Allianz Global Corporate & Specialty

Hurricane Katrina 10
Catastrophe management and global windstorm peril review

Katrina Lessons Learned
Windstorm risk management

Global Loss Analysis
Top locations according to insurance claims

New Exposures
How assets have changed

Loss Mitigation
Best practice checklist

New Orleans after Hurricane Katrina: August 2005

Photo: US Coastguard, Wikimedia Commons

Allianz

Summary

Hurricane Katrina struck the Gulf Coast of the US on August 29, 2005. It remains the largest-ever windstorm loss and the costliest disaster in the history of the global insurance industry, causing as much as $125bn in overall damages and $60bn+ in insured losses.

Storms can have a devastating impact for businesses. Even without considering the impact of climate change the prospect of increasing losses is more likely in future. This is due to continuing economic development in hazard-prone urban coastal areas around the world and in Asia in particular, where growth of exposure is far outpacing take-up of insurance coverage, resulting in a growing gap in natural catastrophe preparedness.

AGCS business insurance claims analysis shows windstorm is the fifth top cause of loss for businesses. 40% of natural hazard claims are storm-related.

US is the top loss location accounting for almost half (49%) of 400+ windstorms claims analyzed over a five accident year period.[1] More than 50 countries around the world have suffered significant windstorm insurance losses in recent years.[2]

Europe is the second top loss region (19%), followed by South East and Far East Asia (6%), Central America (3%) and Australia and New Zealand (3%).

Claims analysis shows the maritime industry is highly exposed to such losses, accounting for 60% of windstorms claims by number compared with 30% for property. High-value claims include loss of commercial vessels, pleasure craft and cargo. However, storms can also damage or destroy ports or coastal infrastructure, including warehouses, cranes, quaysides, terminals, buoys and sheds.

Katrina has helped to improved catastrophe risk management awareness. Impact of storm and demand surge, business continuity and insurance coverage details are among the key lessons learned.

A decade later the Gulf Coast is better prepared to withstand the effects of a hurricane due to better education, improved construction guidelines and increased third party inspection.

However, businesses still need to place greater emphasis on reviewing pre- and post-loss risk management. Preparedness is crucial to mitigating increasing storm losses, particularly in highly-susceptible areas such as construction sites.

Business continuity planning and indirect supply chain exposures are areas which would benefit from greater attention. If such procedures are not in place or reviewed, the magnitude of windstorm losses can increase significantly.

There are four crucial stages to windstorm loss mitigation – pre-, during and post-windstorm and business continuity. Business planning should include development of a comprehensive windstorm emergency plan, to be updated and tested regularly.

Business continuity management is crucial as just-in-time production, lean inventories and global supply chains can easily multiply negative effects. Property damage and business interruption are usually covered but often there is loss of market share, suppliers, clients and staff. Continuity plans also need to be tested.

[1] 11,427 corporate claims from 148 countries with a total value of more than €21.5bn, were analyzed, each with a total value after deductible of €100,000 or higher. There were 426 windstorm claims. All claims figures are 100% (not only the AGCS share but including coinsurers shares) [2] between 2009 and 2013

All currencies $US unless stated

Background

On August 29, 2005 **Hurricane Katrina** made landfall in the US in southeastern Louisiana as a Category 3 hurricane with sustained winds of 200km (125mph).

Katrina was the 12th named storm and fifth hurricane of the 2005 season – the longest and most severe hurricane season in history. Three of the storms (Katrina, **Rita** and **Wilma**) rank in the top 10 costliest global windstorm events of all-time.

To mark the 10-year anniversary of Katrina, **Allianz Global Corporate & Specialty (AGCS)** examines the lessons learned from this major catastrophe event, which remains the largest-ever windstorm loss and the costliest disaster in the history of the global insurance industry.

However, windstorm peril is not exclusive to North America. According to AGCS analysis of windstorm loss data over 50 countries have suffered significant windstorm losses over a five accident year period. Across Europe conventional winter storms still cause the most damage, even more than floods.

Meanwhile, across Asia a combination of increasing wealth, together with growing populations in coastal areas means the prospect of increasing losses from typhoons is more likely in future - and that is before the potential impact of climate change is considered.

This **Risk Bulletin** also outlines what businesses need to do now to ensure they can mitigate the adverse financial impact of future storms around the world, given expected increasing weather volatility.

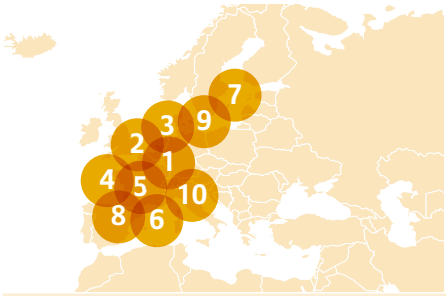
Top windstorm insured losses from North America, Europe and Asia

North America hurricanes

Hurricane loss totals also include losses from outside North America; e.g Caribbean

1	Katrina	$62.2bn	2005
2	Sandy	$29.5bn	2012
3	Ike	$18.5bn	2008
4	Andrew	$17bn	1992
5	Ivan	$13.8bn	2004
6	Wilma	$12.5bn	2005
7	Rita	$12.1bn	2005
8	Charley	$8bn	2004
9	Irene	$6bn	2011
10	Frances	$5.5bn	2004

Europe windstorms



1	Lothar	$6.2bn	1999
2	Kyrill	$5.8bn	2007
3	Daria	$5.1bn	1990
4	87J	$3.1bn	1987
5	Xynthia	$3.1bn	2010
6	Klaus	$3bn	2009
7	Erwin (Gudrun)	$2.6bn	2005
8	Martin	$2.5bn	1999
9	Anatol	$2.4bn	1999
10	Vivian	$2.1bn	1990

Asia typhoons

1	Mireille	$6bn	1991
2	Songda	$4.7bn	2004
3	Bart	$3.5bn	1999
4	Vicki and Waldo	$1.6bn	1998
5	Tokage	$1.3bn	2004
6	Roke	$1.2bn	2011
7	Chaba	$1.2bn	2004
8	Shanshan	$1.2bn	2006
9	Saomai	$1.1bn	2000
10	Yancy	$1bn	1993

The top 10 costliest hurricanes caused $185bn in insured losses –
three times the amount of the top 10 windstorm losses in Europe and Asia combined.

Source: Munich Re, Geo Risks Research, NatCat Service - Jan 1 2015 *(losses in original values)*
Graphic: Allianz Global Corporate & Specialty

Lessons learned from Katrina and the 2005 storm season

Top 5 Nat Cats by overall losses

Earthquake/tsunami, Japan
March 2011 **$210bn**

Hurricane Katrina, storm surge, US
August 2005 **$125bn**

Earthquake, Japan
January 1995 **$100bn**

Earthquake, China
May 2008 **$85bn**

Superstorm Sandy, storm surge , US
October 2012 **$68.5bn**

Source: Munich Re
Photos: Shutterstock

Hurricane Katrina and the other major hurricanes from 2005 including Rita and Wilma had a huge impact on the risk management and insurance industry.

With more than **$125bn** in economic losses and **$60bn+** in insured losses Katrina alone was the most expensive natural disaster when it occurred in 2005 and "an event that intensified discussion nationwide about the way disasters are managed", according to the Insurance Information Institute.

To mark the 10th anniversary of Katrina, specialist insurer AGCS takes the opportunity to look back and analyze the key risk management lessons learned from this catastrophe:

Katrina 10: facts

More than one million people in the Gulf region were displaced by the storm[1]

4,000 lives lost in the 2005 hurricane season[2] – **1,883** lost directly/indirectly due to Katrina[3]

80% of the city of New Orleans flooded after levees failed. **70%** of New Orleans' occupied housing (**134,000** units) damaged in the storm[4]

Katrina caused as much as **$125bn** in overall damages and **$60bn+** in insured losses[5]

New Orleans alone suffered direct property damage of **$30bn**[6]

1.7 million insurance claims filed. **$40bn+** paid in privately-insured property losses[7]

1.2 million claims were for personal property, **156,000** for commercial businesses and **346,000** for damaged vehicles[8]

Claims payments to businesses accounted for around half of the **$40bn+** – an unusually large share[9]

Over **$16bn** in losses insured by the National Flood Insurance Program (NFIP)[10]

The 2005 hurricane season was the costliest in history; inflicting in excess of **$80bn** in insured losses with overall damage generally estimated in excess of **$160bn**[11]

[1][4] Greater New Orleans Community Data Center 2013 [2] Katrina10.org [3] FEMA [5][6] Munich Re [7][8][9] Insurance Information Institute, PCS [10] Insurance Information Institute [11] AGCS

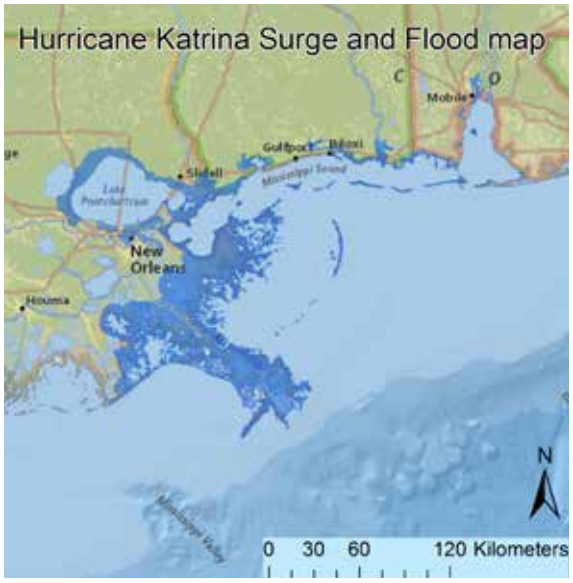
1 Storm surge impact and risk modeling

Previous events had highlighted the potential damage from strong winds, but Katrina - and a number of storms since then, including **Superstorm Sandy** in 2012 – show storm surge can often be more damaging *(see table below)*.

What is storm surge?
An abnormal rise in sea level accompanying a hurricane or other intense storm. The height is the difference between the observed level of the sea surface and the level that would have occurred in the absence of the cyclone. Storm surge is usually estimated by subtracting the normal or astronomic high tide from the observed storm tide.

"Storm surge modeling prior to Katrina essentially assumed that the height of the storm surge was a function of the maximum sustained winds," explains **Andrew Higgins, Technical Manager, Americas, Allianz Risk Consulting**.

"Katrina clearly showed that there are other factors that affect storm surge height," he adds. "In 1969 Hurricane Camille hit Mississippi as a Category 5 hurricane. It had 190mph sustained winds and drove a storm surge of 22.6ft at Pass Christian, Mississippi. Katrina hit the same region of the Mississippi coast as a Category 3 hurricane with 130mph sustained winds and drove a storm surge of 27.8ft at Pass Christian. We have learned that – in addition to wind speed, the physical size of the hurricane can affect the storm surge. Camille's hurricane-force winds extended 60 miles from the storm center, while Katrina's extended 120 miles. The larger size of Katrina was a major factor in pushing more water onto the shore."



The image demonstrates the area impacted by storm surge and flooding which accompanied Hurricane Katrina in 2005. It can be clearly seen how severely impacted New Orleans and the surrounding areas were as a result of this event.
Sources: RMS, National Geographic and ESRI

"From a modeling perspective, the peril of storm surge received much greater attention and probabilistic model vendors enhanced the peril's influence on overall hurricane-modeled losses," adds **Richard Quill, Catastrophe Risk Management at AGCS**.

Storm surges amplified by heavy rain may even be a greater threat to US coastal cities than previously thought, with the number of events having increased significantly over the past century according to Nature Climate Change[1] research.

And surge continues to be one of the important components of the windstorm peril outside of the US as well. In 2014 as Typhoon Rammasun tracked across the Philippines it was accompanied by a storm surge reported to have reached 10 feet in height, causing widespread damage along the eastern coast of the islands.

Costliest storms in US by insured losses

1	**Katrina**	**$62.2bn**	***2005***
2	**Sandy**	**$29.5bn**	***2012***
3	Ike	$18.5bn	*2008*
4	Andrew	$17bn	*1992*
5	**Ivan**	**$13.8bn**	***2004***
6	Wilma	$12.5bn	*2005*
7	**Rita**	**$12.1bn**	***2005***
8	Charley	$8bn	*2004*
9	**Irene**	**$6bn**	***2011***
10	Frances	$5.5bn	*2004*

Storm surge has been a contributing factor in half of the top 10 costliest storm losses in US history – Katrina, Sandy, Ivan, Rita and Irene – which collectively caused almost $125bn in insured losses.
Source: Munich Re, Geo Risks Research, NatCat Service - Jan 1, 2015 *(losses in original values)*

[1] www.nature.com/nclimate/journal/vaop/ncurrent/full/nclimate2736.html

2 Flooding threat

The flooding caused by Katrina showed that the conditions of the levee systems in the US are very poor. "The 2013 Report Card for America's infrastructure developed by the American Society of Civil Engineers rates the levees in the US as a D-," Higgins says. The condition of many of these levees is substandard and the cost to repair them is estimated to be $100bn, according to the National Committee on Levee Safety. "During Katrina, the flooding of New Orleans was primarily caused by the failure of the levees along the canals south of Lake Pontchartrain," Higgins adds *(see right)*.

3 Wind damage prevention

Substantial wind damage occurred to structures that experienced hurricane force winds from Katrina, despite the fact that the recorded wind speeds were less than the wind design speeds (*per ASCE 7 "Minimum Design Loads for Buildings and Other Structures"* - see right) So what happened? "Most of the wind damage occurred to the building envelope," explains Higgins. "That includes the roof covering, walls and windows. If the building codes had been strictly followed, the wind damage would have been greatly reduced. Poor workmanship and a lack of knowledge were the primary culprits."

After Katrina, Allianz developed and implemented a roof survey inspection form and required all risk engineers and consultants to walk all areas of the roof for locations in hurricane-prone areas. "We had always inspected the roofs at any physical survey but, for those exposed locations we decided to take more time to evaluate the condition of the roof covering further," explains **James Crews, Engineering Manager for Highly Protected Risks, Allianz Risk Consulting**.

"These roof surveys place a higher scrutiny on the condition and age of the roofing systems. As a result, we now work even closer with insureds to advise them on when repairs and replacement are needed and when to to bring in a roofing consultant to provide further evaluation of the covering."

"Today, the Gulf Coast is in a better position to withstand the effects of a hurricane due to better education, improved construction guidelines and increased third party inspection," concludes Higgins.

Lessons learned from Superstorm Sandy

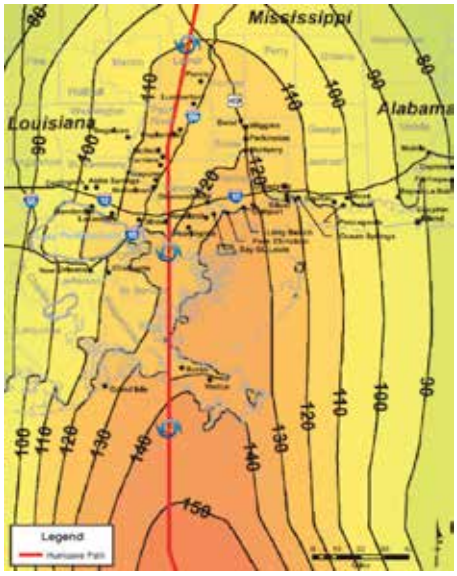
www.agcs.allianz.com/insights/white-papers-and-case-studies/superstorm-sandy/

How does a levee fail?

Three major studies (one by the US Army Corps of Engineers and two by independent experts) were completed in an effort to determine the cause of the levee failures. These studies listed the following as contributing factors:

- Sections of the levee system were incomplete
- Inadequate design of some of the levee flood wall foundations
- Use of substandard fill material in levee construction
- Water level exceeded levee design
- Lack of coordination between governmental agencies during design
- Efforts were made to reduce costs at the expense of system reliability
- Inadequate maintenance and inspection

There are many levee systems throughout the US that would reveal similar deficiencies if subjected to the same level of scrutiny.



FEMA – Katrina wind swath contour plot (3-second gust in mph)

If you compare some of the actual wind speeds from the above plot against the 3 second gust wind speeds from *ASCE 07-2005*, the actual wind speeds were less than the design wind speeds:

New Orleans	107 mph (actual) vs 125 mph (design)
Gulfport	130 mph (actual) vs 135 mph (design)
Pascagoula	107 mph (actual) vs 145 mph (design)

4 The importance of business continuity

As many as 40% of businesses affected by a natural or human emergency fail to reopen[1]

Initially the impact of Katrina in New Orleans was not unmanageable. Then the levees were breached sending the city into chaos. Eventually businesses began the process of securing their sites – many of which had been vandalized or looted. Initial response was hampered by inexperienced staff, a lack of resources and collapsed infrastructure. Many recovery efforts were staged outside the city. Challenges included: weather-related health issues; personal safety and security of recovery personnel; no reliable communication equipment; no civilian authority to partner with; contamination of tools, equipment and clothing; and data recovery.

After widespread catastrophes businesses typically relocate and the client base can diminish until recovery progresses. The key to recovery is to establish a plan in advance that identifies clear priorities for attention to crucial operations, so the business can get back up-and-running as quickly as possible.

5 Insurance coverage issues

Insurance claims settlement levels were high from Katrina. By the second anniversary of the disaster, approximately 99% of the 1.2 million personal property claims had been settled, according to the Insurance Information Institute. In addition so where almost all of the 156,000 commercial claims; accounting for **$20bn+** in payments to businesses.

However, it's imperative to know what's protected ahead of time. Many insureds were surprised to find out they were not covered for storm surge losses, the main coverage issue resulting from the storm. Whether damage was caused by wind or water became a key focus of post-Katrina litigation. Many of the subsequent lawsuits took years to be resolved.

6 Unexpected impact of demand surge

Demand surge is a post-catastrophe complication which can not only have catastrophe-related consequences in terms of rising prices due to a shortage of available goods but peripheral loss consequences as well; for example from **Chinese drywall**.

Katrina and damage from other hurricanes during 2005 exacerbated a shortage of American-made drywall (or plasterboard) caused by the rebuilding demands of the destructive 2004 hurricane season. This led to a significant increase in the importation of defective drywall manufactured in China, subsequently resulting in a number of environmental issues and eventual litigation; particularly in the storm-affected states of Florida and Louisiana.

How better prepared is New Orleans today?

How does the Permanent Canal Closures and Pump Stations (PCCP) project work

www.mvn.usace.army.mil/Missions/HSDRRS/PCCP.aspx

Although AGCS has observed many businesses are rapidly maturing in terms of natural catastrophe risk awareness, management and response there is still room for further improvement and close collaboration between individual business units – and externally – with third parties such as insurers is needed.

[1] Insurance Information Institute

$15bn a year

Average amount paid for extreme weather events including windstorms by insurers between 1980 and 1989[2]

$70bn a year

Average amount paid between 2010 and 2013[3]

327%

Increase in insured losses from weather events including windstorms as a proportion of global GDP between 1974-1983 and 2004-2013 – from **0.018%** to **0.077%.**[4]

Complex climate variables

The 2005 hurricane season was the most active Atlantic hurricane season in recorded history, with 30+ tropical and subtropical storms, including 15 hurricanes. Despite the results of 2005, the hurricane activity in the Atlantic has shown no significant trends in either direction since records began in 1851.

Katrina and the other hurricanes which formed in 2005 were supposed to usher in a new era of increased frequency and intensity of hurricanes in the Atlantic basin. The higher ocean and air temperatures, combined with higher greenhouse gas levels were supposed to be the catalyst for increased hurricane activity. "In reality, the exact opposite has occurred," says **Andrew Higgins, Technical Manager, Americas, Allianz Risk Consulting**. The last 10 years have actually seen a reduction in the Atlantic hurricane activity, with the 2013 hurricane season having the fewest Atlantic basin hurricanes since 1983. "These results illustrate the fact that we do not fully understand the complex climate variables that affect hurricane activity."

Increasing cost of windstorm and weather events

However, whether it is hurricanes in the North Atlantic Ocean, typhoons in the Northwest Pacific Ocean, cyclones in the Southwest Pacific Ocean and Indian Ocean or winter storms in Europe, what is clear is that windstorms can have a devastating impact on business.

With the advent of just-in-time management philosophies and lean inventories, losses can cripple any organization. Property damage and business interruption may be covered by the insurance policy but loss of market share and a damaged reputation are not always so easily recovered.

And while there has been no conclusive answer to the question of how climate change impacts storms, most scientists agree that the severity rather than the frequency of windstorms will increase in future. Based on Allianz experience the severity of losses from weather events including windstorms is already increasing. *(see left)*. A principal reason for this is the continuing economic development in hazard-prone areas. In the hurricane-affected state of Florida for example, the population in 2014 was just under 20 million, compared with just three million in 1950. And this trend is being repeated apace across Asia *(see page 9)*.

What makes the perfect storm?

- High wind speeds: 157mph+ (250km+) Category 5 force
- Wide storm breadth: means wider area impacted; leading to more rainfall and flooding
- High storm surge: 20 feet+
- High exposure accumulation: e,g Caribbean, Miami, Houston, Gulf Of Mexico, southern-Louisiana, Texas etc
- Multiple landfalls
- Large area impacted: e.g recovery and service resources exhausted; more industrial sites exposed

Impact: *Such an event would have the potential to financially impact the insurance industry more so than any previous event on record.*

In future further population growth and expansion of industries – particularly in the developing world - will exacerbate the issue. For example, industrial parks in some Asian cities are prone to a range of perils. Catastrophe modeller RMS describes Ulsan in South Korea as "an industrial exposure hot spot that is highly vulnerable to typhoons"[1]. Accumulation of risks is rising exponentially with the greater interconnectedness of the global economy, resulting in increasing business interruption (BI), contingent business interruption (CBI) and supply chain exposures.

And if natural catastrophe risk management procedures are not in place or have not been regularly reviewed, the magnitude of such losses can increase significantly.

"We are seeing much more awareness regarding natural hazards by insureds," says **Stefan Kippert, Senior Account Engineer, Allianz Risk Consulting in Munich**. "In some cases we organize special risk management workshops to quantify specific natural hazards exposure based on different frequencies. Preparedness is a major issue when trying to limit this natural hazard exposure."

[1] RMS Economic Exposure Databases and Industrial Clusters Catalogs for the Philippines, South Korea, Taiwan, Thailand and Vietnam [2 3] Allianz [4] Swiss Re

Where next? New exposures: The changing landscape in Asia

The Saffir-Simpson scale

1 Winds up to 153km/h
Minimal damage
2 Winds up to 177km/h
Extensive damage
3 Winds up to 208km/h
Devastating damage
4 Winds up to 251km/h
Catastrophic damage
5 Winds 252km/h+
Catastrophic damage

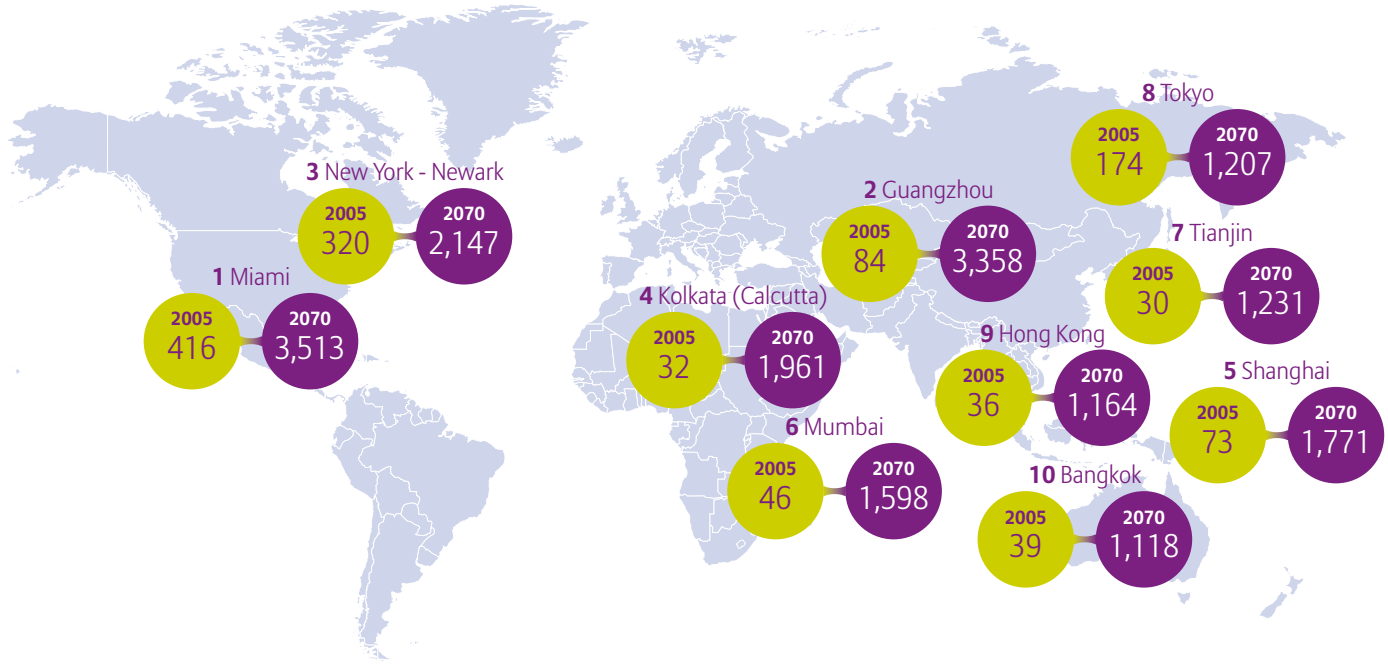
The Northwest Pacific Ocean is the most active basin on the planet generating an average of 26 tropical storms per year compared with 11 in the Atlantic. 2013 saw the most active Pacific typhoon season in almost 10 years with 16 typhoons developing and tropical storm Haiyan being the deadliest on record to hit the Philippines. Even though the 2014 season was not as active and costly as the one that preceded it, it still contained Typhoon Rammasun, which made landfall in Southeast China as the strongest typhoon to hit the region since 1973 - a Category 4 storm on the Saffir-Simpson scale.

Increasing assets and a booming population clustered around tropical storm hotspots in the face of intensifying storm activity means the potential for larger windstorm losses across Asia continues to increase.

Ten years ago the top 10 cities in terms of assets exposed were Miami, Greater New York, New Orleans, Osaka-Kobe, Tokyo, Amsterdam, Rotterdam, Nagoya, Tampa-St Petersburg and Virginia Beach, according to a global screening study by the OECD[1] which made a first estimate of the exposure of the world's large port cities (136 in total) to coastal flooding due to storm surge and damage due to high winds. These cities contain 60% of the total exposure, but are from only three countries: US, Japan and the Netherlands.

Based on the study's projection for 2070 – the exposure landscape looks very different with asset exposure forecast to grow dramatically, reaching **$35,000bn** by the 2070s; more than 10 times the level in 2005 and rising to roughly 9% of projected global GDP in this period.

Top 10 cities ranked by assets exposure to coastal flooding in the 2070s ($USbn)



In 2070 Asian cities dominate the top 10. In 2005 the top 10 cities with exposure to coastal flooding due to storm surge and damage due to high winds were all in the US (including New Orleans), Netherlands and Japan

Source: OECD Graphic: Allianz Global Corporate & Specialty

[1] OECD Ranking Port Cities with High Exposure and Vulnerability to Climate Extremes

Drivers of exposure growth

Population growth, socio-economic growth and urbanization are the most important drivers of the overall increase in exposure. Exposure rises most rapidly in developing countries, as development moves increasingly into areas of high and rising flood risk. A study by the Texas A&M and Yale Universities found that by 2030 the amount of developed low-elevation coastal land in China will have increased by over 60,000sqkm since 2000.[1]

Significantly, as the map on page 9 shows, Asian cities account for 80% of the top 10 exposed locations in 2070.

In 1950 there were just two conurbations of at least 10 million people – New York and Tokyo. Today, there are 28, 15 of them in Asia.[2] Statistics forecast that the population in Asia is set to double by 2050 – particularly in urban coastal areas. An increase in prosperity also means the number of people defined as "middle class" is expected to double between 2009 and 2020. And future increases in income are likely to double tropical cyclone damage even without the impact of climate change according to a 2012 report on The Impact of Climate Change on Global Tropical Cyclone Damage, published in Nature.[3]

Underinsurance a major issue

The situation is exacerbated by the fact that growth of exposures is far outpacing take-up of insurance coverage, resulting in a growing gap in natural catastrophe – including windstorm - preparedness and response. For example, Haiyan is the costliest tropical storm event in Asia by overall losses ($10.5bn) in the past 35 years. However, only approximately $700m of this was insured.

"Historically, hurricanes such as Katrina and winter storms such as Gudrun – both in 2005 – affecting the US and Europe have represented the greatest risk to AGCS," says **Richard Quill, Catastrophe Risk Management, AGCS**.

"However, as the company has entered and expanded in growth markets, windstorm activity in other regions around the world have become more a focus point; most notably in the Asian markets including in particular India, China, South Korea and the Philippines.

"The impact of global warming on windstorm activity is continuously being studied to determine the changes in the occurrence and intensity of events – both in the offshore regions and on-land. There are still multiple challenges regarding risk assessment for windstorms. Sound underwriting will be required to best manage any potential future changes in risk landscape."

One of eight ships washed ashore at Anibong District, Tacloban City during Typhoon Haiyan. Haiyan is the costliest tropical storm event in Asia in the past 35 years ($10.5bn). However, only $700m of this loss is estimated to be insured. Globally, the marine industry is highly exposed to windstorm losses, according to analysis of corporate insurance claims.

Photo: Wikimedia Commons

[1] www.allianzre.com/Allianzre/Press_Page/BusinessNews/2014/Windstorms_A_Rising_Threats.html [2] United Nations World Urbanization Prospects, 2005 and 2014 revisions
[3] www.nature.com/nclimate/journal/v2/n3/full/nclimate1357.html

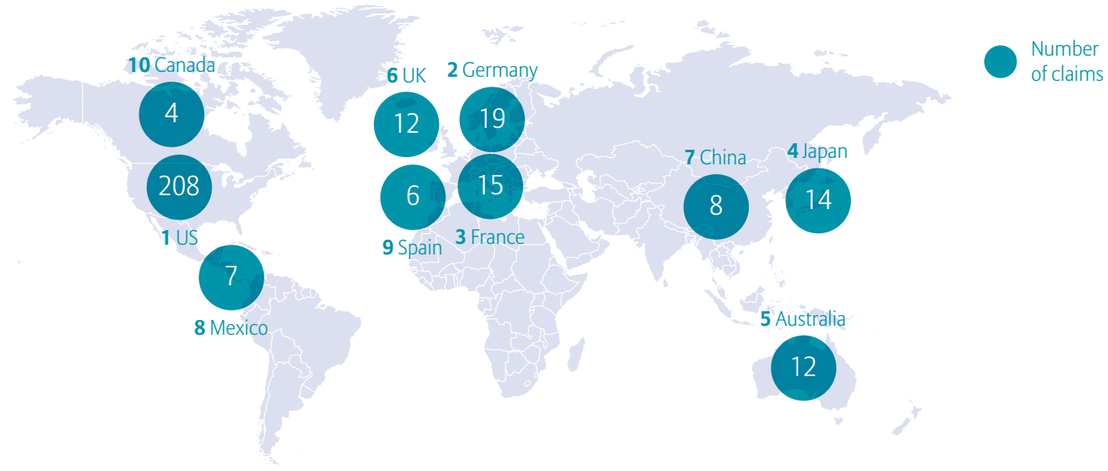
Windstorm loss data dashboard (business claims)

Key Statistics: Windstorm loss analysis

- Natural hazards account for **3 of the top 10** causes of loss for business. **Storm is ranked 5**, based on analysis of over 11,000 major business claims (over €100,000) from 148 countries over a five-year period. **Earthquake is ranked 4**. **Flood 7**.
- Approximately **1 in 10** claims over €100,000 result from natural hazards (**1,092 out of 11,427**).
- **3.7%** of all claims are caused by storm, or every **27th loss** over €100,000 (**426 out of 11,427**).
- Windstorm accounts for approximately **40%** of all natural hazard losses (including earthquake), by number of claims and **26%** of total amount by value.
- US losses account for **49%** of global windstorm claims by number over the past five years (**208 out of 426**) and **42%** by value
- The marine industry is highly exposed to windstorm losses accounting for **60%** of windstorm claims by number compared with **30%** for property and **54%** of all windstorm claims by value. However, the average property claim is higher. Storm is the **fourth** top cause of loss in the marine industry by value of claims.

Analysis includes Allianz Global Corporate & Specialty claims and those from other insurers

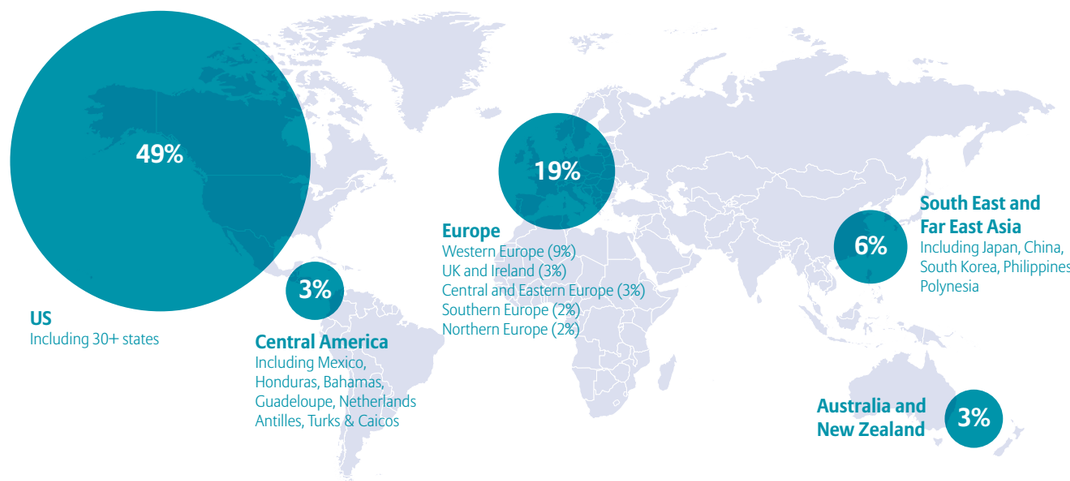
In focus: Top loss locations (countries) by number of business claims (€100,000+)



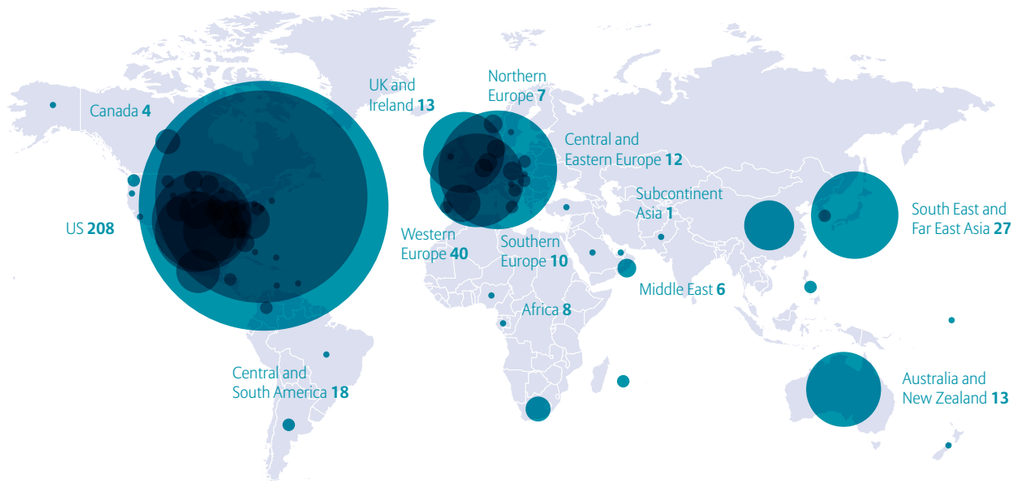
Source: Allianz Global Corporate & Specialty (Based on windstorm claims over €100,000 over a five accident year period: 2009-2013)

In focus: Top 5 regions by number of business claims (€100,000+) in %

Exchange rate:
€100,000: US$110,000



In focus: Five-year windstorm loss locations of business claims (€100,000+)



Methodology: AGCS analyzed 11,427 corporate claims from 148 countries with a total value of more than €21.5bn, recorded for the accident years 2009-2013, each with a total value after deductible of €100,000 or higher, including all its traditional lines of business (excluding Allianz Risk Transfer). There were 426 windstorm claims.
All claims figures are 100% (not only the AGCS share but including coinsurers shares). While the losses analyzed are not representative of the industry as a whole – and reflect risk appetite – they give a strong indication of the major windstorm risks.

Source: Allianz Global Corporate & Specialty

Windstorm loss mitigation #calmbeforestorm

Recent hurricane seasons have been comparatively mild in the US. In 2014 only one hurricane made landfall, causing little damage – the second year in a row without a major hurricane developing.

The beginning of the 2015 hurricane season constituted the longest streak without a major hurricane making landfall (Category 3 or above) since the 1860s, according to the Property Casualty Insurers Association of America (PCI).

Yet other recent events around the globe demonstrate the cost of complacency and reinforce how important it is to be adequately prepared for windstorm events. Storm-related losses account for the top five insured natural catastrophe events around the globe during the first half of 2015, collectively totaling in excess of $5bn[1] with the bulk of these losses coming from extreme winter storms in the US/Canada and windstorm Niklas in Europe.

Such losses can be greatly minimized by adequate preparation before the storm arrives, including the development and implementation of a comprehensive written windstorm emergency plan.

Photo: Jay Siegel

Most of the wind damage to structures from Katrina occurred to the building envelope. Allianz has since developed more extensive surveys which place greater scrutiny on the condition of roofs in storm-prone areas.

Photo: FEMA/Bob McMillan via Wikimedia Commons

A flooded theme park in New Orleans after Katrina. Today, new technology has a key role to play in better aiding risk assessment and response.

[1] Munich Re, Geo Risks Research, NatCat Service - July 2015

Download at

www.agcs.allianz.com/insights/white-papers-and-case-studies/natcat-checklist-windstorm/

Download a checklist for flood preparedness

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Pre-windstorm planning

- Develop a comprehensive written windstorm emergency plan to mitigate exposures
- Designate a person to monitor the status and location of the windstorm, keeping key personnel updated. Allow sufficient time to implement emergency procedures
- Inspect and repair roofs for problems such as loose covering; flashing, blocked or loose drains; inadequately secured equipment such as signs, stacks, roof ventilators etc
- Anchor large equipment, such as cranes and draglines in accordance with manufacturer's guidelines
- Relocate loose outdoor equipment. Secure storage of flammable liquid containers or move to a sheltered area (but never into main facility areas)
- Identify and consider removing any large trees that could fall and damage buildings, outdoor equipment, powerlines etc
- Protect exterior windows and doors
- Fill fuel tanks of generators, fire pumps, company-owned vehicles etc
- Fill aboveground tanks to capacity with product or water to prevent wind damage
- Clean out debris from storm drains and catch basins
- Protect computers, stock and key machinery and equipment subject to water damage. Backup all computer data and store in a safe location. Consider moving valuable/critical stock from the site to a safe location
- Isolate or remove any chemicals that can react violently with each other
- Prepare for possible flooding if located in a flood-prone area
- Be prepared to safely shut down operations if necessary

During a windstorm

- Emergency response personnel should remain at the facility if safe to do so and be prepared to respond
- Continue to monitor weather reports for information on potential storm damage, access to property, utility outage etc. Update management and maintenance accordingly
- Patrol the property and watch for roof leaks, fire, structural damage
- Constantly monitor processes, equipment that must remain on during windstorm
- During power failure, turn off electrical switches to prevent reactivation before necessary checks are completed

After a windstorm

- Secure the site to prevent unauthorized entry
- Organize and prepare emergency crews for salvage and cleaning operations
- If safe to do so conduct an immediate damage assessment
- Notify utility companies of any outages or damage
- Call in key personnel and notify contractors to begin major repairs
- Initiate salvage operations
- Review the effectiveness of the windstorm emergency plan and revise as needed.

Think about business continuity and communication

Even though business continuity management has become a much-discussed topic, not every business has best practices. After insurance has been paid - in some cases - this might only cover perhaps 40% to 50% of the total economic loss. Very often there is a loss of market share, suppliers, clients and qualified staff that the impacted business has to deal with. "An area of possible improvement here could be the evaluation of CBI exposures from national hazard events in addition to those from the direct supply chain," says **Stefan Kippert, Senior Account Engineer, Allianz Risk Consulting**.

Plan (resources, contractors, repair, replacement)

- Ensure how clients will continue to be served
- Negotiate agreements in advance with suppliers and customers to cover such emergencies
- Know markets for available replacement equipment and consider purchasing used equipment
- Shift production to another facility, ideally outside the affected area
- Proactively inform clients or suppliers about the situation, ongoing measures and key contact persons in charge
- Ability to communicate can be constrained. Utilize social media platforms.

Photo: Shutterstock

Claims response

Claims work starts long before a hurricane, storm or typhoon hits – it's about preparing businesses for the worst-case scenario.

"Businesses need to be sure to have tested business continuity plans and especially communications cascades in place and have insurance policies at a safe location," advises **Andreas Shell, Head of Short-Tail Claims, AGCS**. "Creating a separate booking account to which businesses can record hurricane-related damages to easily identify the loss incurred can also help."

According to **Terry Campbell, Regional Claims Head, Americas at AGCS** there are three things that every company should do to ensure the claims settlement process runs as smoothly as possible in the aftermath of a windstorm event.

"Follow the protocol outlined in the catastrophe response plan," he says. "If there isn't one in place, one should be immediately developed for that event. Ensure there is adequate staff to respond and that there is ongoing communication to include scheduled meetings to discuss progress as well as issues, problems etc. These can be done as frequently as necessary."

Increasing influence of new technology

In order to keep up with rapid changes in risk concentration insurers such as AGCS are increasingly making use of modern technology and models to better aid risk assessment and response. AGCS is currently checking new technology such as drones, thermographic imaging and live streaming in order to gain access to otherwise inaccessible areas or property.

Satellite technology and 3D imagery means insurers can also locate risks more precisely – down to the level of individual buildings. But the best mathematical model in the world can only work if the data used is correct and the risk is clearly identifiable. To be even better able to assess risks in the future, geocoding per location and direct dialogue with the insured are fundamental.

Construction site hurricane protection

Engineering and construction firms operating in windstorm-affected areas are acutely aware of the hazards posed to construction sites. However, contractors can make the mistake of leaving inadequate time to protect the project. Construction sites are extremely susceptible to losses when exposed to hurricanes, typhoons and storms. Structures under construction often have incomplete or temporarily supported weakened structural systems, unsecured building envelopes, loose materials and debris, temporary structures and susceptible construction equipment. Construction debris can become projectiles, damaging building components and structures. Windows, doors, roofs and building openings, even if secured, can be damaged and allow water to infiltrate the building envelope. Partially secured walls, shored floors and structures under construction may be at high risk of collapse from wind loadings. A storm surge can flood and damage low-lying structures, foundations and retaining walls. Cranes and other equipment can collapse and/or be damaged by high winds or flying debris. By utilizing a hurricane action plan contractors can minimize the impact and expedite project recovery. However, if the plan is to be useful, project-specific thought and consideration are essential.

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Photo: Shutterstock

Cranes and other equipment on a construction site can be damaged or even collapse due to high winds or flying debris. Contractors can make the mistake of leaving inadequate time to protect the project.

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