

Disaster Prep

Hurricane preparedness and action plan

In this installment of **Disaster Prep**, we focus on hurricane preparedness and actions to take to protect your workplace in the event of a hurricane or tropical storm.

Now is the time to prepare – it only takes one

The Atlantic hurricane season officially begins on June 1 and runs through November 30 each year. Although the peak of the season is usually during August – October, preparation is strongly advised at all times no matter how many storms are forecast. For example, Andrew, a Category 5 hurricane, roared ashore to devastate South Florida on August 24, 1992, a year in which only seven named storms occurred for the season.

According to the National Hurricane Center, the 2018 Atlantic hurricane season featured above-normal activity. Fifteen named storms formed, of which eight became hurricanes and two became major hurricanes – category 3 or higher on the Saffir-Simpson Hurricane Wind Scale. This compares to the long-term average of 12 named storms, six hurricanes and three major hurricanes. There was also one tropical depression that did not reach tropical storm strength. (See page 7, “Understanding hurricane terminology.”)

In terms of Accumulated Cyclone Energy (ACE), which measures the combined strength and duration of tropical storms and hurricanes, activity in the Atlantic basin in 2018 was

We've created this Disaster Prep series to help you prepare for, protect against and respond to the effects of a natural disaster such as a hurricane, flood or tornado.

For more information, please review the resources in our [Disaster Response Center](#) or contact your local Willis Towers Watson client relationship director or risk control consultant.



See our other reports in this series:

- [Disaster Prep: Hurricane preparedness and action plan \(for you and your family\)](#)
- [Disaster Prep: Flood evaluation and recovery plan](#)
- [Disaster Prep: Post-flood safety and security](#)
- [Disaster Prep: Tornado preparedness and safety](#)
- [Disaster Prep: Business continuity management](#)

also above normal. In addition, seven systems were subtropical at some point in their lifetimes this season, which eclipses the previous record of five in 1969.¹

¹National Hurricane Center, Monthly Atlantic Tropical Weather Summary, <https://www.nhc.noaa.gov/text/MIATWSAT.shtml>

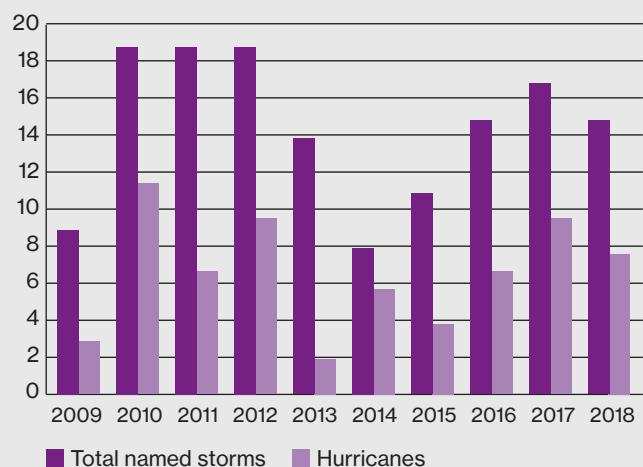
It's important to keep in mind that the effects of a hurricane or tropical storm can be felt for hundreds of miles inland, not just along the coast. For example, inland flooding can be a huge concern, even if you are not physically located in a flood zone. Additionally, tornadoes are frequently spawned from hurricanes and tropical storms making landfall, so precautions are needed to protect structures and personnel from these events as well. (See other installments in this series for more information about safeguarding against floods and tornadoes.)

"Coastal residents are reminded that it only takes one hurricane making landfall to make it an active season for them, and they need to prepare the same for every season, regardless of how much activity is predicted."

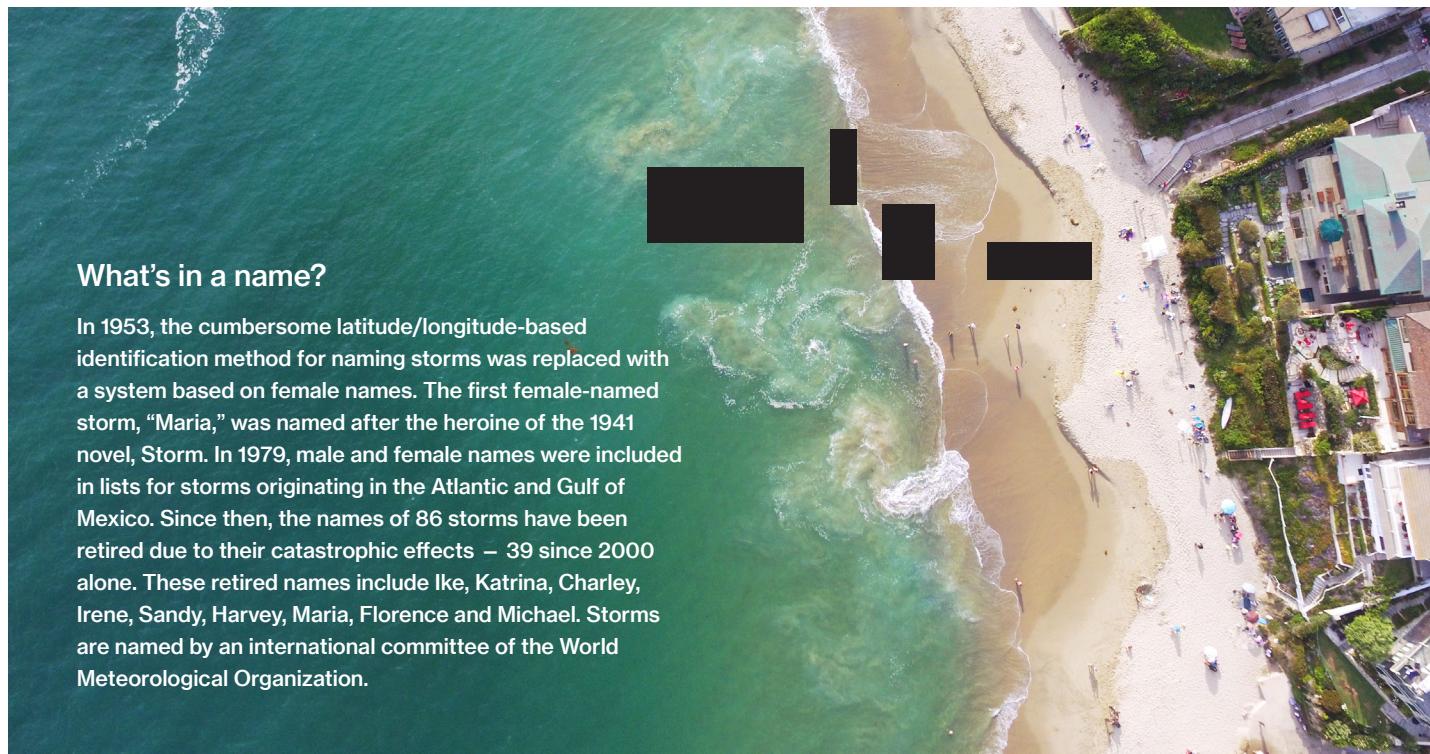
— Philip J. Klotzbach of the Department of Atmospheric Science, Colorado State University

Figure 1 shows the total number of named storms and hurricanes that have occurred between 2008 and 2017. Activity has steadily increased each year since 2014 for named storms.

Figure 1. Total named storms and hurricanes, 2009 – 2018



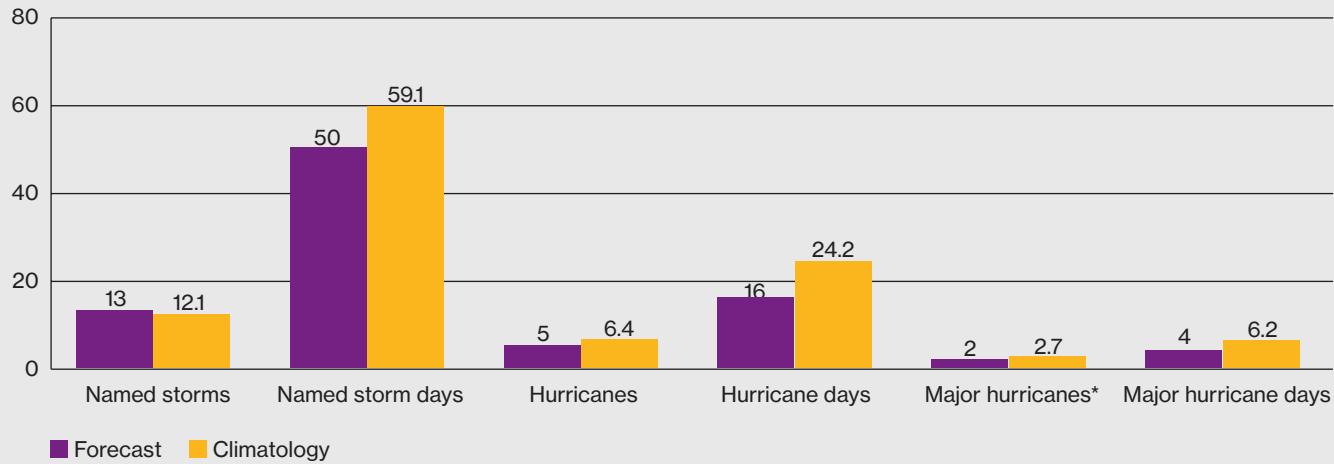
Source: National Hurricane Center



What's in a name?

In 1953, the cumbersome latitude/longitude-based identification method for naming storms was replaced with a system based on female names. The first female-named storm, "Maria," was named after the heroine of the 1941 novel, *Storm*. In 1979, male and female names were included in lists for storms originating in the Atlantic and Gulf of Mexico. Since then, the names of 86 storms have been retired due to their catastrophic effects – 39 since 2000 alone. These retired names include Ike, Katrina, Charley, Irene, Sandy, Harvey, Maria, Florence and Michael. Storms are named by an international committee of the World Meteorological Organization.

Figure 2. 2019 hurricane prediction (forecast vs. climatology)



Source: Extended Range Forecasts of Atlantic Seasonal Hurricane Activity and Landfall Strike Probability, (Department of Atmospheric Science, Colorado State University).

*Major Hurricane: A hurricane which reaches a sustained low-level wind of at least 111 mph (96 knots) at some point in its lifetime. This equates to a Category 3 or higher on the Saffir-Simpson Hurricane Wind Scale.

Figure 2 shows projections for named storms, hurricanes and major hurricanes for 2019, compared to a 30-year average from 1981 – 2010, known as “climatology.”

2019 landfall predictions

Information obtained through March 2019 indicates that the 2019 Atlantic hurricane season will have activity slightly below the 1981-2010 average.²

Here are the probabilities for at least one major (category 3-4-5) hurricane landfall on each of the following coastal areas, and the percentage point increase or decrease this represents compared to the average for the last century:

- **Entire continental U.S. coastline:** 48% (-2 percentage points)
- **U.S. East Coast including Peninsula Florida:** 28% (-3 percentage points)
- **Gulf Coast from the Florida Panhandle westward to Brownsville:** 28% (-2 percentage points)
- **The Caribbean:** 39% (-3 percentage points)

Seasonal updates of Colorado State University’s 2019 Atlantic basin hurricane forecasts will be issued on June 4, July 2 and August 6. Two-week forecasts for Atlantic tropical cyclone activity during the climatological peak of the season will run from August-October. A verification and discussion of all 2019 forecasts will be issued in late November 2019. These updates can be found at: <http://hurricane.atmos.colostate.edu/Forecasts>.

²Philip J. Klotzbach, Extended Range Forecast of Atlantic Seasonal Hurricane Activity and Landfall Strike Probability for 2019, (Department of Atmospheric Science, Colorado State University, 2019), <https://tropical.colostate.edu/media/sites/111/2019/04/2019-04.pdf>

When a tropical storm or hurricane watch is issued, follow local weather and news reports closely to determine the path of the storm and learn about any advisory or mandatory evacuation orders from public emergency management authorities.

Additionally, having clear, concise and well-practiced hurricane plans in place offers the following advantages:

- Once a hurricane or tropical storm watch is issued, instructions will be more readily available, understood and implemented.
- Needed information, supplies and equipment are identified before disaster strikes.
- People, including your emergency response team, respond faster and more effectively.
- A clear assignment of tasks and responsibilities will be in place.
- Emergency training and other resource needs can be easily identified.

How to prepare your workplace

At the start of every hurricane season, review any existing emergency response plans you have developed. These plans detail the actions you will take in the event of an emergency and generally include:

- Up-to-date contact information of employees, business partners and vendors
- A predetermined group of employees who will perform specific tasks in order to prepare for an event (emergency response team)
- Communication procedures
- A list of needed items and materials

For properties you own, you will want to assemble your emergency response team to discuss the availability of employees and the procedures you will take in the event of a tropical storm or hurricane warning. For locations you lease, you will want to work with the landlord to ensure they have the proper materials and procedures to adequately prepare for the storm.

In order to prepare a specific property or structure for a hurricane, keep in mind that buildings located next to open terrain where the wind can blow unobstructed – such as near fields, large bodies of water, parking lots and airport runways – are likely to be damaged when the wind strikes with full force. Some tips for protecting your workplace in the case of a hurricane include the following:



Secure your “building envelope”

The roof covering and building envelope are your first line of defense. A building's envelope consists of its foundation, roof, walls, doors and windows, which provide a physical barrier between the interior and exterior areas of the building. Check the roof drains to ensure they are not clogged with debris and water can flow properly. The roof covering should be in good condition and free from blisters and other signs of physical damage. Also, the roof flashing should be tightly secured at the edge of the roof where the roof and building walls meet. Note: Unreinforced parapets (protective walls), decorative facades and unsecured mechanical equipment can blow over and damage the rooftop.

Rain entering the building, not wind striking it, can account for significant damage to equipment, furnishings and interior finish. Be sure to close and latch exterior doors and windows, and brace large doors at shipping and receiving docks. Be sure to close hurricane shutters or cover windows with plywood.



Protect against wind-borne debris

Glass wall panels and plate glass windows are vulnerable to damage by wind-borne debris and the direct force of wind. Before the storm, remove outdoor furniture, trash cans and other lightweight objects that could become wind-borne missiles. Indoors, relocate equipment away from windows or cover it with waterproof tarps. In offices, remove items from windowsills and place papers and files in cabinets or other waterproof containers. Outside trailers should be tied down to the ground or building to prevent movement.



Prepare equipment and utilities

An orderly shutdown of equipment and utilities should be implemented. If deemed necessary, you may want to shut down critical utilities, such as natural gas and electrical systems, to prevent possible sources of ignition. Simply turning a piece of equipment to the off position may not be recommended until other steps are taken first.

Back-up electrical equipment, such as uninterruptable power supplies (UPS systems) and generators, as well as sump pumps and other water removal systems, should be tested to ensure proper operation. Since it may be several days before the building can be occupied, make sure all fire protection equipment is in ready and working condition. Since electric power will probably not be available, ensure all fuel-fired equipment is full.

Once the hurricane warning is issued, it's time to finalize all preparations as it may quickly become too dangerous to finish all the items you want to complete.

Post-storm assessment

Once the storm has passed, secure the facility and survey for damage, taking pictures or video. Review and document any damage to both the exterior and interior of buildings and their contents.

Assume that all downed power lines are fully energized under all circumstances and avoid them. Before utilities are returned to service, check for gas leaks, look for electrical system damage, and check for sewage and water line damage.

Workers walking through areas covered with glass and other debris should wear proper personal protective equipment, such as steel-toed work boots, thick gloves, eye protection, dust masks and other safety equipment.

During any restoration or repair period, make sure that property conservation programs and procedures are explicitly followed. Should you need to shut down a fire sprinkler system during restoration, follow the proper impairment procedures. Follow proper permit procedure for any hot work that you may need to perform. Hot work includes the use of any flame or heat-producing device used for welding, brazing, grinding and soldering.

A checklist of hurricane precautions and assessment before, during and after the storm

The following checklist will be helpful in covering aspects of hurricane preparedness and damage assessment post-hurricane.

Before the storm

- Review/Update emergency response plans and business continuity/disaster recovery plans.
- Review procedures with emergency organizations or emergency response teams to ensure all positions are filled and all members are properly trained.
- Check the general condition of the building, specifically the roof covering, roof, flashing and roof drains. Make all necessary repairs.
- Order emergency supplies, such as plywood for windows, mops, brooms, tarpaulins for key equipment, sandbags, etc.
- Identify key equipment, stock and supplies, and vital records that will need to be relocated, covered and/or raised off the floor level.
- Have materials available to secure outside and/or roof-mounted equipment, such as cranes, signs, trailers and HVAC equipment. Also, check securing of above-ground tanks, such as propane and diesel fuel.
- Monitor commercial TV, radio and/or Internet websites to keep abreast of weather conditions and watches and/or warnings.
- Test all generators, emergency lighting, uninterrupted power supply (UPS) equipment and sump pumps to ensure proper operation.

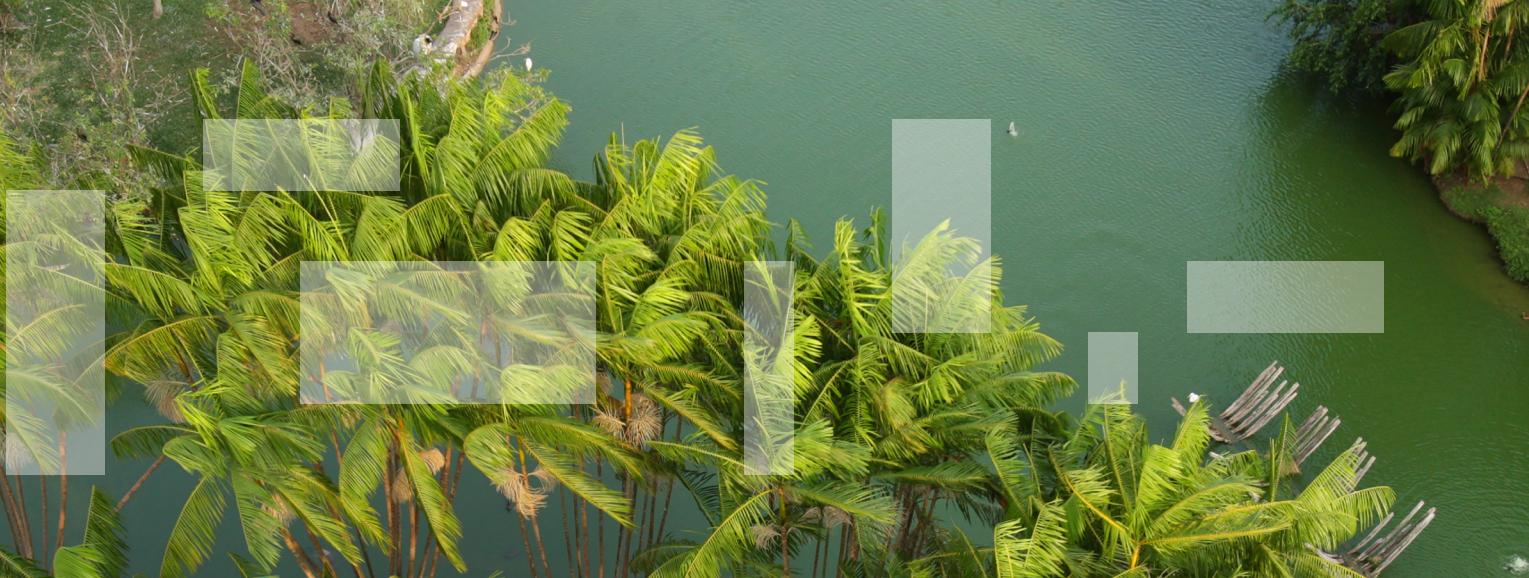
Impending storm

- Implement business continuity/disaster recovery plan.
- Shut down operations in an orderly manner and in accordance with emergency shutdown procedures.
- Check all fire protection equipment, such as sprinkler control valves and fire pumps.
- Fuel all fire pumps, generators, company vehicles, power equipment (e.g., saws, etc.).
- Install hurricane shutters or plywood over windows and doors.
- Cover computers, machinery, stock and supplies with tarpaulins.
- If possible, raise any equipment, finished goods or items off the floor.

- Secure outside and/or roof-mounted equipment, such as cranes, signs, trailers and HVAC equipment.
- If necessary, turn off utilities to reduce the probability of a fire/explosion.
- Conduct final inspection of building and make emergency repairs.
- Heed advice from local officials regarding any evacuation orders.

After the storm

- If safe, make emergency repairs and commence with salvage procedures to try to keep any additional damage from occurring.
- Survey for damage – take pictures of any damage to both the building(s) and its contents.
- Avoid loose or dangling power lines and report them to a utility company, police or fire department.
- Before utilities are returned to service, check for gas leaks, look for electrical system damage, and check for sewage and water line damage.
- Begin salvage operations as soon as possible.
- Clean debris from roofs and property, if safe to do so.
- Use telephone only for emergency calls.
- Use preestablished property risk control programs and procedures programs, such as sprinkler impairment procedures, and cutting and welding permits, when repairs commence.
- Stay tuned to local radio for information.
- Critique pre- and post-storm actions to identify strengths and weaknesses, and make necessary modifications to prepare for the next emergency.



Understanding hurricane terminology

To identify the degree of the hurricane hazard, you should familiarize yourself with the following terms:

Tropical depression. The first official stage of storm classification; a tropical storm has winds less than 39 miles per hour.

Tropical storm or cyclone. A tropical weather event that is named when winds reach anywhere between 39 and 73 miles per hour.

Hurricane. A tropical storm that reaches wind speed of 74 miles per hour or greater.

Major hurricane. A hurricane which reaches a sustained low-level wind of at least 111 mph (96 knots) at some point in its occurrence. This equates to a Category 3 or higher on the Saffir-Simpson Hurricane Wind Scale. (See page 7, Hurricane classifications chart.)

Hurricane watch. An announcement that hurricane conditions (sustained winds of 74 mph or higher) are *possible* within the specified area. (Because hurricane

preparedness activities become difficult once winds reach tropical storm force, the hurricane watch is issued 48 hours in advance of the anticipated onset of tropical-storm-force winds.)

Hurricane warning. An announcement that hurricane conditions (sustained winds of 74 mph or higher) are *expected* somewhere within the specified area. (Because hurricane preparedness activities become difficult once winds reach tropical storm force, the hurricane warning is issued 36 hours in advance of the anticipated onset of tropical storm-force winds.)

Tropical storm watch. An announcement that tropical storm conditions (sustained winds of 39 to 73 mph) are *possible* within the specified area within 48 hours.

Tropical storm warning. An announcement that tropical storm conditions (sustained winds of 39 to 73 mph) are *expected* somewhere within the specified area within 36 hours.

Hurricane classifications

The Saffir-Simpson Hurricane Wind Scale (SSHWS) assigns a 1 to 5 rating to hurricanes based on their sustained wind speed. This scale is used to estimate potential property damage. Hurricanes reaching Category 3 and higher are considered “major” hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still considered dangerous, however, and require preventive measures.

Hurricane classifications

Category	Description	Injury risk to people/animals	Damage risk to homes	Damage risk to industrial structures	Power outages	Example
1	Sustained winds 74 – 95 mph (119 – 153 km/hr) Very dangerous winds will produce some damage.	People, livestock and pets struck by flying or falling debris could be injured or killed.	Potential loss or damage to roof and porch coverings and awnings; unprotected windows may break if struck by flying debris; masonry chimneys can be toppled.	Potential loss of roofing and siding especially from windward corners, rakes and eaves; damage to overhead doors and unprotected windows; windows in high-rise buildings can be broken by flying debris; falling and broken glass will pose a significant danger; occasional damage to commercial signage, fences and canopies.	Extensive damage to power lines and poles will likely result in power outages that could last a few to several days.	Hurricane Dolly, South Padre, TX (2008)
2	Sustained winds 96 – 110 mph (154 – 177 km/hr) Extremely dangerous winds will cause extensive damage.	Substantial risk of injury or death to people, livestock and pets due to flying and falling debris.	High chance of roof structure removal if not anchored properly; high probability of unprotected windows broken by flying debris; substantial risk of roof and siding damage to apartment buildings; unreinforced masonry walls can collapse.	Substantial risk of roof and siding damage; falling and broken glass pose a significant danger; commercial signage, fences and canopies could be destroyed; roads blocked due to broken trees.	Near-total power loss is expected and could last from several days to weeks. Potable water could become scarce as filtration systems begin to fail.	Hurricane Frances, Port St. Lucie, FL (2004) Cat. 2 winds and impacts to coastal areas; Cat. 1 conditions elsewhere in the city
3	Sustained winds 111 – 129 mph (178 – 208 km/hr) Devastating damage will occur.	High risk of injury or death to people, livestock and pets due to flying and falling debris.	High risk of removal of roof and exterior walls to poorly constructed homes; unprotected windows broken by flying debris; high percentage of roof covering and siding damage to apartment buildings.	High risk of roof covering and siding damage; isolated structural damage to wood or steel framing; significant damage to older metal buildings including collapse of older unreinforced masonry buildings; windows blown out of high-rise buildings could result in falling glass; most commercial signage, fences and canopies will be destroyed; roads blocked due to tree damage.	Electricity and water will be unavailable for several days to a few weeks after the storm passes.	Hurricane Ivan, Gulf Shores, AL (2004) Cat. 3 winds and impacts to coastal areas; Cat. 2 conditions elsewhere in this city
4	Sustained winds 130 – 156 mph (209 – 251 km/hr) Catastrophic damage will occur.	Very high risk of injury or death to people, livestock and pets due to flying and falling debris.	High risk of collapse of older unreinforced masonry buildings; most windows blown out of high-rise buildings resulting in falling glass; fallen trees and power poles will isolate residential areas.	Steel frames in older industrial buildings can collapse; nearly all commercial signage, fences and canopies will be destroyed; most trees will be snapped or uprooted and power poles downed.	Power outages will last for weeks to possibly months. Long-term water shortages will occur. Most of the area will be uninhabitable for weeks or months.	Hurricane Charley, Punta Gorda, FL (2004) Cat. 4 winds and impacts to coastal areas; Cat. 3 conditions elsewhere in the city
5	Sustained winds greater than 157 mph (252 km/hr or higher) Catastrophic damage will occur.	Very high risk of injury or death to people, livestock and animals from flying or falling debris, even if indoors in mobile homes or framed homes.	High risk of frame homes being destroyed, with total roof failure and wall collapse; extensive damage to roof covers, windows and doors; wind-borne debris will be lofted into the air causing damage to nearly all windows, whether protected or unprotected; fallen trees and power poles will isolate residential areas; high risk of low-rise apartment buildings being destroyed.	Significant damage to wood roof commercial buildings; complete collapse of many older metal buildings; most unreinforced masonry walls will fail, which can lead to collapse of the buildings; high risk of industrial buildings being destroyed; nearly all commercial signage, fences and canopies will be destroyed; nearly all trees will be snapped or uprooted and power poles downed.	Power outages will last for weeks to possibly months. Long-term water shortages will occur. Most of the area will be uninhabitable for weeks or months.	Hurricane Andrew, Cutler Ridge, FL (1992) Cat. 5 winds and impacts to coastal areas; Cat. 4 conditions elsewhere in south Miami-Dade County

How Willis Towers Watson can help

Hurricanes are one of the most destructive weather events on the planet. However, with advanced warning and preplanning, you can implement the necessary steps to do everything possible to help mitigate the severity of hurricane losses.

Helping clients plan for and resolve complex claims resulting from large scale disasters

Willis Towers Watson has teams of highly qualified experts specializing in disciplines that provide solutions to issues that are critical to our clients. Our National Property Claims and Forensic Accounting & Complex Claims (FACC) practice include: certified public accountants, forensic accountants, property claim consultants, certified fraud examiners, project managers, FEMA experts, and engineering and construction consultants, with colleagues residing in multiple offices around the world.

The senior leaders of the National Property Claims and FACC teams have worked on some of the most challenging and complex insurance claims resulting from some of the world's largest catastrophes and disasters, such as Superstorm Sandy and Hurricane Katrina, and the more recent Hurricanes Harvey, Irma and Maria. These teams have been successful in quantifying and recovering billions of dollars on behalf of clients.

How the National Property Claims and FACC teams can help you recover from catastrophic events

We assist in the preparation, quantification and resolution of large and complex insurance claims, including property damage, business interruption, extra expense, contingent business interruption and third-party claims. We add value for our clients by quantifying the loss amounts, gathering the necessary supporting documents, preparing and submitting claims on the client's behalf, and managing the entire claim process while maximizing the recovery within the parameters defined by the insurance policy. We work in conjunction with Willis Towers Watson claim advocates and other associates to move quickly through the settlement process.

The Property Claims team will analyze the coverage applicable to the claim, advocate on behalf of our clients with respect to that coverage and secure a resolution consistent with the coverage afforded. We use our contacts with senior property claims personnel within the insurance market to better leverage our clients' ability to equitably resolve claims.

We help clients across all industries and geographies recover from catastrophic events by:

- Simplifying the claim process so clients can focus on returning to normal day-to-day business activities
- Quantifying the loss amounts and gathering the necessary supporting documents
- Minimizing the overall disruption to business operations by obtaining advance payments in the early stages of a loss
- Preparing and submitting the claim on the client's behalf in a format that is familiar to insurers
- Working directly with the adjuster and the carrier's experts
- Participating in meetings to explain the methodology behind loss calculations and respond to requests for additional documentation

Visit our website to access more information on disaster preparedness and claim processing.

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Resources

National Hurricane Center:

<http://www.hurricanes.gov>

National Hurricane Center Facebook page:

<http://www.facebook.com/NWSNHC>

National Hurricane Center Twitter page:

<http://www.nhc.noaa.gov/twitter.shtml>

Colorado State University Department of Atmospheric Science Tropical Meteorology Project:

<http://hurricane.atmos.colostate.edu/Forecasts>

Graphical Tropical Weather Outlook:

<http://www.nhc.noaa.gov/aboutnchgraphics.shtml#GTWO>

Saffir Simpson Hurricane Wind Scale:

<http://www.nhc.noaa.gov/aboutsshws.php>

Definition of NHC Track Forecast Cone:

<http://www.nhc.noaa.gov/aboutcone.shtml>

Local and state offices of emergency management, including police and fire departments

Website references

[www.education.noaa.gov/Weather_and_Atmosphere/
Hurricanes.html](http://www.education.noaa.gov/Weather_and_Atmosphere/Hurricanes.html)

www.ready.gov/hurricanes

www.redcross.org

www.petswelcome.com

www.flash.org

www.fmglobal.com (P9811, Protecting Your Facility Against Major Windstorms)

tbrpc.org/tampabaydisaster/hurricane_guide2012/HG_2012.html

www.wunderground.com/tropical/

www.nhc.noaa.gov/

The observations, comments and suggestions we have made in this publication are advisory and are not intended nor should they be taken as legal advice. Please contact your own legal advisor for an analysis of your specific facts and circumstances.

About Willis Towers Watson

Willis Towers Watson (NASDAQ: WLTW) is a leading global advisory, broking and solutions company that helps clients around the world turn risk into a path for growth. With roots dating to 1828, Willis Towers Watson has 45,000 employees serving more than 140 countries and markets. We design and deliver solutions that manage risk, optimize benefits, cultivate talent, and expand the power of capital to protect and strengthen institutions and individuals. Our unique perspective allows us to see the critical intersections between talent, assets and ideas – the dynamic formula that drives business performance. Together, we unlock potential. Learn more at willistowerswatson.com.



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