

Staying Ahead of the Storm

Preparing for Upcoming Hurricane Seasons

CHUBB®

By Kelly Hereid, Matt Booker, and Chris Fanslau

Executive Summary

Recent hurricanes resulted in record commercial property damage and business interruption losses. The disasters also illuminated a lack of effective planning for storms, both at the community and industrial level. In 2017 three hurricanes in rapid succession – Harvey, Irma, and Maria – ranked among the top five costliest hurricanes of all time, and in 2018, Hurricane Florence brought historic levels of rainfall, while Hurricane Michael's wind speeds accelerated from a Category 1 storm to a Category 4 in 24 hours.

The significant rainfall, storm surge and high winds that accompanied these 2017 and 2018 hurricanes, and the continued population and industrial growth along our coastlines, have underscored the need for greater attention to resilience and the broader impact of these storms on wide-ranging and interdependent risks, ecosystems and people. Along with record-setting damages, these storms also left behind valuable lessons that can be used to improve preparation for future storms.



Damages from three 2017 hurricanes totaled

$265 B[1]

- Harvey – $125 billion
- Maria – $90 billion
- Irma – $50 billion

Of this, approximately $92 billion was insured.[2]

These include:

- **Emergency response plans must be comprehensive, regularly updated, and tested – and aimed at elevated response efforts.**

  Comprehensive disaster and emergency response planning, both at the community and industrial level, is a business imperative. The bar has been raised, and companies must elevate their hurricane response efforts with an enhanced focus on the potential impacts as a result of storm surge and flooding, as well as wind. At a minimum, plans should address employees (onsite and evacuation), supply chain issues, transportation logistics, post-disaster mobile communications, backup computer systems, and plant equipment and machinery shutdowns. Realistic drills and regular plan reviews and updates are critical. Marathon Petroleum Corporation's insights, outlined on page 6, highlight planning considerations and best practices.

- **Storm Resiliency requires mitigating the wide-ranging and interdependent impacts hurricanes can have on risks, ecosystems and people – starting with the right insurance.**

  Building resilience starts long before a storm occurs by ensuring adequate insurance is in place and properly structured. When building an insurance program, companies should consider the multiple facets of storm-related property and casualty exposures. This includes property damage from both wind and water (storm surge and flooding), business disruption, and general liability that can occur from explosions and pollution-related incidents, to employee injuries. Organizations should also have a comprehensive understanding of their coverage, including deductible and policy limits before a storm occurs.

- **The right insurance partner can enhance a company's ability to weather a storm and to prepare, respond and recover effectively.**

  Partnering with a carrier that has underwriting expertise to help customize insurance solutions, risk engineering and claims services to help optimize loss mitigation and response, and a comprehensive product offering, are integral components of a successful risk management program.

Organizations and insurers have gained a new understanding of the dangers hurricanes pose, not only from wind, but also from water. With fresh insights and lessons learned, organizations can be better prepared to protect their assets, people, and communities when the next storm inevitably landfalls.



Introduction

To prepare clients for the impact of future disasters, Chubb reached out internally to our underwriting and catastrophe management specialists, as well as externally to a client in the oil & gas industry – Marathon Petroleum Corporation – for insight on lessons learned from the 2017 and 2018 hurricanes.

In a series of discussions with Marathon Petroleum's risk management, disaster planning, and loss engineering personnel, we obtained valuable information on the repercussions of Hurricane Harvey, how their disaster plan limited this impact, and how they have evolved these plans to prepare for the possibility of similar events in the future. Marathon Petroleum has some of the most comprehensive catastrophe management plans in the industry and are a good model for best practices. Marathon Petroleum's insights are spotlighted on page 6 of this paper.

We hope that this paper will assist clients and readers from a diverse range of companies and industries to better understand, prepare for, and respond to future hurricanes.

Major Hurricanes in 2017 and 2018

Catastrophic events aren't a matter of "if," but of "when." With the expansion of population and global insurance penetration, global loss level like those seen in 2017, should be no surprise going forward, with an expected return period of about 10 years.

In 2017, the damages from the top three hurricanes totaled $265 billion, with Harvey at $125 billion, Maria at $90 billion, and Irma at $50 billion. Of this, approximately $92 billion was insured.[2]

These losses may change as the impacted communities continue to recover.

A brief overview:

Hurricane Harvey was the first Category 4 hurricane to make landfall in the U.S. since Hurricane Wilma in 2005.[3] Particularly noteworthy was the storm's unprecedented volume of rainfall, peaking at 60.58 inches, and making it the wettest hurricane event in U.S. history.[4] Harvey also produced the highest storm surge in the U.S. since 1961. This surge – an abnormal rise in seawater levels during a hurricane – happened in Port Lavaca, an area south of Houston.[5]

The hurricane's impact was startling. Approximately 200,000 homes and business structures were destroyed or damaged and more than 30,000 people were displaced.[6] According to estimates by catastrophe modeling firm RMS, 90 percent of the storm's insured losses derived from inland flooding, rather than wind.[7]

Hurricane Irma was a Category 5 storm that produced massive damage across several Caribbean islands. Irma was the second-strongest Atlantic hurricane on record and had the longest duration in recorded history for a Category 5 hurricane, lasting nearly 12 days.[8] The 185 mph winds produced by the storm lasted for 37 hours. The combination of a strong storm surge and heavy rainfall caused extreme flooding in parts of Florida and South Carolina. Fortunately, Irma's peak winds did not reach major cities like Tampa and Miami; otherwise losses could have been even worse.

While Irma targeted the Caribbean islands with 185 mph winds lasting 37 hours, its combination of heavy rainfall caused extreme flooding in parts of Florida and South Carolina.

Hurricane Maria (another Category 5 storm) struck the Caribbean islands with wind speeds reaching 175 mph. The strongest hurricane to hit Puerto Rico since 1928, Maria hobbled the island nation's infrastructure, disrupting the water system, power grid, transportation and communication networks, and energy facilities. The U.S. territory's power supply was unprepared for a storm of this magnitude, which contributed to an estimated 2,975 fatalities, placing it among the deadliest storms in U.S. history.

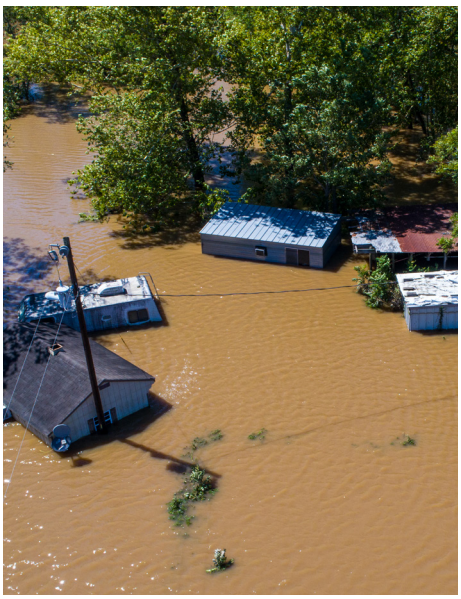
2017 hurricanes produced record losses for the global insurance industry. U.S. insurers collectively posted a net underwriting loss of $23.5 billion for year-end 2017, due mainly to an estimated $52.9 billion in catastrophe-related insured losses globally, more than double the previous year's tally.

In 2018, Hurricane Florence caused historic levels of rainfall that inundated the coastal areas of North and South Carolina and many inland cities. According to Fitch Ratings, most of the losses from Florence will either be incurred by the National Flood Insurance Program or uninsured.

Hurricane Florence hit the Carolinas as a Category 1 hurricane. Initial storm data estimates are that the storm surge and wind from Florence will cause approximately $3 billion to $5 billion in damages.

Although the number of Americans with flood insurance is on the rise, Hurricane Florence unveiled large gaps in coverage. Some 65 percent of properties in flood hazard areas are insured in the state of South Carolina, yet only 35 percent of at-risk properties are insured in North Carolina, a state that experienced a record amount of flooding from the storm.[9]

Florence can be compared to Hurricane Floyd in 1999 and Hurricane Matthew in 2016: both impacted North Carolina and inflicted more than $1 billion in insured damages. Beaufort, South Carolina, experienced a storm surge of approximately 5.51 feet and the storm tide set an all-time record level, breaking the previous water levels incurred during the Category 4 Hurricane Hazel in 1954. Hurricane Michael's rapid intensification drove wind speeds from a Category 1 storm, to a Category 4 storm in a 24-hour time frame. Michael was recorded as the fourth strongest hurricane, based on wind, to make landfall in the mainland of the United States. The storm was the strongest on record for the Florida Panhandle and Georgia recorded Michael as the strongest storm in over a century.



A Deeper Look at Damages

Wind speeds, storm surge, flooding, and moisture produced are key characteristics that contribute to hurricane severity. According to the U.S.

Environmental Protection Agency (EPA), ocean temperatures increased during the20th century and are continuing to rise. From 1901 through 2015, the ocean temperature rose at an average rate of 0.13 degrees Fahrenheit per decade.

There has been an 0.11 to 0.14 inch per year rise in sea levels since 1993 – approximately twice as fast as the long term trend.[10]

With increasing temperatures and sea levels, wet storms get wetter. Sea level rise drives higher storm surges, as every surge sits on top of a higher platform, and increasing temperatures may exacerbate extreme rainfall.

Demographic shifts, particularly mass movements of people to coastline cities in Florida, Texas, California, New Jersey, and elsewhere across the country, are another major factor contributing to increased losses. According to a study by the *New York Times*, citing US Census Bureau statistics, there were more than 3.6 times as many homes in states that border the Gulf of Mexico and the Atlantic Ocean in 2016 than in 1940.[11]

As we saw during Hurricane Harvey, more people and businesses equate to more structures at risk of damage and loss. The greater Houston area is particularly susceptible, given the sheer volume of people and infrastructure located in a region prone to hurricanes. This infrastructure includes refinery and natural gas processing centers, as well as oil rigs, pipelines, storage facilities, and other integrated offshore and onshore equipment. When a major hurricane occurs, this interconnected fuel supply system can unravel. Hurricane Harvey shut down 22 percent of the nation's refinery capacity and severely disrupted oil and gas distribution networks.[12]

The chemical industry also endured significant losses. Harvey flooded the site of a Crosby, Texas, chemical plant, inundating it with six feet of water. The plant was unable to maintain the cool temperatures needed for volatile organic peroxides to remain stable, resulting in massive fires that continued for several days. The rainfall experienced at the plant was unprecedented. Following the fire, the U.S. Chemical Safety Board warned the industry not to be "lulled into a false sense of relief " that safety plans enacted years ago are adequate to address future storms.[13]

The hurricanes also led to a multitude of pollution-related incidents. Floodwaters from the storms inundated above ground storage tanks, in some instances, causing tanks containing crude oil to become unmoored and release pollutants. Additionally, the weight of heavy rainfall impacted the functionality of floating roof systems on storage tanks, which in turn generated accidental releases. Backup power systems also failed due to floodwater inundation. In addition to business interruption exposures, this caused a host of operational issues. We also saw situations where an employee got trapped in floodwaters in a low lying area at a facility where they were not supposed to be.

Business disruption was more fragmented. At Marathon Petroleum, which has more than 2,000 employees in the greater Houston area, many employees were unable to drive to work. Government agencies had closed numerous flooded highways and roads. And pipelines delivering crude oil in and out of the refinery shut down. As such, Marathon Petroleum had to cut back gasoline production at its 459,000 barrel-per-day Galveston Bay Refinery in Texas City.

Two weeks after Hurricane Harvey, Hurricane Irma shut down Marathon Petroleum's product terminals in Port Everglades, Florida. Unable to receive supplies or lacking electricity to operate gas pumps, many of the company's Speedway-branded retail gasoline stations also closed in the Florida region.

Marathon Petroleum was as prepared as they could be for the unique property and casualty exposures encountered. They had comprehensive disaster preparedness and emergency response plans that were tested on a routine basis. Even before the floodwaters receded, actions were well underway to limit property damage, restore supply links, and reopen the refineries.

Taking Action Now: Planning is a Priority

Planning for future hurricanes is a crucial consideration for companies in areas prone to such disasters. Corporate risk managers, building engineers, maintenance staff, and safety professionals should continue to evolve their current disaster planning and emergency response procedures. Certainly, a lasting lesson is to bring a renewed perspective to the unexpected impacts of catastrophes on assets, people, supply chains, customers, and standard business processes.

Companies must bring renewed focus to managing the unexpected impacts of catastrophes on assets, people, supply chains, customers, and standard business processes.

Comprehensive disaster plans and emergency response plans should prioritize required actions in a clear manner to help mitigate property and casualty exposures. Plans should address such crucial needs as employee evacuation, supply chain issues, transportation logistics, post-disaster mobile communications, backup computer systems, and properly shutting down plant equipment and machinery – at a minimum. Routine drills, tabletop exercises and other tests of plans are advisable.

Lessons from Marathon Petroleum



Image provided by Marathon Petroleum

Marathon Petroleum is the nation's second-largest refiner, with a crude oil refining capacity of approximately 3 million barrels per calendar day across 16 refineries.

Having learned from the experiences of previous hurricanes in the greater Houston area, Marathon Petroleum was as prepared as any company could be when Hurricane Harvey made landfall. Still, the storm's historic rainfall and flooding was an eye-opener. "We always plan for the worst, but Harvey took that to the extreme," said Kenneth Bloch, Process Safety Supervisor at Marathon's Galveston Bay refinery.

The flooding prevented employees from traveling to the refinery. "All roads to the facility were closed, making travel to and from the refinery difficult," Bloch explained. "Unexpected complexities related to dock closures also had to be coordinated to limit the impact on refinery operation.

Pipeline suspension resulted in a production constraint, but thankfully we never shut down. As a result, we maximized safety and environmental protection during a disaster that no one had anticipated."

A few weeks after Harvey, Hurricane Irma caused Marathon Petroleum to shut down its product terminals in Port Everglades, Florida. Unable to receive supplies or lacking electricity to operate gas pumps, more than 1,000 of Marathon Petroleum's Speedway-branded retail gasoline stations also closed in the Florida region.

Ironically, the refinery itself was still capable of achieving peak performance. "We could run full blast if we had logistical infrastructure available outside the refinery," said Mark Garvin, Galveston Bay Refinery Fire Chief. "We didn't, compelling us to reduce refinery rates for a few days."

Continued on page 7



Having conducted emergency response drills several times a year, Marathon Petroleum was prepared to limit the storm's disruptive impact on its business.

Marathon Petroleum Corporation: Key Takeaways

Take care of people.
People are critical to mitigating business disruption, and Marathon Petroleum Corporation's emergency response plan emphasizes the humanitarian aspect. Careful incident response planning ensures that when workers stay onsite during a storm, they will be well taken care of and also know that their homes and families are being well taken care of before, during and after an incident.

Practice ensures performance.
Emergency response plans must be tested and updated regularly – and not in isolation. Marathon Petroleum actively engages municipal and federal response agencies in its planning efforts and drills, so relationships are forged before an incident occurs and everyone is on the same page in the heat of response.

Align with a strong insurance partner.
Marathon Petroleum understands the value of partnering with a global insurance carrier that shares its objectives and has the industry expertise, coverage and financial strength to address its catastrophic risks.

Marathon Petroleum's emergency response team, which conducts drills several times a year to respond to hurricanes and other catastrophic events, was pivotal to limiting the impact of the business disruption.

"Our plan includes a humanitarian effort to be sure that employees have access to needed housing, medications, food and water, and other supplies," said Janet Gerken, Insurance Operations Manager. "Apartments were rented ahead of time and supplies were staged in different areas for employees unable to get home. We conduct regular drills so it was a relatively seamless plan execution."

At the company's refineries, safe rooms are set aside with cots, blankets, food, water, flashlights, and other equipment for employees stranded at the facilities.

Most importantly, vital relationships with local, state and federal emergency agencies were cultivated over the years. "When we conduct drills, we have actual representatives from various government agencies onsite to perform the exercises as realistically as possible," said Geri Ewing, Marathon Petroleum Director of Capital Analysis and Insurance. "It is not uncommon for a drill to encompass more than 250 people in all, many of them from outside agencies."

Marathon Petroleum actively cultivates relationships with municipal and federal emergency response agencies and engages them in pre-planning and response drills.

Other pre-planning strategies worked equally well, including the use of drones to survey potential pipeline and dock damage. "My advice to all businesses in the path of a natural disaster is to 'plan, plan, and then plan some more,'" said Ewing. "It is also incumbent to nurture a partnering relationship with the different municipal and federal emergency response agencies. And remember a plan is only as useful as it is tested and updated on a regular basis."

Although the companies' disaster preparedness and response tactics performed as hoped, lessons were learned. "For us, the big challenge was the duration of the hurricane," said Garvin. "Usually when we think of hurricane exposures, we focus on the high winds. Harvey's big lesson was the rainfall. Never underestimate the power of water. It came and took a long time before it went."

Harvey's big lesson was the power of water. Since the storm, Marathon Petroleum has focused on updating response plans to enhance water mitigation efforts.

As a result, it took longer than expected for the company to get its docks back up and running. "Every day those docks are down, the impact on operations is significant," said Artie Myers Emergency Preparedness Supervisor at the Marathon Petroleum Galveston Bay Refinery. "However, our hats are off to the United States Coast Guard, Galveston pilots, and our own dock operators for getting them back in operation as quickly as they did.

Other issues like pipelines that shut down also took longer to address because of the length of the storm and copious rainfall volume. "It took almost a week for our maintenance people and divers to reconstruct the ground supports and culverts that had washed out," Myers said. "Fortunately, the pipeline itself remained intact."



Image provided by Marathon Petroleum

In the aftermath of the storms, the company has upgraded its disaster response plan to encompass the unique lessons from the 2017 hurricanes. For instance, Marathon Petroleum is in the process of reviewing water mitigation efforts to limit flooding impact. "We're thinking about new ways to pump out water and redirect the storm water overflow," Myers added. "It's a logistical challenge, but we're confident there is a solution."

In another post-disaster change, the company no longer relies on a skeleton crew to staff the refinery in the event of an emergency. "We now have two shifts of operational folks at the refinery, so there are always enough people there if things go south," said Garvin. "Logistically, this has created some issues, given all the people here and not at their homes. To relieve the stress, we're creating measures and tactics to ensure their homes and families are taken care of before, during and after the event."

When it comes to effectively managing catastrophic risks, Marathon Petroleum values the power of partnering with a global insurance carrier that shares its objectives and has clear understanding of its unique risk management needs. Marathon Petroleum is committed to the safety of its employees, the community, and the environment.

Evaluating Hurricane Exposures & Insurance

Property

Property risks related to hurricanes include ingress/egress – the inability of employees, suppliers, customers and other parties to travel to affected structures or safely leave them. During recent hurricane seasons, we saw the majority of property claims incurred as a result of flood, wind, and storm surge, with the majority of dollars spent on business interruption.

What types of properties are at risk?

Properties directly exposed to storm surge and flood, specifically those that have processes directly impacted by power outages. Additional organizations at risk include transportation organizations, companies that have primary data centers, and hospitality-related entities including resorts, hotels and casinos. These types of organizations may have difficulty booking and resuming operations after a storm.

Do you know if storm surge is covered?

To help mitigate property risks, organizations should have a comprehensive understanding of their property coverage and ensure it includes flood, wind, and contingent business interruption. Understanding the components of your commercial property program along with its definitions will help ensure adequate coverage and more certainty around the total potential loss amount that could be incurred as a result of a storm.

Flood coverage is mandatory for companies in Federal Emergency Management Agency (FEMA)-designated Special Flood Hazard Areas, where the floodplain management regulations of the National Flood Insurance Program (NFIP) must be enforced.

Businesses located in areas proximate to these hazard zones should also consider buying flood insurance, as the coverage

Below are a few key steps to consider when planning to mitigate property losses:

1. Identify and secure resources in advance. Prequalify and commit as many resources, contractors, and local support agencies as possible.
2. Conduct risk and vulnerability reviews regularly and implement a risk reduction program before the storm season starts.
3. Establish disaster response teams by designating and training appropriate teams within your organization to direct the recovery, restoration and resumption process.
4. Establish a reliable communications network. Consider client, contractor, and employee notification procedures.
5. Familiarize yourself with your insurance claims adjuster and learn how familiar they are with your organization in advance.
6. Have a clear understanding of your organization's utility needs, particularly energy, and plan for backup generators.
7. Considering the possibility of employees being stranded – or needed – at company facilities during a hurricane, FEMA advises businesses to establish a secure interior location that conforms to ICC500 storm shelter criteria. Maintain a list of emergency supplies that should be on hand in the shelter, such as cots, bedding, food and water, a portable generator or backup power system, battery-operated portable lamps, battery-powered weather radios for emergency updates, and a first aid kit.



is commonly excluded from commercial premises and homeowners insurance policies. Although the limits of financial protection and coverage terms and conditions generally are narrow, a private flood insurance market is materializing to provide more robust limits and coverage.

It's also important to have an understanding of your deductible and policy limits to determine if the previously purchased limits are adequate. Review your policy deductible – commercial property owners are often faced with extremely high deductibles which can, at times, be in the tens of millions of dollars.

Chubb Property partners with customers to deliver specialty products to help manage storm exposures, including:

Named Storm deductible buydowns for captives, deductible buyback coverage for properties and construction projects, as well as additional flood protection for organizations that have exhausted the limits of their existing policies following a hurricane event.

Chubb Property has a team of experienced underwriters and risk engineers who can help protect against a wide range of damages or losses with comprehensive risk management solutions for the property insurance needs of large U.S.-based multinational organizations.

The team partners with the Corporate Catastrophe Solutions group to obtain real-time analysis and analytics on hurricane events from the department's scientists and engineers. This insight helps craft comprehensive coverage and deliver underwriting excellence.

Risk engineering and loss control services are available on a bundled or unbundled basis, backed by flexible coverage solutions and superior claims handling.

Casualty

Common perils such as wind and flood can cause a whole host of issues from a casualty perspective, including resulting fires and pollution-related events. Employees or contractors could be trapped and injured at a location. And any first responders that come on site could be exposed to hazardous debris or substances that may have been released into the air or water at a location. All of these situations could result in liability claims.

There are also environmental damages and life-safety issues caused by breaches of water containment systems, such as levees and dikes; spills from storage tanks; leaks caused by ruptured vessels; industrial accidents like a catastrophic explosion; flooding of Superfund sites; and the leaking of harmful contaminants into water systems, among others. Companies may be held liable for potential losses if they have exhibited improper or negligent behavior. Examples of this liability include failure to follow appropriate safety procedures, conduct regular maintenance, and effectively respond to advance warnings.

To help mitigate casualty risks, organizations should consider an umbrella form that provides catastrophe management coverage. This coverage can help with public relations-related issues in the event a company needs to address the media after an accident, provide evacuation assistance, and help cover emergency medical costs.

Environmental coverage via a Pollution Legal Liability (PLL) policy is another important coverage consideration. This type of insurance can often be structured to help companies mitigate pollution-related exposures, whether they involve on-site or off-site clean up or government imposed clean up requirements.

Businesses also must address the potential for environmental liabilities emanating from the release of hazardous chemicals in the air. More than 1 million pounds of dangerous air pollutants were released in the week after Hurricane Harvey struck, including benzene, 1,3-butadiene, hexane, hydrogen sulfide, sulfur dioxide, toluene and xylene.[14]

Companies that own or lease commercial aircraft confront unique liability exposures, including the risk of an accident during a windstorm. Some businesses may elect to use commercial aircraft to transport key executives, engineers, and other people needed to maintain business operations or to evacuate employees from areas deemed hazardous. While companies that own or lease an aircraft are likely to have comprehensive insurance protection, those that may have a need to charter a plane or helicopter for emergency response should consider buying non-owned aviation liability coverage.

To better gauge the risk of liability exposures caused by a natural disaster, it is incumbent upon all businesses to partner with an insurance carrier that underwrites unique environmental hazards and offers a wide range of customized property and casualty products.

Assessing Future Hurricane Impact: Chubb Modeling Services

Well aware of the impact of hurricanes on capital reserves, the global insurance and reinsurance industry has a vested interest in modeling the causes of high-loss events and developing plans to reduce their impact on businesses and homeowners.

Just because an event is catastrophic doesn't mean its effects have to be.

Chubb's Corporate Catastrophe Solutions group can assess the potential impact of potential disasters on a company's property, assets, people and business continuity. We also help companies model the possible impact of extreme flooding caused by higher precipitation and storm surge events.

Chubb's Modeling Sciences department within the Corporate Catastrophe Solutions group is composed of scientists and engineers whose diverse specialties cover the full range of major natural perils. This expertise is leveraged to provide real-time disaster insights and analytics, build custom risk assessment tools for unconventional hazards, and communicate best practices for managing catastrophe risk across the organization.

Chubb also partners with catastrophe modeling firms to assess natural disaster property and business interruption exposures. Catastrophe modeling expertise can be used to assess hypothetical climate scenarios – such as the impact on physical structures of storm surge at a specific rise in sea levels (?) or of a hurricane at different wind speeds.

Advanced hurricane models can assess the impact of storm surge at a specific rise in sea level and the impact of different wind speeds on specific physical structures.

Together, these modeling capabilities allow us to assess the impact of hurricanes with significant storm surges against current sea level conditions, coastal defense and infrastructure conditions.

For example, we know that sea levels have increased globally about 8 inches in the last century. Therefore, every storm surge sits on top of a higher baseline sea level, and is a little bit higher than it would have been without the influence of sea level rise. Coastal cities like like Miami for example, are particularly vulnerable to minor increases in storm surge because of how low lying they are. Furthermore, a very flat coastal city will see a large increase in the area covered by a storm surge from a relatively small increase in the storm surge height.

Therefore, we can reexamine the impact of a historical storm like the 1900 Galveston Hurricane, were a storm of this magnitude to occur today. Although more than 8,000 people were killed when storm surge overtopped Galveston in 1900, today, Galveston is defended by a sea wall along much of its length and many buildings are located on higher elevations. But sea levels have risen in the meantime, offsetting some of those flood defense improvements.

A repeat of this storm, after accounting for changes in infrastructure, population, and climate, would be extraordinarily devastating, estimated to result in insured losses three times higher than Hurricane Harvey for Chubb.

We're Here to Help

The need to partner closely with a global insurance company that provides a broad spectrum of tailored coverages and services is a critical consideration. When evaluating insurers, companies should assess the carrier's breadth of underwriting expertise, product and service offerings, claims handling expertise, catastrophe modeling capabilities and global customer base. Chubb excels in all these areas.

Chubb's broad range of insurance products addresses the gamut of potential financial and business losses caused by hurricanes. Many of our insurance coverages are customized to a client's specific needs in the oil and gas, chemical, and other industries, tailored to each company's unique exposures, regardless of the industry sector, with needed limits of financial protection.

Chubb also takes a proactive approach to claims management. We communicate pre-event considerations and provide comprehensive tips to help our customers better manage potential claims as a result of catastrophic events. Our centralized planning center addresses the multi-facets of these exposures, including business interruption, personal preparedness and business continuity.

Damage to facilities, offices and equipment can interrupt business operations. We know that getting back up and running takes a coordinated team response.



Partnering with the right carrier that has the breadth of products, deep underwriting, risk engineering, claims expertise, and capacity to take on complex risks is a crucial component of preparing effectively for future hurricane seasons.

Our approach includes:

Trained property claim representatives who will guide you throughout the claim process. Specialized training areas include technology, life sciences, wineries, cultural institutions, energy, health care, entertainment, ocean cargo and inland marine/transit.

On-site inspections by field adjusters who have the authority to accept coverage, take protective action and advance payments on the spot.

The option of using your own mitigation and restoration vendor or if you prefer, use one of our service providers through the Chubb Trusted Service Network to get a prompt, professional and warrantied emergency response, including mitigation and remediation services – all monitored by Chubb's network of property re-inspectors – a dedicated catastrophe management team who monitors catastrophic events and coordinates planning and resource deployment before and after a hurricane to ensure the most effective response.

To learn more, visit our microsite:

www.chubb.com/StayAheadoftheStorm

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Prior to Chubb, Matt was the Senior Property Underwriter/Team Leader with Munich Re in London where he led a small team handling property insurance for Fortune 5000 companies headquartered in the UK, Africa, the Middle East, parts of Asia, and Australia. Prior to Munich Re in London, Matt was a Property Underwriter with Munich Re in Munich, Germany focusing on North American property business. Prior to Munich Re, Matt held various property positions with ACE USA in NYC and Atlanta. Matt started out his property underwriting career with XL in NYC.

Matt is a graduate of Clemson University where he earned a Bachelor of Arts degree in Language and International Trade.

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Chris Fanslau currently serves as Vice President and Energy Excess Casualty Segment Leader for Chubb Major Accounts. He joined Chubb in 2002 and has held various underwriting and actuarial roles within the organization, including reserving and pricing actuarial roles from 2002 through 2007, and Excess Casualty field and home office underwriting roles from 2008 to current.

Prior to joining Chubb, Chris obtained a Bachelor's of Science degree in Mathematics from Penn State University's Schreyer Honors College. He became a Fellow of the Casualty Actuarial Society in 2007 and is a Member of the American Academy of Actuaries.

Footnotes

1. National Oceanic and Atmospheric Administration, "2017 U.S. billion-dollar weather and climate disasters: a historic year in context," January 8, 2018
2. Swiss Re. Sigma. Natural Catastrophes and Man-Made Disasters in 2017, April 10, 2018
3. Swiss Re. Sigma. Natural Catastrophes and Man-Made Disasters in 2017, April 10, 2018, p. 6.
4. National Hurricane Center Tropical Cyclone Report, Hurricane Harvey, May 9, 2018
5. Scientific American. "Was the Extreme 2017 Hurricane Season Driven By Climate Change?" October 26, 2017
6. National Oceanic and Atmospheric Administration, "2017 U.S. billion-dollar weather and climate disasters: a historic year in context," January 8, 2018
7. RMS press release. Five reasons to rethink hurricane risk. July 23, 2018
8. National Hurricane Center. Tropical Cyclone Report: Hurricane Irma. June 30, 2018
9. Insurance Journal. Hurricane Florence Likely to Expose Gaps in Flood Insurance, September 17, 2018
10. New York Times, "The Places in the US Where Disaster Strikes Again and Again." May 24, 2018.
11. New York Times, "The Places in the US Where Disaster Strikes Again and Again." May 24, 2018.
12. S&P Global Platts: Oil Factbox, August 30, 2017.
13. San Antonio Express-News, "CSB urges chemical industry to rethink emergency plans after Arkema fires," November, 2017
14. Center for Biological Diversity press release, September 1, 2017

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About Chubb

Chubb is the world's largest publicly traded property and casualty insurance group. With operations in 54 countries, Chubb provides commercial and personal property and casualty insurance, personal accident and supplemental health insurance, reinsurance and life insurance to a diverse group of clients. Chubb Limited, the parent company of Chubb, is listed on the New York Stock Exchange (NYSE: CB) and is a component of the S&P 500 index.

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