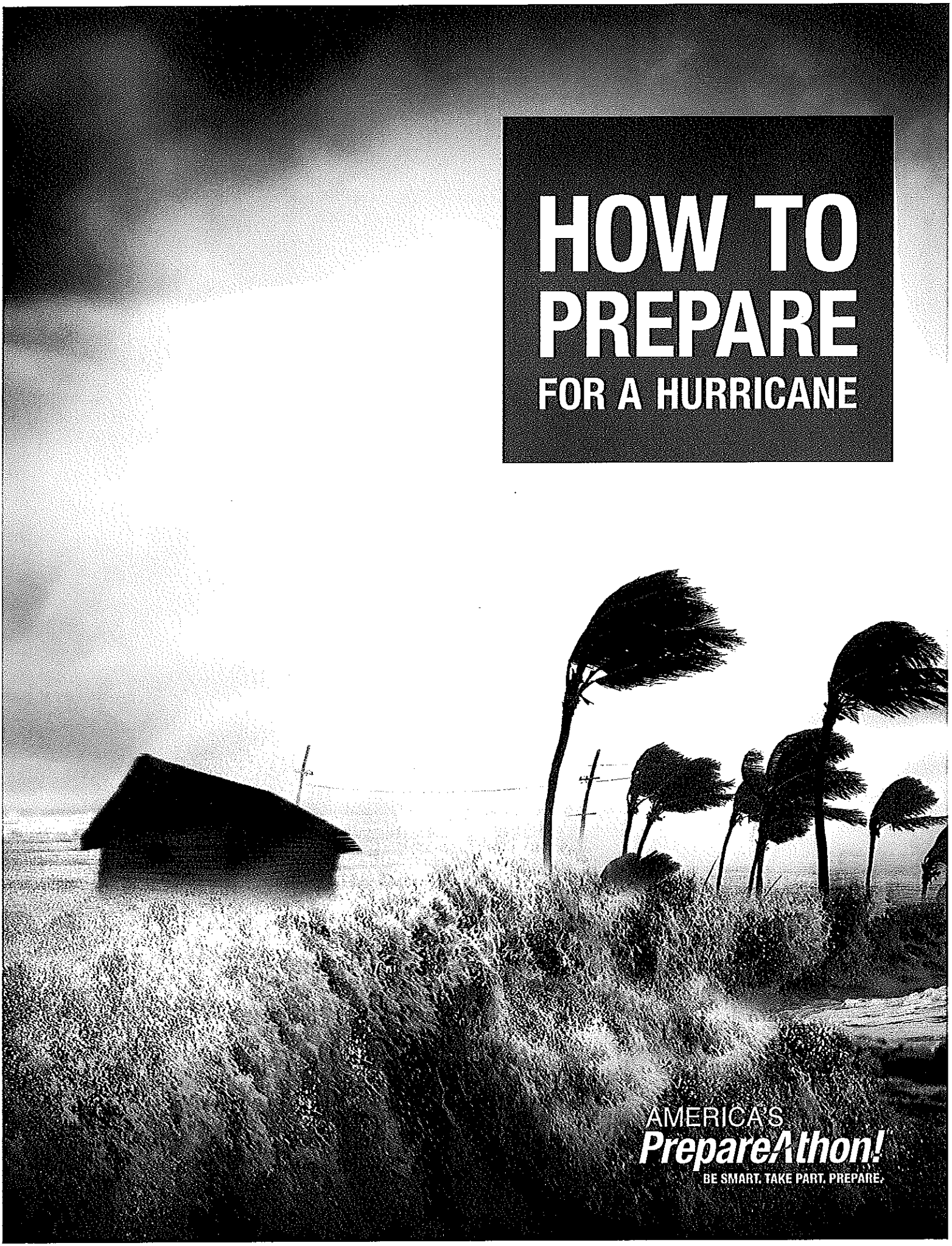
HOW TO PREPARE FOR A HURRICANE



AMERICA'S
PrepareAthon!
BE SMART. TAKE PART. PREPARE.

HURRICANE BASICS

Hurricanes have the power to cause widespread devastation, and can affect both coastal and inland areas. *How to Prepare for a Hurricane* explains how to protect yourself and your property, and details the steps to take now so that you can act quickly at a time when every second counts.

WHAT

Hurricanes are massive storm systems that form over the water and move toward land. Threats from hurricanes include high winds, heavy rainfall, storm surge, coastal and inland flooding, rip currents, and tornadoes. These large storms are called typhoons in the North Pacific Ocean and cyclones in other parts of the world.

The Saffir-Simpson Hurricane Wind Scale classifies hurricanes into five categories based on their wind speed, central pressure, and wind damage potential. With wind speeds of 111 miles per hour or more, Category 3, 4, and 5 hurricanes are major according to this scale. Category 1 and 2 hurricanes can also cause damage and injuries. The Saffir-Simpson scale is shown at the end of this document.

WHEN

The Atlantic hurricane season runs from June 1 to November 30, with the peak occurring between mid-August and late October. The Eastern Pacific hurricane season begins May 15 and ends November 30.

WHERE

Each year, many parts of the United States experience heavy rains, strong winds, floods, and coastal storm surges from tropical storms and hurricanes. Affected areas include all Atlantic and Gulf of Mexico coastal areas, Puerto Rico, the U.S. Virgin Islands, Hawaii, parts of the Southwest, the Pacific Coast, and the U.S. territories in the Pacific.

IMPACT

Hurricanes can cause loss of life and catastrophic damage to property along coastlines and can extend several hundred miles inland. The extent of damage varies according to the size and wind intensity of the storm, the amount and duration of rainfall, the path of the storm, and other factors such as the number and type of buildings in the area, the terrain, and soil conditions. The effects include the following:

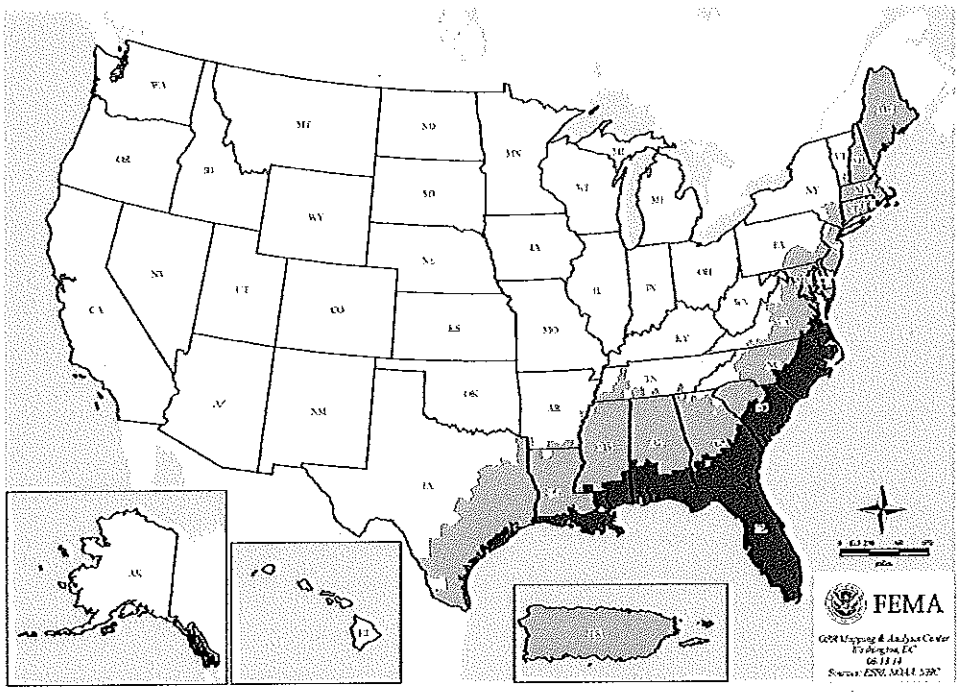
- Death or injury to people and animals;
- Damage or destruction of buildings and other structures;
- Disruption of transportation, gas, power, communications, and other services;
- Coastal flooding from heavy rains and storm surge; and
- Inland flooding from heavy rains.

KNOW THE RISK

Frequency of Hurricane and Tropical Storm Activity by County
Atlantic Data: 1851–2012 ~ Pacific Data: 1949–2012

This map depicts the frequency with which counties have experienced a hurricane or tropical storm based on a 125-mile-wide storm path around the center point of the storm.

- 65–141
- 29–64
- 1–28
- No hurricanes



YOUR GOAL FOR PROTECTION

Deaths and injuries during hurricanes can be caused by building damage from high winds, windborne debris, storm surge, and flooding.

PERSONAL PROTECTION

EVACUATE

Because hurricanes can be detected and tracked in advance of making landfall, residents in the storm's path often get several days of advance notice. When a hurricane threatens your area, the best action to protect yourself and your family from the high winds and flooding caused by hurricanes is to evacuate when ordered to do so, before those conditions hit your area. Know and follow the directions from local officials for community evacuation or seek higher ground for localized flooding.

PROPERTY PROTECTION

REINFORCE FOR WIND, ELEVATE FOR WATER

Your goal now, before a hurricane occurs, is to reduce the risk of damage to structures from winds and flooding. This includes strengthening the building's outer shell—including the doors, windows, walls, and roof—and removing or securing all objects and non-building structures, as well as clearing the outside areas around the building. Measures to protect against potential flooding include waterproofing basements and elevating critical utilities (e.g., electrical panels and heating systems). In flood-prone areas, consider elevating the entire structure.

RISK MANAGEMENT

INSURANCE

Purchasing flood insurance provides financial protection for the cost of repairs due to flood damage. Standard insurance policies do not cover flooding, including storm surge flooding, but flood insurance is available for homeowners, renters, and business owners through the National Flood Insurance Program. You may also be able to purchase insurance for wind.

EMERGENCY NOTIFICATIONS

While storms are tracked as soon as they have the potential to become a tropical cyclone, it is difficult to accurately predict the path of the storm far in advance. Forecasters generally identify a cone or a range to illustrate the path that the storm may take.

The National Weather Service (NWS) of the National Oceanic and Atmospheric Administration (NOAA) issues hurricane watches and hurricane warnings, as well as several other hurricane-related alerts. These include watches and warnings for high winds, storm surge, flooding (e.g., flash flooding, coastal flooding, river flooding), thunderstorms, and tornadoes. Watches, warnings, and evacuation notices are science-based predictions that are intended to provide adequate time for evacuation. Those who wait for actual confirmation of a catastrophic event may be trapped by high winds, flooding, or traffic. Download the *Be Smart. Know Your Alerts and Warnings* document at **www.ready.gov/prepare** for a summary of available notifications.

HURRICANE/TROPICAL STORM WATCH

NWS issues a **tropical storm or hurricane watch** for an area 48 hours prior to when it expects hurricane or tropical storm conditions to materialize. During a watch, tune in to NOAA Weather Radio All Hazards, local radio, or television for information and conduct outside preparedness activities.

HURRICANE/TROPICAL STORM WARNING

NWS issues a **tropical storm or hurricane warning** for an area when weather conditions for a tropical storm or hurricane are expected within 36 hours. During a warning, complete storm preparations and immediately leave the threatened area if directed by local officials.

EXTREME WIND WARNING

NWS issues an **extreme wind warning** to notify an area of imminent extreme winds associated with a major hurricane (Category 3 or greater). These warnings indicate a very significant threat of casualties and are usually valid for two hours or less.

OTHER ALERTS

Because tropical storms and hurricanes encompass several types of hazards, NWS may issue additional watches and warnings as a result of the storm, including alerts for flash floods, tornadoes, and floods. Tune in to NOAA Weather Radio All Hazards, local radio, or television for information and to monitor alert notifications.

EVACUATION NOTICE

If the danger is significant, state or local government officials may issue an evacuation notice. Evacuation orders may vary by state and community and range from voluntary to mandatory. When authorities issue a mandatory evacuation notice, leave the area immediately.

PROTECT YOURSELF BEFORE A HURRICANE

TAKE ACTION NOW!

People who live in hurricane-prone coastal areas should know their vulnerability to wind and flooding, as well as what to do to reduce the effects of both. People who live inland from coastal areas may also experience high winds, power outages, and flooding from torrential rain. Protecting yourself today means having sources for information, preparing your home or workplace, developing an emergency communications plan, and knowing what to do when a hurricane is approaching your community. Taking action today can save lives and property.

KNOW

Know your hurricane risk. Your risk from hurricanes is based on where you live, the structure of your home, and your personal circumstances. People who live on the coast are most at risk for extreme winds and flooding from rain and storm surge. People who live inland are at risk for wind, thunderstorms, and flooding. Hurricanes also cause widespread power outages, which may be a risk factor for people who need power-dependent medical devices. Visit **http://hazards.fema.gov/femaportal/prelimdownload** to learn about your property's projected risk to flood hazards.

Know how to stay informed. Receiving timely information about weather conditions or other emergency events can make all the difference in knowing when to take action to be safe.

- Monitor weather reports provided by your local media.
- Many communities have text or email alerting systems for emergency notifications. To find out what alerts are available in your area, do an Internet search with your town, city, or county name and the term "alerts."
- Consider buying a NOAA Weather Radio (NWR) All Hazards receiver, which receives broadcast alerts directly from NWS. You can purchase these at many retail outlets, such as electronics and big box stores, or online. Some NWR receivers are designed to work with external notification devices with visual and vibrating alerts for people who are deaf or hard of hearing. For more information on NWR receivers, visit: **www.nws.noaa.gov/nwr/nwrrcvr.htm**.
- Think about how you will stay informed if there is a power outage. Have extra batteries for a battery-operated radio and your cell phone. Consider having a hand crank radio or cell phone charger.

Know your evacuation routes; plan your transportation and identify a place to stay. To ensure that you will be able to act quickly should the need arise, you need to plan ahead.

- Know your community's local hurricane evacuation plan and identify several escape routes from your location in case roads are blocked. Include plans to evacuate people with disabilities and others with access and functional needs, as well as pets, service animals, and livestock.
- If you plan to evacuate by car, keep your car fueled and in good condition. Keep emergency supplies and a change of clothes in your car.

- If you will need to share transportation, make arrangements now. If you will need to use public transportation, including paratransit, contact your local government emergency management agency to ask how an evacuation will work, how you will get current information during an evacuation, the location of staging areas, and other information.
- If you will need to relocate for an extended period of time, identify a place away from home where you could go if you had to leave. Consider family or friends who live outside of the local area.
- If you expect to go to a shelter after evacuating, download the American Red Cross Shelter Finder App at **www.redcross.org/mobile-apps/shelter-finder-app**. This app displays a map of all open American Red Cross shelters, and provides the capacity and the current population of each shelter. You can also text SHELTER + your ZIP code to 43362 (4FEMA) to find the nearest shelter in your area.
- If you have pets and plan to go to a shelter, call to inquire whether the shelter can accommodate your pets. Shelters will accept service animals.

PRACTICE

Practice taking shelter. While you may need to evacuate the area due to a hurricane, there are also situations when you may need to seek protection from hurricane-force winds. Identify your protective location and practice getting all household members to that location quickly. If you do not have access to a Federal Emergency Management Agency (FEMA) safe room or an International Code Council (ICC) 500 storm shelter, use a small, interior, windowless room, such as a bathroom or closet, on the lowest level not likely to flood.

Practice how you will communicate with family members. In a dangerous situation, your first thoughts will be the safety of your family and friends. In case you are not together when authorities issue a tropical storm or hurricane watch, or a tropical storm or hurricane warning, practice how you will communicate with each other. Remember that sending texts is often faster than making a phone call. Keep important numbers written down in your wallet, not just on your phone. It is sometimes easier to reach people outside of your local area during an emergency, so choose an out-of-town contact for all family members to call, or use social media. Decide where the members of your household will meet after the hurricane. Visit **www.ready.gov/make-a-plan** for instructions on developing a Household Communications Plan.

Practice first aid skills and emergency response actions through training classes. In most circumstances, when someone is hurt, a person on the scene provides the first assistance, before professional help arrives. Learn and practice response skills now so you will know what to do.

- Each year, more than 3 million people gain the skills they need to prepare for and respond to emergencies through American Red Cross training classes, including first aid, automated external defibrillator (AED), and cardio-pulmonary resuscitation (CPR) training. Visit **www.redcross.org/take-a-class** to find out about classes in your area. Download the American Red Cross First Aid App at **www.redcross.org/mobile-apps/first-aid-app**.

- The Community Emergency Response Team (CERT) Program expands the emergency response network by providing training in basic response skills to community members. CERT Basic Training educates people about disaster preparedness for hazards that may negatively affect their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. Visit **www.fema.gov/community-emergency-response-teams** to find your local program.

STORE

Store supplies so you can grab them quickly if you need to evacuate; know in advance what else you will need to take. Take time now to make a list of the things you would need or want to take with you if you had to leave your home quickly. Store the basic emergency supplies in a "Go Bag" or other container. Be ready to grab other essential items quickly before leaving. Remember to include specialized items for people with disabilities and others with access and functional needs, such as older adults, children, and those with Limited English Proficiency.

When making your list, consider the **Five Ps of Evacuation**:

PEOPLE	PRESCRIPTIONS	PAPERS
People and, if safely possible, pets and other animals or livestock	Prescriptions, with dosages; medicines; medical equipment; batteries or power cords; eyeglasses; and hearing aids	Papers, including important documents (hard copies and/or electronic copies saved on external hard drives or portable thumb drives)

PERSONAL NEEDS	PRICELESS ITEMS
Personal needs—such as clothes, food, water, first aid kit, cash, phones, and chargers—and items for people with disabilities and others with access and/or functional needs, such as older adults, children, and those with Limited English Proficiency	Priceless items, including pictures, irreplaceable mementos, and other valuables

Store supplies you will need to live at home with no power. Even if you are in an area that was not asked to evacuate, you may still lose power and the water supply to your home. Depending on the strength of the hurricane and its impact on your community, you could be in your home with no power or other basic services for several weeks. Think about items you require for this situation. Keep these supplies on hand in your home. For a full list of supplies for your emergency supply kit, visit **www.ready.gov/build-a-kit**.

Here are some suggestions to consider:

- Flashlight and radio, either hand-cranked or battery-powered, with extra batteries;
- At least 1 gallon of water per person per day for at least 3 days. A normally active person needs about three-quarters of fluid daily, from water and other beverages. Water is also needed for food preparation and sanitation;
- At least a 3-day supply of non-perishable food for members of your household, including pet food and considerations for special dietary needs. Include a non-electric can opener for canned food;
- First aid kit, medications, and medical supplies; and
- Battery backup power for power-dependent mobility devices, oxygen, and other assistive technology needs.
- Sleeping bag or warm blanket for each person, if you live in a cold-weather climate.

Store the important documents you will need to start your recovery. Review your homeowners or renters insurance policy and also prepare or update a list of your home's contents by taking pictures or videotaping each room in the house. If your home or business sustains significant damage, you will need access to insurance and rental or mortgage agreements to file a claim or request assistance from the government. During recovery, you may also need access to personal information such as medical insurance, and prescriptions or warranties for durable medical equipment. The Emergency Financial First Aid Kit (EFFAK) can help you identify the records you should keep safe. This document is available at **www.ready.gov/financialpreparedness**. Store your records safely. Keep papers in a fireproof, waterproof box. If records are stored electronically, keep a backup drive in your fireproof, waterproof box, or store files using a secure cloud-based service.

PROTECT

Protect your property and manage your risk. If you live in a hurricane-prone coastal area or in an inland area where heavy rains from a downgraded hurricane might pass, take steps now to protect your property from both high wind and water damage. This includes buying specialized insurance for losses caused by flood and wind damage.

DISCUSS

Discuss what you have done to prepare with your family, friends, neighbors, and colleagues. Talking about preparedness with others will help you think through your plans, share information about alerts and warnings, and share tips for protecting property. Talking about disasters and helping others prepare makes everyone safer.

Discuss how your community can reduce risk. Work with others in your community to improve community resilience planning. Support your community's participation in the Community Rating System of the National Flood Insurance Program and examine how building codes or land-use planning could improve the community's resilience. Work with others to request evaluations of Best Available Refuge Areas in public locations and pursue community investments for FEMA safe rooms and ICC 500 storm shelters. For more information on mitigation options for reducing your community's risk, see *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards* at **www.fema.gov/media-library/assets/documents/30627?id=6938**.

PROTECT YOURSELF DURING A HURRICANE

Hurricanes have the potential to cause massive destruction. If you are in the path of a major hurricane, authorities may direct you to evacuate for your safety.

EVACUATE

- Fatalities and injuries caused by hurricanes are often the result of individuals remaining in unsafe locations during a storm. If authorities advise or order you to evacuate, do so immediately. Be sure to remember the **Five Ps of Evacuation**: People, Prescriptions, Papers, Personal Needs, and Priceless Items.
- Leave early to avoid delays caused by long lines, high winds, and flooding.
- Follow posted evacuation routes and do not try to take short cuts because they may be blocked. Stick to designated evacuation routes.

IF YOU ARE IN AN AREA WITHOUT AN EVACUATION NOTICE

Take precautions to protect yourself and stay safe from the high winds and potential localized flooding.

- Stay indoors away from windows and glass doors. Flying debris from high winds is dangerous and can be deadly. If you are in a mobile home or temporary structure, move to a sturdy building.
- For protection in extremely high winds, go to a small, interior, windowless room, such as a bathroom or closet, on the lowest level not likely to flood.
- If you are in an area that is flooding (e.g., on the coast, on a floodplain, near a river, or on an island waterway), move to a location on higher ground before floodwaters prevent your ability to leave.
- If the power is out, use flashlights, not candles. Turn on a battery-operated or hand-cranked radio to get the latest emergency information. Stay tuned to alerts.

EXPERIENCING A HURRICANE

You may experience any of the following during a hurricane:

- Long periods of very strong winds and heavy rains.
- If you are in a coastal area, you may experience a storm surge, which means that high winds are pushing seawater onto the shore. A storm surge combines with the ocean's tide to produce a storm-tide surge. Storm-tide surges have been registered as high as 35 feet above normal sea level and can cause significant flooding across a large area. This generally occurs over a short period, typically 4 to 8 hours; but in some areas, it may take much longer for the water to recede to its pre-storm level.
- Significant changes in air pressure during the storm can cause discomfort, and loud moaning, shrieking, and whistling sounds may occur because of the winds.
- Many of those in the center of the storm experience a false sense of security. After the center of the hurricane, also known as the eye, passes over, the storm will resume. Do not venture outside until emergency officials say it is safe.

PROTECT YOURSELF AFTER A HURRICANE

IF YOU EVACUATED

- Return home only when authorities indicate that it is safe to do so.
- Be aware of areas where floodwaters have receded. Do not attempt to drive through flooded areas. Roads and bridges may have weakened and could collapse under the weight of a car.
- Be aware of downed trees, power lines, and fallen debris.

IF YOU STAYED IN THE AREA OR AS YOU RETURN

Listen to official public information to get expert, informed advice as soon as it is available. Use the following considerations and precautions:

INSIDE SAFETY

- If the storm damaged your home severely, you may only be able to enter when officials say it is safe to do so. Stay out of any building surrounded by floodwaters.
- Use extreme caution when entering flooded buildings. There may be hidden damage, particularly in foundations. Personal safety considerations include protecting yourself from electric shock, mold contamination, asbestos, and lead paint. Turn off electricity at main breaker or fuse box. Homeowners who are unfamiliar with electricity or their home's electrical systems should contact their local power company or a qualified electrician to assist them in making their property safe from electrical hazards after a flood. Check for loose boards and slippery floors.
- Do not touch electrical equipment if it is wet or you are standing in water. Shut off the utilities to a flooded home or building.
- Use flashlights, not lanterns, torches, or matches, to examine buildings. Flammable gases may be inside and open flames may cause a fire or explosion.
- If you turned off your gas, ask a licensed professional to turn it back on.
- Carbon monoxide kills. Use a generator or other gasoline-powered machine ONLY outdoors and away from windows so fumes do not get inside. The same goes for camping stoves. Fumes from charcoal are also deadly; cook with charcoal ONLY outdoors. For more information, visit the U.S. Centers for Disease Control and Prevention's website on preventing carbon monoxide poisoning at **http://emergency.cdc.gov/disasters/cofacts.asp**.

OUTSIDE SAFETY

- If you see floodwater on roads, walkways, bridges, and on the ground, do not to attempt to cross floodwater. The depth of the water is not always obvious, and the road bed may be washed out under the water. Moving water has tremendous power. Six inches of moving water has the potential to knock you off your feet, and a foot of water can sweep a vehicle—even a large SUV—off of the road. Be especially cautious at night when it is harder to recognize flood dangers. For more information on floodwater hazards, visit the NWS Turn Around Don't Drown® program at **http://tadd.weather.gov/**.
- Avoid wading in floodwater, which may be contaminated with oil, gasoline, or raw sewage.
- Watch for dangerous debris (e.g., broken glass, metal fragments), dead animals, or venomous snakes in floodwaters. Before walking through debris, use a stick to check for hidden dangers. Underground or downed power lines may electrically charge the water.

- Stay away from downed power lines and report them to 911 or the power company's emergency number.
- Stay away from damaged areas unless police, fire, or relief organizations request your assistance.

COMMUNICATIONS

- Use local alerts, radios, and other local information sources, such as American Red Cross apps, to get information and advice as soon as it is available.
- Use text messaging or social media to communicate with family and friends. Telephones and cellular phone systems are often overwhelmed following a disaster, so use phones only for emergency calls.

HEALTH AND SANITATION

- Listen for news reports to learn whether the community's water supply is safe to drink.
- Service damaged septic tanks and leaching systems as soon as possible. A damaged sewage system is a serious health hazard.
- Have wells checked for contamination from bacteria and chemicals.
- Clean and disinfect everything that got wet. Mud left from floodwater can contain sewage, bacteria, and chemicals. Be careful and wear appropriate protective equipment like gloves, safety glasses, and face masks. Follow five basic steps for post-flood building restoration, including (1) air out, (2) move out, (3) tear out, (4) clean out, and (5) dry out. Seek professional services and/or guidance before attempting to repair flood-damaged property.
- Throw out any food, including canned items, that was not maintained at a proper temperature or has been exposed to floodwaters. Do not eat food from a flooded garden. When in doubt, throw it out.
- Remove and replace drywall or other paneling that was underwater. Use a moisture meter to make sure that the wooden studs and framing are dry before replacing drywall. Mold growth in hidden places is a significant health hazard.

CARE FOR LOVED ONES

Look for signs of depression or anxiety related to this experience, such as feeling physically and mentally drained; having difficulty making decisions or staying focused; becoming easily frustrated on a more frequent basis; feeling tired, sad, numb, lonely, or worried; or experiencing changes in appetite or sleep patterns. Seek help from local mental health providers if you detect these signs in yourself or others.

INSURANCE

Photograph damage to your property and contact your insurance agent. Do what you can to prevent further damage (e.g., putting a tarp on a damaged roof) that insurance may not cover.

PROTECT YOUR PROPERTY

WIND

The best way to reduce the risk of damage to a structure from hurricane winds is to reinforce or strengthen the building. Where available, you may also purchase high-wind insurance policies.

Windows are particularly vulnerable components on most structures. Impact-resistant glazing or permanent storm shutters offer the best protection for windows. A second option is to laminate the glass with a thin film to keep the glass from shattering. You can also board up windows with 5/8-inch plywood, cut to fit and ready to install. Tape does not prevent windows from breaking. Numerous manufacturers produce certified storm-resistant window and door products. Also reinforce garage doors against direct wind effects by using storm-resistant doors or by retrofitting existing doors with commercially available products.

Roof failures commonly cause major damage to buildings and their contents. Metal brackets and straps can strengthen the connections between the roof and wall systems. Brackets and straps should be attached at the studs and rafters, not to the plywood sheathing. The entire structure can be bolted to its foundation using anchor bolts along the foundation sill.

When a hurricane is forecast for your area, you should remove or secure items that are typically outside. Bring patio furniture, garden tools, garbage cans, and toys inside. Trim or remove trees close enough to fall on the building. Anchoring storage sheds and other outbuildings helps prevent them from becoming flying debris. Anchor objects that are unsafe to bring inside, like gas grills or propane tanks.

FLOOD

Take steps to protect your property from flood damage.

- Talk to your insurance agent about buying flood insurance. Flood insurance is available for homeowners, renters, and business owners. Because homeowners insurance policies do not typically cover flood losses, you will need to purchase separate flood insurance if your property is at risk for flooding. Visit **www.floodsmart.gov/floodsmart/pages/flooding_flood_risks/defining_flood_risks.jsp** for an estimate of what flood insurance may cost for your property address. A policy purchased today will take effect in 30 days, so act now.
- Elevate the heating system (furnace), water heater, and electric panel if the location is susceptible to flooding.
- Install "check valves" in sewer lines to prevent floodwater from backing up into the drains of your home.
- Waterproof the basement.
- Install sump pumps with battery backup.
- If you live in a flood-prone area, stockpile emergency building materials (e.g., plywood, plastic sheeting, lumber nails, a hammer and saw, a pry bar, shovels, and sandbags).
- In areas with repetitive flooding, consider elevating the building.
- Keep gutters and drains free of debris.

SAFFIR-SIMPSON HURRICANE WIND SCALE

The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and property damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures. In the western North Pacific, the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph.

CATEGORY	SUSTAINED WINDS	TYPES OF DAMAGE DUE TO HURRICANE WINDS
1	74-95 mph 64-82 knots 119-153 km/hr	**These very dangerous winds will produce some damage:** Well-constructed framed homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last for a few hours to several days.
2	96-110 mph 83-95 knots 154-177 km/hr	**These extremely dangerous winds will cause extensive damage:** Well-constructed framed homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and could block numerous roads. Near-total power loss is expected with outages that could last for several days to weeks.
3 (major)	111-129 mph 96-112 knots 178-208 km/hr	**Devastating damage will occur:** Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (major)	130-156 mph 113-136 knots 209-251 km/hr	**Catastrophic damage will occur:** Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5 (major)	157 mph or higher 137 knots or higher 252 km/hr or higher	**Catastrophic damage will occur:** A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

RESOURCES

If you would like more information, the following resources may be helpful.

- FEMA *Against the Wind: Protecting Your Home From Hurricane and Wind Damage:* **www.fema.gov/media-library/assets/documents/2988?id=1641**
- FEMA *Community Hurricane Preparedness Training:* **www.training.fema.gov/EMIWeb/IS/courseOverview.aspx?code=is-324.a**
- FEMA *Coastal Construction Manual: Principles and Practices of Planning, Siting, Designing, Constructing, and Maintaining Residential Buildings in Coastal Areas* (Fourth Edition): **www.fema.gov/media-library/assets/documents/3293?id=1671**
- FEMA *Design and Construction Guidance for Community Safe Rooms:* **www.fema.gov/media-library/assets/documents/3140?id=1657**
- FEMA *Home Builder's Guide to Coastal Construction:* **www.fema.gov/media-library/assets/documents/6131**
- FEMA *Homeowner's Guide to Retrofitting: Six Ways to Protect Your Home From Flooding:* **www.fema.gov/media-library/assets/documents/480**
- FEMA *Safety Tips for Hurricanes: Publication for Teachers and Parents for Presentation to Children.* To order, call 1-800-480-2520.
- FEMA *Taking Shelter From the Storm: Building a Safe Room in Your Home or Small Business:* **www.fema.gov/media-library/assets/documents/2009?id=1536**
- FEMA *Wind Retrofit Guide for Residential Buildings:* **www.fema.gov/media-library/assets/documents/21082**
- FloodSmart: **www.floodsmart.gov/floodsmart**
- Institute for Business and Home Safety Protect Your Home Against Hurricane Damage: **www.disastersafety.org/hurricane**
- National Hurricane Center: **www.hurricanes.gov**
- NOAA, Marine Safety: **www.nhc.noaa.gov/prepare/marine.php**
- NOAA, Tropical Cyclone Preparedness: **www.nws.noaa.gov/os/hurricane/resources/TropicalCyclones11.pdf**
- Ready: **www.Ready.gov/hurricanes**
- Substance Abuse and Mental Health Services Administration (SAMHSA), Disaster-Specific Resources: Annotated Bibliography: **www.samhsa.gov/dtac/dbhis/dbhis_specific_bib.asp#disaster**