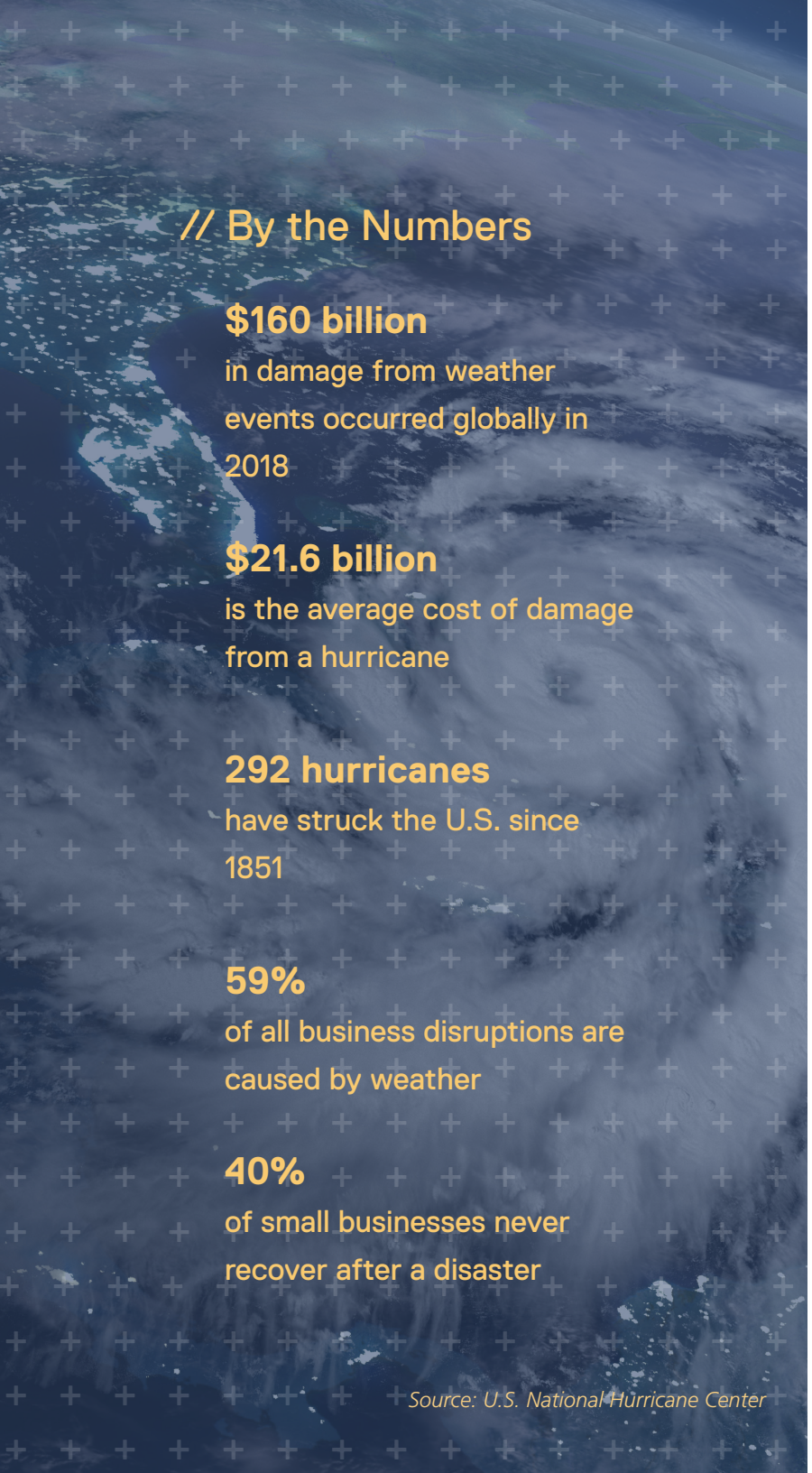
StormGeo
Freedom to Perform

Tracking Storms to Keep Your Business on Track

// Hurricane Preparation Guide



// By the Numbers

$160 billion
in damage from weather events occurred globally in 2018

$21.6 billion
is the average cost of damage from a hurricane

292 hurricanes
have struck the U.S. since 1851

59%
of all business disruptions are caused by weather

40%
of small businesses never recover after a disaster

Source: U.S. National Hurricane Center

In the wake of the 2018 Atlantic Hurricane Season, which produced 15 named storms and caused catastrophic flooding, businesses that have never created emergency plans before are now creating plans to protect themselves and their employees. As hurricanes generate the most damage of all climate catastrophes, impacted areas face long-lasting economic effects that can force businesses to close.

The safest and fastest path to recovery is having an emergency plan in place before the season begins. No matter what protocol you put in place, having an early warning system can save both your business and the lives of your employees.

This guide provides tips and resources to help safeguard your employees and ensure business continuity through severe weather, including:

// How to build a hurricane response plan using a phased approach

// Which triggers should put your plan into motion

// The benefits of working with a professional weather team

// Become Storm Savvy

During times of severe tropical weather, we are inundated with information from various sources. Understanding how storms are tracked, the terminology used to notify the public and when to take action can help you make informed decisions.

Atlantic Hurricane Season:

June 1 – November 30
(peaks between mid-August until late October)

Eastern Pacific Hurricane Season:

May 15 – November 30

Storm Definitions

Tropical Depression: A tropical cyclone with maximum sustained winds of 38 mph or less.

Tropical Storm: A tropical cyclone with maximum sustained winds between 39 and 73 mph.

Hurricane: An intense tropical cyclone with sustained winds of 74 mph or higher.

Storm Surge: A dramatic push of seawater inland across coastal locations in relation to tropical cyclones, such as hurricanes. Most deaths associated with tropical cyclones are drownings due to storm surge.

Storm Watch: Storm conditions are possible to occur in your area within 48 hours.

Storm Warning: Storm conditions are expected to occur in your area within 36 hours.

Eye: A feature unique to strong tropical cyclones caused when warm, moist air spiraling into the center of the hurricane reaches a point where it no longer tracks into the center. Inside the eye, close to the center, the winds are relatively calm, often less than 25 mph.

Eye wall: A circular ring of intense squalls surrounding the center of a hurricane and contains a hurricane's strongest winds. This ring of intense squalls can be as small as one mile or as large as 100 miles in diameter.

What does a hurricane need to develop?

Water Temperature of 80F (27C) or Higher

Hurricanes are heat engines. Rising heat results in more rising air, squalls, and a lowering of the surface pressure which leads to air rotation.

Low Wind Shear

Tropical disturbances do not tolerate wind shear (winds of differing speed and direction aloft). Uniform winds that do not disrupt the vertical columns of squalls within the storm will nurture hurricane development.

Pre-existing Disturbance

Hurricanes do not develop out of "thin air," they require some type of pre-existing weather feature to initially focus the squalls.

// Storm-Tracking Techniques

Advancements in technology are helping meteorologists track and monitor hurricanes with impressive accuracy. However, hurricanes are notoriously difficult to predict. Your storm-tracking process should include a variety of resources to help you understand potential impacts.

// Proximity to a Hurricane

Range rings displayed on a map are an easy way to visually estimate the distance between your company's location and the eye of the hurricane. If a storm is predicted to pass 50 miles away from your business, monitoring range rings alone will not provide sufficient information. For example, Hurricane Florence was forecast to only affect Bermuda. In just two days, the storm changed course and headed towards the U.S. East Coast, drastically changing the areas within the range rings. Many found themselves suddenly in the storm's path, while others were now in the clear of the storm.

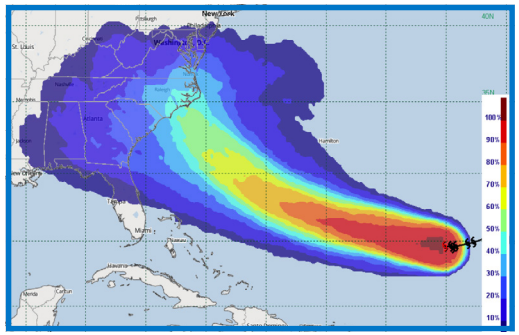
Monitor hurricane activity closely with a forecasting tool like StormGeo's TRAC (Threatened Regions from Active Cyclones). TRAC combines the ensemble hurricane models to provide a 7-day probability of whether the storm will pass within 150 miles of any given point.

// Saffir-Simpson Category Number

Hurricane category numbers are part of the five-level Saffir-Simpson scale, which ranks storms according to wind speeds — the aspect of hurricanes that people can most easily visualize. In most cases, however, it's the storm surge along coastlines that causes most of the damage, including deaths. In some cases, a Category 1 hurricane can produce a greater storm surge than a Category 4 hurricane, depending on the size of the hurricane's wind field. Maximum sustained winds, which drive the category rating, can have little impact on storm surge.

// StormGeo Hurricane Severity Index (HSI)

The StormGeo Hurricane Severity Index (HSI) considers both the maximum wind speed and size of the wind field to create a clearer picture of the damage potential of a tropical storm. Using a 50-point scale, 1-25 points come from the size of the wind field and 1-25 points come from the intensity of the wind. StormGeo's HSI rates all tropical cyclones from the weakest depressions to the most powerful hurricanes. Paired with the Saffir-Simpson scale, HSI provides early warning of a storm's damage capability.



Saffir-Simpson Hurricane Categories

- Category 1: 74-95 mph winds
- Category 2: 96 – 110 mph winds
- Category 3: 111 – 129 mph winds
- Category 4: 130 – 156 mph winds
- Category 5: 157+ mph winds

Saffir-Simpson Hurricane Scale vs. HSI

	HSI Size		HSI Intensity		Total HSI	
	Low	High	Low	High	Low	High
Depress.	0	0	1	1	1	1
TS	1	7	1	4	2	11
Cat. 1	3	15	5	7	8	22
Cat. 2	3	25	8	10	11	35
Cat. 3	4	25	11	13	15	38
Cat. 4	4	25	15	20	19	45
Cat. 5	4	25	22	25	26	50

// Advanced Preparation Ensures Business Continuity

Good planning builds a firm foundation for business continuity. While there is no way to diffuse the impact of a hurricane, the best way to continue your operations is to establish a strategy and timeline to follow. Factor in all potential hazards when creating your hurricane response plan.

Questions to ask yourself before developing your response plan:

// How will our business continue to function immediately after the storm?

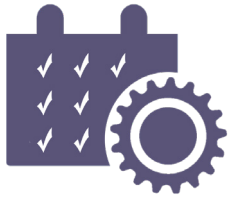
// How will we communicate with staff, vendors and customers when power and communication may be disrupted for days, weeks or even months after a hurricane?

// What potential functions might be lost in the event of direct or indirect damage?

// How will critical functions be temporarily maintained?

// Prepare Your Business for Hurricane Season

Businesses that plan for a disaster have the best chance of recovering and resuming their business. It is important to review, test and update your business continuity plan with your employees to prepare them for the potential effects of a storm.



// Annual Drills

Emergency response drills should be conducted at least once a year to educate new staff, and as a policies and procedures refresher for existing staff.

// Realistic & Thorough

Drills should be as realistic and thorough as possible, walking staff through each step.

// All Key Personnel

Include vendors, key customers and other professionals in your supply chain to keep them informed of your response processes.

// Document Changes

Document any steps that require changes and refine your plan to ensure everything runs smoothly and key players understand their roles.

// Business Checklist

- Identify and protect vital records
- Backup and store key files off-site
- Protect electronic equipment from possible water damage
- Have extra cash and blank checks in case extra money is needed after the storm
- Establish a temporary location for business operations in case your facility is damaged
- Identify a safe room for employees who must remain in the building
- Give employees enough time to secure their homes and families
- Develop a 24-hour emergency contact list with phone numbers of key employees
- Set up contact numbers for employees to check in and receive company information

// Work with Weather Experts

One of the most important decisions you have to make as a hurricane approaches is whether to stay or evacuate. StormGeo's experienced meteorologists can help you build and test your response plan and establish an action timeline.

StormGeo can help you develop a meteorologically-sound timeline, including:

- **Identification of the Initial Hurricane Threat**
  Trained meteorologists can identify a developing storm's location, movement and level of uncertainty in the forecast track.
- **Earliest Likely Arrival Time of Storm Conditions**
  Your business should assume that the hurricane might turn toward your location or arrive earlier than expected. Calculate the possibilities of various arrival times so that critical decisions can be made even when the storm is not initially forecast to impact your area. The response plan for that specific location would state: 96 hours before the earliest likely arrival time of 39 mph winds is greater than "x" percent.
- **Forecast Time of Arrival of Storm Conditions**
  Once the hurricane is within 36-48 hours of reaching the coast, you should be certain whether the hurricane is heading toward your location, allowing you to move to the next steps in your plan with confidence.
- **Probability of Wind Impact**
  It is important to know the forecast wind speed as well as the likelihood that your location will experience those winds.

Advanced warning about when a hurricane is expected to make landfall and the severity of the wind impact will help you know when to trigger your response plan. Base your decision on accurate, reliable data vetted by a team of experienced meteorologists.

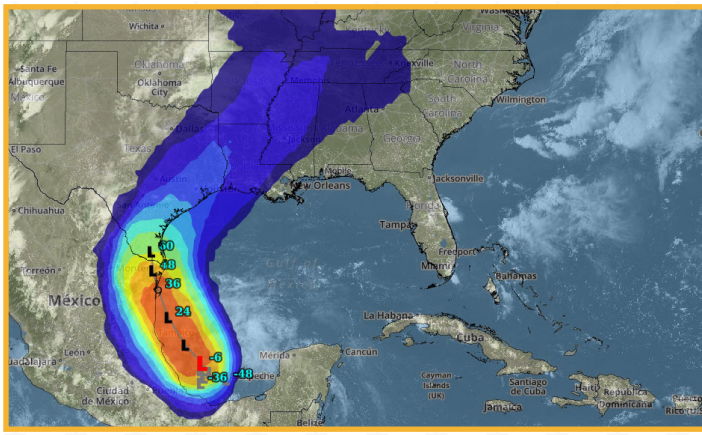
Ensuring your business has an early warning system can save not only your business, but the lives of your employees, vendors and customers.

// TropicsWatch

StormGeo's TropicsWatch provides regular forecasts for anticipated rainfall, storm surge, winds and predicted paths of all tropical storms, whether or not those storms are predicted to make landfall.

TropicsWatch service pinpoints expected weather conditions at exact locations:

- Alerts you to advisories 7-10 days ahead of publicly-released information
- Indicates how much time you will need to take action before a storm
- Provides you with response activator to trigger your hurricane response plan
- Delivers a probabilistic view of where the storm is expected to move



// Site-Specific Forecasts Saves Hospital Millions

Medxcel manages healthcare facilities across the U.S. When Category 5 Hurricane Irma approached three of the company's facilities in Florida, local authorities advised them to evacuate one of the hospitals due to the anticipated level of storm surge and flooding to the region. Hospital evacuations require a minimum of 48 hours and carry major implications in terms of time, safety, expense (in the hundreds of thousands, if not millions) and potential patient distress.

Medxcel worked with a dedicated team of StormGeo meteorologists, who analyzed satellite and radar information, plus the meteorological and coast conditions of the company's exact location, to help determine whether an evacuation was the safest option. Facility managers, emergency teams and staff received custom weather briefings including fine-tuned estimates of potential wind, rain and flooding. The site-specific data StormGeo provided Medxcel enabled the hospital team to make decisions with efficiency and confidence, and it enabled them to avoid a costly and unnecessary evacuation during a time of crisis. While Hurricane Irma caused extensive flooding to the region, it was not detrimental to the hospital or its patients.

> We had been working with StormGeo meteorologists throughout the morning and night, and they had told us the predicted rise was only 18 inches. So we stood our ground, telling emergency services what the data was pointing to.

// Asset Protection

High winds, flooding and power outages put your assets at risk. Here are a few things to consider:

- Where are your assets located?
- What physical protection is available for each asset?
- Which assets are business-critical?
- Are the assets owned or insured?
- For leased assets, what is your responsibility if they are damaged?
- What back-ups are in place for repairing or replacing critical assets?

// Take Data to the Cloud

Cloud-based backups provide you with a safe, secure and compliant way to store data and continue essential business functions during disasters. If a hurricane strikes, your data and networks remain protected.

Tips for Protecting Your Equipment & Data

- Regularly backup your data (including individual devices used by employees)
- Test the backup system to ensure critical information can be accessed
- Consider a cloud storage system and backup for business-critical data
- Server racks, computers, power generators and other equipment should be stored above the ground floor in case flooring occurs

// Stockpile Supplies

High winds can cause power outages that require immediate short-term action. Ensure your company has these supplies on-hand in the event employees must stay inside the building for several days:

- Emergency lights
- Radio/TV
- Batteries and portable chargers for phones
- First aid kits
- Water
- Non-perishable snacks and food
- Two-way radios

// Tip: Lock in Emergency Services Early

The demand for emergency services spikes after a hurricane. Identify and form agreements with contractors and restoration companies in advance.

Food Lion relies on StormGeo to provide clear weather intelligence to achieve a 24-hour reopening goal as part of the company's proactive emergency plan.

> Prior to a storm's impact, our company has made plans for recovery—including which stores may need generators and which associates in the areas surrounding the impact zones can be called upon to help reopen stores. As soon as the storm has passed, we are working to route trucks to stores to stock fresh supplies.

Tina Sellers
Former Director of Asset Protection
Retail Business Services

// Contract Obligations

Your hurricane response plan should include any contractual obligations with vendors, clients, providers, etc. Review contracts to ensure weather-related events, damages and total losses are adequately addressed.

// Understand your Vendors' Response Plans

Even if your company is not damaged by a hurricane, your operations could be affected if the partners or vendors you depend on are impacted. Connect with critical vendors, suppliers, distributors, contractors and transportation firms to ensure backup plans are in place for continuing production. You should also find an alternative you can immediately turn to in the short-term if needed. Discuss your emergency plans with vendors and others in your supply chain to learn about their response plans and their ability to support you during a crisis.

// Manage Shipments

Review options to postpone unnecessary incoming shipments, or accelerate outgoing shipments.

// Stay Connected & Operational

Map evacuation routes to help your employees find the safest course away from the storm's path.

Set up a dedicated website or national toll-free number where employees can check in, receive updates and report their status.

Establish a backup location where employees can work during the recovery phase or ensure employees can work remotely.

// Prepare Your Employees

As hurricane season approaches, provide your employees with preparedness training for the home and work site. Include reminders about protocols, resources (toll-free numbers, websites, etc.) and checklists to ensure they have ample provisions in place at home.

Employees who are prepared at home for emergency situations are able to quickly get their home and family in order before, during and after the storm and return to work more quickly.

The next pages contain important information to share with your employees.

Protect & Connect With Your People

Your most valuable asset is your people. You rely on them to handle specific business functions and they rely on you for leadership and guidance. In times of crisis, communication is critical. Here are some considerations when developing your response plan:

- **Where is each employee located, including those working remotely?**
- **Is the employee directory kept current and does it include personal contact numbers and email addresses (home, mobile, in-case-of-emergency contacts, etc.)?**
- **Which employees travel and to where?**
- **Is there a mass notification system in place to quickly reach everyone?**
- **Are social media account managers briefed on how to receive and distribute updates via Facebook, Twitter, LinkedIn, etc.?**

// Tip: In disaster zones where the phone system may be overloaded, text messages have a higher rate of success in getting through than voice calls.

// Hurricane Preparedness Kit Checklist for Employees

- Flashlights/lantern
- Extra batteries and LED bulbs for flashlights
- Power banks for charging/recharging devices
- Portable TV/Radio (hand-crank or battery-operated)
- Fire extinguisher
- First Aid kit
- Duct tape, tarp and rope
- Non-perishable food that requires little preparation (5 day supply)
- Manual can opener
- Collapsible water containers and water (1 gallon per day per person)
- Corded phone (it may continue to work if you have landline service)
- Small tool kit
- Generator (follow safety guidelines and invest in residential CO detectors)
- Extra oil and gas for generator and vehicles
- Grab-N-Go folder with important papers and household documents (birth certificates, insurance, medical, etc.)
- Video and/or photos of home and possessions (for flood insurance)
- Walkie-talkie or FRS-type radios
- Program cell phones with ICE (In Case of Emergency contact)
- Download emergency apps to cell phone
- Window coverings of plywood, fabric screens or metal
- Garage door brace
- Medicines and extra prescriptions
- Pet supplies, pet medication and pet carrier

// Public Resources to Follow

National Weather Service

Provides weather, water, and climate data, plus forecasts and warnings to help you stay informed.

www.weather.gov

National Hurricane Center

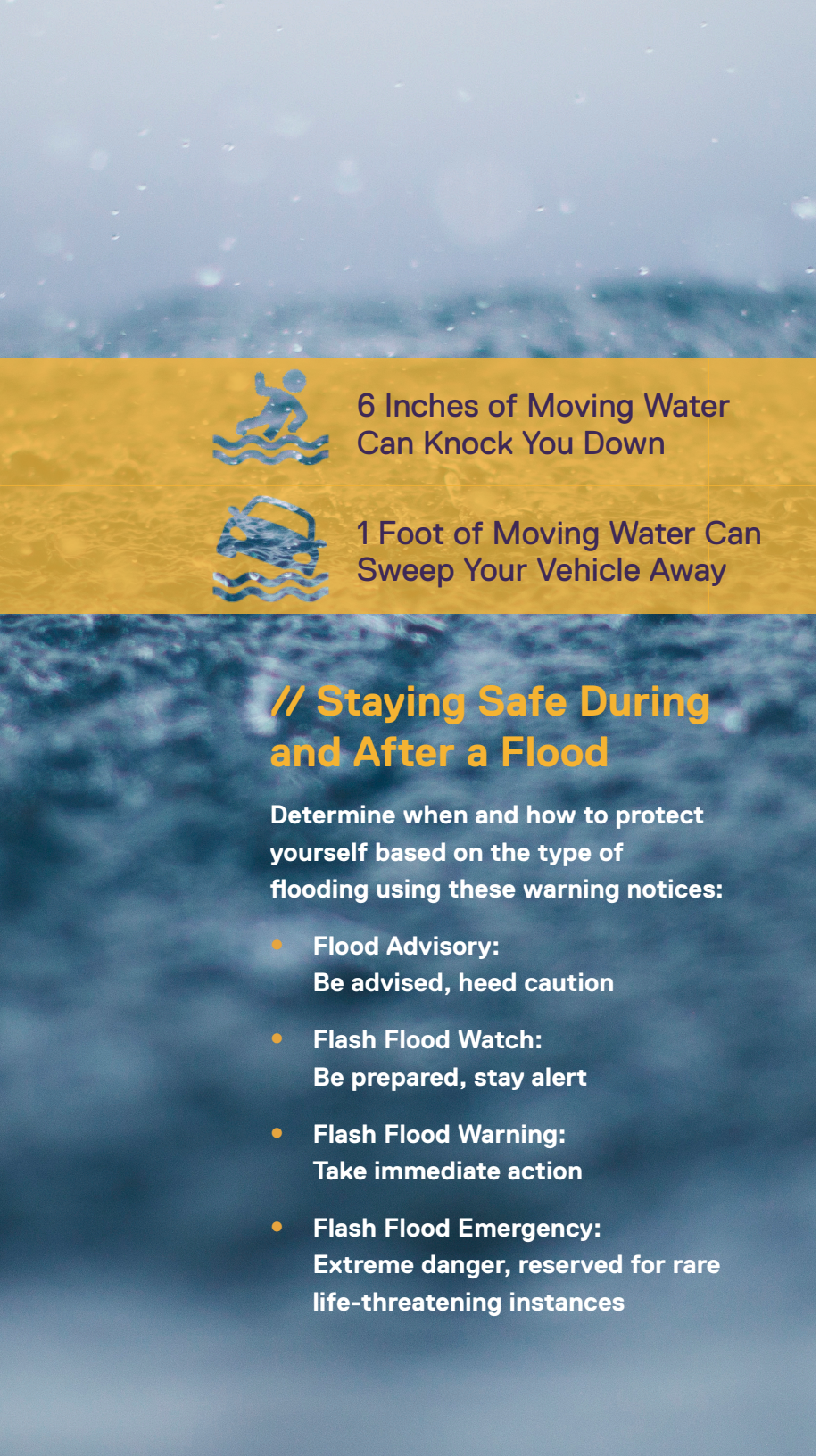
Issues watches, warnings, forecasts and analysis of hazardous tropical weather events.

www.hurricanes.gov

Federal Emergency Management Agency

Download the app to receive severe weather alerts.

www.fema.gov



6 Inches of Moving Water Can Knock You Down

1 Foot of Moving Water Can Sweep Your Vehicle Away

// Staying Safe During and After a Flood

Determine when and how to protect yourself based on the type of flooding using these warning notices:

- **Flood Advisory:**
  Be advised, heed caution
- **Flash Flood Watch:**
  Be prepared, stay alert
- **Flash Flood Warning:**
  Take immediate action
- **Flash Flood Emergency:**
  Extreme danger, reserved for rare life-threatening instances

// Flood Safety

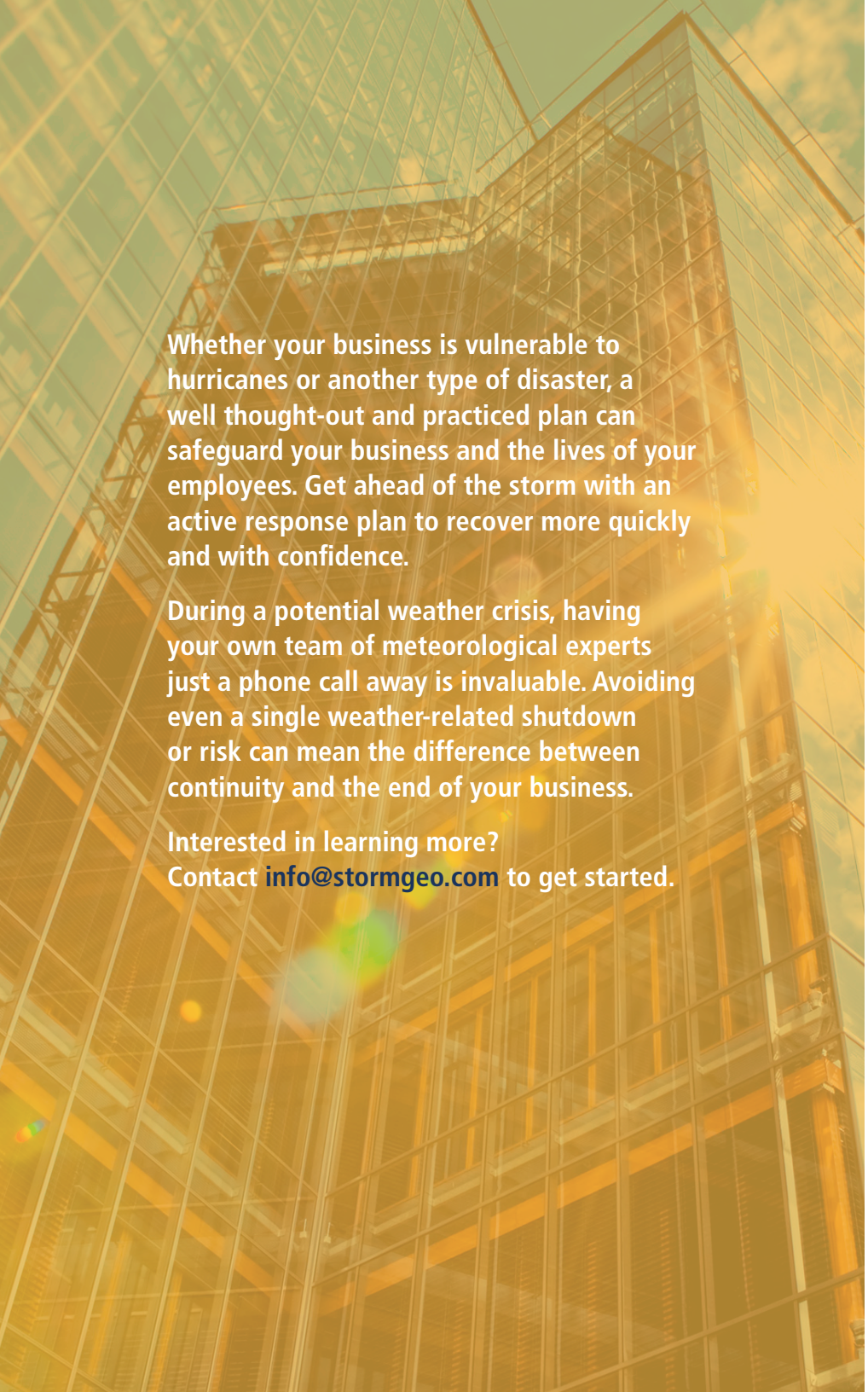
Hurricanes often cause flash flooding from heavy rains, especially inland from the coast. They are the most common natural disaster in the U.S. Most flood-related deaths and injuries can be avoided if you take the appropriate precautions.

Preparation Tips

- Refer to FEMA's Flood Map Service Center to understand flood risks in your area
- Sign up for emergency alerts such as the Emergency Alert System (EAS)
- Establish evacuation routes (more than one option is ideal) and circulate to employees
- Move business-critical equipment (server racks) to the highest floor possible
- Create password-protected digital copies of all documents and store off-site or in the cloud

If you need to evacuate, never drive around barricades or attempt to walk, swim or drive through flood waters. Fast-moving water can wash away bridges without warning. Do not cross a bridge over fast-moving water. If your vehicle is trapped in rapidly moving water, stay inside. If the water rises inside the vehicle, seek refuge on the roof. If you are in a building surrounded by floodwaters, make your way to the highest level.

After a flood, follow instructions from authorities and do not drive except in an emergency. Avoid contact with floodwater, which can contain dangerous debris or contaminates. Underground or downed power lines can electrically charge the water. Do not touch electrical equipment if it is wet or if you are standing in water – turn off the electricity at the source to prevent electric shock. Gas-powered generators should only be used outdoors and away from windows.



Whether your business is vulnerable to hurricanes or another type of disaster, a well thought-out and practiced plan can safeguard your business and the lives of your employees. Get ahead of the storm with an active response plan to recover more quickly and with confidence.

During a potential weather crisis, having your own team of meteorological experts just a phone call away is invaluable. Avoiding even a single weather-related shutdown or risk can mean the difference between continuity and the end of your business.

Interested in learning more?
Contact info@stormgeo.com to get started.

// About StormGeo

StormGeo is a global provider of advanced weather intelligence and decision support services, and is relied upon to maintain business continuity, avoid supply chain disruption, protect assets and maximize productivity for industries including healthcare, oil and gas, insurance, telecom and retail. The company has offices worldwide, including six 24/7/365 operations centers. As a participant in the UN Global Compact for Sustainable Ocean Business, our passion for weather and the protection of natural resources motivates us to support our clients in making informed, environmentally responsible business decisions.

Hurricanes can cause business closure and costly repairs, resulting in significant detriments to revenue, infrastructure and the environment. Preparing enables you to:

- Avoid business disruption
- Mitigate toxic substances
- Generate response plans