STORMS SURGING
BUILDING RESILIENCE IN EXTREME WEATHER
The intensity, frequency and duration of North Atlantic hurricanes, as well as the frequency of Category 4 and 5 hurricanes, have all increased since the early 1980s. Hurricane-associated flooding and rainfall rates are projected to rise. Models project a slight decrease in the annual number of tropical cyclones, but an increase in the number of the strongest (Category 4 and 5) hurricanes going forward1.

Companies must consider the full spectrum of risks associated with extreme weather, such as operational, reputational and regulatory impacts, in addition to increased property damage from natural catastrophes. Resilience requires corrective action and investment, but also brings opportunities for loss prevention solutions and adequate insurance coverage.


### TOP 10 COSTLIEST HURRICANES IN THE UNITED STATES2

<table>
<thead>
<tr>
<th>Rank</th>
<th>Date</th>
<th>Location</th>
<th>Hurricane</th>
<th>Estimated Insured Loss (2018 dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>August 25-Sep. 3, 2005</td>
<td>AL, LA, MS, TN</td>
<td>Hurricane Katrina</td>
<td>$41,100</td>
</tr>
<tr>
<td>2</td>
<td>September 19-22, 2017</td>
<td>PR, UT, FL, GA, NC</td>
<td>Hurricane Maria</td>
<td>$25,000</td>
</tr>
<tr>
<td>3</td>
<td>August 25-Sep. 3, 2017</td>
<td>AL, LA, FL, NC, TX</td>
<td>Hurricane Irma</td>
<td>$22,000</td>
</tr>
<tr>
<td>4</td>
<td>August 25-Sep. 3, 2017</td>
<td>AL, LA, MS, TN, TX</td>
<td>Hurricane Harvey</td>
<td>$18,000</td>
</tr>
<tr>
<td>5</td>
<td>October 28-31, 2012</td>
<td>CT, DE, ME, MD, MA, NH, NJ, NY, PA, RI, VT, WV</td>
<td>Hurricane Sandy</td>
<td>$19,760</td>
</tr>
<tr>
<td>6</td>
<td>August 24-27, 1992</td>
<td>FL, LA, MS</td>
<td>Hurricane Andrew</td>
<td>$15,500</td>
</tr>
<tr>
<td>7</td>
<td>September 12-14, 2008</td>
<td>AR, IL, IA, MO, OH, PA, TX</td>
<td>Hurricane Ike</td>
<td>$12,500</td>
</tr>
<tr>
<td>8</td>
<td>October 10-12, 2018</td>
<td>AL, FL, GA, MS, NC, SC, VA</td>
<td>Hurricane Michael</td>
<td>$9,900</td>
</tr>
<tr>
<td>9</td>
<td>October 24, 2018</td>
<td>FL, CA, NC, SC</td>
<td>Hurricane Florence</td>
<td>$3,000</td>
</tr>
<tr>
<td>10</td>
<td>August 10-14, 2018</td>
<td>FL, NC, SC</td>
<td>Hurricane Charley</td>
<td>$1,971</td>
</tr>
</tbody>
</table>

Source: Insurance Information Institute, Facts + Statistics: Hurricanes, 2020

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1 National Climate Assessment, Our Changing Climate, 2014
2 Property losses only. Excludes flood damage covered by the federally administered National Flood Insurance Program. Ranked on dollars when occurred. As of November 20, 2019.
3 Adjusted for inflation through 2018 by the Insurance Information Institute using the GDP implicit price deflator.
4 Insurance Information Institute estimate based on data from catastrophe risk modelers, reinsurance companies, the Property Claims Services unit of Verisk Analytics, the Federal Emergency Management Agency of the U.S. Department of Homeland Security, and the Florida Office of Insurance Regulations. These estimates are preliminary because the organizations involved periodically reassess the events, and the severity of losses and other factors create a high level of uncertainty surrounding the ultimate loss figures.
The 2019 hurricane season was above average in magnitude. It was only the seventh season since the 1930s to rack up multiple Category 5s over the Atlantic Basin.

With 18 named storms, 6 hurricanes, 3 intense hurricanes, and a seasonal ACE (Accumulated Cyclone Energy) index of 129.8, 2019 was above average by many metrics. ACE charts approximate wind energy used by a tropical system over its lifetime and is calculated every six hours. 2009 was also the fourth consecutive year in which a category 5 storm developed in the Atlantic basin—a new record. Across the board, 24% more ACE was expended by storms in 2019. It also brought about one of the strongest Atlantic hurricane landfalls on record.

The ACE index is used by various agencies, including the National Oceanic and Atmospheric Administration (NOAA) and the India Meteorological Department, to express activity of both individual tropical cyclones and entire tropical cyclone seasons. Seasonal ACE index is the sum of ACE indexes for each storm and takes into account the number, strength, and duration of all tropical storms in the season. The highest ACE calculated for a single storm in the Atlantic basin since 1950 was 70.4, for Hurricane Ivan in 2004.

Two category 5 storms (Dorian and Lorenzo) were each exceptionally long-lived. These two storms combined for more than 60% of 2019’s ACE. Dorian’s winds were among the strongest of any Atlantic hurricane in history before it made landfall in the Bahamas as a strong Category 5 storm and stalled for more than 24 hours. Dorian also brought winds and heavy rainfall to Coastal Carolina before making landfall near Cape Hatteras. Lorenzo was noteworthy for being the farthest east Category 5 storm in history, reaching peak intensity southwest of the Azores off the coast of Portugal, and then moving across northwestern Ireland as an extratropical cyclone.

The 2020 Allianz Risk Barometer—our annual report detailing top corporate risks for the year—notes that increasing volatility of weather rises to its highest-ever position (17% of responses). The report highlights why weather volatility has the potential to trigger enormously unpredictable loss scenarios for businesses and provides insights that should be at the core of all mitigation and resilience actions. According to more than 2,700 corporate decision makers surveyed by Allianz, increasing volatility of weather rises to its highest-ever position (17% of responses).

The 2019 hurricane season was above average in extent as wind damage. 2019 was also the fourth consecutive year to break the former record of 150 billion dollars. While there were more significant catastrophic events in previous years, 2019 delivered damaging events demonstrating a trend of higher losses. Clearly, such extreme weather conditions imperil factories and other assets, as well as transport and energy links that tie an entire supply chain together. A smaller portion of losses, about $52 billion, was insured when compared with 2018. This was due in part to the high share of flood losses which are often not insured to the same extent as wind damage.

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‘HEAT ISLANDS’ BRING MORE RAIN

Recent research finds that climate-heated oceans will increase rainfall from hurricanes and tropical storms. Hurricanes also appear to be slowing as they move ashore, further increasing the potential for high rainfall and flooding. Sea surface temperatures are expected to rise 3°F in regions where tropical systems form and will result in at least a 7% increase in rainfall, according to a peer-reviewed study written by Princeton University researchers in collaboration with NOAA’s Geophysical Fluid Dynamics Laboratory and the National Science Foundation. A good example of this type of storm was Hurricane Harvey, a Category 4 hurricane that made landfall in August 2017. Harvey caused catastrophic flooding and many deaths in Texas and Louisiana and is tied with 2005’s Hurricane Katrina as the costliest tropical cyclone on record. Harvey inflicted $125bn in damage, primarily from rainfall-triggered flooding in the Houston area and Southeast Texas, and was the wettest tropical cyclone on record in the US.

Warmer seas warm the air, and warmer air temperatures allow the atmosphere to hold more moisture. According to the Princeton study, warmer water also results in increased wind speeds (between 3.2% and 9%). In turn, higher winds consolidate moisture toward the center of storms. That combination could result in between 19% and 29% more rainfall within the central area of each storm. Thomas Knutson, a research meteorologist specializing in climate change at the NOAA lab and a co-author of the study, said conclusions were based in part on repeated runs of the lab’s new High Forecast-oriented Low Ocean Resolution (HiFLOR) model, which tracked rainfall results of modeled storms in present and future climate conditions.

The study also pointed out that flooding can be intensified by increased land coverage of pavement and buildings, which limits the ability of rainfall to seep into the ground, and concentrates water flowing through streets, canals and tunnels. Large cities, like Houston, can see a “heat island” effect that increases rainfall amounts. The addition of concrete and asphalt, buildings and rooftops, combined with the loss of trees and other vegetation, results in warmer temperatures within urban areas that also increase the ability of air above them to hold water vapor.

HOW DORIAN MAY ALTER THE SCALE OF HURRICANES

Hurricane Dorian’s devastating impact on the Bahamas in 2019 was nothing like the Caribbean had recently experienced. Dorian was the longest-stalling Category 5 hurricane since 1851, when record-keeping began. It maintained peak intensity for nearly 12 hours while impacting two islands, Abaco and Grand Bahama, and stayed at Category 5 intensity for nearly 30 hours. While the geographical extent of this event was limited mainly to those two islands, the record-setting landfall intensity and highly unusual storm path – in combination with its extensive damage footprint – was so shocking that it rekindled debate on whether the Saffir-Simpson Hurricane Wind Scale should be amended to include such upper-echelon events. A Category 5 hurricane classification is based on sustained windspeeds over 156 mph. While rare, such high speeds are not unheard of. In 2015 Hurricane Patricia, just off the west coast of Mexico, hit a speed of 215 mph before rapidly weakening in the interior mountains.


Some scientists believe these qualify as Category 6 storms which should be capped at 199 mph, with Category 7 starting at 200 mph. They warn of more intense storms with sustained wind speeds of 180 mph in coming decades – storms no longer viewed as extremely rare. They also worry that the emphasis on wind speeds tends to distract attention from the statistically more dangerous components of hurricanes: storm surge and flooding.

6 Houma Today. Study: Gulf storms will become more potent, December 2, 2019
9 Princeton University. Why are big storms bringing so much more rain? Warming, yes, but also winds, October 29, 2019
10 Aon Annual Report, Weather, Climate & Catastrophe Insights, 2019
11 South Florida Sun-Sentinel, Why we should consider adding Cat 6 to our hurricane categories, December 3, 2019

Source: Anya Douglas / Shutterstock.com

Debris image: Anya Douglas / Shutterstock.com
Concerned about the impact of a volatile climate on commercial operations and client vitality, AGCS is taking an active lead in promoting and investing in zero emissions and a sustainable future. Through a variety of solutions, we are consistent in our commitment to Environmental, Social and Governance (ESG) criteria.

**ACTION WHERE IT MATTERS**

Allianz established guidelines for zero emissions and was instrumental in the creation of the Asset Owner Alliance (AOA). Currently a group of 17 institutional investors representing over $4trn in assets under management (AuM), AOA is committed to transition our portfolios to net-zero emissions by 2050. Convened by the United Nations, the Allianz team worked with UN Secretary General Antonio Guterres to develop this portfolio. Our climate package in May 2018 put us in a good position to bring our peers on board. Asset owners are at the beginning of the value chain in the financial industry and have direct influence on the real economy. With the goal of a climate-neutral portfolio, our mandates support necessary change in the global economy.

What do our customers get out of it? We have a long-term investment horizon and need to generate attractive returns for our clients in 30 years’ time. This includes how and when companies switch to low-emission business models and processes. Severe weather changes create enormous financial risks for companies – physical, reputational and transformational – which is why we take such an active role. Moreover, the range of purely “green” investments is far too small for a global investor like Allianz. Therefore, the adaptation of the “grey” sectors such as mobility, real estate, production and others is crucial in reducing greenhouse gas (GHG) emissions by half every 10 years through 2050.

**SUSTAINABLE DEVELOPMENT**

is a crucial element of Allianz’s daily business. We promote and monitor products and services that create social value or support sustainable development. We created a category of insurance and assistance services called Sustainable Solutions to improve lives, make a positive environmental impact, and address weather-related concerns. Allianz integrated ESG criteria into both insurance and investment businesses several years ago. As a result, Allianz is recognized as the most sustainable insurer worldwide, according to the Dow Jones Sustainability Index (DJSI). We have the business model and market presence to protect our clients from severe weather risks, while contributing to a climate-friendly economy and a fair society.

Sustainable Solutions are offered to both commercial and retail customers. Commercially, this includes tailor-made insurance products for largescale renewable energy projects, green building insurance, and advisory services to cover facilities or office buildings that are built or refurbished to improve resource efficiency. For retail customers, examples include special discounts on car insurance for drivers with fuel-efficient and electric vehicles, property insurance for roof-mounted solar panels, and investment products that support sustainable development.

Every year we review the performance of our Sustainable Solutions and report the conclusions in our sustainability report. For more details about our sustainable solutions criteria, please see the ESG Integration Framework.

Our two asset management entities, Allianz Global Investors and PIMCO, offer a broad range of sustainable investment products. They provide opportunity to incorporate ESG criteria throughout an entire investment value chain, while adjusting investments to suit client preferences. For more information visit Allianz Global Investors and PIMCO websites.

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**SUSTAINABILITY AND READINESS AT AGCS**

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Canal Park, in Mexico Beach, Florida, 16 days after Hurricane Michael. Source: Terry Kelly / Shutterstock.com
Climate strategy and performance of Allianz

Start integration of sustainability; leading in ESG ratings for over 10 years

Climate neutrality in business operations

Exit from investments in coal; subsequently divested EUR 326.5mn in proprietary investments and approximately EUR 5.7mn in fixed-income securities

Most sustainable insurer in the Dow Jones Sustainability Index (DJSI)

ESG scoring in policyholder investments – ecological, social and governance criteria are bindingly applied to all investment decisions

Climate Package: Allianz investment portfolio gradually adopted (interim targets every 5 years including reporting) to Paris climate targets: Climate neutrality until 2050. In addition, all coal-based business models will be removed from insurance portfolio in 5-year steps until 2040; membership in Science Based Target Initiative; and Allianz will switch to 100% renewable electricity by 2023

Co-initiation of the Asset Owner Alliance, an association of asset owners with the aim of making the portfolio carbon neutral by 2050

ALLIANZ CLIMATE RISK RESEARCH AWARD

Launched in 2017, the Allianz Climate Risk Research Award acknowledges and rewards young scientists worldwide whose work sheds light on the nexus between the extreme weather events that threaten millions of people and presents ways they could be better protected. It targets PhD candidates and post-doctoral researchers whose research focuses on:

- reducing the risk of extreme weather events that are intensified by climate change;
- fostering resilience by applying technological solutions.

Ten candidates are shortlisted by a jury and their work is published in a compendium. Out of the ten, four are invited to Munich, Germany to present their research at the awards ceremony. In addition to all expenses paid, all four finalists receive cash prizes to support their work.

"Many companies today focus on risk reporting rather than risk management. Risk managers need to drive environmental, social and governance changes internally to influence decisions."

Chris Bonnet
Head of ESG Business Services at AGCS

Source: Multiverse / Shutterstock.com
AGCS RESOURCES
WHAT’S IN OUR TOOLBOX?

While various institutions research and develop advanced technical solutions to protect against the growing threat of extreme weather, factors such as a lack of time, investment and foresight can sometimes slow or even prevent the immediate implementation of solutions to protect life and property. AGCS developed solutions and suggestions that clients can implement NOW to protect assets and strengthen resiliency.

ANTICIPATION AND PREPARATION
Our knowledge of hurricane-related risks allows us to better calculate and mitigate our clients’ exposure to loss. Businesses are better prepared for hurricane events by implementing loss prevention and survey recommendations we provide on an ongoing basis.

In a property scenario, we are proactive in determining client exposure based on the location of their facility or group of facilities. We look at whatever exposure might occur – wind, earthquake, storm surge – based on our analysis. When we calculate what type of event will impact a facility, we help our clients understand the exposures and the steps to reduce loss.

Some successful examples include:

– advising a client to increase the height of their levees around a project site to decrease storm surge risk, in the event of a hurricane;
– advising a client to move their rail spur (to act as a levee/barrier) to protect a project from storm surge.

Both recommendations were implemented and reduced the client’s risk.

In 2012, in response to increasing flood and windstorm losses, Allianz Risk Consulting (ARC) created a flood loss estimate (FLE) calculator and a windstorm loss estimate (WLE) calculator. These are internal tools engineers use to estimate potential flood and windstorm damage for a specific building/facility.

– The FLE calculator estimates the average damage to the building and contents based on the height of flood waters expected to enter the building. The tool can calculate damage for any flood return period, where the flood heights are known.
– The WLE calculator uses Munich Re’s Tropical Cyclone and Extratropical Storm Zones as the source of wind speeds to calculate windstorm damage to a building. To calculate loss estimates, the tool assumes some portion of the roof system will fail and is based on loss history. The amount of damage depends on type of roof covering, wind speeds, roof height, etc.

In addition to the calculation tools described above, ARC trains engineers to conduct flood and windstorm surveys. Engineers utilize these surveys to produce a detailed risk analysis report, which provides our clients with suggestions to mitigate damage from these natural hazards.

We have developed actionable checklists for before, during and after natural catastrophes. To minimize damage from wind and flood events, please see our guidelines for FLOOD and WINDSTORMS.

THE IMPACT OF INSIGHT

BEST CLAIMS PRACTICES
An insurance claim is the defining moment of service – the moment when a promise is delivered. At AGCS, we deliver superior hurricane claims experience to our customers: before, during and after a loss. A coordinated approach to claims management is the key to prompt and direct action. Immediate storm claims services and efficient claims handling is how we help our clients resume operations and return to business as usual. Our dedicated and respected team of experts lead businesses to preventative measures to support resilience and are also there to provide prompt evaluation and resolution of losses as they occur.

Below are just two examples of success stories from previous hurricanes that made ARC a leader in the industry.

– In 2011, ARC Senior Risk Consulting Engineer, Jay Siegel, who conceived and wrote The Calm Before the Storm, a comprehensive informational packet of guidelines and checklists for construction managers to mitigate storm and hurricane damage, visited a municipal project site in New York City. Siegel conducted a routine risk survey and asked the site manager how the site survived Hurricane Irene a month earlier. The manager said the documents were extremely helpful in securing the site from wind and water. When a storm is looming, preparations have to be made quickly and efficiently. We found the information useful and straightforward and easily followed the recommendations. As a result, we suffered no loss.”

– Allianz delivered outstanding claims service for SuperStorm Sandy. In less than six months, more than 80% of the claims attributed to Sandy were paid. Altogether, Allianz paid close to 1.400 claims totaling $337mn. The Allianz regional adjusting team was deployed before the storm in order to access sites and adjust the first clients’ claims the day after Sandy. One of those claims, a particularly large loss, was paid $2mn as an advance payment within 48 hours.

MODELLING
ARC utilizes many proprietary tools to determine the potential hazards for a specific location. Modelling tools help us predict the path and intensity of hurricanes and help businesses plan for resilience and mitigate risk. Each and every year these models become more sophisticated and more accurate.

Another critical resource is the Storm Surge Watch/Warning, instituted in 2017 by the National Hurricane Center. This graphic helps identify and visualize areas most at risk from potential storm surges, which typically cause the most damage during a hurricane.

“The many of the tools we use in risk assessment are constantly adjusted to reflect current data and information from weather events. Because these computer models are always updated, they are becoming more sophisticated and accurate for prediction purposes. Also, since 2017, the National Hurricane Center has instituted the storm surge watches and warnings – often the most damaging component of a storm – which give our clients a better idea of what to prepare for. This is a tool not previously available.”

Thomas Varney
ARC Regional Manager, AGCS
WE COVER THE BIG RISKS
INDUSTRIES AND SUPPLY LINES

We provide best practice documents for a variety of perils and, during surveys based upon what we observe, we issue concrete and actionable recommendations to mitigate specific risks.

INDUSTRIES MOST AFFECTED BY FLOODING AND HURRICANE DAMAGE
Retail business and hotels/resorts along the east coast are some industries most vulnerable to hurricane damage, as these are primarily located along coastal areas. In Gulf Coast areas, oil platforms may also be impacted. Obviously, any facility in the path of a hurricane making landfall would be at risk, but supply lines and transit must also be considered. During an event, ingress/egress exposures may be especially vulnerable, denying or delaying necessary services. Many areas of the globe may be severely affected by wind and flooding, even from a small wind or flood event, which may adversely affect a business located hundreds or even thousands of miles away.

AGCS PROVIDES SUPPLY LINE SERVICES/PRODUCTS
We can help you with your Business Continuity Plans (BCP) and assessment around logistics. Information gathered as part of this process helps clients anticipate solutions around stored materials, alternate suppliers, backup power, etc. Most importantly, when storms approach, we reach out to insureds to offer advice and assistance. Both during and after the storm, Allianz Risk Consulting (ARC) Marine has experts working with clients to diminish supply chain risks.

One such example took place in Puerto Rico during a recent hurricane season. One of our clients exercised their BCP by simulating the shutdown of one of their main global supply chain plants in Puerto Rico. The test was a success – the BCP worked exactly as expected. All other plants throughout the world supplied the needed output of the plant in Puerto Rico.

CLIMATE CHANGE: WHAT ARE THE MOST SIGNIFICANT RISKS EXPOSURES ITS IMPACT CREATES FOR BUSINESSES?

<table>
<thead>
<tr>
<th>Risk Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical loss impact</td>
<td>49%</td>
</tr>
<tr>
<td>(e.g. higher property damages due to increasing volatility of weather)</td>
<td></td>
</tr>
<tr>
<td>Operational impact</td>
<td>37%</td>
</tr>
<tr>
<td>(e.g. higher cost for cooling facilities, relocation of facilities, etc.)</td>
<td></td>
</tr>
<tr>
<td>Strategic/market impact</td>
<td>35%</td>
</tr>
<tr>
<td>(e.g. move to electric vehicles, rise of renewable energy, national decisions to phase out coal power plants/fossil fuels, shift in consumer preferences)</td>
<td></td>
</tr>
<tr>
<td>Regulatory/legal impact</td>
<td>33%</td>
</tr>
<tr>
<td>(e.g. changing laws on environment, emission and reporting requirements, fines and penalties, increasing prospect of litigation, etc.)</td>
<td></td>
</tr>
<tr>
<td>Technological impact</td>
<td>25%</td>
</tr>
<tr>
<td>(e.g. costs to retrofit deploy new practices and processes, write-offs and early retirement of existing assets)</td>
<td></td>
</tr>
<tr>
<td>Liability impact</td>
<td>25%</td>
</tr>
<tr>
<td>(e.g. directors and officers, asset managers, etc. held accountable for perceived inaction)</td>
<td></td>
</tr>
<tr>
<td>Reputation impact</td>
<td>24%</td>
</tr>
<tr>
<td>(e.g. public criticism of activities, stigmatism of sectors, NGO protests)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Allianz Risk Barometer 2020 – Climate change / increasing volatility of weather, 1/14/20

Motorists inspect a road flooded by rain from Hurricane Florence.
Source: Jeremy Warner / Shutterstock.com
STORMS SURGING: BUILDING RESILIENCE IN EXTREME WEATHER

When a hurricane watch is issued for your area, know your zone. Authority-ordered evacuation is called based on the possibility of storm surge and flooding, not due to the pending landfall of a tropical storm or hurricane. Visit www.flash.org and search “evacuation zones” to find your location and more information regarding mandatory and voluntary evacuation.

In light of lessons learned from recent hurricane seasons, we routinely notify clients of approaching storms and provide guidance on how best to prepare. Through a series of risk bulletins, windstorm and flood checklists, and loss prevention kits, we outline what businesses need to do now to protect their people, property and worksites. It is our value pledge to be there for them when they need us most – before and after the storm.

Guides include:
- The Calm Before the Storm: Construction Site Hurricane Protection: A comprehensive informational packet prepared by ARC which provides construction managers with information about how to secure property against hurricanes or other wind events, as well as recommendations for crisis communication/business continuity activities afterwards. It is designed for managers of any construction project – big or small.
- Windstorm Checklist: Prepared by ARC, tells what to do before, during and after a windstorm to minimize potential damage.
- Water Damage During Construction: A Contractor’s Loss Prevention Guide: ARC white paper offering best practices for preventing and mitigating water damage to protect project profitability, enforce quality of subcontractor work and ensure client satisfaction.
- Water Damage Checklist: ARC checklist to minimize potential water damage.
- Flood Risk Bulletins: Protect Your Employees and Business from Flood Damage.
- Windstorm Checklist: ARC checklist to minimize wind damage.
- Flood Checklist: ARC checklist to minimize flood damage.

Download these tools and more at www.agcs.allianz.com/insights.

HOW TO MINIMIZE DAMAGE

The howling winds and torrential rain have died down. But just because the hurricane has passed, does not mean you are in the clear yet. With the danger of dangling power lines, fallen trees, flooding and more, you will want to keep these eight things in mind when safely returning to assess for damage.

1. Check your power lines: Be wary of loose or dangling power lines and report them immediately to the proper authorities. If you see a power line that’s down, move away from it and be wary of any water or other objects touching the lines.
2. Don’t use your water: Use your emergency supply of water or boil water before drinking until officials have given word that it’s safe.
3. Operate a generator safely: If you’ve lost power, make sure to operate your generator outside your home in a well-ventilated area. Do not operate generators or gas, propane or charcoal grills indoors or near your home’s ventilation areas.
4. Protect the exterior: If your home has sustained damage, cover the roof with tarps and your windows with plywood if it is safe for you to do so.
5. Clean items left indoors: Dust items with a soft brush and wipe metal objects with a soft, lint-free cloth.
6. Assess interior damage: If you have wet or damaged artwork, blot off excess moisture, remove wet backings, mats and frames and keep them in an air-conditioned room. Take pictures of any damage and contact professionals for assistance.
7. Protect your vehicles: Wash any debris from your car and take photos of any damage.
8. Use caution while driving: Be wary of fallen power lines, debris on the road, missing signs, or broken traffic lights. Be cautious of any moving water before driving through it, and make sure you have a spare tire.

On September 20, 2017, the strongest storm to hit Puerto Rico in almost a century – Hurricane Maria – made landfall. The results were devastating: almost 3,000 deaths, $1bn in damage, and the longest power blackout in US history. Jackie Otero, Senior Claims Adjuster with AGCS and the only claims expert in Puerto Rico, tells the story of Hurricane Maria and how she was there to help customers trying to get back to business. One year later, we take a look back at Puerto Rico with Otero, AGCS’ only full-time employee on the island, through this podcast edition of Global Risk Dialogue: bit.ly/GRD_Maria

AFTER THE STORM

Cleanup can take months before a business can safely reopen in the aftermath of a storm.

Source: Dustie / Shutterstock.com

City of Miami Beach prepares for a Hurricane Irma.

Source: Mia2you / Shutterstock.com
STORMS SURGING: BUILDING RESILIENCE IN EXTREME WEATHER

FINDING FLOOD RISK WITH DRONE TECHNOLOGY

Drone data can help engineers model a project site in order to make a 3D simulation measuring potential flood risks. Along with a growing number of other sectors, we are increasingly making use of the benefits drone technology has to offer, such as delivering greater certainty in risk and claims assessment, as well as improving overall service. Examples include:

- AGCS recently used drones, laser scanning and computer modeling to carry out analysis of the root cause of a machinery explosion at a construction site. The site, inaccessible to loss adjusters, was first explored by a drone, while a 3D laser scanner and computer modeling then simulated the explosion to establish the cause of the loss.

- Drones and satellite imagery helped AGCS to assess claims after recent natural catastrophes, such as wildfires and hurricanes in the US. This enabled loss adjusters to get a quick overview of the damage, as well as assess claims in hazardous or inaccessible areas.

- Together with IABG, a geodata technology firm, AGCS has developed a new flood risk survey based on topographic data from drones used to model flood and drainage behavior on construction sites. By coupling 3D topographical data with hydrogeological modeling software and rainfall simulation data, it is possible to assess water flow across a construction site and predict flash flooding risk.12

HELLO, DOLLY!
NAMES FOR 2020 SEASON

A list of Atlantic storm names is maintained by a committee of the World Meteorological Organization and repeat every six years unless a hurricane or storm is so destructive and/or deadly that the committee votes to retire use of a name. None of the storms or hurricanes from 2014 were retired, so the 2020 list is identical to the one used six years ago. An average Atlantic storm name is about 30 years old, which explains why many of the hurricane names seem rather old fashioned or outdated. If all 21 names are used up in a season and another name is needed, the National Hurricane Center would then begin using letters from the Greek alphabet.

TROPICAL CYCLONE NAMES 2020

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<th>Name</th>
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<tr>
<td>Arthur</td>
<td>Hanna</td>
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<td>Isaias</td>
<td>Paulette</td>
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<td>Gonzalo</td>
<td>Nana</td>
<td>Wilfred</td>
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Atlantic Basin Tropical Cyclone Names for 2020
Source: The Weather Channel®

Drone data can help engineers model a project site to measure potential flood risks.
Source: Allianz Global Corporate & Specialty / Drone use ready to take-off
STORMS SURGING: BUILDING RESILIENCE IN EXTREME WEATHER

WHAT’S ON THE HORIZON?

To counteract extreme weather and climate change, researchers are looking to geo-engineering — large-scale technological and scientific interventions — that have promise in helping insureds diminish losses, while counteracting damage to the planet. They include staving off sea level rise and curtailing warming temperatures. Some government policy changes are also underway.

SEAWALLS

Coastal areas not only power much of the world’s economy, they also house 40% of its population. With that in mind, a six-mile $119bn barrier14 against floodwaters during fierce hurricanes is just one of five options the Army Corps of Engineers (USACE) is studying to protect the New York metropolitan area. The largest option includes man-made islands with retractable gates stretching from the Rockaways in Queens to a strip of land in New Jersey south of Staten Island.14

As storms become more frequent and destructive, proposals have sparked fierce debate among coastal cities grappling with the broader question of how to survive flooding and rising seas. How and to what degree cities must transform their landscape and lifestyle sparks proposals and projects such as the following. In the New Orleans area, levees that the USACE recently spent $14bn to upgrade are sinking and are projected to be inadequate within four years. Boston recently studied a sea barrier but rejected it in favor of a mix of onshore measures, such as retractable flood walls and wetland terraces. Russia, however, completed a nearly 15-mile barrier in 2010, and credited it with protecting St. Petersburg from a catastrophic storm the following year. It is unclear if the city, New York State, New Jersey and Congress will agree to jointly fund the proposed USACE project, which would take 25 years to build. Even if construction went smoothly, opponents say the barrier could be obsolete within decades because, they say, USACE estimates of future sea levels are too low.

SAND SCAFFOLDING

One project, from Princeton University scientist Michael Wolovick, involves using massive piles of sand or other materials to build a brace under glaciers from the sea floor up, similar to scaffolding, to slow glacial collapse. Farther beneath the surface of the ocean is warmer sea water. As it moves closer to glaciers, it destabilizes the foundation, causing pieces to break off and melt into the ocean. Shoring up the glacial foundation could keep glaciers submerged in the icy upper layers of water, and — theoretically — prevent them from melting.15

Such a project would easily run into the billions of dollars, researchers admit, but without coastal protection, the global cost of damages could reach $50trn a year. In the absence of geoengineering, the sea walls and flood defenses necessary to prevent those damages would cast tens of billions of dollars a year to build and maintain. Most importantly, this approach would address a symptom, not the cause. Targeted approaches could slow melting glaciers, thereby forestalling some of the most expensive effects of global climate change. Engineers have already constructed artificial islands and drained water beneath a glacier in Norway to feed a hydropower plant. Raising a berm in front of the fastest-flowing glacier in Greenland — constructing an underwater wall 3 miles long and 350 feet high in arctic waters — would be a comparable challenge.

ARTIFICIAL TREES

CO2 is an undisputed culprit when it comes to climate volatility. But some researchers are looking to simply suck it out of the air. Trees do that naturally, but after years of deforestation there are not enough of them to make a sizable impact. Scientists at Columbia University are developing plastic trees that passively soak up carbon dioxide from the air and store it on a honeycombed-shaped “leaf” made of sodium carbonate, similar to baking soda. These artificial trees are proving to be a thousand times more efficient at soaking up CO2 than real trees. The next challenge will be to purify the carbon dioxide or bury it safely.16

FUNDING FOR THE FUTURE

A $1trn program, created by the US Congress and overseen by the Department of Housing and Urban Development, is meant to help states better prepare for future natural disasters. It is the first time such funds have been used to prepare for disasters that haven’t yet happened, rather than respond to or repair damage that has already occurred. The money is distributed according to a formula benefiting states most affected by disasters in 2015, 2016 and 2017. That formula favors states along the Gulf and Atlantic Coasts, which were hit particularly hard.17

REVAMPING FEMA

The US Federal Emergency Management Agency (FEMA) is encouraging homeowners and renters to buy flood insurance. The agency provides more than 96% of all flood coverage through its National Flood Insurance Program, making it the sole option for most Americans. But FEMA is revamping the debt-ridden program to make it operate like a private insurer, raising concerns that coverage could become unaffordable for many higher-risk areas across the country. Agency officials have not said how many Americans could be affected. New York City officials warn that skyrocketing flood insurance premiums could trigger a foreclosure crisis in lower income neighborhoods. Annual premiums in Canarsie, a neighborhood in Brooklyn, for example, now average $600, but could jump up to $3,000 to $6,000 as soon as 2022. That expense could be out of reach for many already struggling to keep up with housing costs. Hundreds of thousands of homes could regularly face flooding from sea level rise by 2050, according to estimates. Heavier rains will threaten properties far from oceans.

40% world’s population in coastal areas

$14bn amount spent to upgrade New Orleans levees after Katrina — which are already sinking

15-mile Length of Russian seawall built in 2010 that protected St. Petersburg from flooding during 2011 storm
A 2017 American Meteorological Society study found that using aircraft observations reduced six-hour forecast errors in wind, humidity and temperature by 15% to 30% across the US. The more accurately experts can predict impending weather, the better prepared individuals, communities and businesses can be. Less accurate forecasts can lead to a lack of preparation and bad weather-related decisions. From an insurance perspective, this can result in larger claims and losses.

In addition to the traditional challenges of the upcoming hurricane season, COVID-19 presents us with new obstacles. How do we shelter thousands of people? Will hurricanes be harder to predict if air traffic is curtailed? First responders are already stretched thin – how will they carry out rescues and evacuations?

The Covid-19 outbreak will require a new kind of planning from both emergency managers and the public. And that planning needs to happen now. The National Hurricane Conference and Florida’s Governor’s Hurricane Conference were both canceled this year due to the pandemic. These events would have provided opportunities to learn the latest in first-responder tactics, atmospheric conditions and best-practice recovery efforts. “Much of what we use as baseline assumptions for emergencies will not work right now,” said Bryan Koon, a former director of the Florida Division of Emergency Management who is now a disaster consultant. “We can’t open shelters like we used to under current social distancing guidelines.”

Longer-term recovery is another potential challenge. Supply chains, already stressed, will be hard-pressed to handle port disruptions coupled with a sudden localized uptick in demand for everything from batteries to building materials.

The US Federal Emergency Management Agency (FEMA) is currently orchestrating one of the most complex response efforts in its history while simultaneously preparing for the upcoming wildfire and hurricane seasons. With just another month to the official start of hurricane season, FEMA officials are already examining what shelter in-place rules would look like in the event of a major hurricane or flooding situation.

According to a FEMA administrator, Pete Gaynor, this season “will be a little more complicated, with social distancing and ensuring we keep hygiene at the top of our list.” Gaynor elaborated on how the agency is adjusting its hurricane preparedness measures in the midst of fighting the COVID-19 virus. He is currently drafting the agency’s “COVID-19 Pandemic Operational Guidance for 2020 Hurricane Season,” affirming that FEMA’s new ‘surge’ National Response Coordination Center will facilitate managing disasters such as hurricanes and wildfires, in addition to COVID-19.

FEMA is coordinating with state, local, tribal and territorial partners to strategize evacuation and sheltering protocols to account for social distancing, how to virtually inspect damaged homes; and measures to ensure agency employees’ safety when conducting field operations.

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It turns out that forecasting models depend heavily on data collected by aircraft. The European Centre for Medium-Range Weather Forecasts (ECMWF) said that the number of aircraft reports received worldwide declined 42% from March 1 to 23, 2020. In less than a month, the number of aircraft reports over Europe received and used by the ECMWF fell 65%. Airlines have had to dramatically cut flight schedules due to the coronavirus pandemic, and some experts believe this has begun to hurt weather forecasting.

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