45 meters, compared to normal water levels of around 2 meters.

Thousands of people were also evacuated from their homes elsewhere in eastern Germany after the Elbe burst through a dam. In the historic eastern cities of Dresden and Halle, 30,000 people were evacuated after the highest water level in 400 years was recorded on the Salle River. Both the cities of Halle and Dresden were flooded as water seeped through flood dykes, although the historic city center was spared in Dresden.

F-4 | AFFECTED AREA OF THE 2013 CENTRAL EUROPE FLOOD



Source: Guy Carpenter

[1] Swiss Re News Release, December 18, 2013.

The flooding was followed by a series of severe hail events that affected Germany in late July. Hailstorm Andreas caused significant damage in northern and southern regions of Germany on July 28 and July 29. Reports indicated that approximately 100,000 properties and 50,000 vehicles were damaged by Andreas. This event consequently became one of the costliest natural disasters to hit Germany, with estimated insured losses of USD3.7 billion.[2]

The autumn and early winter months also brought a series of severe windstorms to Northern Europe that was very impactful and costly. Estimated insured losses were around USD1.4 billion for Windstorm Christian in October and USD925 million for Windstorm Xaver in December, according to PERILS. Another series of windstorms (including Dirk and Erich) affected Northern Europe in late December, bringing wind damage and notable coastal impacts. Soil saturation in many areas of Europe is a concern going into 2014, amplifying the risk of flood during normally wet months.

Asia /Australasia

Asia and Australasia also received their share of both natural and man-made catastrophes in 2013. The most costly man-made event occurred in China after a major fire hit a large microchip factory in September. The blaze caused significant damage to the SK Hynix-owned facility in the city of Wuxi, with reports saying the cost to the (re)insurance sector is estimated to have totaled USD1.3 billion. The incident represents the most expensive single-risk loss on record to occur in China. It was also the largest single-risk loss of 2013, surpassing the USD1 billion payout following the collapse of a Rio Tinto mine in the U.S. state of Utah in April.

The region was also hit by a number of destructive natural catastrophes during 2013. The first major event of the year occurred in Australia as severe floods affected Queensland and New South Wales, incurring insured losses of approximately USD1 billion, according to the Insurance Council of Australia.

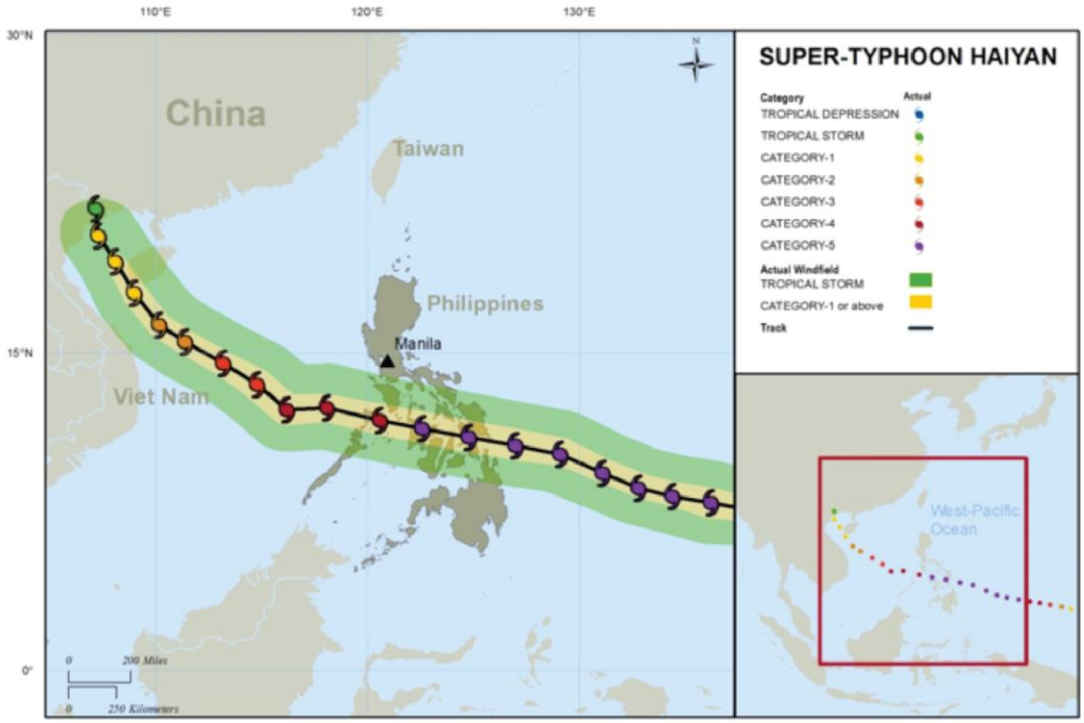
Tropical cyclone activity across Asia also caused widespread devastation, despite relatively low insured losses. The North Indian basin saw five storms of tropical storm strength or higher, with three cyclones. The strongest of these, Cyclone Phailin, made landfall in October on the northeast coast of India, causing notable flooding.

In the Northwest Pacific Ocean, there were 29 named storms, 16 typhoons and seven super typhoons, with an explosive increase in tropical cyclone activity in the mid- to late-autumn months. The most impactful of these included Typhoon Fitow and Super Typhoon Haiyan. Typhoon Fitow made landfall in China in October, with some reports estimating insured losses of USD1 billion.

Meanwhile, Super Typhoon Haiyan was possibly the most powerful landfalling tropical cyclone on record as it affected the Philippines in November. Haiyan later affected Vietnam and China. Tragically, Haiyan inflicted over 7,000 fatalities, with exceptionally severe damage in the Philippines due to extreme winds and storm surge. Haiyan incurred insured losses of USD1.5 billion, according to the Philippine Insurers and Reinsurers Association. Due to the low insurance penetration in the country, this was a relatively small portion of the total loss of approximately USD10 billion.

[2] Munich Re News Release, January 7, 2014.

F-5 | SUPER TYPHOON HAIYAN TRACK AND INTENSITY



Source: Guy Carpenter with data from the Joint Typhoon Warning Center

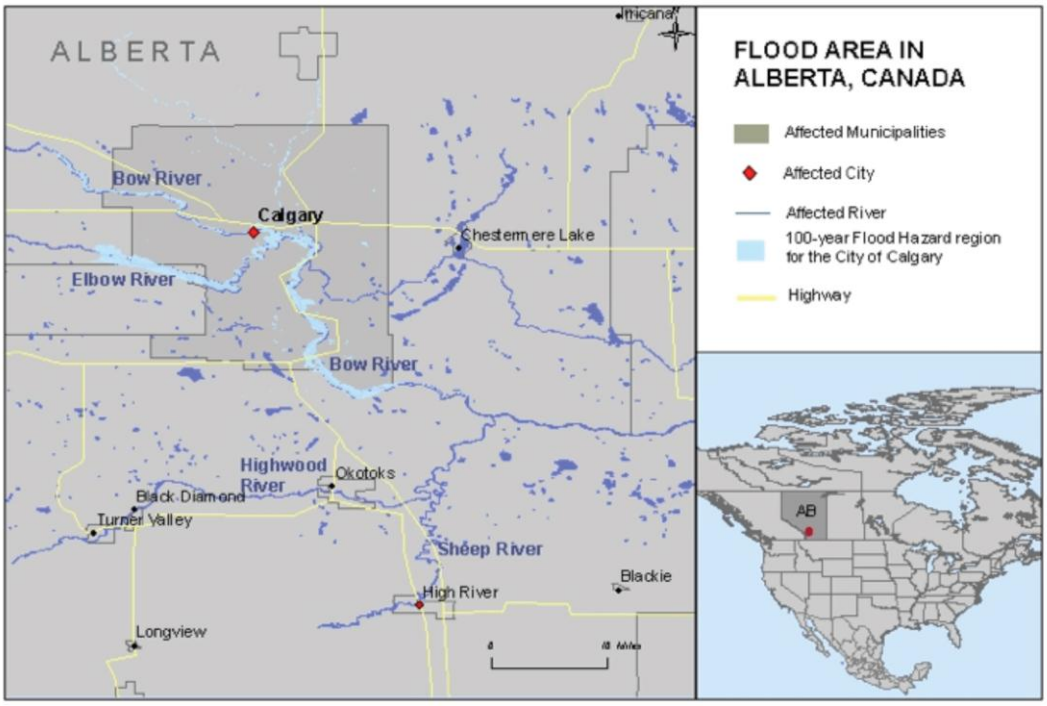
With the forecast of a neutral season of the El Niño Southern Oscillation (ENSO) forecast by the NOAA Climate Prediction Center, statistical guidance for the 2014 tropical cyclone season is difficult to determine. Some guidance indicates that a weak El Niño could develop, which would be statistically associated with elevated tropical cyclone activity in the North Pacific basin.

Americas

As with Europe, 2013 was a year of flood in the Americas, with notable events in Alberta, Toronto and Colorado. The flood event in the Calgary, Alberta area of Canada resulted in estimated insured losses of around USD2 billion, with economic losses of USD4.8 billion.[3] This event, combined with flash-flooding in Toronto, Ontario in July, meant Canada experienced its most expensive insured catastrophe loss year on record.

[3] Swiss Re News Release, December 18, 2013.

F-6 | CALGARY FLOOD AREA JUNE 2013



Source: Guy Carpenter

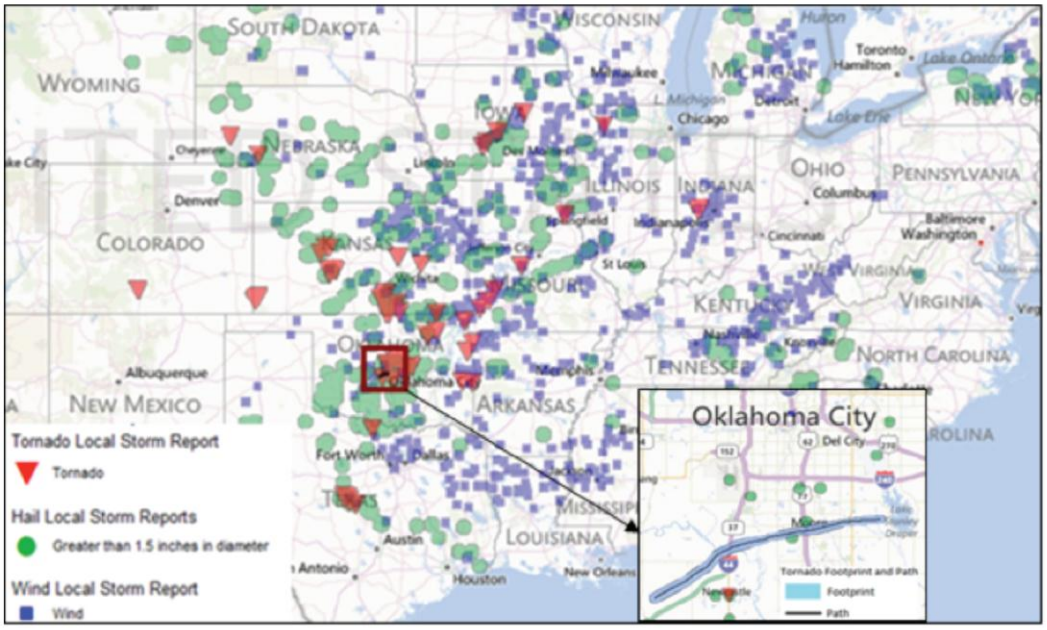
Despite a very quiet 2013 tornado season in the United States, there were a handful of severe tornado outbreaks throughout the year. Most notable among these was the U.S. severe weather outbreak in May that affected the Southeast, Midwest and Southern Plains. This outbreak triggered the devastating Moore, Oklahoma tornado, rated as an EF-5 tornado on the Enhanced Fujita Scale. Moore, Oklahoma is located adjacent to Oklahoma City. Insured losses for this event reached USD1.8 billion.[4] Another outbreak struck shortly after the Moore event at the end of May, affecting the Midwest and Southern Plains on this occasion. This outbreak included the El Reno tornado, with Doppler-estimated wind speeds near 295 mph (475 km/hr) above the ground. Insured losses for this event were estimated at USD1.4 billion.[5]

Other severe convective outbreaks included storms in March that affected the Southeast and Lower Mississippi valley, with estimated insured losses of USD1.6 billion.[6] A late-season outbreak impacting the Midwest and Ohio Valley resulted in insured losses of USD930 million.[7] Such outbreaks are infrequent but not rare or unprecedented.

Other notable events of 2013 included a winter storm affecting the U.S. interior from April 7 to April 11, causing estimated insured losses of USD1.2 billion.[8]

[4] PCS Catastrophe Bulletin No. 14. PCS - http://my.verisk.com/2013YearinReview?source=gc
[5] PCS Catastrophe Bulletin No. 15. PCS - http://my.verisk.com/2013YearinReview?source=gc
[6] PCS Catastrophe Bulletin No. 93. PCS - http://my.verisk.com/2013YearinReview?source=gc
[7] PCS Catastrophe Bulletin No. 29. PCS - http://my.verisk.com/2013YearinReview?source=gc
[8] PCS Catastrophe Bulletin No. 96. PCS - http://my.verisk.com/2013YearinReview?source=gc

F-7 | U.S. SEVERE WEATHER REPORTS MAY 19 TO MAY 22 2013.
MOORE OKLAHOMA TORNADO SHOWN IN INSET



Source: Guy Carpenter with data from the U.S. Storm Prediction Center (NOAA)

Meanwhile, the 2013 Atlantic Hurricane season was one of the most inactive on record. The most impactful events of the 2013 hurricane season were the landfalls of Hurricane Ingrid (Atlantic) and Tropical Storm Manuel (Pacific) in Mexico in September. These storms caused excessive rainfall, flooding and mudslides. Thousands of people were displaced. Combined estimated insured losses for Ingrid and Manuel totaled USD920 million, according to the Mexican Association of Insurance Institutions.

Only five other seasons since 1970 have had less activity than 2013. The quiet season was due to persistent dry, stable air over large portions of the Atlantic main development region. Tropical cyclones require moist, unstable air for development and this was not sufficiently enabled for much of the 2013 season.

The inactive season was unexpected given statistical forecasts for above-average activity provided by seasonal outlook providers. These providers included the team led by Dr. Bill Gray and Dr. Phil Klotzbach at Colorado State University (CSU), Weather Services Incorporated (WSI) and the U.S. National Hurricane Center (NHC). Statistical methodologies differ from agency to agency and incorporate features such as the Atlantic Multidecadal Oscillation (AMO), ENSO and sea-surface temperatures (SST) in the Atlantic main development region. Such indicators provide statistical guidance that surpasses simple averaging, but these techniques do occasionally fail.

Statistical indicators predicted an active 2013 season, and this simply did not materialize. Research into the physical reasons for this anomaly is ongoing by experts in the field. Gray and Klotzbach (CSU) theorize that an intermittent shift in the Atlantic thermohaline circulation, together with the corresponding response of the atmosphere and winds, resulted in dry, stable conditions over the Atlantic main development region. Statistical techniques to detect and leverage such behavior for improved predictability are being developed by the scientific community.

T-1 | SEASONAL OUTLOOKS FOR THE 2013 ATLANTIC HURRICANE SEASON

	Named Storms[6]	Hurricanes[7]	Major Harricanes[8]	A.C.E.[9]
WSI[1]	16	9	5	
TSR[2]	15.2	7.5	3.4	131
CSU[3]	18	9	4	165
UK Met[4]	14	9		130
NOAA[5]	13-20	7-11	3-6	107-183
1995-2012 Mean[10]	**15.2**	**8**	**3.7**	**138.4**
1950-2012 Mean[10]	**11.2**	**6.3**	**2.7**	**103**
2013 Actual	**13**	**2**	**0**	**33**

1: Weather Services Incorporated
2: Tropical Storm Risk
3: Colorado State University (Gray & Klotzbach)
4: UK Met Office
5: U.S. National Hurricane Center
6: Tropical cyclones with maximum sustained winds of at least 39 mph
7: Tropical cyclones with maximum sustained winds of at least 74 mph
8: Tropical cyclones with maximum sustained winds of at least 111 mph (Category-3 or higher on the Saffir-Simpson scale)
9: Accumulated Cyclone Energy (ACE) – defined as the sum of squares of six-hourly maximum sustained wind speeds (knots) for all tropical storms or hurricanes. Units are 10^4 knots^2. The index is a proxy for energy expended by a tropical cyclone.
10: Source: Hurricane Research Division (NOAA)

Source: Guy Carpenter with agency input as identified above.

There is no guarantee that the 2014 Atlantic hurricane season will be like the 2013 season. We are still in an active phase of the AMO and we should remain in an ENSO neutral phase through the coming summer, according to the NOAA Climate Prediction Center (CPC). This indicates basin activity should meet or perhaps exceed the long-term mean. Landfalls are predicted by *weather* during the lifecycle of a tropical cyclone and cannot be reliably predicted on a seasonal basis. ENSO predictions will have to be monitored for the possible emergence of a weak El Niño, which would merit the re-evaluation of estimated tropical cyclone activity for the North Atlantic basin.

Despite the long-term active phase of the AMO, it is interesting to note that only four seasons in the Atlantic have seen basin activity exceeding the long-term mean since 2005. Only one of these seasons has seen U.S. landfalls exceeding the long-term mean (this does not include Sandy, which was classified as a post-tropical cyclone at landfall by the NHC).

With a neutral ENSO phase predicted by the NOAA CPC through the summer of 2014, there is no statistical reason to expect that U.S. severe weather activity should be lower than average. Significant variability from year to year is to be expected for such activity. The tornado events of the very active 2011 season are not unprecedented in history.[9] Such outbreaks have occurred before – in 1974, for example – and such outbreaks will occur again.

Of great concern is the water situation in the state of California. According to NOAA, 2013 had the lowest precipitation in recorded history for California. Snowpacks are also at 30 percent or less of average for this time of year. This has already led to exceptionally severe drought conditions in the state. Impacts to water resources, agriculture and an aggressive wildfire season are therefore areas of concern for 2014.

[9] Doswell, C.A., Carbin, G.W., Brooks, H.E., 2012: The tornadoes of Spring 2011 in the USA: an historical perspective. Weather. 67 (4), 88-94.

Contacts

James Waller, PhD
Research Meteorologist
GC Analytics©
+1 215 864-3622
James.Waller@guycarp.com

Julian Alovisi
Vice President
+44 207 357-2967
Julian.Alovisi@guycarp.com

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