Resident's Handbook

To Prepare for Natural Hazards in Georgia



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The Resident's Handbook to Prepare for Natural Hazards in Georgia is a resource that has been developed by University of Georgia's (UGA) Marine Extension and Georgia Sea Grant, in collaboration with several federal, state and local partners. This handbook provides detailed information on emergency preparedness, evacuation planning, and steps that residents can take to protect their life and property. The purpose of this handbook is to provide actionable information that residents can use to build resilience to natural hazards in Georgia. Resources included throughout the handbook address specific needs of underserved populations, including people with functional and access needs.

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An author list for the Resident's Handbook is provided on the following page *(* indicates first author)*. All authors also helped edit the handbook.

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PART ONE:

Introduction

Why read this handbook?

Your home is your castle. It protects you, your family, and your possessions from the elements. Whether you are a renter or owner, your home is also a major financial investment. Natural hazards such as hurricanes, tropical storms, floods, tornadoes, winter storms, excessive and prolonged heat waves, drought, and forest fires can threaten your home, your family, and your community. When a natural hazard occurs, the impacts can be devastating.

This handbook will help you prepare for natural hazards in Georgia and reduce risks to your family and property. While it is not possible to eliminate all potential threats from a natural hazard, as a resident, you can take action by implementing small, cost-effective steps that could significantly lower your risk. More million-dollar weather-related disasters have occurred in the Southeast than any other region in the United States. Your family and home deserve the protection that only you can provide.

This handbook is divided into the following parts:

Part 1 provides an introduction, presents the purpose and layout of the handbook and includes a discussion of common myths that may have prevented you from taking action in the past. A summary of the content of this handbook is also provided in the form of 10 actionable items.

Part 2 covers basic information about natural hazards in Georgia including hurricanes, tropical storms, floods, tornadoes, winter storms, excessive and prolonged heat waves, drought, and forest fires. This will allow you to learn more about potential hazards and make decisions about the steps that you can take to protect your family and your property.

Part 3 discusses detailed ways in which you can protect yourself and your family. Included in this section are a suggested stock of essential emergency supplies, instructions for preparing an evacuation kit, food and water safety, evacuation planning, evacuation procedures, and important information that emergency management agencies want you to know before a natural hazard warning or event occurs.

Part 4 covers information on how you can strengthen your house and protect your physical property.

Part 5 includes information about homeowner's insurance and ways in which you can protect your finances after a hazard.

1.1 Common Myths and Reasons to Prepare

There are several myths that prevent residents from fully planning and preparing for natural hazards. In order to remove common barriers, some myths are debunked below.

Myth 1: ***"A natural hazard can't happen to me. I don't need to evacuate."***

Truth: The paths of tropical storms, hurricanes, and tornadoes cannot be precisely predicted, although forecasts are improving. The Georgia coast is in the approximate center of the curved coastline known as the Georgia Bight, which extends from Cape Fear, North Carolina to Cape Canaveral, Florida. Although the Bight often protects Georgia residents from hurricanes, the coast is still susceptible to experiencing severe storms. Coastal residents need to take precautions and prepare for hurricane threats accordingly.

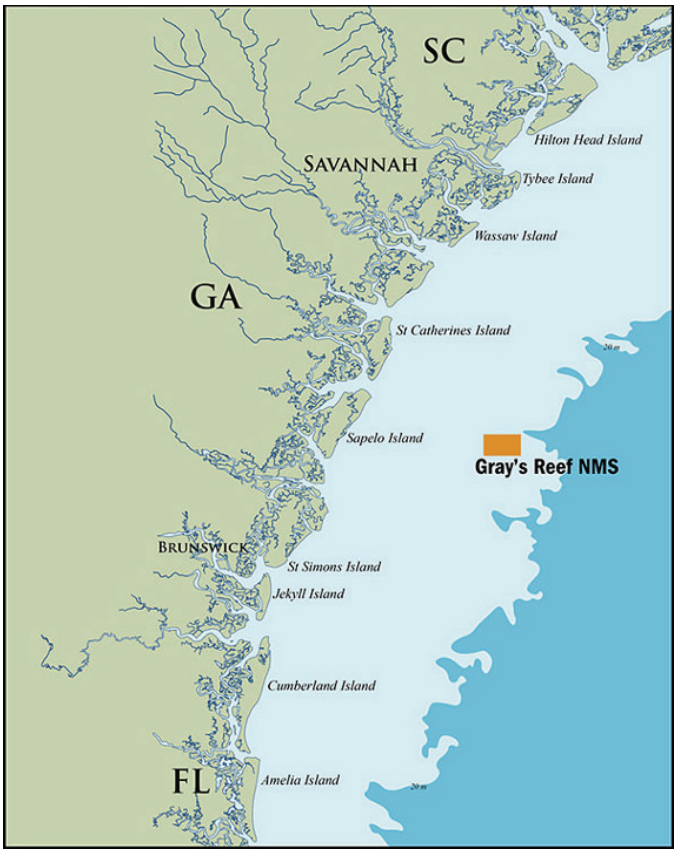


Figure 1-1. A map of the Georgia Bight.
(Source: NOAA's Grays Reef National Marine Sanctuary)

Sixty-five disasters have occurred in Georgia since 1953. Some of the most devastating hurricanes to have threatened Georgia's coast include Hurricane David (1979), Hurricane Hugo (1989), Hurricane Floyd (1999), and Hurricanes Cindy and Dennis (2005). More recently, Hurricanes Matthew (2016) and Irma (2017) impacted Georgia. While Irma was only a tropical storm when it crossed Georgia, and Matthew stayed off the state's coast as it moved north, Georgia still suffered damage including fallen trees, power outages, road closures, flooding, and lack of services. People who evacuated were relieved, while others who stayed wished they had left.

Federal disaster designations have most commonly been declared in Georgia for severe storms, followed by tornados, fires, floods and hurricanes from both the Gulf and Atlantic coasts. The state has also experienced prolonged drought, freezing temperatures impacting agricultural crops, snow and ice storms. The best way to protect your life and property is to plan ahead BEFORE a natural hazard strikes, then heed the warnings and advice of your local emergency management agency. Be safe and stay safe.

Myth 2: ***"If a hazard occurs, it won't be that bad."***

Truth: Although many people are at risk of natural hazards, they are often less prepared than they could be. One factor that hinders preparation is called the "optimism bias" which is the judgment that negative events are less likely to happen to oneself than to other people. Optimism bias can lead to poor decision-making, and lead to disastrous results.

Myth 3: ***"I don't live near the coast, so I am safe."***

Truth: Natural hazards do not just impact the coast. Hazards like wildfires and tornadoes can strike anywhere in the state. Ice and winter weather can impact Northern Georgia. Strong winds, heavy rain, tornadoes, and inland flooding can spread hundreds of miles from coasts, rivers, and marshes, leaving extensive damage and death in their wake. In 2018, Hurricane Michael caused $2.5 billion in economic losses to Georgia's agriculture industry. Severe impacts occurred in counties located over 200 miles inland from where the hurricane made landfall. Therefore, all residents should prepare, not just those along the coast. According to the Federal Emergency Management Agency (FEMA), it is estimated that every $1 spent on mitigation saves around $6 in recovery costs.

Myth 4: ***"I survived natural hazards in the past, so I am sufficiently prepared."***

Truth: Many people are under the impression that if they survived one event, they are adequately prepared. Each event carries its unique set of threats that can be deadly and destructive. Planning and preparation can make a major difference, especially in the face of more frequent and more intense extreme weather events. Remember the adage, "expect the best, but plan for the worst, and prepare to be surprised."

Myth 5: ***"My weather app will tell me if I need to take action."***

Truth: Smartphone apps can be very useful in obtaining weather forecasts, current weather conditions, and weather warnings. However, they may not provide frequent and real-time updates regarding rapidly changing weather conditions. Weather forecasts are inherently uncertain and could change significantly over a few hours, such as during snow and ice storms. Reliance on technology is not enough - cell phone batteries may die, apps may stop working and mobile phone service could be suspended. It is important to have multiple sources of reliable information. Identify diverse ways to get updates from emergency personnel so that you can act quickly upon their recommendations.

Myth 6: ***"If a natural hazard occurs, the government or someone else will come to the rescue."***

Truth: It is important to remember that local governments may not risk the lives of their emergency personnel to come out in dangerous conditions to rescue people who failed to heed evacuation orders. If a mandatory evacuation is issued, emergency responders have no obligation to respond to calls from those who chose to stay in the area. If you know there is a likelihood that you may be impacted by a natural hazard, prepare to evacuate and follow the directions of local

officials. If evacuation orders are optional and you decide to stay, be prepared to be self-sustaining for a minimum of 72 hours.

The Stafford Act provides a federal process for declaring disasters, determining the appropriate level of response, and dividing the costs associated with disaster response and recovery between the federal, state, and local governments. However, the Stafford Act has many limitations, and residents may find that the government may not repair their damaged houses or provide adequate compensation for property damage. It is up to you to plan properly, strengthen your house, and have the appropriate financial protections in place, such as insurance, if it is available. After a natural hazard, the government, along with local agencies, may be overwhelmed by the number of people in need and may not respond quickly. It is better to take care of yourself and your family whenever possible. For renters and homeowners, insurance may be the first line of assistance.

Myth 7: ***"Even if I protect my property, my home could still be damaged."***

Truth: Even though someone may wear a seat belt, shoulder belt, and have an airbag, there is no guarantee that they will not be injured in a major auto accident. Yet most people recognize the importance of these safety devices in reducing risk and use them. Similarly, even though it is not possible to eliminate the risks from natural hazards, there are many steps that you can take to significantly reduce the potential damage to your life, family and property.

Myth 8: ***"My mobile home is tied down and braced, so it is a safe place to ride out a storm."***

Truth: A mobile home is never a safe place to stay during a hurricane, tornado, or even a severe thunderstorm. Anyone living in a mobile home must evacuate, regardless of the category of severe storm it is. According to the National Hurricane Center (NHC), no mobile or manufactured home – no matter how new it is – can be a safe shelter from hurricane-induced winds. While never a safe place to ride out a storm, tie-downs and straps can prevent your mobile home from coming loose and causing damage. Additionally, mobile homes are at risk from hazards such as fallen trees, utility poles and other large objects.

Myth 9: ***"Even if a hazard occurs, there is nothing I can do."***

Truth: Fortunately, there are many small steps that you can take to significantly reduce the risk of damage to life and property. While it is not possible to eliminate all risk or damage, reasonable planning steps can make a major difference and determine whether your house survives with minor or no damage. Information provided in this handbook can be extremely helpful in terms of providing step-by-step instructions on actions that residents can take to reduce risks posed by natural hazards in Georgia.

Myth 10: ***"Strengthening my house is too expensive or complicated and not worth the effort."***

Truth: There are multiple ways to strengthen your house, including:

- Strengthen your roof structure (trusses and rafters) with bracing. Strengthening your roof can be less expensive if it is done when you replace your roof at the end of its normal life.

- Install hurricane clips or window coverings.
- Upgrade the foundation of your house.
- Install flood vents to reduce your flood risk and save money on flood insurance.
- Flood-proof your home by elevating your house by two feet above potential flood water mark. Retrofitting an older house is more expensive than elevating a new home out of the expected potential height of flood waters. Either way there may be savings on flood insurance premiums, plus peace of mind and a higher resale value.

Strengthening your house not only protects you from hurricanes, storm surges, and floods, it also adds value to your house. The time and money that are invested in preparing your house are a very small fraction of the resources that may be needed if you fail to minimize damage when a natural hazard strikes. Many upgrades can be offset with insurance premium discounts.

By strengthening your house, you are not only protecting yourself, but also your neighbors and your community. A house that falls apart during a hurricane will create debris, which can damage adjacent properties. You also help emergency responders by allowing them to assist other people instead of requiring help yourself. See Part 4 for additional information on strengthening your home.

1.2 Actions to take to Prepare for Natural Hazards

Action 1: Gather your emergency supplies.

Many items that you need to plan and prepare are probably already in your home (See Section 3.2). Create a checklist that you can check and restock each month so that the supplies are complete, not outdated or used. Expiration dates, which are hard to read because of small print, can be made more visible on the packaging with an indelible ink pen such as a Sharpie. During Hurricanes Matthew (2016) and Irma (2017), many stores were sold out of food, water, gas, and other supplies even two or three days before expected landfall. Be prepared before the event.

Action 2: Identify multiple ways to get information about impending severe weather.

In addition to a NOAA (National Oceanic and Atmospheric Administration) weather radio, consider getting one or more smartphone apps that are specifically designed to provide a warning in case of severe weather. Make sure devices and app notifications are turned on at night and that your smart phone is fully charged if there is any possibility of severe weather. If possible, have a back-up battery charger accessible in your home in the case of a power-outage. Do not count on a siren to provide you with a warning. Many locations throughout Georgia do not have tornado sirens and, even if they do, you might not hear them. The sirens often must be physically activated by a person on site, and severe weather might hit before they are activated. Also, identify the source of your

local Emergency Management information for your area so that you know the official recommendations for what to do in case of an emergency. Many county emergency management agencies (EMA) have an alert system in place to automatically text or call you if a hazardous situation is imminent in your area. As landline phones become less common, you will need to contact your local EMA and register for your community's notification system to receive emergency alerts. A list of locations can be found on the GEMA website (https://gema.georgia.gov/locations). Appendix A also provides a table of locations by county.

Action 3: Create a separate evacuation plan for different natural hazards, such as hurricanes, tropical storms, tornadoes, floods and wildfires.

All hazards are different. For a hurricane or tropical storm, evacuate early. When the whole coast evacuates, lodging can be difficult to find, and roads are likely to be congested. Your plan may include sheltering in your house if it is outside the evacuation zone and your home is strong enough. If you cannot use your house, use a friend's or relative's house or an official shelter (listen to local radio and television). Apps/Internet resources that provide weather updates are published by the National Weather Service and are listed in Appendix B.

For a tornado, tune in to your local TV news station, or listen to NOAA radio or commercial radio for the latest information. A smartphone app specifically designed to provide severe weather warnings can also be used. Make sure that they are turned on and your phone is fully charged so that you can get the warnings. Be alert for changing weather conditions. You may not have time to evacuate to a designated shelter or your warning may be a tornado siren or a phone alarm. If you hear the warning, take immediate safety precautions in your home. Go to your basement, storm cellar or the center of a windowless interior room on the lowest level, such as a laundry room, bathroom or closet. If possible, get under a sturdy table and use your arms to protect your head and neck. A football or bike helmet can be worn for added protection.

If you are instructed by local radio or television to evacuate in case of a flood, go to high ground outside the evacuation zone. Know your evacuation routes. Once you have evacuated, the wait may be several hours or even days. Discuss and practice drills of your evacuation plan with your family throughout each year.

For a wildfire, identify multiple escape routes well in advance since the fire front advances with the wind, which could change over time. Your EMA will identify areas for mandatory evacuation, so make sure you have a way to receive those orders in a timely manner. Emergency alerts can come through radio stations, cable, home phone lines and cell phones. Be prepared to leave quickly. Sheltering in place should be only be undertaken as a dire last resort when roads are already affected by the fires.

Based on the nature of the disaster, some familiar routes may be closed. Call "5-1-1" for information on road closures and conditions before evacuating. Georgia Public Radio (GPB) will also provide traffic information and road conditions during severe weather conditions. See Appendix B for a list of stations.

Action 4: Know your property and take appropriate action.

When was your house built? Does it have connectors to tie the roof to the wall or the wall to the foundation? When will you need to re-roof? If available, look at your blueprints to understand the framework of your house. They may be available from your home builder, your local building department, your architect or your landlord. Learn where the cutoffs for gas, water, and electricity are located and how to operate them. In the case of an evacuation, you may need to shut off your utilities to prevent further damage until you return home.

Look at where your property is located. If the land floods, then consider buying flood insurance. If trees overhang your house, consider trimming or cutting the overhead branches before they can damage your house in a storm. Fire is part of life in the Southeast. Consider drought-resistant and fire-resistant native plants for your yard (see Section 4.9.1). Know your house and take appropriate action.

Action 5: Strengthen your house.

A house built after the early- to mid-1990s should have hurricane clips to tie the roof to the wall and strong connectors from the wall to the foundation. If your house was built before then, you can still retrofit. All households should consider the many options now available to protect their windows, garage and doors. You can also strengthen your roof when it is time to re-roof. The steps a homeowner can take will vary with each house, but for most homeowners, there are a few steps that can make a significant difference. View the Federal Alliance for Safe Homes website (*https://flash.org/*) to learn about how to strengthen your home and protect your family.

Action 6: Insure your home and valuables.

Do not gamble with the safety of your house. Obtain homeowners or renters insurance, if you do not have it. Check your insurance policy to see if it covers hurricane damage and know the deductible amounts and options. Insurance policies to cover damages to your home and the contents of your home due to flooding are purchased separately from your home insurance. Consider getting flood insurance even if you are not in an area that has historically seen floods, because changes in land use, weather patterns and sea levels can affect your vulnerability. You might experience flooding even if your area has not flooded before. This was the case for many victims in Houston, TX, during Hurricane Harvey in 2017. If you are not in a designated floodplain, attaining flood insurance could cost much less and give you peace of mind.

Action 7: Take advantage of potential discounts for your hurricane and flood insurance premiums.

Coverage may vary among insurance companies, so call your insurance agent to find out about discounts that may be available. Significant discounts may be provided for reducing the hurricane damage risk to your house with window protection, roof-to-wall tie downs (hurricane clips), and wall-to-foundation tie downs. Discounts may be provided on flood insurance premiums for homes located in a flood zone if you provide flood vents or elevate your HVAC units and water heater

to a specific level. Elevating the entire house above the 100-year flood level is certain to reduce insurance premiums. Additionally, a FEMA elevation certificate could lead to a decrease in premium price. The overall savings may be large enough to offset the initial costs.

Action 8: Finance creatively.

Consider efforts to strengthen your house as an important home improvement project. For the more costly projects, a small home improvement loan and potential discounts from hurricane insurance premiums may make these projects within reach. It is a great investment to strengthen your house and provide more protection to you and your family.

Action 9: Seek the assistance of a qualified, licensed architect, structural engineer or contractor.

This handbook emphasizes work that you may be able to do yourself. If you are unable to undertake any actions listed above, then please seek qualified assistance through trusted references from friends and family, the Structural Engineers Association, county, emergency management agencies, or local/state contractors' associations. Even if you do the work yourself, it is always best to seek professional advice for guidance.

Action 10: Seek alternatives when financial costs and transportation are barriers.

Everyone might not be able to act on the aforementioned recommendations. If finances are a barrier for preparing you and your family against natural hazards, here is a list of suggestions to consider:

- Gather supplies and make home improvements little by little.
- Gather extra items around your home to build your emergency kit.
- Purchase non-perishable food items and water in small portions each month.
- Buy off-brand items to save money.
- Look for hazards in and around your house, such as dead trees and brush, smoke and carbon monoxide detectors with dead batteries, and exposed electrical wires.
- Communicate safety plans with your family.

Prepare to the best of your ability and seek additional help when you need it. It is better to do what you can than to do nothing.

If you do not have access to transportation at the time of an evacuation, there are a few alternatives you can try. Ask neighbors or family members for a ride. Take public transportation if possible. The government will often reduce or remove public transportation fares during emergencies in order to transport people to safety. Depending on the disaster and your ability, riding a bike or walking could be another option. For additional assistance, call the number "5-1-1" to be connected with local resources during an evacuation. Police departments can also be contacted at their non-emergency number to assist you. Additionally, you can work with your own local organizations such as neighborhoods, clubs, churches and places of worship to develop plans to ensure everyone has an evacuation plan.

PART TWO:

Natural Hazards in Georgia

An Overview for Residents

In Georgia, many different types of natural hazards can occur. Hurricanes, tropical storms, floods, tornadoes, winter storms, excessive and prolonged heat waves, drought, and forest fires can threaten our state's residents. These events can have potentially devastating impacts on life and property. This handbook provides basic information about preparing for Georgia's natural hazards that could be instrumental in saving your own life, your family members' lives, and your property.

2.1 Tornado and Severe Thunderstorm Hazards

2.1.1 Tornadoes

Tornadoes are one of nature's most violent storms. Spawned from powerful thunderstorms, tornadoes can cause fatalities and devastate a neighborhood in seconds. Tornadoes come in different shapes and sizes, ranging from thin and pencil-like to wide and bowl-shaped. Waterspouts are tornadoes that form over water. Tornadoes generally occur near the trailing edge of a thunderstorm or accompany a tropical storm or hurricane as it moves onshore, adding to the storm's destructive power.



Figure 2-1. A photo of a tornado touching the ground over a wide area of land. *(Source: National Weather Service)*

Georgia averages 20 tornadoes a year, although annual variability is high. Peak tornado season is March through May with a secondary peak occurring in November. Since 1950, tornadoes have been reported in many counties in Georgia. Contrary to some commonly held beliefs, rivers, mountains, and urban areas do not provide protection from tornadoes and high winds. Everyone is susceptible to tornado damage.

Warmer daily temperatures can contribute to the formation of thunderstorms, which can form tornadoes and produce high winds and hail. The peak time of development for these storms is late afternoon or early evening between 3:00 p.m. and 9:00 p.m., but they can occur at any time of day or night if the conditions are right. Unlike the Plains of the Midwest, tornadoes are not easily visible over long distances in the dense, wooded areas of the Southeast. Heavy rainfall in the Southeast associated with higher humidity can also wrap around tornadoes and hide them from view.

A tornado appears as a rotating, funnel-shaped cloud that extends to the ground with whirling winds that can reach in excess of 250 miles per hour (mph). Damage paths can be more than one mile wide and 50 miles long. While most tornadoes move southwest to northeast, they can essentially travel in any direction, making their paths very difficult to predict. The average forward speed of a tornado is 30 mph, but this speed may vary from stationary to 70 mph. Furthermore, the size of a tornado is not necessarily an indication of its intensity. Large tornadoes can be weak, and small tornadoes can be violent. Since 2007, the National Weather Service (NWS) has used the Enhanced Fujita (EF) Scale to measure the strength of a tornado and describe its potential damage.

EF - Scale Number	Class	Wind Speed	Possible Damage
EF-0	Weak	65-85 mph	**Light**: Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages signboards.
EF-1	Weak	86-110 mph	**Moderate**: Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF-2	Strong	111-135 mph	**Significant**: Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF-3	Strong	136-165 mph	**Severe**: Roof and some walls torn off well-constructed houses; trains overturned; most trees uprooted.
EF-4	Violent	166-200 mph	**Devastating**: Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
EF-5	Violent	>200 mph	**Incredible**: Strong frame houses lifted off foundations and carried considerable distances and destroyed; automobile sized missiles fly through the air in excess of 300 feet; trees debarked; steel reinforced concrete structures badly damaged; asphalt stripped from road surfaces.

Figure 2-2. The Enhanced Fujita Scale.
(Source: National Weather Service)

During a tornado outbreak on January 21-22, 2017, a storm system released 41 confirmed tornadoes in Georgia - the largest outbreak ever recorded in the state over a two-day period. An EF-3 tornado with wind speeds up to 150 mph and up to 1.25 miles wide slammed through five counties in southwest Georgia. The tornado destroyed several mobile home parks, flipped and lifted semi-truck trailers, damaged dozens of homes, and snapped or uprooted nearly every tree in its path. There were 16 deaths in Georgia as a result of this tornado outbreak, most of them occurring in mobile home parks.

HOW TO PREPARE:

Georgia residents can prepare for tornadoes by taking shelter in a room on the lowest level of a house or building with no windows. Helmets, mattresses, or cushions can be used as cover from flying objects or debris from the tornado. Mitigation efforts include identifying a safe room to use before a storm hits and implementing a safety plan for all household members and pets.

2.1.2 Hail



Figure 2-3. A photo of hail the size of tennis balls.
(Source: Ryszard Stelmachowicz, Shutterstock)

Hail is another weather hazard that comes from severe thunderstorms. The NWS considers hail that is 1 inch or larger in diameter to be "severe." Hail is formed from ice, which is cycled up and down through a strong thunderstorm updraft (upward-moving air), growing in size with each cycle. Many hailstones show layering due to the movement of stones through the storm, but others show spiky lobes or even brain-like contours. Large hailstones can cause injury or death to people and animals who get caught in the open, since they can fall at speeds of up to 100 mph and from as much as 10 miles high in the sky. Hailstones can break windows, dent vehicles and puncture holes in roofs of poorly built structures. Some hail is associated with tornado producing thunderstorms, although hail can also fall from non-tornadic storms. The presence of hail is often associated with skies that appear greenish in advance of the severe weather.

HOW TO PREPARE:

Disaster resistance efforts for hail storms include seeking shelter, placing your vehicle in a garage or carport if possible, bringing pets inside and providing shelter for farm animals, maintaining trees and the landscape around your house, covering windows and glass around your house before a storm, closing drapes or blinds to prevent damage from flying glass, and inspecting your roof a few times a year to prevent damage from storms.

2.1.3 High Winds and Straight-Line Winds

Even if no tornado is present, strong thunderstorms can be severe if wind gusts reach 58 mph or higher. The NWS will generally issue a Severe Thunderstorm Warning if a storm is producing hail or high winds. Straight-line winds can be just as damaging as a tornado; therefore, a Severe Thunderstorm Warning should be taken seriously. Wind damage includes blowing out windows and light doors, blowing shingles or even whole roofs off buildings, and pushing over trees, especially if the ground is wet and roots are less able to withstand the wind.

On January 2, 2017, a severe thunderstorm in Southwest Georgia produced 6 tornadoes and 2 instances of 80 to 85 mph straight-line winds that were 3 to 4 miles wide. Hundreds of trees were uprooted or snapped and fell on homes, buildings, cars, and power lines.

HOW TO PREPARE:

Maintaining trees and the landscape around your home by cutting down dead limbs and removing debris can help mitigate damages before a storm occurs. Securing outdoor furniture and other large items or moving them inside during severe windstorms can prevent further damage to your house and property.



Figure 2-4. A photo of a fallen tree on a house in Paulding/Cobb County, Georgia, caused by a tornado and straight-line winds. *(Source: National Weather Service)*

2.1.4 Derechos

One specialized storm that contains strong straight-line winds is called a derecho. The term "derecho" has been around since 1888 but has only been used for roughly the past 30 years by meteorologists in severe weather warnings. A derecho is an organized line of strong thunderstorms that can last for hours as it moves generally west to east across a significant swath of territory. Some of the strongest derechos have moved from as far west as Iowa all the way to Washington DC and lasted for more than a day, causing damages and deaths along the entire path of the line. There is no separate warning for derechos, but you may sometimes hear the name used when a Severe Thunderstorm Warning is issued. Because they are long-lived, the NWS can sometimes issue a Severe Thunderstorm Watch several hours before the derecho is expected to affect your region.

HOW TO PREPARE:

Mitigation efforts for derechos follow the same efforts for high and straight-line winds. Make sure trees around your property and landscape are maintained, and secure outdoor furniture during windstorms to prevent significant damage to your house.

2.2 Tropical Cyclones

2.2.1 Tropical Storms

A tropical storm is an intense weather system characterized by a low atmospheric pressure center surrounded by a spiral arrangement of thunderstorms that produce strong winds and heavy rains. The winds blow in a counterclockwise flow at speeds ranging from 39 to 73 mph. Tropical storms have the potential to develop into a hurricane once winds consistently exceed 74 mph; thus they are monitored, tracked, and named by the NWS.

Also monitored are "tropical depressions," which are organized systems of persistent clouds and thunderstorms with similar closed low-level circulation patterns sustaining winds of 38 mph or lower. Tropical storms and depressions can cause storm surge due to winds and rain, although damage is usually less severe than hurricanes due to the lower wind speeds.

Individuals should not downplay these storms. They can produce strong waves and storm surges that can result in shoreline erosion and coastal flooding. They also produce heavy rains that can produce inland flooding and erosion. For example, in 1994 Tropical Storm Alberto had a major impact from the Florida Panhandle into central Georgia. Although it only had maximum sustained winds of 65 mph, it stalled over Georgia, causing catastrophic flooding that resulted in 34 deaths and over $750 million in damages. Following the storm, 55 Georgia counties were declared federal disaster areas.



Figure 2-5. A photo of individuals in a boat navigating the flooding from Tropical Storm Alberto in 1994.
(Source: NOAA-NWS)

Mitigation efforts for tropical storms include purchasing flood insurance to protect your home against flood damage, being aware of floodplains flood zones in your area, and making your house more flood resistant. The Floodplain Management Agency (*www.fema.gov/floodplain-management*) administers flood insurance programs and can be a good resource. Additionally, the Georgia Department of Natural Resources' Coastal Resources Division has a floodplain management program that provides resources on flood damage prevention (*http://www.georgiadfirm.com/#*). You can also mitigate for wind damage and power outages by securing outdoor furniture, maintaining trees and the landscape around your house, and keeping flashlights and other sources of back-up power in your home.

2.2.2 Hurricanes

A hurricane is an intense tropical weather system with a well-defined counterclockwise circulation pattern and sustained winds of 74 mph or more. Hurricane season in the Atlantic Basin is traditionally from June 1 to November 30, but can start earlier or end later than these dates. Generally, though, most of the activity occurs from August to October.

Many believe that Georgia's curved coastline, known as the Georgia Bight, provides protection against hurricanes; however, Georgia is highly vulnerable to storms and hurricanes that form in the Atlantic Ocean and the Gulf of Mexico. Since the 1950s, Georgia has been impacted by over 80 tropical depressions, tropical storms, and hurricanes, of which 16 have been major hurricanes. The past hundred years have been a relatively calm period for hurricanes making landfall in Georgia. Recently, Hurricanes Matthew (2016) and Irma (2017) have demonstrated that even brushes with major hurricanes can cause extensive damage, disruption, and loss of life. It is important for homeowners and residents to remain vigilant against hurricane threats.

Atlantic basin storms are not the only storms that Georgia's citizens need to worry about. Storms that approach from the Gulf of Mexico can cause severe impacts, as seen during Hurricane Michael in 2018. With storms that approach from the Florida panhandle area, storm surge is not an issue for Georgians; however, high winds, tornadoes, and heavy rainfall can cause significant impacts even far from the coast.

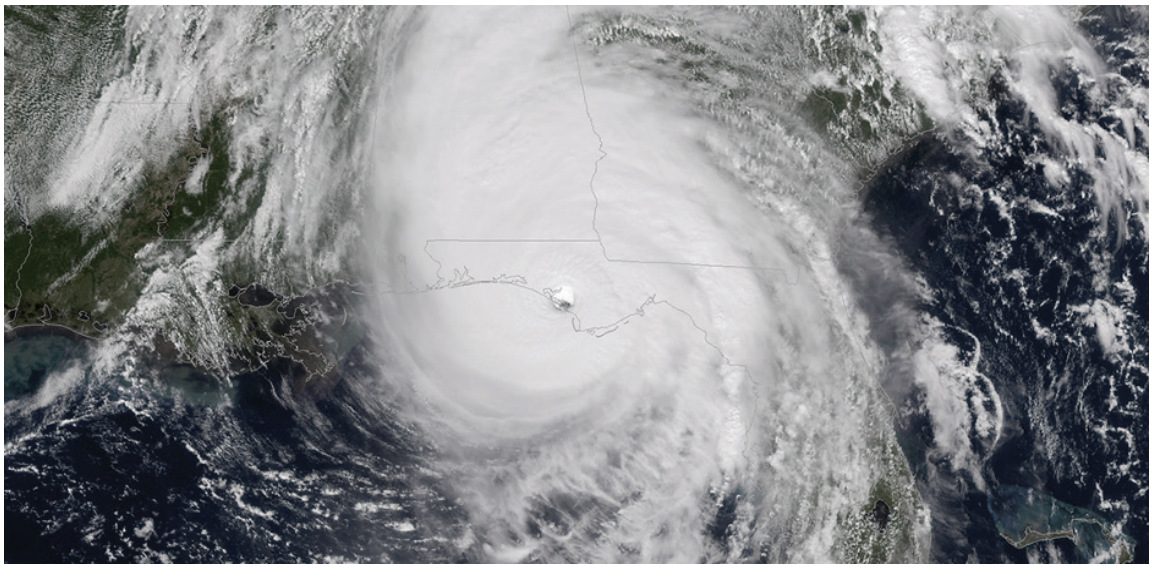


Figure 2-6. An aerial view of Hurricane Michael as the eye of the storm moves through Florida into Georgia. *(Source: NOAA-NWS)*

For over 46 years, the National Hurricane Center (NHC) has used the Saffir-Simpson Scale to classify hurricanes into five categories. In 2009, storm surge ranges, flooding impact, and central pressure statements were removed from the scale to help reduce public confusion about the impacts associated with the various hurricane categories, as well as to provide a more scientifically

defensible scale. Now only peak winds are employed in the revised version known as the Saffir-Simpson Hurricane Wind Scale. It is important to note that the Saffir-Simpson Scale only illustrates the "sustained winds" of a hurricane. Wind gusts can reach up to 135 mph for a Category 2 storm and up to 160 mph for a Category 3 storm.

During a hurricane, there is a triple threat of damage from high winds, storm surge and flooding associated with heavy rains. In a hurricane, the winds rapidly increase inward in strength, from the weakest on the outer edge to the strongest near the eye, being most intense around the eyewall. This area is generally 15 to 20 miles wide and contains the most intense rainfall as well. Hurricanes also produce tornadoes, which adds to their destructive power.

Storm surge is the result of many factors, including wind speed, forward speed of the storm, size of the storm, the slope of the shore, and angle of approach to land. Storm surge is a large dome of water, a rise in coastal sea level above the usual tide level as a result of the decrease in atmospheric pressure, often 50 to 100 miles wide that typically sweeps ashore near where a hurricane strikes land. Due to the shape and slope of Georgia's shoreline, coastal communities in Georgia are particularly vulnerable to storm surge, even if landfall is far away. In 2017, Hurricane Irma made landfall in the Florida Keys and then again on Marco Island in South Florida. It was a tropical storm by the time it passed through central Florida

Category	Sustained Wind Speed	Impacts due to Wind
5	157 mph or higher 137 kt or higher 252 km/h or higher	Catastrophic Impacts: High percentage of homes will suffer severe damage or destruction, due to breached openings, roof failure, and wind-driven rain. Fallen trees and power lines will isolate neighborhoods. Disruption to utilities may last weeks or months.
4	130-156 mph 113-136 kt 209-251 km/h	Catastrophic Impacts: Homes will suffer severe damage to roof structure, exterior walls, and windows. Wind-driven rain may cause interior damage. Numerous trees will be snapped and uprooted. Disruption to utilities may last weeks.
3	111-129 mph 96-112 kt 178-208 km/h	Devastating Impacts: Homes will incur major damage to exterior walls, roof shingles and decking. Snapped trees and downed power lines will block numerous roads. Disruption to utilities may last days to weeks.
2	96-110 mph 83-95 kt 154-177 km/h	Extensive Impacts: Many homes will incur damage to siding, roof shingles and decking. Many trees will be snapped, uprooted, and block some roads. Power outages expected for several days.
1	74-95 mph 64-82 kt 119-153 km/h	Homes could have damage to shingles, vinyl siding, and gutters. Trees may lose major branches; smaller trees may uproot. Power loss could last days.
Tropical Storm	39-73 mph 35-63 kt 63-118 km/h	Damage to some trees and power lines. Power loss in some areas. Outdoor items may become airborne and dangerous.

Figure 2-7. Saffir Simpson Hurricane Wind Scale.
(Source: National Weather Service)



Figure 2-8. A sign reading "GO AWAY IRMA" in Brunswick, Georgia.
(Source: UGA Marine Extension and Georgia Sea Grant)

and into Georgia. Despite passing hundreds of miles away and peak storm surge not occurring at high tide, the Georgia coast experienced substantial flooding. The long-term NOAA tide gauges at Fort Pulaski National Monument in Savannah, Georgia and Fernandina Beach, Florida both measured the second highest water levels in their recorded history.

Typically, storm surge accounts for 90% of storm-related deaths. A surge of 10 feet or more can cause severe flooding far inland and cause severe damage along the coast when wave action adds destructive power and height to the basic surge elevation, particularly when the storm's landfall coincides with high tide. According to NOAA, Hurricane Ike in 2008 generated a storm surge of 15-20 feet above normal tide levels and caused around $24.9 billion in property damage in Texas around the Galveston Bay area and Bolivar Peninsula.

Rainfall totals of 10 inches or more are not uncommon when a tropical storm or hurricane moves across a coastal location. Torrential rains continue in upland areas long after the high winds of a hurricane diminish. Rainfall totals of this magnitude can result in destructive flash flooding near streams, bayous, and rivers. Flooding also causes extensive property and agricultural losses.



Figure 2-9. A picture of coastal flooding in Savannah, Georgia.
(Source: UGA Marine Extension and Georgia Sea Grant)

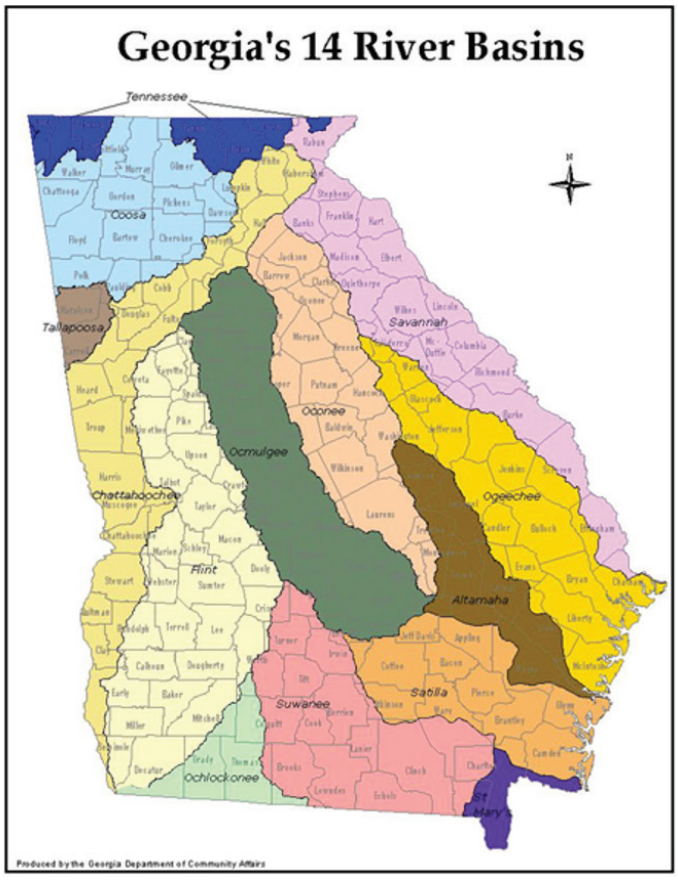


Figure 2-10. A map of Georgia's 14 river basins.
(Source: Georgia Department of Community Affairs)

Watches

Listen closely to instructions from local officials on TV, radio, cell phones or other reliable sources of information for instructions from local officials. Evacuate if told to do so.

The types of storm watches include:

- **Storm Surge Watch:** There is a possibility of life-threatening inundation from rising water moving inland from the shoreline somewhere within the specified area, generally within 48 hours.
- **Hurricane Watch:** Hurricane conditions (sustained winds of 74 mph or greater) are possible within your area. Because it may not be safe to prepare for a hurricane once winds reach tropical storm force, The National Hurricane Center (NHC) issues hurricane watches 48 hours before it anticipates tropical storm-force winds.
- **Tropical Storm Watch:** Tropical storm conditions (sustained winds of 39 to 73 mph) are possible within the specified area within 48 hours.

Warnings

Listen closely to instructions from local officials on TV, radio, cell phones or other reliable sources of information for instructions from local officials. Evacuate immediately if told to do so.

The types of storm warnings include:

- **Storm Surge Warning:** There is a danger of life-threatening inundation from rising water moving inland from the shoreline somewhere within the specified area, generally within 36 hours. If you are under a storm surge warning, check for evacuation orders from your local officials. Storm surge maps for Georgia can be found on NOAA's National Storm Surge Hazard Maps web page (https://www.nhc.noaa.gov/nationalsurge/).
- **Hurricane Warning:** Hurricane conditions (sustained winds of 74 mph or greater) are expected somewhere within the specified area. NHC issues a hurricane warning 36 hours in advance of tropical storm-force winds to give you time to complete your preparations. All preparations should be complete. Evacuate immediately, if ordered to do so.
- **Tropical Storm Warning:** Tropical storm conditions (sustained winds of 39 to 73 mph) are expected within your area within 36 hours.
- **Extreme Wind Warning:** Extreme sustained winds of a major hurricane (115 mph or greater), usually associated with the eyewall, are expected to begin within an hour. Take immediate shelter in the interior portion of a well-built structure.

Disaster resistant efforts for hurricanes include utilizing the Saffir-Simpson Scale to measure the hurricane intensity, checking for severe weather alerts in your area and building houses with hurricane protection measures. According to FEMA, for every $1 spent on strengthening your house and property from severe weather damage, you save $6 per $1 on recovery. Purchasing insurance plans that cover flood and home damage also help with financial costs of disaster impact.

2.3 Flood Hazards



Figure 2-11. A picture of Highway 80 flooding towards Tybee Island.
(Source: Sean Compton)

Flooding in Georgia occurs with many severe weather events, such as heavy rain, thunderstorms, hurricanes, and storm surge. Although residents throughout Georgia can experience flooding on highways, streets, and neighborhoods, the coast is prone to heavier amounts of flooding and damage. Much of the state's coastal region is at or near sea level, and with approximately 5.2% of its 10.43 million residents living along Georgia's coast, the population is very vulnerable to coastal flooding.

Coastal flooding and wave inundation can be produced by a hurricane or high-surf event with waves generated by local storms. Flooding can also be caused by a tropical storm, tropical depression, or other weather system that produces heavy rain. In addition, astronomical events, such as king or perigean spring tides, can produce flooding at high tide due to the alignment of the moon and sun with Earth. Flooding can build up gradually over a period of days or suddenly in a few minutes (this is commonly known as a flash flood). You can also have flooding that is a combination of these effects, such as heavy rains during high tide or storm surges.

A good way to determine the risk of flooding for your house is to observe and study your property. Even properties outside a flood plain may be susceptible to flooding if there is poor localized drainage or if recent development has altered the ability for water to drain out of your area. If your property floods during small rain events, then the probability is greater for flooding during a storm or hurricane. You can protect yourself by improving the local drainage, making your house more resistant to floods and purchasing flood insurance. You do not need to be in a designated flood zone to obtain flood insurance.

The Georgia Department of Natural Resources has a website with information on your flood risk and how to lower it (www.georgiadfirm.com). Additionally, a mapping tool is provided that can



Figure 2-12. Coastal flooding in Brunswick, Georgia.
(Source: UGA Marine Extension and Georgia Sea Grant)



Figure 2-13. A road that was washed out from flash flooding in Troup County, Georgia.
(Source: National Weather Service)

determine flood risk based on your address. Even if you are not in a high-risk flood zone, you should consider purchasing flood insurance for your home and the contents of your home. A renter's flood insurance policy will cover up to $100,000 of your personal property. The rates for properties outside of high-risk flood zones are very affordable and are "priceless" if a flood event should occur. Note that it will take 30 days to process flood insurance, so do not wait until a storm is approaching to buy insurance because it will be too late!

Mitigation efforts for flooding include the Federal Community Development Block Grant, the National Flood Insurance Program, and the collaboration between Georgia Emergency Management Agency/Homeland Security and the Department of Natural Resources to develop better floodplain management. Communities with high participation in flood insurance programs have overall improved community resilience. Coastal flooding mitigation efforts include increased green space to manage flooding and wetland and stream buffers to absorb large amounts of water.



Figure 2-14. Flooding beside the road in Clayton County, Georgia.
(Source: National Weather Service)

2.4 Wildfire Hazards

Wildfires, or any naturally occurring fire in a grassland, brush, or forested area, are especially dangerous hazards during periods of drought. Areas with large amounts of dry fuel, such as vegetation, debris, or trees, are particularly susceptible to wildfires caused by lightning strikes. Fire probability depends on local weather conditions, human activity, and implementation of community fire prevention measures. From 2000–2016, there were 108,044 wildfires that occurred in Georgia, burning a total of 725,030 acres. The most common cause of wildfire was negligent human behavior. For this same period, careless debris burning was the number one cause of wildfire in Georgia followed by arson. Lightning strikes were the third most common cause and typically occurred during summer months.

Land managers and Georgia Forestry Commission firefighters use prescribed or controlled fires to mimic the natural benefits that wildfires provide to private and public properties across the state. Prescribed burns help to reduce the amount of flammable vegetation in an area, which in turn lessens the intensity of a wildfire that may occur in that same area. This allows firefighters the opportunity to suppress the fire while it is still small and easier to control. These prescribed burns also play a vital role in maintaining the health of many ecosystems, in part by promoting a mosaic of vegetation and stimulating the establishment and growth of a diversity of trees and other plants.

Wildfire hazards will continue to escalate as residential and commercial development encroaches upon wildland and forestland areas. This area where structures and other human developments meet or intermingle with wildlands or vegetative fuels is called the Wildland Urban Interface. Currently, 80% of all wildfires occur within one mile of Wildland Urban Interface areas. Because of this fact, wildfire prevention and public awareness campaigns have increased significantly to reduce the number of human-caused wildfires in Georgia.



Figure 2-15. A photo of the West Mims Fire in the Okefenokee National Wildlife Refuge.
(Source: U.S. Fish and Wildlife Service/Mark Davis)

Georgia's long growing season, ample sunshine, and high annual rainfall produce large amounts of vegetation each year. The Georgia Forestry Commission and other state agencies have worked for several years to mitigate this wildfire risk. Mitigation measures have included using prescribed burns, mechanical fuel treatment such as mowing or chopping, chemical treatment, and pre-suppression firebreak plowing.



Figure 2-16. An aerial view of the West Mims Fire in the Okefenokee Wildlife Refuge.
(Source: U.S. Fish and Wildlife Service/Mark Davis)

Additionally, public education programs teach citizen responsibility in reducing vulnerability through the development of Community Wildfire Protection Plans (CWPP) and hiring Firewise Community Coordinators. CWPPs are updated approximately every five years in conjunction with county Hazard Mitigation Plans. These plans are developed in conjunction with the Georgia Emergency Management Agency, the Georgia Forestry Commission and Federal Emergency Management Agency to prioritize ways of reducing fuel and structural ignitability and recommend public education activities.

2.5 Extreme Heat

Across the United States, extreme heat is one of the biggest weather-related causes of human and animal mortality. Extremely high temperatures during the day, especially when coupled with high humidity levels, make it impossible for bodies to cool off to normal levels and can lead to heat stress and even death. High temperatures at night eliminate the overnight cooling that is necessary for bodies to recover from the daytime heat; this results in stress from heat accumulating over days, amplifying the effects of the hot conditions. Children, the elderly, and those experiencing homelessness are the most susceptible to heat illnesses because their bodies are less capable of regulating their internal temperature, but anyone working or playing outside can be affected by high heat. Individuals who work outside doing strenuous activities are also quite vulnerable heat-related stress. High temperatures are associated with increased stress on plants, which often shut down their transpiration and growth at high temperatures in an attempt to preserve moisture.

Heat-related syndromes include heat cramps, heat exhaustion and heat stroke. Heat cramps are the mildest of these conditions, and heat stroke is the most severe. Heat cramps are painful, involuntary spasms of the muscles and occur most often when exercising in hot, humid weather. They are caused by imbalances in electrolytes due to heavy sweating and can often be treated by drinking fluids or sports drinks containing electrolytes (i.e., Gatorade, Powerade), getting into cooler temperatures such as in an air-conditioned building or shaded location, and resting. Heat exhaustion occurs if the body's core temperature starts to rise and it cannot cool itself off through perspiration. Dehydration, alcohol use, and over-dressing can contribute to heat exhaustion. Untreated, heat exhaustion can lead to heat stroke, a life-threatening condition that occurs when your body temperature reaches 104°F or higher. Heat stroke requires immediate medical attention to prevent permanent damage to the brain and other vital organs.

The NWS provides heat advisories when conditions leading to heat exhaustion are likely. In those conditions, it is recommended that you stay indoors in air-conditioned buildings, drink plenty of fluids, take rest breaks, and limit strenuous outdoor activities. Check on elderly neighbors to make sure that they are cool and comfortable. If the air conditioning not available, look for a public area with cooler conditions to help prevent heat-related impacts, such as a public library or community center. Animals that are outdoors can also be impacted by extreme heat levels and should be cared for appropriately by providing them shade or bringing them indoors. Residents with cattle and other livestock should provide animals with shade and plenty of water to help reduce heat caused symptoms.

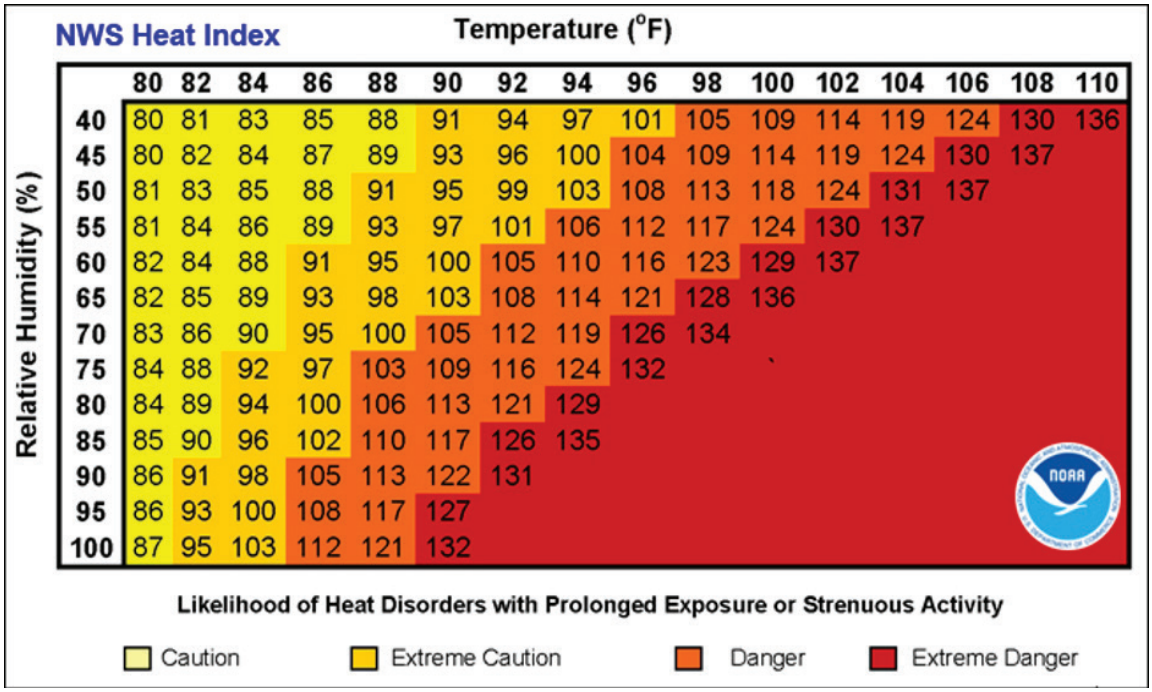


Figure 2-17. Heat Index Chart. *(Source: National Weather Service)*

Extreme heat and vehicles provide a particularly deadly combination for pets and young children. Every year, children die when they are left inside cars or trucks by inattentive caregivers. The temperatures inside a vehicle can rise rapidly. A car at 70°F in full sun can reach 104°F in 30 minutes, and 113°F within an hour. In higher temperatures, the interior of a car can quickly rise to as much as 172°F. Do not leave children or pets unattended in hot vehicles.

Ways to mitigate heat-related illness and death include becoming familiar with heat-related illness signs and symptoms, staying cool in extreme heat by wearing light-colored clothes, hydrating, and finding access to air-conditioning. Pay special attention to children and the elderly, outdoor manual labor workers, the homeless, and children and adolescents who participate in prolonged outdoor activities throughout the summer. Additionally, those with breathing impairments may experience worsening symptoms as air quality often decreases with high heat. Take appropriate precautions to avoid low air quality levels and extreme heat based on your circumstances and ability.

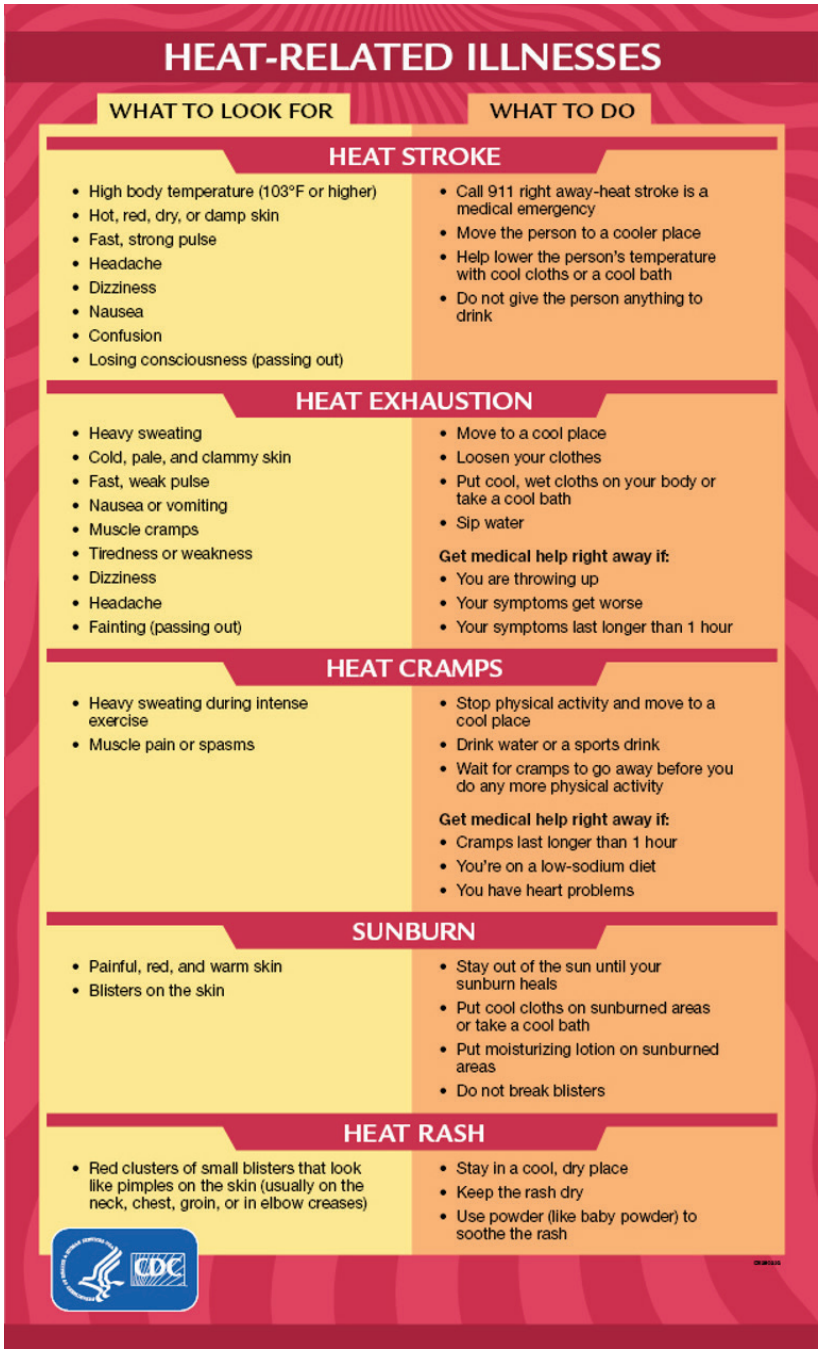


Figure 2-18. Heat Related Illness Chart.
(Source: Centers for Disease Control and Prevention)

2.6 Drought

Drought conditions are the result of extended periods of limited or no precipitation. Human activities, high temperatures, high winds and low humidity can accelerate the development of drought conditions which may also make areas more susceptible to wildfire. Periods of drought can have significant negative impacts on agriculture, water reservoir levels, surface and groundwater supplies, or any water-dependent resource or product.

There are two main types of drought. **Agricultural drought** is a short-term drought which usually occurs in summer when temperatures are hot and dry spells occur, putting stress on growing plants. Dry conditions can be particularly damaging if they occur during periods of plant development, like flowering or pollination. **Hydrologic drought** is a drought which occurs over a time period of months to years and is characterized by a long-term decrease in precipitation which slowly depletes lake and reservoirs, stream flows, and groundwater levels. If rain falls frequently enough, hydrologic drought may not affect agriculture, even if it is reduced in amount. However, this longer-term dryness will cause significant problems with water availability and may cause water shortages and even outages if the drought becomes severe enough.

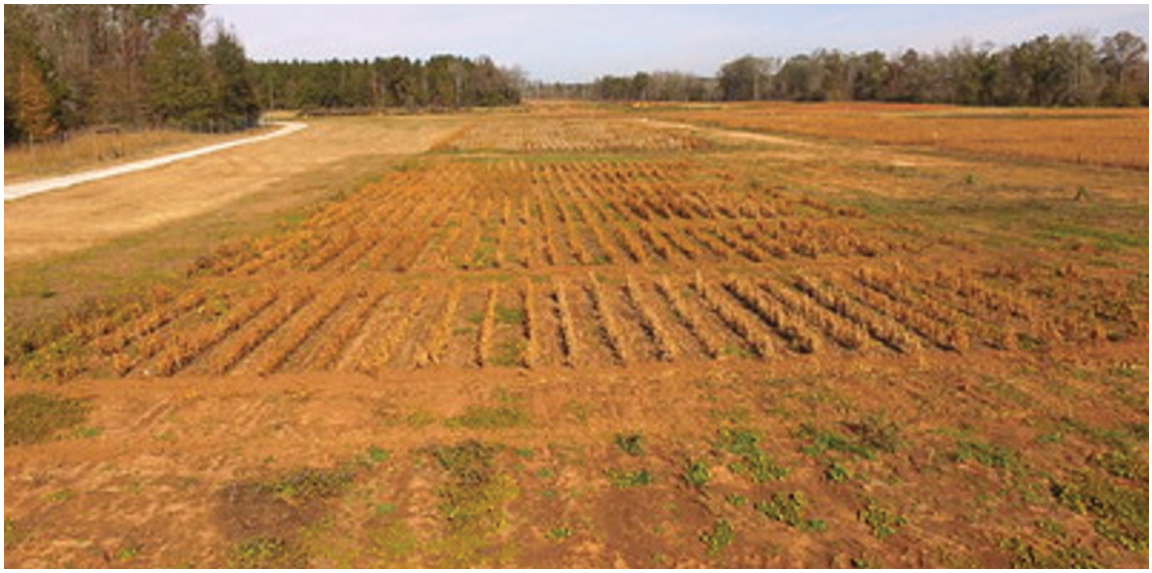


Figure 2-19. A photo of a soybean field at the University of Georgia Research and Education Center in Rome, Georgia.
(Source: UGA Cooperative Extension, creativecommons/flicker.com)

In Georgia, there are several different groups monitoring drought conditions. The National Drought Monitor (https://droughtmonitor.unl.edu/) uses a combination of physical factors like soil moisture, rainfall deficits, and temperatures, as well as the input of government groups that are monitoring for impacts of drought conditions, to determine a drought level from D0 (abnormally dry) to D4 (exceptional drought). The Drought Monitor level is often used by crop insurance

companies to determine if payments for drought-stricken crops are warranted. The Georgia Environmental Protection Division also determines a drought response level, considering only the state of water supplies, not the impacts on agriculture. If water supplies become limited, they can declare a drought response level from Level 1, which is limited to providing education on water conservation through public service announcements and water bill inserts, to Level 3, which limits outdoor water use severely and may restrict it to one day of use per week or no outdoor water use at all if water supplies are extremely low. The US Department of Agriculture also provides drought designations for counties that have impacts of drought on agriculture — this provides access to low-cost loans for farmers to recoup some of their drought-related losses. More information on drought designations can be found on the USDA website (https://www.fsa.usda.gov/programs-and-services/disaster-assistance-program/disaster-designation-information/index).

Residents should be aware of the current drought level and the rules they are expected to follow under each drought level. For example, a Level 2 drought bans some private outdoor water-using activities, like washing cars, and limits the times during which you can water your landscape. You can find information on the current drought status and what water conservation rules to follow for each drought level at the Environmental Protection Division website (https://epd.georgia.gov/watershed-protection-branch/water-conservation).

Mitigation efforts for droughts include Georgia HydroWatch from the United States Geological Survey which projects drought information and monitors water levels, the National Drought Monitor and the Georgia Environmental Protection Division as mentioned, and practicing water conservation regardless of drought status.

2.7 Winter Storms

Winter weather is not an event you would typically associate with the southeastern United States; however, records since 1950 have shown that winter storms have increased both in frequency and intensity. Winter storms include a variety of precipitation, such as snow, sleet, or freezing rain, that only occur at low temperatures. Due to these weather events being historically less frequent in Georgia, they are often extremely disruptive. Conditions often upset transportation and can result in life-threatening situations. Storm effects, such as extremely cold temperatures, snow accumulation, and sometimes coastal flooding resulting in ice can cause hazardous conditions and unplanned problems for people in the affected area.

On January 28, 2014, the winter storm some called “Snowpocalypse,” or “Snowmageddon,” left many Georgia residents stuck in gridlocked traffic, inconvenienced and cold. Two inches of snowfall coupled with insufficient planning resulted in over 940 vehicle accidents. Unable to reach home and safety, many people slept on the floor of local businesses while other panicked citizens were found walking on interstates ill-equipped to weather the storm. The winter storm paralyzed much of Atlanta, showing how a lack of preparedness can result in confusion and chaos.



Figure 2-20. Cars pulled over into a ditch during the January 2014 winter storm in Pickens County, Georgia.
(Source: National Weather Service)



Figure 2-21. Ice storm in Sandersville, Georgia, February 2014.
(Source: National Weather Service)

The Georgia Department of Transportation (GDOT) prepares for winter hazards by monitoring winter weather and using the Road Weather Information System to predict road conditions across the state. The GDOT responds to winter weather storms by clearing state routes and interstates and improving road conditions for drivers. Georgia residents can prepare by keeping blankets and water in vehicles, checking windshield washer fluid levels, having a full tank of gas and preparing for power outages at home.

Before a winter storm, you should prepare your emergency kit, update your family communications plan, check weather radios and weather apps, and winterize your property. Tune in to NOAA Weather Radio, local radio, TV, or other reliable news sources for more information. Monitor weather alerts, check your emergency supplies, and gather any items you may need if you lose power.

It is a good idea to know the terms used to describe winter weather conditions. There are specific actions that you can take depending on the type of winter weather and the severity of the winter storm. The following terms are defined by the NWS and can be found at www.ready.gov/winter-weather.

- **Freezing Rain –** Rain that freezes when it hits the ground, creating a coating of ice on roads, walkways, trees, and power lines.
- **Sleet –** Rain that turns to ice pellets before reaching the ground. Sleet also causes moisture on roads to freeze and become slippery.
- **Wind Chill –** Wind chill is the temperature it "feels like" when you are outside and your potential for frostbite from exposure to wind and cold air. The NWS provides a wind chill chart to show the difference between air temperature and the perceived temperature and the amount of time until frostbite occurs.
  For more information, visit: http://www.nws.noaa.gov/om/winter/windchill.shtml.
- **Winter Weather Advisory –** The NWS issues a winter weather advisory when conditions are expected to cause hazards. If caution is used, these situations should not be life-threatening.
- **Winter Storm Watch –** The NWS issues a winter storm watch when severe winter conditions, such as heavy snow and/or ice, may affect your area but the location and timing are still uncertain. A winter storm watch is issued 12 to 36 hours in advance of a potential severe storm.
- **Winter Storm Warning –** A winter storm is occurring or will soon occur in your area.
- **Blizzard Warning –** Sustained winds or frequent gusts to 35 miles per hour or greater with considerable amounts of falling or blowing snow (reducing visibility to less than a quarter mile) are expected to prevail for a period of three hours or longer.
- **Frost/Freeze Warning –** Below freezing temperatures are expected.

PART THREE:

Protecting Yourself and Your Family

Georgia is vulnerable to a variety of hazards, including, hurricanes, freshwater flooding, coastal storm surge flooding, tornadoes, ice storms, droughts, extreme heat, and wildfires. Although some of these hazards, such as hurricanes, are seasonal, planning and preparation is important throughout the year. Preparing in advance is a critical step in protecting your home and family. Having a plan in place can help keep your family safe and reduce the burden on first responders. Discussion among family members can also help lower stress levels before, during, and after a hazard event.

3.1 Understanding Your Risk

The first step in preparing for a natural hazard is to understand your risk before an event. Look around your property for trees that hang over buildings or power lines. If the trees are not in good health, you should remove the trees before high winds are a threat. If you live in an area vulnerable to power interruption, you could invest in a generator to minimize the impacts. A chainsaw to clear a path through fallen trees can be a good investment in a rural area. To reduce flooding around your house, make sure any low-lying areas drain away from the house. If you are a renter, talk to your landlord about hazards around your house and work out ways in which you could minimize risks. Even if your home and landscaping are well prepared for severe weather, extreme conditions can overwhelm the best prepared properties. The Federal Emergency Management Agency (FEMA) estimates that 25% of flood damage claims are from properties outside of the floodplain, so just because your parcel of property is not prone to certain hazards does not mean that those hazards will not impact your property.

After assessing outside conditions, evaluate internal spaces and identify where the safest places in your home are located. For tornadoes, high wind events, and severe storms, you will want to put as many walls as possible between you and the severe weather. Interior closets or bathrooms without windows, provide the best shelter. Make sure your entire family, including children, know where to go when severe weather threatens. Practice what to do and how to get to safety quickly so that you all know how to respond if, and when, a hazard occurs. Construction of safe rooms is discussed in Section 4.5, but if construction of a safe room is not feasible, locate the safest closet or bathroom on the lowest level of your house. Bring a mattress or sofa cushions into the room when severe weather strikes to use as a protective covering over your heads. If you live on the upper floors of an apartment complex, contact the main office about safe spaces to go.

The next step in understanding your risk is to be aware of daily weather conditions and the potential for severe weather. The National Weather Service (NWS) is the best source of information on daily weather and impending severe conditions. While smartphone apps are convenient for daily weather forecasts, they are not all suitable for rapidly changing weather conditions, so make sure you have an app or an alert that provides immediate notice of severe conditions. The NWS provides watches indicating that conditions are favorable for the potential development of severe weather later that day and usually give a few hours' notice of impending severe weather. Once severe weather is observed by a trained observer or radar, a warning will be issued identifying the location and direction of the severe weather. When this happens, you need to take immediate action to protect yourself and your family by finding safe shelter. Wireless Emergency Alerts are sent to your phone by your mobile carrier, and many counties have alert systems in place through sirens or phone notification. If you do not have access to the Internet or a smartphone, use a NOAA Weather Radio or listen to GPB or local AM/FM stations. If you have access to a television and power, local news updates will broadcast weather alerts.

3.2 Emergency Supplies

Families and individuals should be prepared to have 72 hours worth of food (3 day supply), water, and other essential supplies in case of natural hazard. If a catastrophic event occurs, first responders and emergency workers may not be able to reach all households before this time-window. Furthermore, some hazards cannot be predicted or have very short lead times. Winter storms and hurricanes can often be predicted several days in advance, while tornadoes and earthquakes cannot.

The following is a list of supplies that should be gathered for sheltering in place for 72 hours. The next section (Section 3.3) includes a list of items that one should put in an evacuation kit.

- ☐ Family communication plan, including written phone numbers and a reunification plan
- ☐ Bottled water for all members of the household. You should plan at least 1 gallon per day per family member. You should fill bathtubs or buckets with additional water to flush toilets if septic systems are widely used.
- ☐ Nonperishable food items (see list below)
- ☐ Can opener, scissors or a knife as needed for opening food packages
- ☐ Grill or camping stove for outdoor cooking (including charcoal or fuel)
- ☐ Supplies for infants (diapers, clothing, stored breastmilk or ready to use infant formula)
- ☐ Supplies for pets (food, water, medication, microchip information, leashes, carriers and bedding)
- ☐ Household unscented chlorine bleach for cleaning food cans and sanitizing water

- ☐ Medicine dropper

  Note: *To sanitize drinking water, add 16 drops (1/8 teaspoon) of bleach per gallon of water, stir, and let stand for 30 minutes.*
- ☐ Flashlights and batteries
- ☐ Metal whistle with lanyard
- ☐ First aid kit and manual
- ☐ Prescription medications
- ☐ Blankets and extra clothes
- ☐ Matches in a waterproof container
- ☐ Weather radio with batteries
- ☐ Important documents stored in a waterproof container (see list below for household documents)
- ☐ Wipes and towels
- ☐ Rain ponchos and jackets
- ☐ Chainsaw for clearing tree limbs and fuel stored in proper container
- ☐ Cell phone charger for your car
- ☐ Fuel for your vehicles
- ☐ Cash

Nonperishable Food Items:

- ☐ High energy foods such as peanut butter, nuts, trail mix or energy bars
- ☐ Dried fruits, smoked or dried meats such as jerky, crackers
- ☐ Ready-to-eat canned meats, fish, fruits and vegetables
- ☐ Juices: canned, powdered or crystallized
- ☐ Powdered or canned milk and extra water for rehydrating
- ☐ Soup: bouillon cubes or dried soups in a cup with extra water
- ☐ Comfort/stress foods such as cookies, hard candy and sweetened cereals
- ☐ Foods for infants, elderly with special needs or persons with allergies or on special diets, such as diabetics, if these situations apply
- ☐ Sugar, salt, and pepper if needed

If you have time, label the contents of canned foods along with the date on the can with a permanent marker. Paper labels can get wet or fall off in weather emergencies, and the food inside will not be known.

Household Documents:

The following documents should be kept together and stored in a waterproof container. In case original documents are inaccessible (i.e., they are stored in an offsite lockbox), then copies or scanned versions of the following important documents should be stored in a box.

- ☐ Will, insurance policies, contracts, deeds, stock and bonds
- ☐ Health insurance cards, list of doctors and their contact information
- ☐ Passports, social security cards, immunization records
- ☐ Family records (birth, marriage, death certificates)
- ☐ Bank account numbers
- ☐ Credit card account numbers and company information
- ☐ Inventory of valuable household goods
- ☐ Photos of valuable items (for insurance purposes)
- ☐ Emergency phone numbers

First Aid Kit:

If assembling your own first aid kit, include the following items. Consider taking a first aid course at your local community center to familiarize yourself with first aid terms and procedures.

- ☐ Sterile adhesive bandages in assorted sizes
- ☐ 3-inch sterile gauze pads (8-12)
- ☐ Triangular bandages (3)
- ☐ Scissors and needle
- ☐ Bar of soap
- ☐ Antiseptic spray
- ☐ Tongue blades and wooden applicator sticks
- ☐ Assorted sizes of safety pins
- ☐ Latex gloves
- ☐ Cleaning agent
- ☐ 2-inch sterile gauze pads (8-12)
- ☐ Hypo-allergenic adhesive tape
- ☐ 2 and 3-inch sterile roller bandages (3 rolls each)
- ☐ Tweezers
- ☐ Safety razor blade
- ☐ Moistened towelettes (8-10 packages)
- ☐ Non-breakable thermometer
- ☐ Tube of petroleum jelly or other lubricant

3.3 Evacuation Kit or "GO" bag

Evacuation may be necessary to protect yourself and your family. It is important to heed mandatory evacuation orders because this means that life-threatening conditions are expected to occur. In Georgia, hurricane evacuations are the most likely type of large-scale evacuation event. Keep in mind that an evacuation may require your family to travel a long distance for a prolonged period of time. Evacuation readiness is different from preparing to shelter in place because the supplies and planning may vary. For a sheltering-in-place event (such as a winter storm), the standard preparedness checklist (Section 3.2) will be useful. In the event of a **mandatory evacuation**, the following supplies are needed:

- ☐ Cash
- ☐ Cell phone charger
- ☐ Fuel for vehicles
- ☐ Train or bus fare
- ☐ Maps and GPS
- ☐ Bottled water
- ☐ Books, toys or art supplies for children
- ☐ Seasonally appropriate clothing
- ☐ Ponchos or rain gear
- ☐ Jumper cables for vehicles
- ☐ Car seat for infants and young children
- ☐ Pet carriers
- ☐ Sleeping bags and pillows
- ☐ Toiletries and items from the emergency supply kit, such as important documents and prescription medicines (read section above)
- ☐ Food and water for all family members and pets
- ☐ Battery operated weather radio with AM/FM receiver and extra batteries
- ☐ Non-prescription medications, such as: vitamins, antacid, aspirin or non-aspirin pain reliever, laxative, rubbing alcohol, activated charcoal, anti-diarrhea medication, emetic (to induce vomiting), eye wash and antiseptic or hydrogen peroxide
- ☐ Prescriptions drugs, contact lenses, and supplies if needed, as well as an extra pair of eyeglasses

Keep the items you will most likely need during an evacuation in an easy-to-carry container such as a large, covered trash container, camping backpack, or duffle bag. Keep a smaller version of the hazard supplies kit in the trunk of your car. It is also a good idea to pack these items in tightly closed plastic bags (zipper closures work well) to keep them as dry and airtight as possible.

Other supplies that may be helpful for you and your family during this time include the following categories:

Tools and General Supplies:

- ☐ Sterile adhesive bandages in assorted sizes
- ☐ 3-inch sterile gauze pads (8-12)
- ☐ Triangular bandages (3)
- ☐ Scissors and needle
- ☐ Bar of soap
- ☐ Antiseptic spray
- ☐ Tongue blades and wooden applicator sticks
- ☐ Assorted sizes of safety pins
- ☐ Latex gloves
- ☐ Cleaning agent
- ☐ 2-inch sterile gauze pads (8-12)
- ☐ Hypo-allergenic adhesive tape
- ☐ 2 and 3-inch sterile roller bandages (3 rolls each)
- ☐ Tweezers
- ☐ Safety razor blade

Sanitation Supplies:

- ☐ Toilet paper and towelettes
- ☐ Plastic garbage bags and ties
- ☐ Plastic bucket with tight lid
- ☐ Household unscented chlorine bleach
- ☐ Soap and laundry detergent
- ☐ Personal hygiene items, including feminine supplies
- ☐ Small shovel to dig expedient latrine

Clothing and Bedding:

- ☐ Sturdy shoes or work boots
- ☐ Rain gear
- ☐ Blankets or sleeping bags
- ☐ Hat and gloves

- ☐ Thermal underwear
- ☐ Sunglasses
- ☐ Polyester film or plastic sheet emergency blanket
- ☐ Plastic tarpaulin (to keep bedding off the floor or ground)

Special Items for Babies:

- ☐ Formula, diapers, bottles, medications and powdered milk
  - Water will be needed for any reconstituting.

Special Items for Pets:

- ☐ ½ to 1 gallon of water per day per pet
- ☐ 3-day supply of food
- ☐ Kitty litter and litter box or puppy pads
- ☐ Collar with identifying tags and leash
- ☐ One, size appropriate pet carrier per pet. Pet carriers will likely be required at pet shelters in an evacuation scenario.
- ☐ Medicines

Additionally, once your family has begun the evacuation process, continue to monitor weather and road conditions through radio and other information channels. Traffic may need to be re-routed, contraflow lanes may be implemented, and sheltering locations may change.

3.4 Evacuation Planning

3.4.1 Emergency Alert System and Communication

Before a storm approaches, be sure to have a list of several trusted sources for weather and other hazard information. See Appendix B for suggested sources. Although social media and internet sources are convenient and popular, internet access may be unavailable during a storm event and social media sources are not always the most reliable. Check to see if your county or city emergency management agency has an emergency alert system that you can register for to receive text or phone call alerts. A battery-powered weather radio can provide updates on the weather conditions, traffic, and other critical information.

3.4.2 Evacuation Procedures for Hurricanes

Keep in mind that the most familiar route out of your town or community may not be the most optimal during an evacuation. Check news and traffic updates to help you to choose an efficient route.

When planning for evacuation, keep in mind that emergency officials will normally issue evacuation orders during daylight hours. If evacuating to a public shelter, bring supplies for at least 72 hours (see list in Section 3.3). If you plan to stay with friends or family members or in several different locations, remember to bring your emergency supplies as well as a communication plan for reunification. Do not attempt to reenter your community after a mandatory evacuation until an "all clear" message has been issued.

3.5 Wildfire Prevention

Georgia is prone to periodic dry, warm weather, especially in recent years. To protect your family and your home, it is important to understand ways in which you can reduce your fire risk.

- Never burn trash, firewood, or other items during a mandatory "burning ban."
- Know the restrictions of pine straw for landscaping near and around your home. Pine straw is extremely flammable.
- Monitor air quality if your community is experiencing smoky conditions.
- Heed evacuation orders from emergency managers and public officials.
- Refer to the section on wildfire hazards in Georgia (Section 2.4).

Burning yard leaf piles is the most common cause of wildfire. All outdoor burning requires a burn permit from the Georgia Forestry Commission (GFC), and only natural vegetative materials may be burned. The burning of household garbage and construction debris is prohibited. A major cause of debris burn wildfires is not obtaining a permit and burning with improper weather conditions. You may obtain a permit from GFC at their website (http://www.gatrees.org/) by reading the web page information and requesting a permit screen, or by calling (877) 652-2876. Fires should not be initiated before 8:00 a.m. and should be completely extinguished before dark.

3.6 Tornado Safety

Although tornadoes are more common in the spring and early summer, they can occur year-round in Georgia. Some counties use outdoor warning sirens or phone alert systems. Find out what your county uses.

Here is a list of things you can do or know to protect yourself from tornadoes.

- A watch means a tornado is possible; a warning means a tornado has been spotted.
- The center and lowest level of your house is the safest place to be during a tornado.

- Stay away from windows.
- If you have a pre-designated underground safe room, make sure this area is not prone to flooding.
- After a tornado, check in with family and friends.
- Use flashlights instead of candles to avoid accidental fires.
- Do not attempt to "outdrive" a tornado.

If you live in an apartment complex, check with the front office to see if there are designated safety areas in your building. If not, go to the lowest level possible and avoid rooms with windows. Mobile homes are particularly vulnerable to tornado damage. Evacuate to a safer location if you live in a mobile home.

3.7 Winter Weather Preparedness and Safety

Although not as common as other natural hazards in Georgia, winter storms, such as ice or snowstorms, can be dangerous due to hazardous travel, utility interruptions, and freezing temperatures. As with other weather systems, always stay updated and continue gathering information ahead of an approaching winter storm.

Here are some tips for winter weather preparedness:

- If your driveway is on an incline, move your vehicle to a safe place before precipitation begins. Ice may make it difficult to leave the driveway.
- Stay away from fallen power lines caused by an ice storm.
- Bring pets indoors when temperatures are predicted to fall below freezing.
- If traveling, keep water and blankets in your vehicle.
- If your vehicle is stranded in snow, make sure the exhaust pipe is not blocked by snow to prevent carbon monoxide poisoning.
- Carry an ice scraper and a small shovel in your vehicle during winter months.
- Never use kerosene or any fuel-burning heater indoors or in areas without proper ventilation.
- Check on elderly neighbors before and after a major winter weather event.

3.8 Helping Children

3.8.1 Helping Children Prepare Before a Hazard Strikes

Your family may realize clearly after a hazard what could have been done to get ready. No matter what the hazard is (fire, tornado, flood, etc.), preparing with some thought and action beforehand can usually help both children and adults in your family cope more effectively when a hazard strikes. Consider not only how your children might react in a hazard, but also what your own reactions might be, and how the crisis may affect each person's emotional and physical well-being. It is much easier to think through actions and reactions to crisis situations before the emergency occurs, rather than trying to cope with the stress when you are experiencing the hazard. FEMA provides preparedness worksheets that walk individuals through multiple hazards and disasters, which can be found in their "Are You Ready?" guide (https://www.fema.gov/media-library/assets/documents/7877).

Well before a hazard strikes, adults in a family should create a plan. Think through the supplies you will need, where everyone should meet, and how to take care of basic needs such as food, shelter, clothing and sleep. Once you have created a plan, talk through the basics with your children and practice together how to respond during a hazardous event. Simple tasks like practicing how to evacuate a burning home or how to call 911 can help children cope by giving them skills and information they can use later. Involve children in putting together a family emergency box or stocking your first aid kit. Talking, practicing, and actively preparing together can help reduce children's stress by making the unknown more familiar.

One important tool to help prepare children for hazards is to review what to do regularly. You can discuss what each family member should do in case of a hazard situation at informal times during the day. For example, you can discuss while sharing a meal or snack, during a quiet time in the afternoon or evening, or even while doing chores together. Schedule family drills to practice what to do in a fire, tornado, or hurricane evacuation.

Here are some simple ideas to help children prepare before a hazard:

- **Talk about a specific situation.** Read a news story about an emergency. Talk over your family's plan for that kind of emergency. This gives children a concrete example to discuss and the time to think through actions for real life crises. Rehearse how to call for help. Help young children practice identifying 911 on the phone or the community numbers for fire, police, or ambulance. If your community does not use 911, enter local numbers into your cell phones, and make sure children know how to find them.

- **Help children identify an emergency.** Remind children not to call 911 unless it is an emergency. Take turns sharing situations and talking about whether or not they are an emergency. For example, a building on fire is an emergency; a fire in an outside fire pit is not.

• **Play a game of "Let's Pretend."** With preschool and kindergartners, describe a hazard situation that might arise in your area and then ask, "What do you do?" Talk about good ways and bad ways to respond. For example, leaving the house and going to a family meeting place during a fire is good; hiding under the bed to avoid the fire fighters is bad.

• **Try a family game of "Escape."** On five or six slips of paper, write down different places where a fire might happen in your house. Put them in a bowl or in a hat. On five or six other slips of paper, write down various rooms where you might be, and put them in a second container. Pull a slip from the first jar locating the fire. Have each family member take a slip from the second jar, locating each person in the house. Work together to figure out how to escape and how to help those who may be trapped.

• **Stock a box** with games, books, and hobby materials each family member might enjoy. Keep the box in a safe place and pull it out during emergencies that require sheltering at home.

3.8.2 Helping Children Cope During a Hazard

Natural hazards such as floods, fires, tornadoes or hurricanes can be difficult for everyone in the family, but young children may be more frightened than adults or older siblings. Infants, toddlers and preschool-age children do not have the ability to understand what is happening during a hazard and may feel extreme stress when their lives are disrupted. Extra understanding and patience are essential to help children cope.

Here are some points to remember when helping children cope during a hazard:

• **Take care of safety first.** Follow public safety warnings and seek shelter when hazards are coming. Being alert and acting quickly may help keep your family safe.

• **Remain calm.** Remember that children mirror their parents' behaviors. If you project a sense of calm, children are more likely to stay calm as well.

• **Explain in simple terms.** Tell children simply and matter-of-factly about the problem and how your family is handling it. This helps reduce children's fear of the unknown. Do not try to shield children from all information; they can sense that something is wrong, and not knowing is scarier than a simple explanation.

• **Bring along security objects.** If you need to evacuate and have time, safely collect a few possessions -- a favorite blanket, doll, stuffed animal, or other toy -- that can provide comfort to your child. Having something familiar in a new situation helps everyone, and especially young children, feel more secure.

• **Give children a job.** If there is work to be done during the hazard, find jobs that children can do, no matter how small they might be. For example, designate the job of locating and bringing the flashlight to the designated shelter-in-place location to your child. They need and want to carry out important roles. Having a job helps them feel a part of the family and prepares them to cope with later situations.

• **Be prepared for regression.** In a crisis, children may return to unusually "childish" behavior that they previously outgrew. For example, a five- or six-year-old may ask to sit on a parent's lap or want to be cuddled, or a 3-year-old who has been using the toilet may have accidents again. This is a common sign of stress for children. Be patient and give the child extra reassurance to help them feel more secure.

• **Remember that children are still children.** Even in a crisis, children may find ways to have fun. Adults who do not understand child development might be upset or punish children for not behaving seriously enough. Remember that most young children are not able to understand the magnitude and severity of the hazard. Also keep in mind that play can be a powerful way for children to express feelings, relieve stress, and cope with fear.

• **Find ways to be active.** Physical activity is a great stress-reliever for adults and children alike. If your family is stuck indoors for an extended time, find creative ways to be active. A dance party, a fast game of Simon Says, or taking turns jumping rope can get the blood flowing and lower everyone's stress level.

• **Talk with your child.** Hazards are challenging and upsetting for everyone. Children may be upset because their daily routine is disrupted, or they may be missing something special such as a pet or favorite toy. Ask children of all ages to talk about what they miss. It is also okay to share your own feelings of loss. Reassure your child that it is okay to be upset and that your family will get through the hazard together.

3.8.3 Helping Your Child Prepare for Separation

Sometimes it is necessary to leave children with a relative or friend while you cope with certain effects of a natural hazard.

Here are some ways to help prepare your child for being away from home – and from you:

• Wait to tell them until you have made specific plans. This will prevent them from worrying about the separation prematurely.

• Choose a trusted adult. Leaving your children with someone they are familiar with and love is much less stressful than leaving them with someone they barely know.

• Explain where they will be staying and where you will be. Knowing where you are will help them feel more secure.

• Tell them how long you will be away. If you will be gone for more than a day or two, create a simple calendar that children can use to mark off the days until you return.

• Tell them how often you will be in touch with them and how you will communicate. Do your very best to stick to that schedule.

• Communicate regularly with the relative or friend who is taking care of your children. Ask about your children's physical and emotional health, and give them information to help them, such as each child's likes and dislikes or their particular fears. You know your children better than anyone else.

3.9 Helping the Elderly and People with Functional and Access Needs

The elderly and those living with disabilities are at an increased risk during natural hazards. It is important for individuals and caregivers to have a preparedness plan in the case of an emergency. Georgia Emergency Preparedness Coalition for Individuals with Disabilities and Older Adults is a state and federally funded coalition that partners with organizations throughout Georgia, aiming to support older adults and individuals with disabilities during disasters. If you have specific needs or concerns, reach out to the organizations partnered with the coalition.

Community partners include:

- **American Red Cross – Atlanta**
  http://www.georgiaredcross.org/
- **Atlanta Autism Consortium**
  https://atlautism.org/
- **Center for Advanced Communications Policy – Georgia Institute of Technology**
  https://cacp.gatech.edu/
- **Dekalb Emergency Management Agency (DEMA)**
  https://www.dekalbcountyga.gov/dema/dekalb-emergency-management-agency
- **Department of Human Services – Division of Aging Service (DAS)**
  https://aging.georgia.gov/
- **Department of Human Services, Office of Facilities and Support Services (OFSS)**
  https://dhs.georgia.gov/division-offices/office-facilities-support-services
- **Federal Emergency Management Agency (FEMA)**
  https://www.fema.gov/
- **Friends of Disabled Adults and Children (FODAC)**
  https://www.fodac.org/
- **Georgia Center for the Deaf and Hard of Hearing**
  https://www.gcdhh.org/
- **Georgia Advocacy Office (GAO)**
  http://thegao.org/
- **Georgia Department of Behavioral Health and Developmental Disabilities**
  https://dbhdd.georgia.gov/portal/site/DBHDD/
- **Georgia Department of Public Health – Division of Health Protection – Office of Emergency Preparedness and Response**
  https://dph.georgia.gov/emergency-preparedness
- **Georgia Emergency Management Agency (GEMA)**
  https://gema.georgia.gov/
- **Georgia State Financing and Investment Commission – State ADA Coordinators Office**
  https://ada.georgia.gov/

- **Gwinnett Coalition for Health and Human Service Emergency Preparedness Committee**
  https://www.gwinnettcounty.com/web/gwinnett/Splashpages/GwinnettCoalitionforHealthandHumanServices
- **Gwinnett, Newton, and Rockdale County Health Departments**
  http://www.gnrhealth.com/
- **Project Independence: A Function of the Georgia Vocational Rehabilitation Agency**
  https://gvs.georgia.gov/
- **Shepherd Center**
  https://www.shepherd.org/
- **Southeast ADA Center**
  http://www.adasoutheast.org/
- **Tools for Life – The Alternative Media Access Network – Georgia Institute of Technology Enterprise Innovation Institute**
  https://gatfl.gatech.edu/index.php

3.9.1 Register with Your Local Emergency Management Office

If you or a loved one requires additional assistance, register with your local emergency management agency. To do this, find the location closest to you from Appendix A and contact that office. They will be able to assist and direct you to the appropriate resources based on your needs.

3.9.2 Helping Individuals with Memory Impairment

Alzheimer's and Dementia affect a large portion of the aging population. In the event of a natural hazard, memory impairment can cause a great deal of harm to individuals experiencing these illnesses. Emergencies and unfamiliar environments can cause major stress and feelings of panic. Memory function may be better some days over others, but it is important to create an emergency preparedness plan on what to do during a hazard. Having a detailed, step-by-step plan can alleviate some of the stress.

If you or a loved one are living with a memory impairment, make sure to have a list of any medications currently prescribed, along with important things to remember and an emergency contact list. If you have forms of identification such as an ID or medical bracelet, keep those with you in an evacuation. If you are a caretaker, help create the plan and prepare an emergency kit so that you are better prepared to help during a hazard.

3.9.3 Helping Individuals with Functional and Access Needs

Evacuating during hazards can be even more challenging if you live with a functional or access need. If you rely on a wheelchair for mobility, make sure you have a manual wheelchair in case of emergencies, if possible. Be sure to pack extra batteries for power-charged wheelchairs and have a

plan in place if you lose access to power. For people who are visually impaired or those with limited sight, make sure you have the tools you need to get around such as a support cane or service animal. If you live with communication barriers, make sure you have alternative ways of communicating without a technology aid.

For individuals who have hearing impairments or are deaf, bring writing utensils and paper, hearing aids, and batteries. For the mute population or for those with deteriorating illnesses, bring writing tools and paper as a communication aid. If you are unable to write or use fine motor skills, make sure you bring your technology aid, batteries, and anything else needed for assistance.

If you live with a chronic illness or medical diagnosis that impacts your daily life, talk with your primary care practitioner or medical provider about what to do in the case of an emergency. For those reliant on regular medical treatments such as dialysis or chemotherapy, be aware of alternative locations of treatment centers. If you live with diabetes, make sure you prepare an emergency kit with insulin, medication, snacks, and necessary equipment to check blood sugar levels. Additionally, talk with your primary care practitioner about medication refills in the event of an emergency. Many shelters and organizations are able to provide certain medications in disasters.

If you or a loved one experiences a sensory disorder, pack items such as noise-cancelling headphones, games, coloring books, and a small tent to minimize distractions in your emergency kit that will help in loud, stressful environments. Bring security items that reduce stress and anxiety.

You know the needs of yourself and your loved ones best. List out your daily needs and pack an emergency bag or kit accordingly.

3.9.4 Helping Pets

If you are evacuating with animals, emergency officials will designate shelters for pets. Many hotels will also accept pets, and a variety of airlines will waive pet fees if you are evacuating by plane. Often, hotels near the evacuation zone reach capacity early, so it is important to evacuate as soon as possible if you are in a mandatory evacuation zone. You can check the Bring Fido website (https://www.bringfido.com/) for a list of pet-friendly lodging locations.

More pet preparedness tips:

- Microchip your pet.
- Have a recent photo of your pet.
- Have a leash and crate or carrier for your pets.
- Have pet vaccination records, particularly rabies and distemper.
- Do not leave pets behind.
- Do not assume that if you evacuate, you will be able to return immediately.

Ensure that public shelters, hotels and other lodging facilities can accommodate infants, young children, and/or pets. If needed, inquire about spaces that might be available for nursing or if there are pet fees. Some hotels that do not normally accept pets may make exceptions and even waive pet fees during a mandatory evacuation.

3.11 Food Safety after the Emergency

If you are at home and the electricity has gone off, first consume perishable and refrigerated foods. If the power has been off more than four hours and the temperature of the refrigerator is above 40° F, discard perishable foods. Then, use foods from the freezer until they become too warm. To minimize the number of times you open the freezer door, post a list of freezer contents on it. If you plan to evacuate and are not sure how long the power might have been out, you can put a plastic bag of ice cubes in the freezer. If you return to a solid cube then you know the food fully defrosted and then refroze, which means the food is still safe to eat. In a well-filled, well-insulated freezer, foods will usually still have ice crystals in their centers, which means the food is still safe to eat for at least two days. Consume the foods only if they have ice crystals remaining or if the temperature of the freezer has remained at 40° F or below. Covering the freezer with blankets will help to hold in cold. Be sure to pin blankets back so that the air vent is not covered. Finally, begin to use non-perishable foods.

If raw meats, poultry, seafood, eggs, or products containing these ingredients meet the temperature guidelines above, cook them thoroughly. If cooking is not possible, do not use them. Warming devices such as candle warmers, chafing dishes, and fondue pots that use small fuel cans should not be used for foods needing thorough cooking to be safe for consumption. Commercially canned or properly home-canned foods are already cooked and can be eaten right out of the can or jar or warmed, if preferred. Foods that are canned are considered shelf stable and do not require refrigeration until opened. Do not eat out of any cans that are rusty, leaking, bulging, or badly dented. Cans with large or severe dents in the sides or dents near seams may have allowed contamination to occur and could contain bacteria.

To clean sealed food cans after a flood:

1. Mark contents on the can with a permanent ink pen if this has not already been done.
2. Remove paper labels (they can harbor dangerous bacteria and will likely fall off during cleaning).
3. Wash the cans in a strong soap or detergent solution with a scrub brush. Carefully clean areas around lids and seams.
4. Soak cans in a solution of two tablespoons of chlorine bleach to each gallon of water for 15 minutes.
5. Air dry cans at least 1 hour before opening (with sanitized can opener).

Any raw, unpackaged foods that may have been contaminated with flood waters should not be used. Also discard any food, including pet food, not in a waterproof container if you suspect contact with flood waters occurred. Food containers with screwcaps, snap lids, pull tops, and crimped caps should not be disposed of after flooding. Other foods to discard after contact with flood water include home canned foods, boxes and bags, and those with pull-back films or foil closures.

3.12 What to do if you lose Everything

If your home is devastated by a disaster and you find yourself experiencing great loss, it can be difficult to know what to do next. Finding housing, food, and financial resources are important first steps to recovering.

3.12.1 Finding Food and Housing

If you are evacuating with animals, emergency officials will designate shelters for pets. Many hotels will also accept pets, and a variety of airlines will waive pet fees if you are evacuating by plane. Often, hotels near the evacuation zone reach capacity early, so it is important to evacuate as soon as possible if you are in a mandatory evacuation zone. You can check the Bring Fido website.

The American Red Cross provides:

- A safe place to sleep.
- Meals, snacks, and water.
- Health services (for disaster-related conditions), such as first aid, refilling lost prescriptions, or replacing lost eyeglasses.
- Emotional support and mental health services.
- Spiritual care.
- Help reconnecting with loved ones.
- Information about disaster-related resources in the community.

In some emergencies, the Red Cross may be able to provide access to disaster case workers, childcare, laundry, and direct access to services provided by their partners. The Salvation Army is another well-known organization that provides emergency resources such as food service, emotional and spiritual care, emergency communications, disaster social services, and donations management.

Georgia state parks typically waive park fees for people and their pets during evacuations. Airbnb participates in an Open Homes Program (https://www.airbnb.com/openhomes/disaster-relief) that gives evacuees a free place to stay for a certain length of time. Additionally, the Georgia

Department of Community Affairs offers the Georgia Housing Search tool (https://www.georgiahousingsearch.org/) for those looking for short- or long-term housing options after a disaster.

3.12.2 Financial Resources

It is important to note that government aid takes time to process, and it could be months before you receive financial assistance. Depending on the disaster, thousands of people could be in the same situation as you.

Georgia Emergency Management Agency (GEMA) Individual Assistance Grants are available upon Presidential Declaration of a Major Disaster. Grants include Housing Assistance, which provide repairs to damaged houses, and Other Needs Assistance, which provides replacement of essential goods and services such as vehicles, essential appliances, and child-care. These grants are only available upon approval and are only for losses not covered by insurance.

FEMA grants include Disaster Assistance, Crisis Counseling, Disaster Legal Services, Disaster Unemployment Assistance Program, and the National Flood Insurance Program. Disaster Assistance grants provide money or assistance to individuals, families, or businesses whose property damage and losses are not covered by insurance. Crisis Counseling grants are provided for states to implement short-term counseling services in impacted areas. Disaster Legal Services are provided for free to victims of disasters seeking legal aid. The Disaster Unemployment Assistance Program helps individuals who have become unemployed due to major disasters by providing unemployment benefits and re-employment services. The National Flood Insurance Program (NFIP) allows homeowners to purchase affordable flood insurance and encourages communities to implement regulations around floodplains. See Section 5 for additional information on how to navigate FEMA and the disaster assistance process.

Disaster Temporary Assistance for Needy Families (D-TANF) was made available after Hurricane Michael through the Department of Human Services (DHS) and the Division of Family and Children Services (DFCS).

The DHS has listed the following criteria needed to be met in order to qualify for D-TANF:

- Provide proof of application for FEMA Individual Assistance.
- Reside in one of the counties declared for FEMA Individual Assistance at the time of the disaster.
- Provide photo identification and proof of residency at the time of the disaster.
- Provide proof that the Household includes minor children under the age of 18 (or 18 and in school).
- Meet TANF basic eligibility.
- Gross income under 300% of the Federal Poverty Limit (FPL) for household size at the time of the disaster.

Although D-TANF was implemented in response to Hurricane Michael, it is likely that the Department of Human Services would provide this program in the future following disasters

impacting low-income Georgia residents (https://dhs.georgia.gov/).

Georgia Legal Aid provides resources to renters about house damages due to disasters. If your landlord will not let you out of your lease or will not fix repairs after a disaster, legal action can be taken. Based on local housing codes, housing conditions may or may not be enforced by your city or county of residence. Contact the Georgia Legal Services Program if you are unable to live in your house and are experiencing unreasonable delay of repairs from your landlord.

There are additional federal disaster assistance programs depending on specific needs such as farmers, businesses, legal services, and a variety of loans. Contact your local FEMA Disaster Recovery Center or Emergency Management Office for more information. See Appendix A for a list of Emergency Management Agency locations throughout Georgia.

3.13 Helping Yourself Cope after an Emergency

Coping with hazards can cause overwhelming feelings of anxiety, stress, and loss. If you find yourself or family members experiencing difficulties coping, there are resources that can help. The National Disaster Distress Help Line is available for those experiencing emotional distress from disasters. To talk to someone over the phone, call 1-800-985-5990. To text with a Help Line member, send "TextWithUs" to 66746.

3.13.1 Mental Health

Your mental health is just as important as your physical health. Common mental health symptoms after hazards include stress and natural reactions to loss. Typically, symptoms will go away gradually after a few weeks. Identify ways you can practice self-care and develop healthy coping skills. Returning to normal routines is helpful but, depending on the disaster and damage, this can take time.

Signs you might need to seek professional help include social withdrawal and isolation, mood disturbances, thought disturbances, irregular expression of feelings, changes in behavior, and thoughts of self-harm or suicide. Appendix C has a reference list of mental health clinics and agencies throughout the state of Georgia that you can contact.

Many people may experience Post Traumatic Stress Disorder (PTSD) after a disaster. PTSD is a response to traumatic experiences that lasts longer than a month and interferes with your daily life. Common symptoms mentioned by the National Center for PTSD include:

- Unwanted distressing memories, images, or thoughts.
- Sudden feelings of anxiety or panic.
- Feeling like the trauma is happening again (flashbacks).

- Dreams and nightmares related to the trauma.
- Difficulty falling or staying asleep.
- Irritability, anger, and rage.
- Difficulty concentrating or staying focused.
- Trouble feeling or expressing positive emotions.

People experience trauma differently and distress does not always look the same from person to person. Like any mental health problem, children and adolescents often express signs and symptoms differently than adults due to various developmental stages. Pay attention to changes in behavior and talk with your children about how they are feeling.

For immediate mental health assistance, the Georgia Crisis and Access Line provides crisis mental health services throughout Georgia. To reach this service, call 1-800-715-4225.

3.13.2 Sexual Assault and Family Violence

Sexual assault and family/intimate partner violence are often hidden and kept secret because of fear or shame. During hazards, sexual assault is common in mass evacuation areas where shelter space is crowded and limited. Women, men, and children all have the possibility of experiencing sexual assault, however it does occur more frequently with women and girls. If you find yourself in this situation, seek help from someone you trust.

Look out for any physical signs of sexual violence in children and adolescents such as bruising or bleeding, ripped clothing, and pain or distress while walking or sitting down. Behavioral symptoms of sexual violence in children can look similar to depression or PTSD. Look out for signs of difficulty concentrating, expressing sexual knowledge or behavior that is inappropriate for age, bed-wetting and nightmares, and avoidance of physical contact.

The Rape, Abuse and Incest National Network (RAINN) is a national anti-sexual violence organization that provides resources for sexual assault and abuse. Call 1-800-656-4673 to reach this service. For more information visit their website (https://www.rainn.org/) or see Appendix C.

Experiencing family or intimate partner violence after a hazard happens more frequently due to the higher amount of stress and chaos. If you see something that looks concerning, say something to a person in authority. If you are experiencing domestic abuse, seek help immediately.

Types of domestic abuse or intimate partner violence include physical, emotional, sexual, financial, digital, and reproductive coercion. For more information on types of abuse and how to seek help, visit the National Domestic Abuse Hotline (https://www.thehotline.org/is-this-abuse/abuse-defined/) or see **Appendix C.**

The Georgia Coalition Against Domestic Violence provides access to domestic violence shelters throughout Georgia. To reach this service, call 1-800-334-2836.

See **Appendix C** for a list of crisis and mental health resources and additional information on mental health concerns for children, adolescents, and adults.

PART FOUR:

Protect and Strengthen Your Property

Protecting your property and protecting your family go hand in hand. Your home provides shelter from daily and severe weather conditions, and a stronger home means the more likely it is that you will have a home to come back to after an evacuation. Homeowners can take several steps to protect their property and mitigate the damage caused by natural hazards. Knowing your risks from hazards, flooding and hurricanes and then mitigating for them can help minimize the impacts of hazards. Whether you are building new, or remodeling your home, following the recommendations in this chapter will greatly improve the chances your home will survive extreme events.

The ability for your house to survive a hazard event is limited by several factors, some of which are listed below:

1. Your location
2. The severity of the hazard event
3. How well your home was built
4. How your home has been maintained
5. What steps you take to strengthen your home

Many of the steps outlined in this chapter are intended for homeowners. However, if you are renting a property, you still have a vested interest in keeping yourself, your family, and your contents safe. You can play a key role in educating your landlord about hazard risks and ways of protecting the property. You can also take important actions as a renter to reduce potential impacts, particularly maintaining the landscaping year-round. Be sure to communicate with your landlord potential to clarify expectations and responsibilities of both parties in preparing the property for an extreme weather event or evacuation. Determine who will be responsible for taking protective measures such as covering windows and clearing the yards. If you are interested in implementing low-cost retrofits to your rental property, be sure to seek the permission of your landlord or rental management agency before making any changes to the property.

4.1 Best Standards for Building Better

Research and data have informed the best practices to strengthen your home. Building codes are defined as the minimum standard. However, homes can be built exceeding what is required by building codes using “beyond code” standards and building methods. Building beyond code standards allows homes to better withstand the hazards they may face and allows homeowners to

recover more quickly. Many insurance companies also give premium discounts for specific actions that make a home more resilient to natural hazards. To learn more, contact your insurance agent or insurer.

More information about Georgia State Minimum Standard Building Code on Georgia Department of Community Affairs website (https://www.dca.ga.gov/local-government-assistance/construction-codes-industrialized-buildings/construction-codes). You can also look up FEMA's Building Science Technical Bulletins and Reports (https://www.fema.gov/building-science).

4.1.1 Understanding Building Codes

When and how your home was built can make a big difference in how it will perform during severe weather. Building codes are sets of regulations governing the design, construction, alteration, and maintenance of structures. They specify the minimum requirements to adequately safeguard the health, safety, and welfare of building occupants.

Rather than creating and maintaining their own codes, most states and local jurisdictions adopt the model building codes maintained by the International Code Council (ICC). The ICC's family of International Codes include:

- International Building Code (IBC): Applies to almost all types of new buildings.
- International Residential Code (IRC): Applies to newly constructed one- and two-family dwellings and townhouses of not more than three stories in height.
- International Existing Building Code (IEBC): Applies to the alteration, repair, addition, or change in occupancy of existing structures.

Many cities and jurisdictions adopt and enforce building codes, but some do not. You need to know what codes are in place when you buy or build a new home, re-roof or update your existing home, or rebuild your home after a disaster. Building codes can change over time, and utilizing newer building codes can reduce claim frequency by 60% and claim severity by 42%. Find out which codes are in place in your area by contacting your local building code office or planning and zoning department.

If your city, jurisdiction, or municipality enforces building codes, then they typically adopt the codes every three to six years to provide a level of life-saving protection and to provide the local building industry a level of consistency. Building codes are intended for life safety, not for property protection or for ensuring that your property is there after the next big storm. While you must meet the minimum code requirements in your area, you can exceed minimum building standards when remodeling, re-roofing, or building new structures.

Mandatory Building Codes Across Georgia:

- International Building Code
- International Residential Code
- International Fire Code

- International Plumbing Code
- International Mechanical Code
- International Fuel Gas Code
- National Electrical Code
- International Energy Conservation Code
- International Swimming Pool and Spa Code

Permissive Building Codes:

- Disaster Resilient Building Code IBC Appendix
- Disaster Resilient Code IRC Appendix
- International Property Maintenance Code
- International Existing Building Code
- National Green Building Standard

For more information on building codes, see Construction Codes under the Georgia Department of Community Affairs (https://www.dca.ga.gov/local-government-assistance/construction-codes-industrialized-buildings/construction-codes).

4.1.2 FORTIFIED Home™

For homeowners who want to strengthen their home beyond code standards, the FORTIFIED Home™ program is a nationally recognized building standard developed by the Institute for Business and Home Safety (IBHS). Funded by property (re)insurers, IBHS is a nonprofit that conducts building safety and mitigation research, identifying ways to increase the resilience of structures for homeowners and businesses.

FORTIFIED standards can be used when building a new home, re-roofing, or updating an existing home. They help ensure that your home offers additional protection during severe weather events, such as hurricanes, strong thunderstorms, and lower-level tornadoes. The FORTIFIED designation is particularly relevant for properties that are considered high risk to natural hazards, such as homes in coastal or barrier island communities.

In order to receive a designation, you will need to use an IBHS Certified FORTIFIED Evaluator to assure that your home was built, re-roofed, or retrofitted to meet the program's stringent requirements. See Part 5 for more information on how this standard can lead to discounts in your home insurance and increased value in your home.

FORTIFIED LEVELS OF STANDARDS		
BRONZE	**SILVER**	**GOLD**
Roof Sealed roof deck, standardized attachment and roof coverings	**Attic Ventilation** Water intrusion resistant soffit vents	**Chimneys** Standardized attachment
Attic Ventilation Vents are rated for high-winds and gable vents are rated against water	**Openings** Approved system impact protected openings	**Openings** Designed with appropriate pressure ratings
Gables – Exterior Structural sheathing and standardized gable overhang	**Attached Structures** Roof, beam and column connection to prevent uplift	**Continuous Load Paths** Roof-to-wall, wall-to-floor, and floor-to-floor connections
	Gables – Bracing Gables braced for high wind	

Table 4-1. FORTIFIED House Designation Chart. The Silver standard includes every requirement from the Bronze level, and the Gold standard includes every requirement from the Bronze and Silver levels. Gold is the highest level of the FORTIFIED program and has the highest amount of protection.
(Source: Institute for Business and Home Safety - FORTIFIED "Home Rack" card - table adapted from IBHS website)

4.2 Retrofitting and Existing Home

Most of us live in existing homes, but when updating or retrofitting an existing home, you should consult with a licensed structural engineer or architect. They can go over the costs and benefits of installing the following common retrofit options:

- Roof-to-wall and wall-to-foundation connections.
- Hurricane clips only without additional foundation connection.
- Stronger connectors than those required in the current building code.

More information about retrofitting homes can be found at FEMA's Homeowner's Guide to Retrofitting (https://www.fema.gov/homeowners-guide-retrofitting).

4.2.1 Roof-to-Wall Connection

Concepts regarding the roof-to-wall connection are covered in Section 4.5. A properly selected hurricane clip is required for each rafter, and the rafters at gable-end eaves should be strapped down. Exterior beams supported by corner columns also require strap downs. For houses with post-and-beam roof construction, fasteners should be used at roof rafter to roof beams, top of post to horizontal ridge beam, and post to beam connections located at the exterior wall.

You should seek a licensed structural engineer or architect to select the proper connectors and nails for your house. You can then do either all or part of this work yourself or hire a licensed contractor.



Figure 4-1. Example of retrofitting by connecting a piece of the house to the foundation. This is an example of attempting a continuous load path connection from the roof to the foundation.
(Source: Hurricane Protection Services)

4.2.2 Re-Roofing

Strengthening the roof is important and should be considered for new constructions and for when a roof is replaced on an existing structure. The roofing option involves installing a continuous structural sheathing (for example, plywood where it is missing or damaged). Additional fasteners and a secondary waterproof membrane are required. You should seek a licensed roofing contractor to do this work.

As a side note, there are small things you can do to strengthen the roof even if it is relatively new. For example, if you climb up into your attic and see that the nails that should attach the plywood sheathing to the truss have missed the truss, this could be a structural weakness. The joint can be strengthened with a wood epoxy or the application of closed cell foam insulation.

4.2.3 Foundation Uplift Strengthening Restraint

Strengthening the foundation to resist uplift will generally require the removal of interior finishes. The installation of uplift connections should be planned by a licensed structural engineer only after they have inspected the home to understand the materials and methods used to construct the home and have calculated the uplift requirements.

they have inspected the home to understand the materials and methods used to construct the home and have calculated the uplift requirements.

4.3 Strengthening the Roof System

The roof is your home's first line of defense against severe weather and is often one of the most vulnerable systems of the home. Roofs are highly exposed to wind, rain, and hail and have the risk of failing in a severe weather event. Roof damage is common, even in lower level hurricanes and other high wind events, often leading to significant property damage inside the home. When the roof covering is lost, water can get in and damage the house and its contents. Strengthening the roof is one of the most important and often cost-effective ways to reduce damage from severe weather events. The best opportunities for strengthening the roof are when building new or re-roofing. There are also techniques to strengthen roofs on existing homes that do not require completely re-roofing.

4.3.1 Roofing Assembly

Several layers of materials create the structural strength of a roof and keep water out from the interior of the home. The bottom layer is called the roof decking, which is topped by an underlayment that keeps moisture from the decking. The most common underlayment used with shingles is a felt material, however, synthetic roof underlayment has recently begun to replace traditional roofing felt as the preferred material.

What you see from the outside of a home is the roof covering, typically in the form of shingles, metal, or tile. It protects your home from weather, heat, rain, hail, and wind during its lifespan and should be replaced at least once within the lifetime of a typical mortgage. Shingle roofs can last up to 20 or more years depending on their type, location, sun exposure, and maintenance level. Metal, slate, or tile roofs can last much longer, usually 40 or more years.

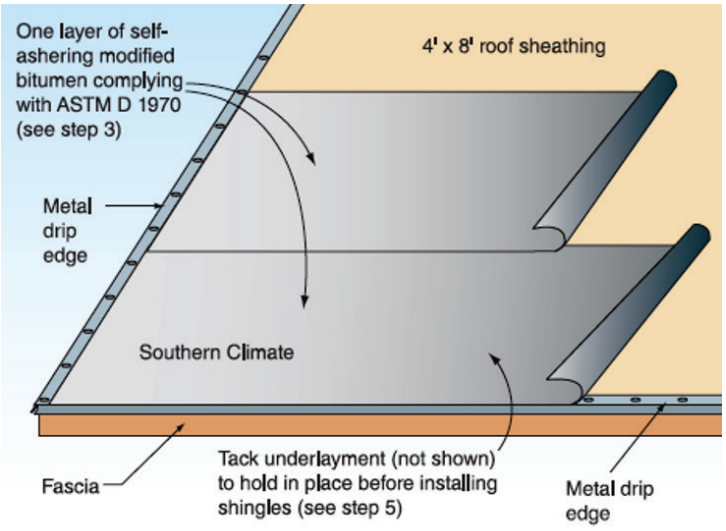


Figure 4-2. The installation roofing sequence for Southern climates. *(Source: FEMA's "Home Builder's Guide to Coastal Construction)*

It is important to ensure your roof covering is installed properly, based on wind speeds and building codes for your area and according to the roof covering manufacturer specifications. To make sure your roof is properly installed, only hire a licensed, trained, and insured roofer or contractor, preferably with credentials and references.

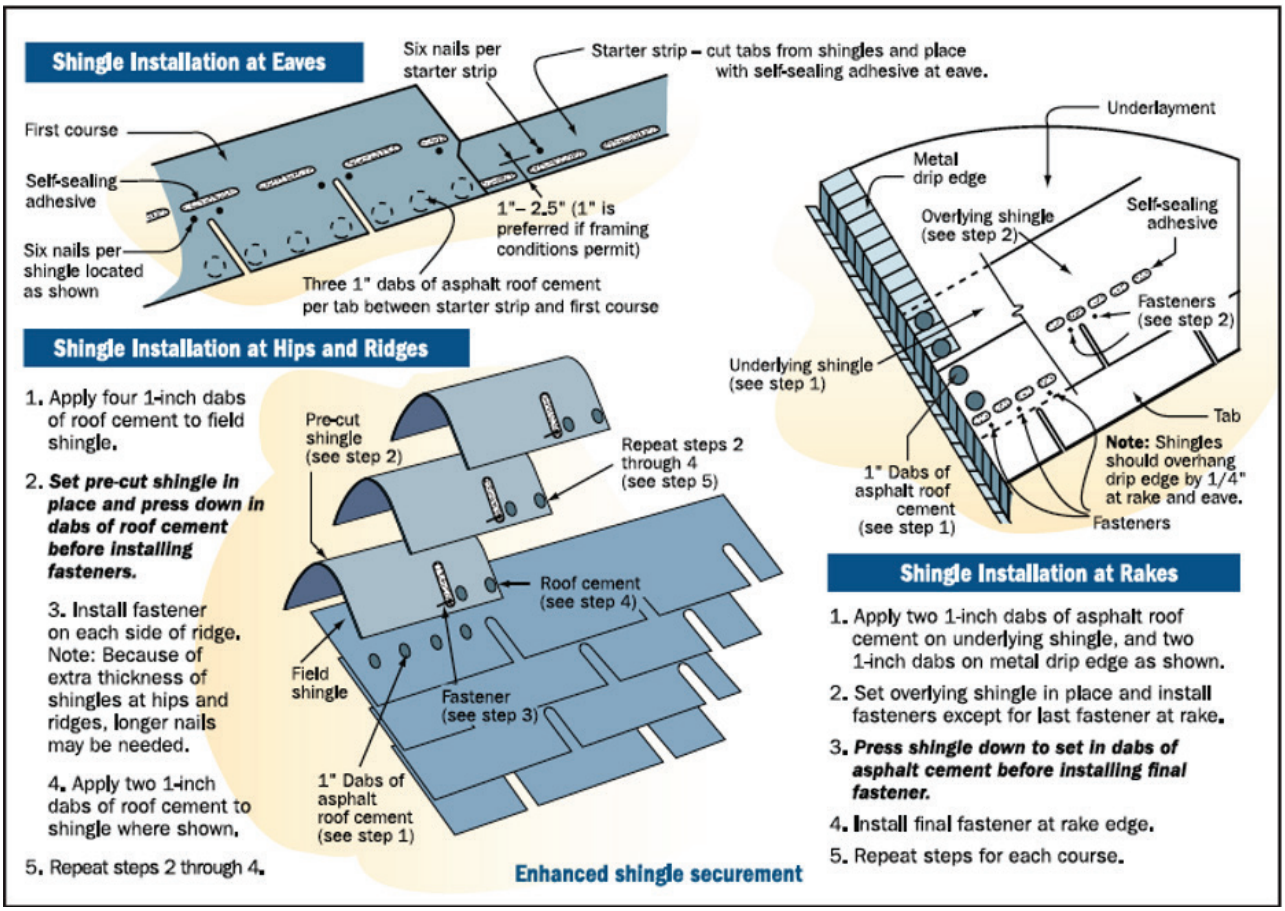


Figure 4-3. Installation instructions for asphalt shingles.
(Source: FEMA's "Home builder's Guide to Coastal Construction")

Roof Deck:

This is the wood paneling or boards (sheathing) that are attached to the roof structure (trusses or rafters). Once attached, the roof framing becomes stronger and rigid, so it transfers wind or weight loads to the exterior walls. The roof deck is typically plywood, oriented strand board (OSB) or in case of many older homes, individually sawn wooden boards (often called "one by's" or 1x's). The minimum recommended roof deck thickness is 7/16", but it is common to find 1/2" roof decking. Anything thinner than 7/16" can be too weak to protect a home from damage during a severe storm or hurricane.

Sealed Roof Deck:

Sealing the roof deck is not typically required by code, but is one of the most important components of the FORTIFIED program. A properly sealed roof deck is one that seals the seams or gaps between pieces of the roof decking, so that water cannot flow into the attic if the roof cover is lost. This is not a common practice in most areas, however, some cities and counties have started requiring this added protection. Check with your state and local building code requirements to understand the minimum requirements for underlayment.

The best time to seal a roof is when re-roofing or when building a new home. When re-roofing, it is recommended that the roof covering be removed to check the overall roof condition, make any necessary repairs, re-nail the roof deck, and apply the sealed roof deck properly.

There are three ways to achieve a sealed roof deck when building new or re-roofing:

1. Install a 4" wide modified bitumen or acrylic roofing flashing tape over all roof deck seams, then cover with a 30# felt or equivalent synthetic underlayment.
2. Install a self-adhered (peel-and-stick) membrane over entire roof deck.
3. Install a double layer of 30# felt.

Technical supplements for sealing a roof deck can be found in the following:

- Section 4 of the Hawaii Homeowner's Handbook (http://seagrant.soest.hawaii.edu/homeowners-handbook-to-prepare-for-natural-hazards/)
- FEMA's Guide to Coastal Construction (https://www.fema.gov/media-library/assets/documents/6131)



Figure 4-4. Water intrusion tape being applied to roofing seams to prevent leaking.
(Source: FEMA's "Local Officials Guide for Coastal Construction")



Figure 4-5. Spray foamed attic, used to strengthen rafters and plywood sheathing supporting the roof.
(Source: FEMA)

If you have an existing home that is not in need of a new roof and the entire underside of your roof deck is accessible from your attic, it may be possible to seal your roof deck by applying a closed cell foam from the inside along the seams and rafters or trusses. This should only be done by a professional installer that is trained in this specific application of foam.

Roof Deck Attachment:

How a roof deck is secured to a home's roof structure (the trusses or joists) is called its attachment. Nails, screws, and staples, collectively called fasteners, are common ways to attach a roof deck to the roof's structure. Typically, roof decking is nailed with "8d smooth" nails. Stapling is the weakest attachment type, while ring shank nails can double the strength of a roof's attachment compared to traditional 8d smooth nails. The distance between nails is also important to maximize their holding power; the farther apart the nails are, the less effective they are. Nailing should be spaced according to the building code to resist the design wind loads and pressure on the roof. Utilize your local building codes as guidance for which nails to use and the appropriate distance needed.

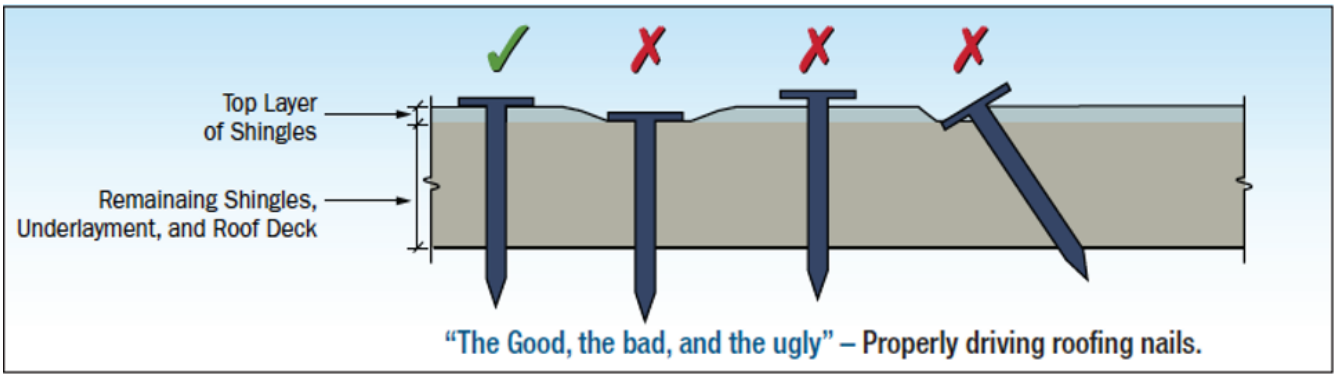


Figure 4-6. Example of how to properly drive roofing nails when nailing shingles, underlayment, and the roof deck together.
(Source: FEMA's "Home Builder's Guide to Coastal Construction")

The stronger the roof deck attachment, the better a home's chances are of withstanding a major hurricane or high winds and of avoiding damage during storms, while a weaker roof deck attachment is more likely to be peeled off or damaged. Building codes typically require the appropriate attachment types according to the probable risk in your area. Re-roofing or building new are opportune times to increase the strength of your home's roof deck attachment and reduce your risk of damage in a cost-effective way.

Drip Edge:

Drip Edge or Drip Eave is important flashing at the edge of the roof that helps channel water away from the roof facade, reducing the chance of rotting the roof deck and fascia. Drip edge may not be installed in many existing homes and even in some areas for new construction but is required by the FORTIFIED program.



Figure 4-7. A self-adhering, modified bitumen layer acts as a synthetic underlayment material on top of the initial plywood layer.
(Source: Hawaii Sea Grant)



Figure 4-8. Roofing felt tacked on to the self-adhering modified bitumen layer.
(Source: Hawaii Sea Grant)

Roof Underlayment:

This is installed between your shingles and your roof deck and is an added layer of protection from severe weather. It is primarily designed to act as a moisture barrier.

Underlayment has historically been known as "tar paper" or roofing felt. However, there are other options to consider, including synthetic underlayment and the fully adhered membrane, or "peel-and-stick," which also creates a sealed roof deck. The FORTIFIED program requires certain criteria for each type of underlayment.

For more information, see the FORTIFIED roofing checklist: (https://fortifiedhome.org/standards/).

Roof Cover:

The roof cover is the final layer of the roof system, most commonly consisting of shingles, metal or tile. When selecting a roof cover, it is important to know the building code and wind speed requirements for your area to ensure that your roof cover can withstand the highest possible winds to which your home might be susceptible.

HELPFUL TIP:

Be sure your roof cover is high wind rated AND properly installed to meet your area's design wind speed rating.

Shingles are the most common and inexpensive type of roof cover. It is important that shingles be "high wind" rated and properly installed, usually meaning 6 nails per shingle. Ask about the shingle rating during the purchase and bidding process, and look for a rating of Class G, H or F. Roof covers other than shingles (metal, tile, low-sloped roofs, wood shakes/shingles) should be rated and installed for the site-specific wind speed and design pressures. Information on the wind speed for your home's location should be available at your local building department.

Ridges:

Ridges are the high points of a roof, where the roofing comes to a peak. Often, roof ridges are used to add attic ventilation using ridge vents. Ridge vents can be an access point for wind-driven rain unless a high wind rated vent is used and properly installed.



Figure 4-9. The roof ridge (on left) has holes spaced out along the length of the ridge to create ventilation into the attic.
(Source: Hawaii Sea Grant)



Figure 4-10. The ridge vent (on right) is applied over the roof ridge and is secured by doubling the nailing pattern. This strengthens the ridge vent and makes it less vulnerable to being blown off in a storm.
(Source: Hawaii Sea Grant)

Valleys:

The opposite of a ridge, valleys are formed where two inward sloping roof lines meet. These areas require additional sealing to keep water from entering the home. This sealing is often done using thin metal plating under the roof covering or by adding additional fully adhered roofing membrane or underlayment, often known as "ice and water shield" or peel-and-stick. Peel-and-stick can also be used over an entire roof deck to create a fully sealed roof deck.

Roof Venting:

Venting allows your home to breathe and maintain comfortable interior temperatures, while keeping heating and cooling costs as low as possible. However, if improperly done, venting can allow wind-driven rain and pests into your home and attic. There are many ways to vent an attic. It is critical to determine the appropriate approach, such as the number and size of vents, to ensure that your home performs well during storms.

4.3.2 Strengthening Gables and Soffits

There are two common types of roof framing for a home: Gable-end and Hip-style. Gable-end roofs have two flat ends that are A-shaped and two sloped sides. Hip roofs have all four sides of the roof sloping up towards the center of the roof. This inward sloping design makes hip-style roofs inherently sturdier than gable-style roofs. During a hurricane, gable-end roofs are vulnerable

to intense wind pressure on their flat ends. If one of those ends collapses, it can allow wind-driven rain to enter through the attic and wind pressure to blow off the roof decking, potentially causing catastrophic damage to a home.

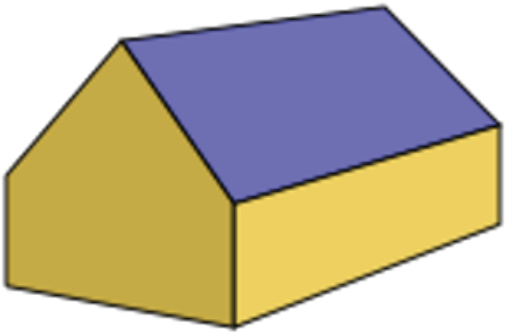


Figure 4-11. Example of a gable roof.
(Source: Wikimedia "Roof_forms")

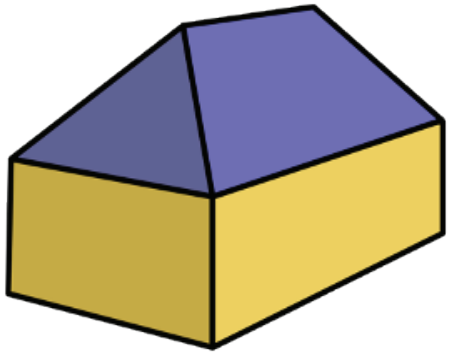


Figure 4-12. Example of a hip roof.
(Source: Wikimedia "Roof_forms")

Strengthening a gable-end roof is recommended and can be done by adding lateral and diagonal bracing. For lateral bracing, a system of metal connectors and 2x4s are attached to the gable-end wall framing and braced against the next four to five adjacent trusses of the roof. Each vertical member of the gable-end wall should be braced using this method, and additional vertical braces behind the gable-end wall may be necessary to achieve appropriate bracing. Diagonal bracing runs from the top of the gable-end to the bottom of the fourth truss and from the top of the fourth truss to the bottom of the gable-end.



Figure 4-13. Lateral bracing consists of 2x4s running the length of the roof and overlapping where they meet each other.
(Source: FEMA's "Against the Wind" brochure)

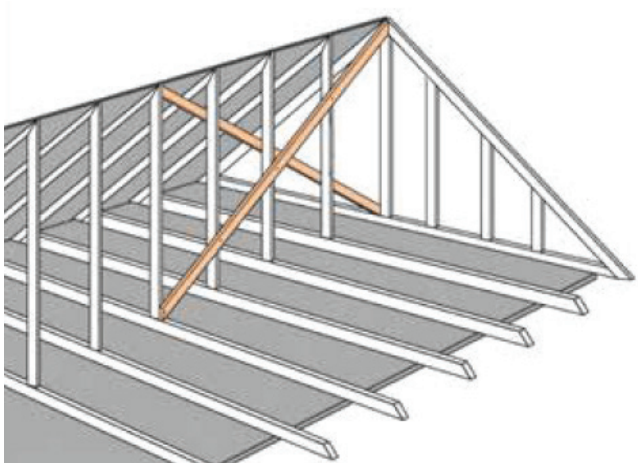


Figure 4-14. Diagonal bracing runs from the top of the gable end to the bottom of the fourth truss, and from the top of the fourth truss to the bottom of the gable end.
(Source: FEMA's "Against the Wind" brochure)

Soffits and Eaves:

When a roof overhangs the exterior walls of a home, it creates eaves, which are typically the ends of the roof's structure, sometimes called rafters. Eaves can be used to help vent the home's attic and protect the sides of a home from rain. A home can have no eaves, or they can range from 4 to more than 24 inches in depth. Soffits cover exposed eaves and protect the interior of a home from water intrusion and wind. Many different materials can be used to create durable soffits, from rigid materials like plywood or fiber cement to flexible materials like vinyl or aluminum.

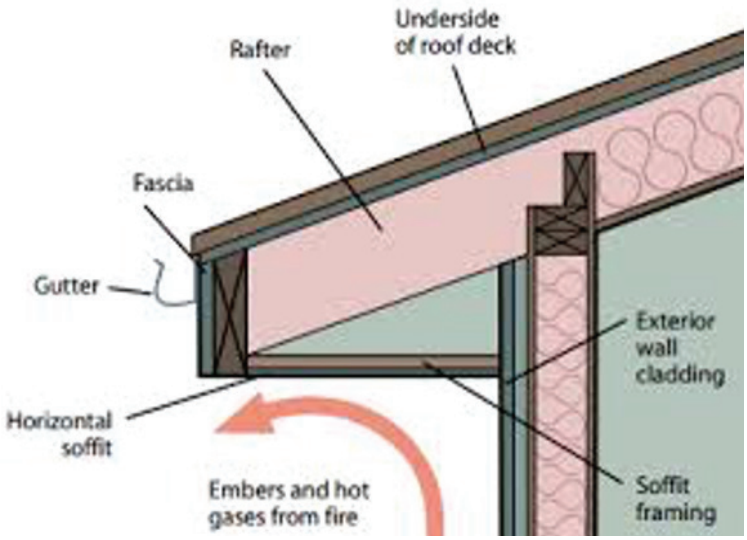


Figure 4-15. Diagram of a horizontal soffit with an enclosed overhang.
(Source: FEMA's "Eaves, Overhangs, and Soffits")

Vinyl or aluminum soffits can be a weak link in a home's protection when they are 12" in depth or more and are not reinforced or braced. Without reinforcement, these types of soffits can fail in high winds by being blown off or pushed into the attic space, allowing wind and water to get into a home. Bracing unreinforced vinyl or aluminum soffits can be done easily in many cases by using several different approaches.

4.4 Shutters and Other Protective Barriers

Keeping out wind and water is critical to the survival of your home during severe weather. To be effective, protective barriers, such as shutters and impact-rated windows and doors should be installed well in advance of a storm. The FORTIFIED program requires shutters or impact ratings on all openings to meet specific testing standards in any location with wind speeds greater than 130mph. However, many current codes allow the use of plywood. It is important to check with your local building code department for requirements specific to your area. If plywood is used, it must be properly fastened, and installation should not be attempted once the winds increase. Hanging plywood in high winds is extremely dangerous.

Finally, DO NOT tape your windows. It is a myth that this will prevent them from breaking when impacted by windborne debris. This method provides no protection and wastes valuable time that should be used for other storm preparation tasks.

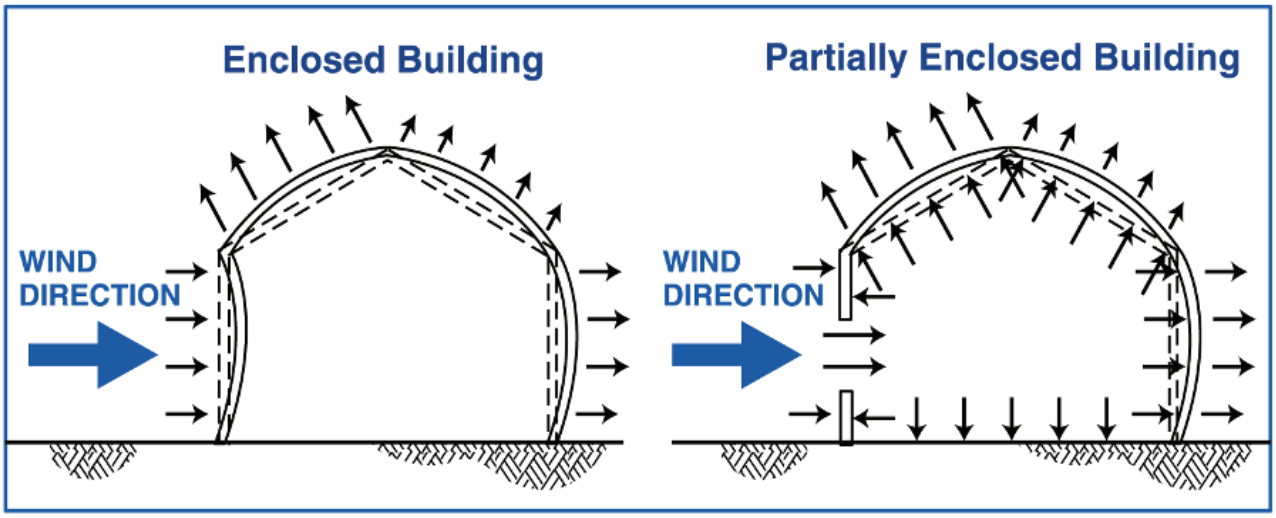


Figure 4-16. Example of how to properly drive roofing nails when nailing shingles, underlayment, and the roof deck together.
(Source: FEMA's "Home Builder's Guide to Coastal Construction")

Benefits of Protective Barriers for Openings:

When installed properly, protective barriers can:

- Keep wind pressure from building up inside, which often leads to loss of the roof.
- Reduce the chance glass will break.
- Reduce the chance of wind-driven rain soaking the interior.
- Help ensure continued habitability of a home.

Protective Barrier Options:

Protective barriers may be temporary or permanent. When possible, install permanent protection, such as impact-rated windows and doors or roll-down and accordion shutters. For temporary protection, permanent fasteners should be installed on the building long before storm warnings, so shutter panels can be put in place quickly when needed. A wide range of products are available to fit your budget, including some do-it-yourself options, which cost about 50% less per square foot than options requiring professional installation. Aesthetics may also be important when determining the right protection. Some permanent barriers have a greater impact on a building's appearance, which should be taken into consideration. However, there are also options that do not affect appearance, like impact-resistant glazing. Many homeowners choose a mixture of protective measures to meet their individual needs, budgets, and tastes.



Figure 4-17. Roll-down shutters applied to a home. These can be deployed electronically or manually.
(Source: Hawaii Sea Grant)



Figure 4-18. Rolldown shutters protecting windows at a NOAA National Weather Service facility. Two shutters are fully deployed and the remaining are partially deployed.
(Source: Hawaii Sea Grant)

Plywood Shutters:

One of the most common options for window protection is regular plywood. Plywood is available at almost every hardware store and offers good protection if properly installed. Furthermore, the material cost is less expensive than any of the other options discussed here. If budget for protective barriers is a hurdle, you can buy and prepare plywood with a recommended thickness of at least ⅝ inches. You should make your customized system well in advance of hurricane season, so that you can quickly install the shutters before evacuating for a hurricane. Make sure to pre-measure, pre-cut, pre-label, and pre-drill the plywood beforehand so you are well prepared.

The disadvantages of plywood are that it can rot or warp if stored in a wet or warm area. In addition, plywood shutters are relatively heavy. You will need two people who can lift 30-40 pounds to help with the preparation and deployment of these shutters; however, it can be done with one physically strong person. Plywood shutters can be taken down and re-used considering they are stored in cool, dry areas and not damaged from previous use.



Figure 4-19. Example of engineered plywood shutter fasteners securing plywood to window of a home.
(Source: Floodproofing.com)



Figure 4-20. Plywood cut to protect sliding glass doors, supported with two 2x4s and attached with screws.
(Source: Hawaii Sea Grant)

Please refer to this installation resource from the Federal Alliance For Safe Homes (*https://flash.org/protect.php#3*).

Ratings and Labels are Critical:

- Choose products with the proper approval rating for impact resistance based on your local building code requirements or FORTIFIED Home™ recommendations. The label "hurricane tested" alone is not adequate. The most common impact rating for opening protection is commonly known as the "Large Missile Impact Test," meaning that it has withstood the impact of a nine-pound 2x4 lumber board fired at the shutter at 30+ miles per hour followed by cyclic wind load testing.

ASTM E1886 and E1996 | AAMA 506

Look for these ratings or labels, and if you have questions, contact your local building code department.

Consider These Questions When Determining the Appropriate Opening Protection:

- Am I a year-round resident?
- Am I capable of installing temporary shutters by myself?
- Do I have the tools needed to install temporary shutters (ladders, plywood, screws, etc.)?
- Do I have a single-story home?
- Will the look of permanent products, such as roll down or accordion-style shutters, negatively impact the appeal of my home? (These often have visible storage "boxes" on a home's exterior when not in use.)

If the answer to any of these questions is no, installing permanent shutters or impact-rated windows and doors is highly recommended.



Figure 4-21. Impact-resistant glass installed in a window, which adds protection from strong winds and debris from hurricanes and tornadoes. *(Source: Hawaii Sea Grant)*

Protective Barriers Resources:

Regardless of the system you choose, installation is key. We encourage you to consult with a competent, licensed, and insured contractor specializing in supplying and installing these systems.

To compare different types of opening protections and choose what is right for you, use the IBHS Opening Protection Selection Guide (https://ibhs.org/wind-driven-rain/hurricane-resources/).

4.4.1 Garage and Entry Doors

One of the most important yet frequently overlooked openings in a home that also requires protection are the doors — both the garage door and entry doors. Most major suppliers of both types of doors offer products that meet wind and impact resistance requirements.

The garage door is often a significant weakness during a hurricane due to its large area and the forces to which it is subject. Its failure can cause extensive damage. Garage door options include replacement with a stronger door, horizontal bracing, vertical bracing, or other types of bracing kits. For many garage doors, vertical bracing is a popular and reasonably priced option.

The FORTIFIED program requires that garage doors without glazing or windows should, at the very least, be pressure rated for the location of your home. These stronger door assemblies should come with more brackets to fasten the door to its frame. Garage doors are available with impact ratings as well. If a garage door does have windows, it is important that the door be impact rated or be protected by a tested shutter system. Often, replacing a non-rated door with a newer, sturdier version is as cost-effective as installing protection for the original door.

Double-entry doors, such as French doors, should have slide bolts at the top header and bottom threshold of the inactive door, a deadbolt with at least 1-inch throw length between each door, and three hinges attaching the door to the frame. Single-entry doors should have three hinges and a bolt long enough that it goes into the 2x4 framing of the door. Non-impact-rated double-entry doors should also be covered by a tested shutter system or plywood.

As with impact-resistant windows, any replacement of a garage or entry door with a stronger or impact-resistant version should be done by a qualified, licensed and insured professional.



Figure 4-22. Vertical braces on the garage door run from the top and are connected to fasteners that are built in to the concrete floor. This strengthens the garage door during storms with high wind events.
(Source: Hawaii Sea Grant)

4.4.2 Opening Protection to Avoid

Window film is an aftermarket product used to enhance glass breakage characteristics and is commonly known as security window film. Such products are often touted as “hurricane film” or similar – claims that have not been substantiated by testing. Before applying any of these window films to existing windows consider doing some research on impact testing standards. For more information, visit the International Window Film Association (IWFA) (https://iwfa.com/).

4.5 Continuous Load Path, Design Pressure, and Chimney Anchoring

4.5.1 Continuous Load Path Connections

All homes have a continuous connection from the roof to the foundation, often called a "Load Path," that is analogous to a chain — it is only as strong as the weakest link. In response to recent hurricane damages, much stronger connections are now required to protect against hurricane winds. For example, new homes are designed with continuous load path connections; older homes may need to be retrofitted to add load path components.

Framing and creating the structure of a home can be done with many types of materials, such as wood, concrete, and steel framing. New technologies and methods have also emerged and are being used, such as insulated concrete forms (ICF), Structural Insulated Panels (SIPs) and even modular homes where the individual components are built off-site, shipped, and then assembled on the lot. There are also new "advanced framing" techniques to increase energy efficiency and reduce the amount of materials used while retaining the strength of a structure. Each of these has advantages and disadvantages, but when building a new home using any of these systems, an engineer should always be involved in the design to assure that the connections and load paths are appropriate for the specific wind speeds and wind loads of the home's location.

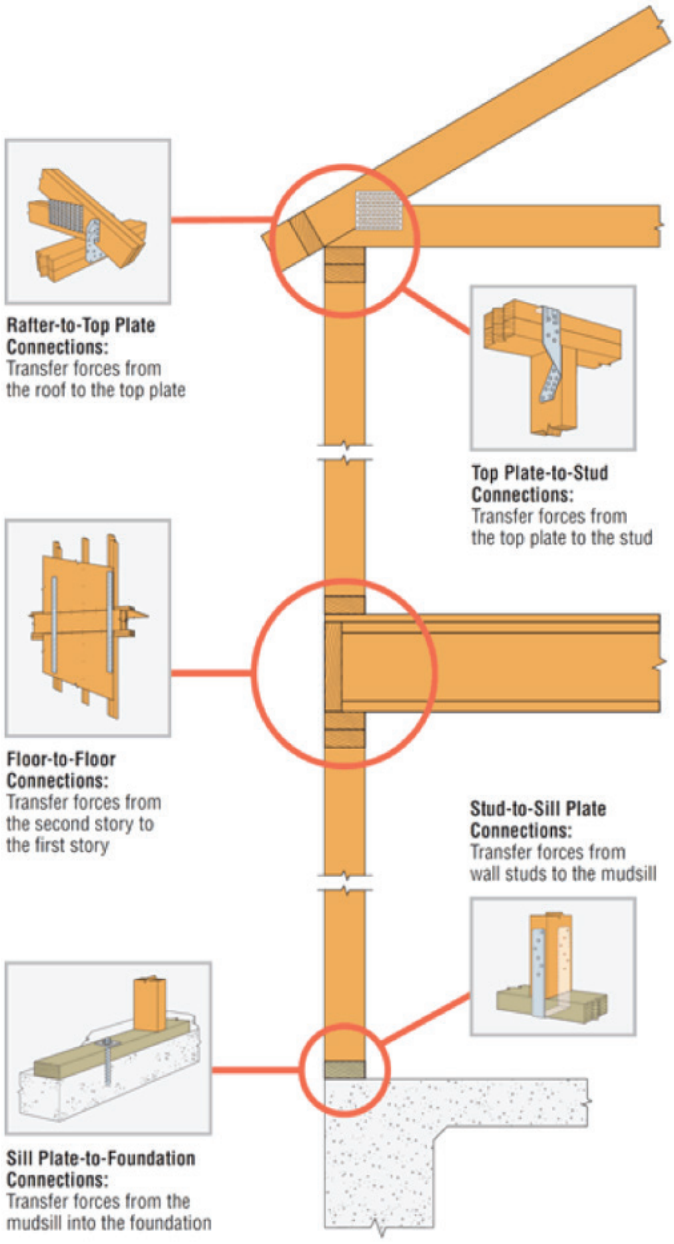


Figure 4-23. Continuous Load Path Connections.
(Source: Simpson Strong Tie Company)

Most homes are built using wood frame construction, with the walls, floors, ceilings and roof structure made of wood. Building codes outline how a home should be built based on its location and the materials used. The roof is tied to the wall, typically with hurricane clips and plate ties. The wall of a higher story is tied to a lower story with straps. The walls are tied to the foundation with plate ties and anchors. There are a wide variety of clips, ties and anchors available for all these connections, and it is critical that an engineer specify which are appropriate for each location in order for them to work properly.

The weakest link for many homes is the roof-to-wall connection. The hurricane clip (aka hurricane tie) was created to improve this connection. There are several types of hurricane clips; which one should be used on your home depends on the design and the load of the home. A properly selected hurricane clip is required for each truss or rafter.



Figure 4-24. Hurricane clip on a new build.
(Source: Hawaii Sea Grant)



Figure 4-25. Hurricane clip on a retrofit.
(Source: Hawaii Sea Grant)

For older houses, it is possible to add load path connections. Each home is different, but in general, it will be easier and less expensive to put in hurricane clips than to add the foundation connections. Hurricane clips help to keep your roof from blowing off during a hurricane or high winds. Check with a licensed professional or structural engineer or architect to determine what is feasible for your home. You can then determine if you can do the retrofitting yourself or if you will need to hire a licensed contractor.

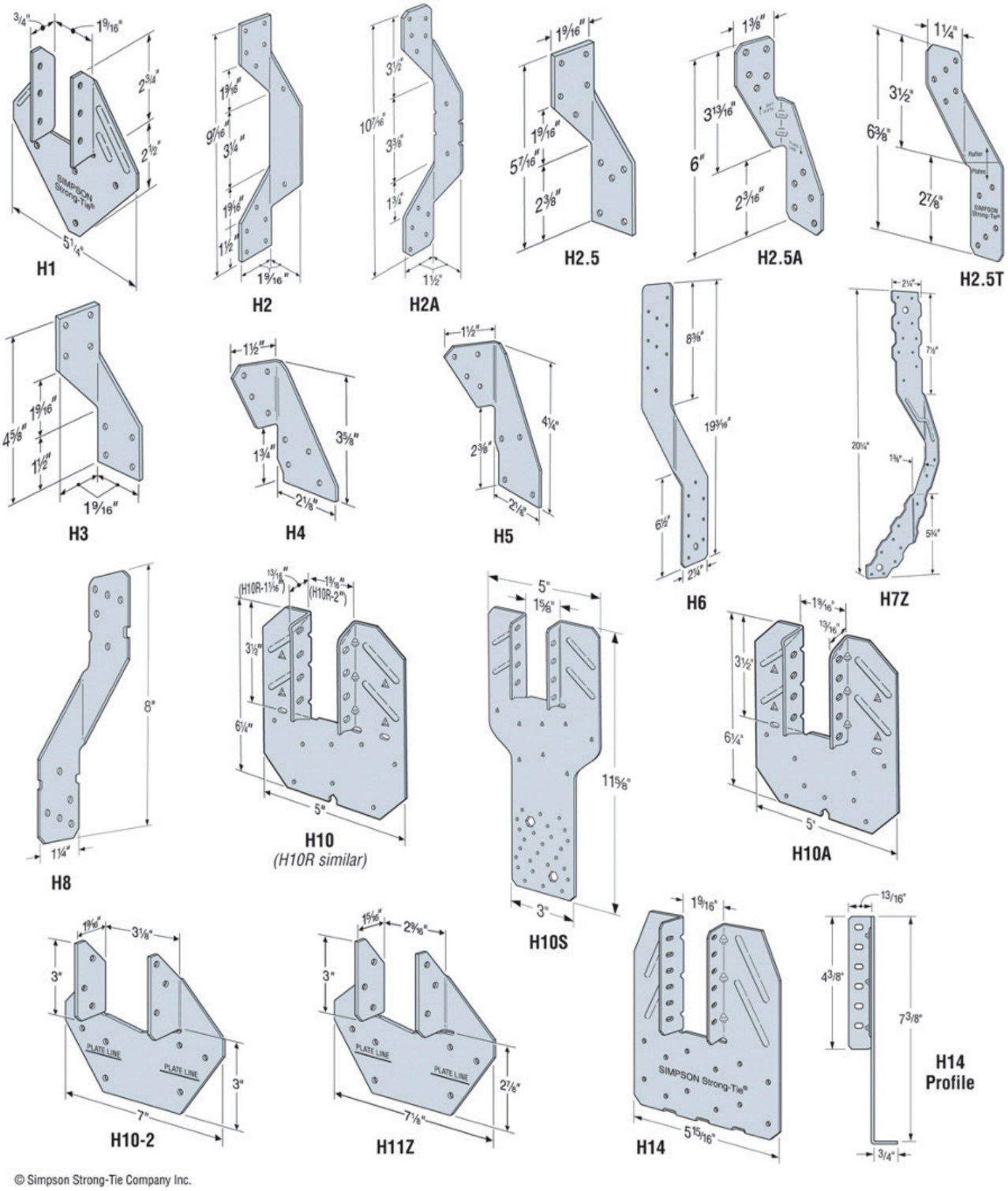


Figure 4-26. Examples of Hurricane Clips.
(Source: Simpson Strong Tie Company)

4.5.2 Window and Door Design Pressure

When an engineer designs a load path, he or she takes into account the ways that wind and other pressures will affect the materials and parts of the home. The walls, foundation and roof are not the only aspects of a home where pressure must be considered. Windows and doors are also designed to withstand specific amounts of pressure and are rated using a Design Pressure rating (DP rating). This rating takes into account the entire window or door assembly, not just components like glass, sash or frame of the window. DP ratings are set by local building codes and aim to keep these components from breaking or failing under normal circumstances. It is important to note that because of the way wind flows around and acts on a home's surface, windows or doors near the corners of a home experience more pressure than those closer to the center of walls.

When purchasing doors and windows, most will come with labels showing the design pressure. It is nearly impossible to tell the design pressure of openings in existing or older homes. However, if you are replacing openings or building a new home, you should purchase those with design pressure ratings for the location of your home.

Blower door tests are used by energy auditors to determine a home's airtightness of exterior doors. More information on blower door tests can be found on the Department of Energy website (https://www.energy.gov/energysaver/blower-door-tests).

Design pressure is different from impact rating. Impact-rated doors and windows keep debris from penetrating the opening but does not protect the window from the wind pressure. To ensure your windows and doors will keep wind and water out of your home in a severe weather event, you should consider both design pressure rating and impact rating.

4.5.3 Chimneys

Chimneys that have wood framing around the chimney flue can also be particularly vulnerable to severe wind events. It is important that when an engineer designs the load path and specifies the opening design pressure, he or she should also specify the framing and hurricane tie connections for the chimney. This is very difficult to achieve in an existing home but can easily be done when designing and building a new home.

4.6 Foundation

A building's foundation is arguably its most important structural element. It must support the building above it and all the loads that are exerted on it. It must resist weathering, decay, and corrosion (with little or no maintenance) to remain viable for the entire lifespan of the building.

There are many factors involved in determining the loads on a foundation and best type for your location, so it is important to involve a professional or structural engineer in foundation design for new construction.

The foundation a home needs, or has, depends on several factors:

• **The load capacity:** Some foundations are meant to hold a certain amount of weight. Exceeding that load-bearing capacity can result in some very unfortunate results, like complete foundation and home failure or collapse.

• **Groundwater:** Overexposure to groundwater can weaken a home's foundation. Foundations should be built in an area with good drainage. In some cases, this can simply mean on top of a hill. In other instances, this means using gravel or grading or sloping the area around a home to drain water away. Other types of foundations may lift a home off the ground. However, some foundations cannot be used in areas where the ground remains too saturated.

• **Climate and risks:** Different climate zones and local risks determine the type of foundation a home will need. A home in a high-risk flood zone will have a different foundation (e.g., pier and beam) versus one that is not susceptible to flooding (e.g., concrete slab). The same applies to areas with extreme temperature ranges, extreme precipitation, or other extreme climatic conditions.

The most common closed foundation types are typical footing and stem walls, slabs, basements, and crawlspaces. Closed Foundations are becoming popular choices for many reasons, and it is recommended that homeowners consider them depending on their location and the hazards to which they are exposed. Each foundation type has variations that you can talk about with your contractor, engineer, or inspector.

The primary open foundation practice in coastal high-risk flood-prone areas is an elevated home because it allows the home to sit above the base flood elevation. These houses typically have a wood-frame foundation that is secured atop concrete columns or wooden piles (often called stilts), which are poured or driven into the ground based on building code requirements. Generally, the deeper the columns or piles, the more secure the home will be.

In FEMA's Special Flood Hazard Area, elevated homes may have "breakaway" components beneath them such as staircases or storage areas and "flow-through" ventilation built into the foundations. When flooded, these breakaway elements are designed to come off the structure, leaving the main, elevated home intact. Many areas have building codes and flood ordinances that do not allow permanent fixtures or rooms on the ground level in areas where homes must be elevated because the risk of flooding or storm surge is too great. If you live in a special hazard flood area, using breakaway walls may decrease your flood insurance premium costs, except in an X Zone, in which premiums may increase with any structure below the base floor elevation (BFE). Please double check the building standards in your area and contact your insurer.

4.7 Flood Prevention

Protecting your property from flooding can involve a variety of actions, from inspecting and maintaining the building to installing protective devices. Most of these actions, especially those that affect the structure of your building or their utility systems, should be carried out by qualified maintenance staff or professional licensed contractors.

You can go to the FEMA FloodSmart website (https://www.floodsmart.gov/) and type in your street address to determine a very general estimate of the flood risk for your property. Even if you are not in a designated flood zone, you may be at risk from flooding, as FEMA estimates that 25% of flood damage claims come from outside high-risk flood zones.

High Risk of Flooding

Zone A: These zones are in the Special Flood Hazard Area (SFHA). They are highly prone to flooding with a 1% chance every year of being flooded. These A Zones are also known as the 100-year flood zone, and the Base Flood Zone. They are labeled on the FIRM as A, AE, AO, AH, A99, and AR.

Zone V: These zones are also in the Special Flood Hazard Area, with a 1% chance every year of being flooded. These zones are high risk flood zones along the coast that are subject to high velocity wave action. They are labeled on the FIRM as V and VE.

Moderate Risk of Flooding

Zone X (shaded) or Zone B: These zones have a 0.2% chance every year of being flooded. They are also known as the 500- year flood zones.

Low Risk of Flooding

Zone X (unshaded) or Zone C: These are zones of minimal flood hazard.

Undetermined Risk of Flooding

Zone D: This zone includes areas where the risk of flooding has not been determined.

The most important information to know about your home when considering flood prevention techniques is the base flood elevation (BFE) shown on the Flood Insurance Rate Map (FIRM) for your community. Minimum elevation requirements can differ by community and are reflected through local codes and ordinances. Based on the age of your building and the cost of the mitigation, your local floodplain manager can provide guidance on whether your home needs to meet any minimum elevation requirements. These minimum elevation requirements are usually related to the BFE, but local governments can also require elevating one feet or more above the BFE (known as "freeboard"). Flood insurance premiums are significantly higher when a home is below the BFE. Premiums decrease for every foot that a home is built above the BFE (up to 4 feet), so building or retrofitting to an elevation above the BFE is recommended. Additionally, it is a good idea to check with local building codes to see if there is a height restriction or limit for home elevation.



Figure 4-27. Building Elevation Insurance Example.
(Source: FEMA)

Elevating a home above the minimum elevation requirement provides the best protection from flooding. Other options can be less expensive, but it should be noted that they may provide less protection. Floodproofing a home requires taking the necessary precautions to minimize water damage from storm surge or rising flood waters to protect critical electrical and mechanical equipment, as well as interior contents.

There are two main types of flood proofing systems - wet floodproofing and dry floodproofing. FEMA's Protect Your Home from Flooding (https://www.fema.gov/media-library/assets/documents/165910) provides information on low-cost ways you can help protect your home against flooding. Prior to considering any mitigation measures, homeowners should also review FEMA P-312, Homeowner's Guide to Retrofitting (https://www.fema.gov/homeowners-guide-retrofitting), which addresses several techniques.

4.7.1 Wet Floodproofing

The first method to prevent significant flood damage is to design and construct areas of the home that are in the floodplain to allow water to pass through. Wet floodproofing is designed with the understanding that the portion of the building below a specific elevation will flood. Wet floodproofing entails either removing critical components of the home from potentially flooded areas or reducing the pressure of flood waters from the walls.

Successful wet floodproofing aims to:

- Ensure that floodwaters enter and exit the home's enclosed area (for the National Flood Insurance Plan (NFIP) compliance, floodwaters must exit the enclosed area automatically, without the use of pumps).
- Ensure that floodwaters inside the home rise and fall at the same rate as floodwaters outside the home.
- Reduce damage caused by contact with floodwaters to areas of the home that are below the flood level.
- Protect service equipment inside and outside the home.
- Relocate high-value contents stored below the Design Flood Elevation.

Methods for wet floodproofing include the following:

- **Repurpose all floors below the minimum elevation**: Floors located below the minimum elevation can be used for storage, access or parking. The walls must also be designed with flood openings or to break away under flood loads.
- **Install flood vents and/or flood openings in walls:** This will allow water to pass through perimeter walls and throughout the wet floodproofed areas.

- **Elevate critical systems:** It is important to elevate interior and exterior critical systems like mechanical, air handling, electrical and plumbing above the minimum elevation to ensure their function during a flood, prevent direct contact with floodwater and minimize damage and repair costs.
- **Provide backwater valves for water and sanitary systems.**
- **Elevate, secure or tie down fuel tanks:** If tanks, including fuel oil or water tanks, cannot be elevated above the BFE, tanks must be secured or properly tied down.
- **Use flood resistant materials:** Tiled floors can be easily cleaned after a flood whereas carpet must be replaced.

Look at FEMA's Protect Your Home from Flooding (https://www.fema.gov/media-library/assets/documents/165910) to see low-cost ways you can help protect your home against flooding.



Figure 4-28. Example of an engineered flood vent in the crawlspace of a home.
(Source: Smart Vent Products, Inc.)

4.7.2 Dry Floodproofing

Another way to protect a structure and its contents from flood damage is to seal the building so that floodwaters cannot enter, making it watertight. This method, referred to as "dry floodproofing," encompasses a variety of measures. Dry floodproofing is a more affordable option than wet floodproofing and is a great alternative for a smaller mitigation budget. There are no premium rate discounts for dry floodproofing under the current NFIP, however there are discounts available for elevating building utilities based on what flood zone you live in. It is important to note that houses built in Special Flood Hazard Areas have restrictions on dry floodproofing based on guidelines set by FEMA. This is to ensure houses located in zones with higher flood risk are equipped to withstand greater amounts of flood damage. Make sure to check what flood zone you live in before you choose a floodproofing method.

Success with dry floodproofing can be difficult, and failure to do it properly can result in flooding of the building or even collapse of building walls. The design of a dry floodproofed building and inspection during construction should be done by a professional structural engineer. You may also need to consult with your local building department for dry floodproofing measures that are up to code.

Some of the measures necessary to dry floodproof a home are:

- **Strengthening walls** so that they can withstand the pressures of floodwaters and the impacts of flood-borne debris.
- **Applying a waterproof coating or membrane** to the exterior walls of the building.
- **Constructing watertight shields** to cover doors, windows, and other openings and the ability to install them quickly.
- **Anchoring the building** as necessary so that it can resist flotation.
- **Installing backflow valves** in sanitary and storm sewer lines.
- **Raising HVAC and electrical system components** above the flood level.
- **Anchoring fuel tanks and other storage tanks** to prevent flotation.
- **Installing a sump pump and foundation drain system** that can run for extended periods when area power has been lost.
- **Building with materials that can withstand floodwaters for at least 72 hours** (examples: concrete, ceramic tile, pressure-treated lumber, steel, metal, brick, epoxy paint, foam, and closed cell insulation).
- **Ensuring wells are properly constructed** to avoid contamination from floodwaters.

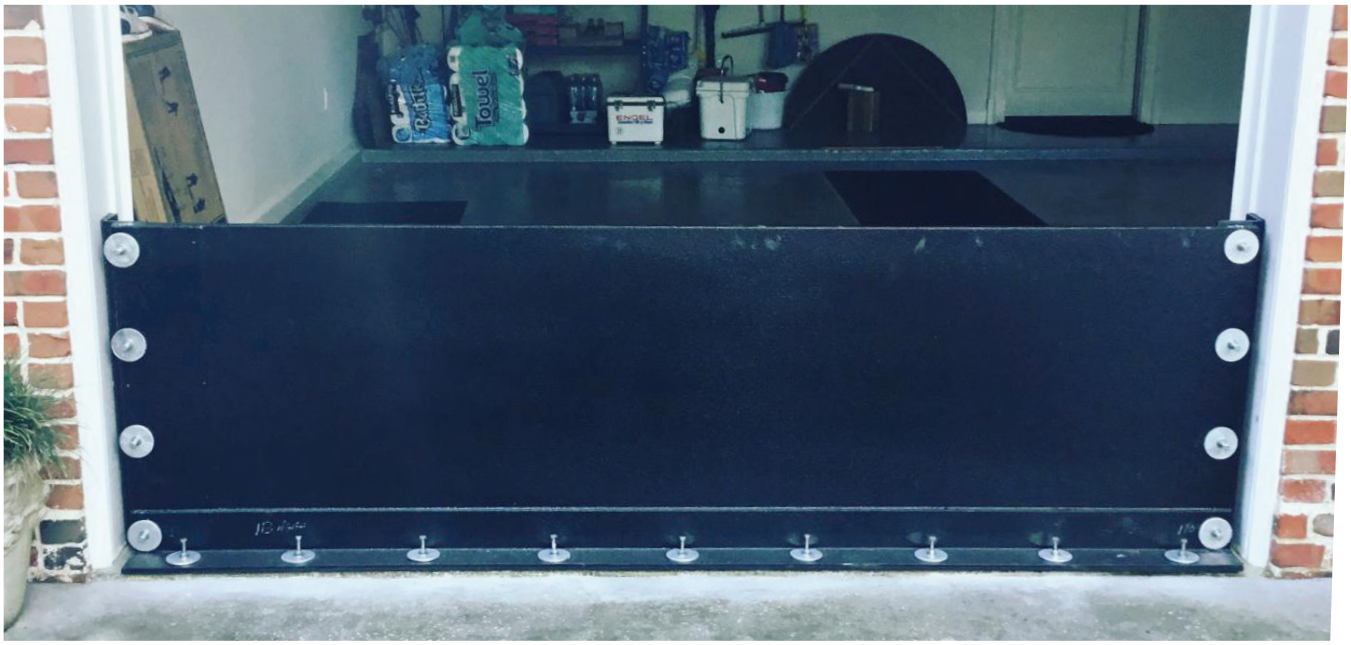


Figure 4-29. Example of an engineered flood panel on the garage of a home.
(Source: Floodproofing.com)

Keep these points in mind when you dry floodproof:

• **Dry floodproofing** is appropriate primarily for slab-on-grade buildings with concrete or solid masonry walls. Concrete and masonry are easier to seal, more resistant to flood damage, and stronger than other conventional construction materials.

• **You cannot dry floodproof** a "substantially damaged" or "substantially improved" building (as defined by the National Flood Insurance Program [NFIP] regulations) or a newly constructed building. Check with your local floodplain manager or building official for more information.

• **Check with community building codes and regulations** to make sure dry floodproofing is a good option for your home based on the flood zone you live in.

The height of your dry floodproofing should not exceed three feet. The pressures exerted by deeper water can cause walls to buckle or collapse. If your dry floodproofing measures require human intervention before flood waters arrive, such as placing shields over doors and windows, you should have an operations and maintenance plan that describes all the actions that must be taken and lists the persons who are responsible.



Figure 4-30. Find flood resistant building materials for your home in the "Flood Damage-Resistant Materials Requirements" by FEMA.
(Source: FEMA's "Flood Damage-Resistant Materials Requirements")

4.7.3 Elevating Existing Structures

Elevation Certificates are required for new construction and for substantial improvements (where repairs are 50% or more of the structure's market value) to existing structures within the floodplain. The certificate demonstrates a structure's compliance with local floodplain ordinances. The elevation certificate needs to be completed by a registered professional land surveyor, engineer, or architect to ensure that all elevation requirements are met per the community's flood damage prevention ordinance.

The lowest floor elevation of a new or substantially improved structure must be at or above the locally required minimum elevation. Any area below the minimum elevation can only be used for parking, storage, or access. In FEMA designated V-Zones, and where Coastal A-Zones are applicable, additional elevation requirements apply. The area below the base flood level must be free of obstructions, and any enclosure must be made of breakaway walls. In V-Zones and Coastal A-Zones, a breakaway wall certification letter may be required, and any structure below the minimum elevation may substantially increase flood insurance premium rates.

FEMA's publication Free-of-Obstruction Requirements (https://www.fema.gov/media-library/assets/documents/3490) provides more information on building and protecting homes located in V-Zones. In any floodplain, elevation is the single most important factor in reducing the risk of flooding, but in areas subject to coastal storm surge, wave action and high-velocity water can destroy buildings with insufficient foundations. Major storms and flash floods can cause waters to rise higher than the BFE; therefore, it is always a good investment to safely build above the BFE. This accounts for sea level rise and varying storm surges based on tides and wave heights.



Figure 4-31. A beach house elevated (left) next to a beach house on the ground (right).
(Source: Texas Sea Grant)

For those properties located within a flood zone, elevating a building's lowest floor above predicted flood elevations by a small additional height (known as "freeboard") can lead to substantial reductions in damages caused by flooding as well as reductions in flood insurance premiums. The home on the left is elevated with freeboard. The home on the right is elevated at the minimum requirement.



Figure 4-32. House on the left pictured without freeboard.
(Source: FEMA)



Figure 4-33. House on the right elevated with freeboard.
(Source: FEMA)

FEMA has several other tools and resources designed to help citizens build safely and cost-effectively in coastal areas, including:

- Coastal Construction Manual (FEMA P-55)
  https://www.fema.gov/media-library/assets/documents/3293#
- Home Builder's Guide to Coastal Construction fact sheet series (FEMA P-499)
  https://www.fema.gov/media-library/assets/documents/6131
- Recommended Residential Construction for Coastal Areas: Building on Strong and Safe Foundations (FEMA P-550, second edition)
  https://www.fema.gov/media-library/assets/documents/3972

4.8 Concrete Structures

Concrete structures, even for residential units, are becoming much more popular in coastal areas. Concrete homes were some of the few left standing in storm surge zones after Hurricanes Katrina, Ike, and Michael. Along with well-built, wood-frame structures, concrete structures can withstand the high winds of Category 4 and 5 storms, as well as lower category tornados.

Concrete may be somewhat more expensive initially than a wood-frame home, but the advent of insulated concrete forms (ICF) allows for a structurally sound, wind-resistant house with excellent excellent insulation, making concrete structures a worthwhile investment. In the long run, these thermal properties of ICF and other concrete technologies mean overall lower energy costs. Keep in mind, though, that elevation is still an important factor in a coastal surge zone, even with an ICF structure.

4.8.1 Safe Rooms

A safe room is a room designed to withstand winds from hurricanes and tornadoes. This option should only be considered if the safe room is outside of all known flood and storm surge zones and sited in accordance with FEMA requirements. Although costs vary nationwide, it is much less expensive to build a safe room during the original construction of a home than to add one later. The safe room can also double as a master closet, bathroom, or utility room. The additional cost can be wrapped into the original home mortgage. This can be a good investment, yielding a sizable return by adding value to your home as well as protection and peace of mind for your family.

More information regarding design and construction of safe rooms can be found in:

- Standard for the Design and Construction of Storm Shelters (ICC 500)
  https://codes.iccsafe.org/content/ICC5002014
- Design and Construction Guidance for Community Safe Rooms (FEMA P-361)
  https://www.fema.gov/media-library/assets/documents/3140
- Taking Shelter from the Storm (FEMA P-320)
  https://www.fema.gov/fema-p-320-taking-shelter-storm-building-safe-room-your-home-or-small-business

4.9 Trees

Cutting or trimming trees that overhang your home is an additional measure you can take to protect your property during a hurricane. There is a serious danger if large trees or limbs are close enough to fall on your home or your neighbors' homes. Tree limbs or branches falling onto or impacting your home will cause considerable damage. Few roofs are strong enough to withstand a falling 20-inch or more diameter tree. FEMA recommends that the distance between a tree and your house should always be greater than the height of the tree when it is fully grown. This is to prevent the tree from falling on the roof, either at its current size or in the future.

If it is not possible to remove a tree, you can still cut off all branches that hang over the roof of the home. Generally, you should hire a licensed arborist to perform an evaluation of what should be done.

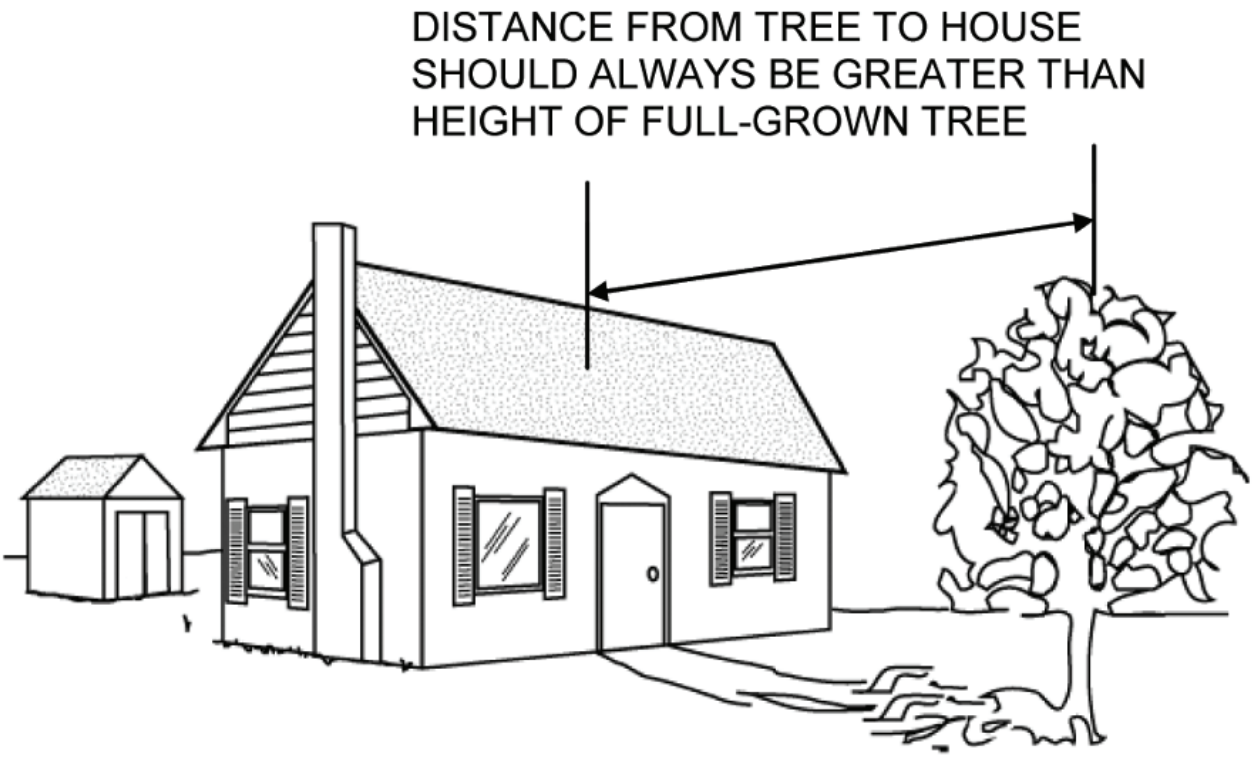


Figure 4-34. Recommended Tree Distance from Tree to House.
(Source: FEMA's "Protecting Your Property from Wind")

4.9.1 Landscaping Tips

Choosing the right landscaping can be the difference between a tree falling on your living room or a safe distance from your house. No matter if this is your current home or the one you are deciding to build or buy, look at the land it is built or will be constructed on and ask yourself these questions:

- **Are these trees healthy?** Trees afflicted by disease or decay are much weaker than healthy trees. Some signs of disease are the loss of leaves (other than in fall or winter), fungus growth, brittle limbs or bark, holes, and soft or spongy wood. If you spot trees that are diseased or rotten, remove them. This can be expensive to do, but so is removing the same tree out of your home after a storm. Consult a certified arborist (http://www.treesaregood.org/findanarborist/findanarborist) if you need help identifying trees to remove, prune, trim, or that need to be brought back to good health.

- **Are large trees too close to the home or power lines?** Even strong, healthy trees can fail against high wind combined with rain. If trees are too close to your home or power lines, they could fall. If you do not remove them, at least keep them trimmed back as much as you can.

- **Is there a place where rainwater settles?** If that gathering place is near or under your home, then consider using swales, berms or other techniques to divert the water. If you are in a floodplain, consult with your local floodplain manager before constructing anything to divert water.

When deciding what vegetation to use in your landscape, consider the climate you live in and how it affects your home and property. Native plants are adapted to live in certain areas and vary across Georgia. A coastal home will have different native plants and protection needs than an inland home. Research which trees and plants are best for your area, the risks your home will face, your natural climate and environment, and the aesthetic you are aiming to create in your landscaping.

Some good general rules are:

- **Choose trees and shrubs with deep growing root systems.** Healthy root systems are what keep the wind from toppling your vegetation even after the ground is rain saturated.
- **Make sure the trees you use are not susceptible to breaking under heavy wind or rain loads.**
- **Stick to a reasonable size.** Be mindful of the distance from your house, size of area where it has to grow and spacing from other trees and shrubs. Think about trees with flexible trunks and limbs. Look for trees that tend to have some give in the wind. Compare trees based on their wind resistance.

Drought and Fire-Resistant Native Plants in Georgia:

A list of drought-resistant native plants in Georgia are: crepe myrtles, Indian hawthorn, lenten rose, loropetalum, viburnums, camelia, magnolia, crocosmia, lantana, aspidistra, lavender, and rosemary.

A list of fire-resistant native plants in Georgia are: catalpa, bald cypress, cherrybark oak, crabapple, dogwood, northern red oak, persimmon, redbud, red maple, sawtooth oak, sawtooth-gobbler oak, swamp chestnut oak, water oak, white oak, and yellow poplar.

4.9.2 Protecting Your Home Against Wildfires

As mentioned in section 4.9.1, fire-resistant plants can add a wildfire barrier to your yard. It is important to keep up with dead brush around your home, particularly in a dry season or drought, as dead plants can act as fuel for fires. Wildfires are more likely to occur in dry seasons and droughts because there is less moisture to slow the fire from burning. Be familiar with the landscape around your home and know your risk of being affected by a wildfire.

Consider replacing material that is more likely to burn with material less likely to burn, such as replacing a wood fence with a metal fence. Houses with open spaces beneath them are more susceptible to catching on fire from embers getting trapped and burning dead plants and brush. Consider installing a garden hose that can reach a large portion of your home, as well as an indoor sprinkler system and fire extinguisher. Make sure your indoor fire alarms are working properly and are equipped with new batteries.

4.10 Electrical Issues

Following safety precautions for electrical issues after storms, disasters, and power outages are important for preventing personal injuries and further damage to your home. Make sure you are aware of your surroundings and avoid areas where electrical shock is possible, such as where power lines are down and using electrical appliances that have been affected by water.

In the case of an emergency, turn the power off to your house through the main breaker switch, circuit breaker panel, or fuse box. Ground fault circuit interrupters (GFCI) are utilized in houses where water and electricity are in close contact and act to protect people from severe or fatal shock. Kitchens, bathrooms, and laundry rooms are the most common areas GFCI's are found and can be installed by a licensed electrician if areas in your home do not have them.

Georgia Power gives the following tips for preparing electrical materials before, during and after a storm.

- **Before:** Charge cell phones, gather your emergency kit, keep freezers and refrigerators closed, and unplug major appliances such as refrigerators and freezers, microwaves, computers, washers and dryers, TVs, stoves, etc.

- **During:** Stay away from electrical appliances, water, and metal objects until the storm is over and avoid showering or being in the water. Find the safest area to shelter away from windows and openings and have your emergency kit with you.

- **After:** Do not touch any wires laying out in the open, wires laying in water or that have had contact with water, and do not remove debris or enter areas with heavy debris. Avoid stepping in puddles of water. Do not try to make your own electrical repairs.

4.10.1 Energy Efficiency

Energy efficiency can be improved by updating household appliances with products that have the Environmental Protection Agency's (EPA) Energy Star label. These products are a more sustainable option compared to those without the label and save energy and money over the lifetime of the product. Although products with the Energy Star label can cost more than those without, you will be saving money in the long run with the lower amount of energy used.



Figure 4-35. Energy Star Label
(Source: Environmental Protection Agency)

Disasters often cause power outages, which impact many appliances throughout a home. Products that are energy efficient will be more useful in an emergency when paired with alternative power options because they will be able to run longer with less energy. For example, a regular 100-watt lamp running off an emergency power station (essentially built around a car battery) may run for two hours. That same emergency station can run a modern energy efficient 15-watt LED bulb for more than 13 hours with the same light output. Another example is a refrigerator with the EPA Energy Star label can keep food cold for up to two days on one gallon of gas when paired with a fuel-efficient generator. Because the refrigerator is a certified Energy Star product, it is more efficient with its energy use and utilizes energy when needed instead of continuously.

4.10.2 Generators

Generators are an important item to have, particularly if you or your loved ones experience functional needs requiring a constant source of power. Medical equipment utilized for health needs such as home-dialysis machines, respirators and respiratory aids need power in order to run properly. Additionally, many medications need to be refrigerated after a certain period of time, which makes a working refrigerator important for the long-term storage of medications such as insulin or antibiotics. Most medications are okay when stored at room-temperature, but follow individual instructions for long-term storage. If you or your loved ones live with functional needs requiring constant access to power, a portable generator is a good investment for emergency health needs.

When considering what type of generator to purchase, it is important to look at customer reviews of the product, along with cost and power needs, reliability, quietness, and fuel efficiency. Different generators support varying levels of power, so make sure you choose one that fits your personal power needs. Some generators are more fuel efficient than others, running off of one or two gallons of gas compared to six or seven gallons. Determine the amount of power you will need and compare the amount of fuel needed to run the generator.

Do not run a generator inside your house or in your garage. Carbon-monoxide is a poisonous, odorless gas that can build up and cause major harm or death to you and your family.
To ensure that the generator is installed safely and properly, contact a licensed electrician for assistance and guidance on connecting the generator to the house power supply. It is important that you do not install one on your own. To maintain good air ventilation, operate the generator outside and away from open windows. Additionally, make sure extension cords have a sufficient gauge to carry the power load when hooking up the cords to different household appliances.

When running a refrigerator with a generator, it is generally best to keep both the freezer and refrigerator at the coldest settings. Refrigerators may only need to run a few hours a day in order to preserve food. This can be done by running a commonly used four-hour off, one-hour on cycle. The refrigerator should be kept at or below 40°F and the freezer should be kept at or below 0°F. Keep the doors closed as much as possible to maintain the temperature and only open the doors when necessary.

4.10.3 Power Stations

Power stations are found in many hardware stores and may have a radio, flashlight, air compressor, battery jump starter, AC outlet and DC outlet built around a modified car battery. These units can come in handy during a power outage since they can be included in your stock of emergency supplies and provide limited emergency power.

4.10 Plumbing Issues

During heavy rain events and severe storms, Georgia residents can experience plumbing problems due to an excess amount of water in sewers and water systems. Because flood waters can impact household plumbing, it is important to replace old plumbing pipes in your home when they have become rusted, worn out, or if they experience leaking. Excess water and floods will make these problems worse.

Georgia has minimum state requirements for all residential buildings to follow, which may vary based on location. See the Georgia State Amendments to the International Plumbing Code for more information on residential plumbing codes and guidelines (https://www.columbusga.gov/InsCode/codes2020.htm).

Ready.gov, from the Department of Homeland Security, provides information related to different natural hazards.

The following are plumbing issues you should consider addressing **before** and **during** a natural hazard:

- During thunderstorms and lightening, avoid running water or using landline phones. Electricity can travel through plumbing and phone lines.
- To prepare your property against hurricanes, declutter drains and gutters, install check valves in plumbing to prevent backups, consider hurricane shutters, and review insurance policies.
- To prepare for a drought, check plumbing throughout your home for leaks and repair when necessary. Install energy and water efficient appliances when upgrading. Consider retrofitting existing faucets by installing aerators that provide water flow restrictions.
- During winter storms and extreme cold, prevent pipes from freezing by running a dripping faucet and locate your water shut-off valves in case of a pipe burst. To prepare for winter storms and extreme cold, insulate your plumbing pipes to prevent cracks and pipe bursts.
- During and after a wildfire, do not drink water from your faucets until local authorities prove it is okay to drink. Wildfires and their debris can impact and contaminate ground water.

Floods can cause major damage to homes that utilize septic tanks or drinking wells. According to the EPA, there are tips you can follow on what to do after a flood to ensure your drinking water and septic tank are safe to use.

- Only drink well water after it has been tested.
- If you think your septic tank has been damaged, contact a plumbing professional for an inspection and do not the sewage system until it has been checked.
- Do not try to pump your septic tank while the ground is still wet and/or flooded. This can cause mud and dirt to clog the tank and cause additional problems. You can pump the septic tank when the ground has dried to prevent further clogging.
- Check your basement for any signs of sewage flooding. If you have sewage flooding, clean and \ disinfect the area as soon as possible with a chlorine and bleach solution.
- Contact your local health department for additional concerns and questions. They can provide you with a list of septic tank professionals in your area.

For more information on flooding and septic systems, see the EPA's brochure ***Septic Systems – What to do after the Flood*** (https://www.epa.gov/ground-water-and-drinking-water/septic-systems-what-do-after-flood). Additionally, see the EPA's brochure What to do after the Flood for more information on disinfecting drinking wells that have been flooded (https://www.epa.gov/privatewells/what-do-your-private-well-after-flood).

Practicing water conservation can be beneficial for saving money and energy over time. Although droughts are when water conservation efforts are the most widespread, managing water use and purchasing appliances that are more water and energy efficient can be practiced year-round. Water conservation and money saving tips from the EPA can be found in the CDC's ***Healthy Housing Reference Manual*** (https://www.cdc.gov/nceh/publications/books/housing/cha09.htm). This manual is a great resource for homeowners, as it also includes technical information and detailed descriptions of the household plumbing system.

The manual includes the following tips:

- Stop leaks
- Take showers
- Replace shower heads
- Turn the water off when not needed
- Replace your old toilet
- Replace your old clothes washer
- Plant the right plants with proper landscape design and irrigation
- Water plants only as needed

PART FIVE:

Financial Protection

Insurance is an important way to protect your family and property from the impacts of natural disasters. Even families who strengthen their properties (see Part 4), should use insurance to protect themselves from potential loss and damage to the structural integrity of their home. This chapter will discuss the types of insurance available to homeowners, what to do after a damaging event, and how to rebuild properly.

5.1 Understanding and Obtaining Good Homeowners Insurance

A Homeowners Policy (HO) is a package policy that bundles both property and liability insurance into a single policy for convenience and economic value. Besides covering the principal dwelling and other structures, it also includes coverage for additional living expenses, personal property and medical payments. There are two major sections of the HO policy: Part I is for property coverage, and Part II is for liability. Part II liability coverage is always the same for homeowner's policies.

Homeowners insurance covers both damage to your property as well as your liability for any injuries and property damage you or members of your family cause to other people and their properties. Homeowners insurance will cover damages caused by many events, including fire and burglary, but there can be exceptions, and you may need to know what is covered. Coverage can be bought in separate policies for damage from floods, termites, pests, earthquakes, hurricanes. When a policy specifically lists or names the perils that it insures against, it is said to be using the "named perils" approach. If damage is caused by a peril not specifically named, it will not be covered. Whereas, an "all-risk" insurance policy offers you coverage and protection from all risks or perils that could damage your home, its contents, and personal property unless the risks are excluded specifically in the policy wording.

There are many carriers that provide insurance and markets often change, which makes finding the right company and coverage a daunting task. Here are the steps to keep in mind with purchasing insurance.

Step 1: Know your risks and costs of assets.

Step 2: Select agents and insurance companies.

Step 3: Request quotes and complete applications.

Step 4: Compare quotes.

Step 5: Purchase the policy.

INSURANCE TIP:

When purchasing coverage for the structure of your home, remember this simple guideline: Purchase enough coverage to rebuild your home.

Most homeowner policies are written on Insurance Services Offices (ISO) forms and expressed as "HO" followed by a number. Each of these ISO forms covers property in a different way or covers property of different types. Some companies may have their own proprietary forms; however, they usually mirror ISO standard forms to a large extent.

Here are the forms currently in use:

HO-2 is also known as the Broad or "cheap" form and provides limited coverage.

HO-3, the Special Form, is the most common and provides broad and affordable coverage options.

HO-4, the Contents Broad Form, is the tenants' form and is a special, contents-only policy for renters.

HO-5 provides the best coverage and is considered the high-end form.

HO-6 is the Condominium Form for condominium owners.

HO-8, the Modified Coverage Form, gives more limited coverage than the HO-3 and is directed towards older homes without specific required updates.

Important terms to be familiar with while shopping for insurance include the following:

Dwelling versus Homeowners Insurance

The basic difference between Dwelling Insurance and Homeowners Insurance is that Dwelling Insurance covers property only, not liability (although some liability protection is available by endorsement).

Actual Cash Value (ACV) is the cost to replace damaged or destroyed property with new property of like kind and quality minus the value of its physical depreciation. Essentially, the "used up" value of the property is subtracted from the loss payment. The policy does not provide payment for the entire cost to repair or replace your house.

Replacement Cost Value (RCV) means that the insurance policy pays to repair or replace damaged property with NO deduction for depreciation. Importantly, there are other clauses in RCV policies that can limit coverage, but this generalization largely holds true.

Ordinance and Law is an endorsement to the policy which will pay extra money on your claim for the increased cost of construction due to local building standards and codes

Additional Living Expenses (ALE) are an important feature of a standard homeowners insurance policy. They are expenses such as rent and utilities for temporary living in the case of your house suffering major damage due to a covered hazard. This is necessary since you may not be able to live in your house while it is being repaired. A decrease in revenue, such as lost income from renting out a section of your home, is also included as an additional living expense. It is important to note that some insurance policies cover additional living expenses and some do not.

> INSURANCE TIP:
>
> RCV is recommended whenever possible.

Deductibles are the amount of money you are required to pay before insurance will step in, and they apply to every property loss. Dollar deductibles are a specified amount that you choose (subject to a company-specific minimum). Percentage deductibles are a percentage of the amount of coverage on the house. When applied, they are translated into a dollar amount based on the dwelling coverage and applicable percentage. Small changes in percentages can translate into large dollar differences. Consult your insurance agent to learn more. The deductible is subtracted from the amount of loss, not the amount of coverage.

The **liability** portion of homeowners insurance provides coverage against lawsuits for bodily injury or property damage that you, your family members, or your pets cause to other people, as well as court costs incurred and damages awarded. You should have enough liability insurance to protect your assets. Coverages typically range from $100,000 to $500,000.

5.1.1 Shopping for Your Insurance

Although the task of getting the right insurance seems daunting, shopping for insurance can help you save money and find the right coverage for your current needs. The market for homeowner's insurance changes frequently as new companies enter and existing companies change coverage. If it has been more than a few years since you shopped for insurance, or if you have never shopped beyond your current agent or insurance company, you could be paying too much or not getting the right coverage.

When shopping around, ask your agent these ten questions to be sure you get the insurance coverage you need and can afford:

1. How much coverage did you quote on my house, and does this include detached structures (garage, workshop, etc.)?

2. How much coverage is provided for my personal property (my stuff)?

3. Are my contents insured for replacement cost or actual cash value (ACV)?

4. Is my house insured for replacement cost or ACV?

5. Do I have sewer and water coverage?

6. How much is my deductible in dollars? How about my wind deductible?

7. Do I have (or did you quote) a separate wind / hail policy?

8. Do I have coverage for additional living expenses?

9. How much ordinance and law coverage do I have?

10. Do I have (or did you quote) a flood policy? What is my flood zone?

Obtaining renters insurance is important if you do not own your home. Homeowners insurance from your landlord can help pay for home repairs in the event of a disaster or damages, but this will not cover your personal belongings. A few things to consider before purchasing renters insurance include what your landlord's insurance does and does not cover, how much coverage you will need based on your personal property, and what rates are available from different insurance companies to get the best value. Make sure you are getting the coverage you need.

5.1.2 Understanding the Residual Market

Properties in areas considered high risk to natural hazards may have difficulty obtaining property insurance through the voluntary private market. A high risk region in Georgia is the coastal region which includes the following counties: Bryan, Camden, Chatham, Glynn, Liberty, McIntosh, Bulloch, Effingham, Long, and Screven, in addition to the 14 barrier island communities off the coast. At the same time, mortgage lenders require home insurance to protect their investment.

To help these homeowners secure coverage, many states offer a Fair Access to Insurance Requirements (FAIR) Plan as an option of last resort, where the underwriting risk is shared across taxpayers and private insurers. In Georgia, this plan is offered through the Georgia Underwriting Association (GUA). As of 2017, Georgia had almost 20,000 FAIR policies in force, providing coverage for $2.6 billion in property. As development increases in hazard-prone areas and climate and weather risks intensify, more properties in Georgia may fall into this residual market.

5.1.3 Determining How Much Insurance You Need

Standard homeowners' policies provide coverage for disasters, such as damages due to fire, lightning, hail, or explosions. If you live in areas where there is risk of flood or earthquakes you will need additional coverage for those disasters as well. You will want the limits on your policy to be high enough to cover the cost of rebuilding your home from the ground up. Insuring the current value or mortgage of your home could be higher or lower than the cost of rebuilding, so it is important to get an accurate estimate of the rebuild value. Keep in mind that there will not be economies of scale, or savings in cost gained from a higher rate of construction, when rebuilding as there are for builders when creating a new subdivision. Additionally, other items, such as debris removal, must be considered when selecting the proper coverage amount. Also surge demand is important to keep in mind, as if there is a natural hazard the number of contractors and supplies can be in high demand. The price you paid for your home—or the current market price—may be different than the cost to rebuild. If the limit of your insurance policy is based on your mortgage (as some banks require), it may not adequately cover the cost of rebuilding.

While your insurer will provide a recommended coverage limit for the structure of your home, it is a good idea to educate yourself as well. To make sure your home has the right amount of structural coverage, consider:

- Factors that impact the rebuilding costs for your home (ex: improvements, additions, renovations, building code changes, etc.).
- Specific styles and features of your home.
- Whether or not your home is currently up to code.

You will also be required to select coverage for "other structures," which are structures not attached to the main dwelling, such as sheds and detached garages. Dwelling limits refer to the total cost of rebuilding your house. Typical coverage ranges from 10 - 25% of the dwelling limits depending on the size of the structure and its contents.

Most homeowners insurance policies provide coverage for your personal belongings around 50-70% of the dwelling coverage you have on your house. However, that standard amount may or may not be enough. To learn if you have enough coverage:

- Conduct a home inventory of your possessions.
- Take stock of expensive items.
- Make a visual record with photos/video.
    - Have copies of receipts and an itemized list with details for high-value items.
    - Update annually or after major purchases.
    - Store safely.

5.2 Insurance for Wind Events

Many insurers in Georgia have a wind insurance policy that is separate from a homeowners policy, which have different deductibles covering specific damages or losses from wind and hail. These "shared markets" are state-run programs that provide insurance to high-risk individuals and properties that do not qualify for private insurance. Since they are designed to cover such high amounts of risk, they rely on the backing of the government, which spreads the cost among all the insurers in the state.

In Georgia, the Georgia Underwriters Association manages the shared market for residential properties and offers wind/hail coverage for properties on Georgia's barrier islands and the six oceanfront counties of Bryan, Camden, Chatham, Glynn, Liberty and McIntosh. Visit their website to learn more: https://www.georgiaunderwriting.com.

In 2013, the GUA adopted a mitigation program for FAIR policies, aiming to improve home safety and reduce the loss of lives and property from natural disasters. Properties that receive the following FORTIFIED (see Part 4) designations are eligible for three levels of discounts for wind peril under homeowners programs:

FORTIFIED MITIGATION CATEGORY	GUA DISCOUNT
Roof	5%
Silver	7.5%
Gold	10%

There are two kinds of wind damage deductibles: hurricane deductibles, which apply to damage solely from hurricanes, and windstorm or wind/hail deductibles, which apply to any kind of wind damage. Based on your insurance policy, there will most likely be a specific deductible amount that you have to cover before insurance will step in. If your policy does not cover windstorms, damage to your house from tornado or hurricane winds may not be covered. It is important to be familiar with the perils your policy covers and those it does not.

5.3 Insurance for Flood Events

Flooding is the most common natural disaster in the United States. Flood insurance is recommended for those who live near coastlines, rivers, stream systems or any other body of water. Flood insurance is not mandatory for all mortgages. It is mandatory for federally backed mortgages. On average, just one inch of water can cause $25,000 in damages to a home. It is a common misperception that disaster assistance will always be available to help after a flood event. Disaster funding is only allocated when the president issues a disaster declaration, which occurs for less than half of all floods according to FEMA.

Almost all homeowners policies specifically exclude coverage for flooding unless they are considered an "all-risk" policy. You must purchase a separate flood policy if you want to be insured for losses caused by flood damage. These policies are typically purchased from the National Flood Insurance Program (NFIP) through an insurance agent or company.

Maintaining flood insurance is mandatory if you have a mortgage and live within a Special Flood Hazard Area (SFHA). A SFHA refers to land located in 100-year flood areas, which have around a 1%change of flooding in a given year. Outside this area, insurance is not required, but many people have policies because flooding can occur. For example, FEMA estimates that nearly 1 in 4 of all federal flood claims occur outside of high-risk areas. The rates for properties outside the SFHA are very affordable, as they qualify for the lowest rates that are offered by the NFIP. If you are a

first-time applicant for flood insurance from the NFIP, know that there is a 30-day waiting period before a flood insurance policy goes into effect. Additionally, new policies will not be written, and existing policies cannot be modified, when a storm is predicted to approach or already approaching your area.

You can purchase flood coverage from either the NFIP or from the private flood market. Private carriers who specialize in covering flood risk may offer competitive rates; consult your insurance agent to learn more. It is important to note that you can only obtain coverage through the NFIP by contacting an insurance agent or company participating in the program.

Key facts to know about flood insurance:

- Many homeowners insurance policies exclude flood.
- In applying for a NFIP policy, homeowners use the NFIP Dwelling Form.
- Flood coverage in the Dwelling Form is based on the replacement cost with two conditions:
  - The house is insured to 80% of its replacement cost or the maximum amount of coverage available from the NFIP ($250,000).
  - You live in the house at least 80% of the year. Rental homes have different guidelines for flood insurance, however renters are also eligible to purchase a policy from the NFIP.
- Flood policies are subject to a maximum limit ($250,000 on the dwelling and $100,000 on personal property). If the replacement cost of your house exceeds $250,000, additional limits are available from private companies.
- Separate deductibles apply to the dwelling and personal property.
- Be sure to get coverage for BOTH the dwelling and its contents as they are sold individually. There are many instances where people thought they had purchased coverage for both and found out they had only coverage for their structure. The flood policy covers **direct** loss only, not additional living expenses.
- Regardless of the flood zone in which your house is located, you should consider purchasing flood coverage in the case of a flood event. Floods can, and do, happen outside of flood zones and cause major damage to homes. Flood insurance can generally be obtained at cheaper rates outside of areas prone to flooding.
- Flood coverage has a 30-day waiting period (unless for a loan closing or a few other reasons). Because of this, you should plan coverage well in advance, not waiting for a storm.

INSURANCE TIP:

The average annual flood insurance policy premium is $700. The Average flood claim payout from the NFIP is $43,000.

Five pieces of information are generally needed to get a flood quote/policy:

- An Elevation Certificate (not always required)
- The flood zone in which your house is located
- The year your house was built
- The year of the initial Flood Insurance, if applicable
- Flood Insurance Rate Map (FIRM) for your area

The following sections explain how each of these things work.

5.3.1 National Flood Insurance Program

In 1968, the U.S. Congress enacted the NFIP, primarily because flood insurance was mostly unavailable from the private insurance market. The federal government had been providing most of the funding for recovery after flooding events, but this system was not sustainable. Under the NFIP, homeowners pay premiums that contribute to their recovery after a flooding event. Communities must decide to join the NFIP, but the individual premiums vary according to the location of the property. Homeowners participating in the NFIP must also maintain certain requirements to mitigate flood damage, such as elevating or floodproofing structures.

Homeowners can learn more about flood insurance, perform an address-based risk assessment, and locate an insurance agent serving their address at www.FloodSmart.gov, a website maintained by the NFIP. The Georgia Department of Natural Resources also offers much of this information on their Flood Map Viewer (http://map.georgiadfirm.com/).

Preferred Risk Policy (PRP)

A PRP is available for a property located in a low-risk area (e.g., B, C, and X zones) in a community that already participates in the NFIP. The PRP premiums are lower than those for standard policies. If your property was mapped into a low-risk flood zone, you may still be eligible for a PRP, so ask your insurance agent. Previous and current flood zone documentation for your property must be validated for eligibility. Likewise, your property must meet certain loss history requirements, even if you are the new owner. The requirements involve the number of flood claims and the cost of the claims. You can also decide between two types of policies: building-and-contents coverage or contents-only coverage.

5.3.2 Community Rating System (CRS)

The CRS is a program that rewards communities for floodplain management activities that exceed the minimum NFIP requirements. Individual insurance premium rates are discounted to reflect the reduced flood risk resulting from those activities. You can contact your local floodplain manager or insurance agent for more information.

The three goals of the CRS program are:

- Reduce flood damage to insurable property.
- Strengthen and support the insurance aspects of the NFIP.
- Encourage a community's comprehensive approach to floodplain management.

In Georgia, 10% of the communities that participate in the NFIP also participate in CRS. Four of these communities have gained a rating of 5, earning property owners in the special flood hazard area a 25% discount on federal flood insurance.

5.3.3 Increased Cost of Compliance (ICC) Coverage

Sometimes the damage from wind or flooding is far greater than a homeowner can afford with a direct loss insurance claim, especially when the homeowner must upgrade the home to meet current codes and requirements upon rebuilding. Increased Cost of Compliance (ICC) coverage may fill the gap between repairing your house to its pre-existing condition and complying with current codes and requirements.

For example, suppose that flooding causes $200,000 of damage to Jane's house. After speaking with her insurance adjuster and the local building inspector, she finds out that she needs to elevate the house to meet new floodplain requirements. Jane can file for her direct loss claim and ICC coverage if she needs the additional financial assistance. The ICC coverage will provide no more than $30,000 (for any policyholder). Also, the combined amount of the claim and the ICC coverage cannot exceed $250,000 (the maximum limit of coverage for any residence).

Your community's building department must determine the extent of damage and what is necessary to bring your home up to compliance with current codes and requirements (whether you file for ICC or not). The department must then give you a written letter with those terms, which you will turn in to process your claim and ICC coverage.

There are four options you can choose from, in any combination, to help you reduce future flood damage. You should consult with your local floodplain administrator to determine which option is best for your property.

1. **Elevation:** This raises your home or business to or above the flood elevation level adopted by your community.
2. **Relocation:** This moves your home or business out of harm's way.
3. **Demolition:** This tears down and removes flood-damaged buildings.
4. **Floodproofing:** This option reduces the potential for flood damage by making a building watertight through a combination of structural and nonstructural adjustments or additions.

FEMA TERMS TO LEARN
BEFORE FILING INSURANCE CLAIMS

Repetitively Damaged (or Repetitive Loss - RL) means the building must have had flood damage on at least two occasions during a 10-year period, and the cost to repair the flood damage, on average, equaled or exceeded 25% of the market value of the building on each occasion.

Substantially Damaged (SD) means damages of any origin sustained by a structure in which the cost of restoring the structure to its before-damaged condition would equal or exceed 50% of the market value of the structure before the damages occurred.

Substantial Improvement (SI) means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure (or smaller percentage if established by the community) before the "start of construction" of the improvement. This term includes structures that have incurred "substantial damage," regardless of the actual repair work performed.

5.4 Making a Claim After Receiving a Loss

Being able to file a claim is why we pay for insurance. If your home or property is damaged, follow these steps to file successfully, negotiate your claim, and get your damage fixed correctly. As soon as you receive your policy, conduct a mock run-through for filing a claim, so that you are familiar with the process and know what pieces of information from your declaration pages will be needed. Save your claim number once you first file the claim. This will be used as a reference number for all future communications with the insurance company. Start taking notes on everything you do and the correspondences you have. Include the date and time. If at any time you have difficulties contacting or working with your insurance company through the claims process, use the Georgia Department of Insurance as a resource for help. Also, save everything to a flash drive, email it to yourself or save to a cloud drive (i.e. Google, Amazon, iCloud, or Dropbox).

More detailed steps include:

1. **Follow your policy's guidelines:** Most insurance policies have a section that details how to file a claim. Follow the instructions carefully to make it easier for yourself. It should detail where to find and submit forms and the ways you can file them.

2. **File your claim immediately:** Filing a claim quickly is a good idea for several reasons, including expedited handling before a rush of claims comes through that require prioritization by your carrier.
    - Your insurer will be able to help you with your claim and give you advice.
    - They will schedule an adjuster to come and visit your property.
    - You can start your claim by phone or online with many insurers.
    - You may also be eligible for additional incentives, such as Ordinance and Law to build back to the newest building code.
    - You should also ask about improving the new structure's resiliency by using certain standards, like FORTIFIED Home, or options to elevate your home to avoid the next flood. Your choices will vary based on your policy and your insurer.
3. **Take pictures:** Get your phone or camera and take pictures of the damage before you start cleaning up. Additionally, it is a good idea to take pictures before the event itself to give a comparison of the damage. You cannot take too many pictures. Get different angles, including wide shots and close-ups. Make sure to get very detailed photos where the most damage occurred. These will help you negotiate your claim with your insurance adjuster. Be sure to include:
    - The serial and model numbers of electronics and appliances.
    - Views looking down your hallways, into bedrooms, looking out of rooms, outside, inside, and of the floors.
    - Photos of the inside of your cabinets – your cookware, serving pieces, flatware, baking ware, small appliances, everything!
    - Clothes and shoes in your dressers and closets, including labels
    - Food in your refrigerator and freezer
4. **Take videos, if possible:** Conduct a walk-through of each room in the house and narrate what is in it. Zoom in on each expensive item's serial number, brand, etc.
5. **Find or create a home inventory:** The more detailed your list is, the more accurate your insurance claim payout will be when you work with your adjuster. Often, your insurance company will ask for an inventory of damaged items (usually on a provided form). This practice will save you time and ensure accuracy. If you already have a home inventory, secure it or make it digital by taking pictures of it.
6. **After documenting, begin cleanup as soon as it is safe to do so:** Make temporary repairs to prevent further damage (e.g., tarping a damaged roof, boarding up damaged windows, drying out home to prevent mold growth). Insurance will not cover additional damage that you could have reasonably prevented.
    - Damaged items can be taken outside to facilitate cleanup, but it is recommended not to have them hauled away until after your inspector has seen them (except for health

hazards, such as spoiled food). Be sure to take photos of the removed items.

- In case of flood damage, it is recommended to preserve a waterline on a wall or window and save samples or swatches of carpet, flooring, drapes, etc. to show the adjuster. Is it best to do only repairs that prevent further damage until an adjuster can see the property?

7. **Save your receipts:** Save receipts from every expense from the day of the damage until your home is back to normal. If you have old receipts of purchases, take pictures of them. Digital pictures do not fade, but hard copies of receipts do. Plan to do this with any receipts you get for future purchases too.

> INSURANCE TIP:
>
> Save photos before and after to a cloud-based format, then you'll have records and can easily share with adjusters/ insurance agency.

8. **Work with your adjuster:** Have a copy of your photos, home inventory, and the damaged items ready to share. Make sure you are home during the inspection and walk the inspector through the damage you see. Take note if they are thorough with the inspection, such as getting on the roof, taking lots of photos and recording measurements.

9. **You can negotiate your claim:** Once you receive your initial claim proposal, you can negotiate with the adjuster.
    - Use your home inventory and damage checklist as proof of what you lost and ensure the replacement costs are correct.
    - If you have Ordinance and Law coverage in your homeowner's policy, make sure that was taken into account.
10. **Use any contractor bids for repair work:** This is done to justify the costs needed to fix the damage. These bids can also be used to negotiate your claim. Bringing your home up to code will add additional costs to the job.
11. **Using your payments wisely:** Spend your money according to the claim. Otherwise, you may be ineligible to receive your recoverable depreciation.

> INSURANCE TIP:
>
> How do I file my flood claim?
> https://www.floodsmart.gov/flood/how-do-i-file-my-flood-claim

5.5 Choose a Qualified Contractor and Avoid Scams

This section will help you make decisions about choosing the right contractor to build or retrofit your home. This is especially important in the busy and often chaotic environment following a disaster. Watch out for unscrupulous contractors or others who take advantage of people while they are displaced. assessing their damage or beginning repairs. It is important to know how to recognize and avoid inept contractors and scams.

5.5.1 Tips to Choose a Qualified Contractor

Get at least three bids from qualified contractors.

- Do not give a price range or let them know what you have received from your insurance claim.
- Make sure they have (and that you get copies of or take pictures of):
  - A Contractor's License (General or Roof) or Home Builder's License, depending on the amount of work. Verify that their license/registration is valid by conducting an online search through the Georgia Board of Residential and General Contractors (https://sos.ga.gov/index.php/licensing/plb/46) when looking for the appropriate contractor.
  - General Liability insurance
  - Workman's Comp Insurance for their staff
  - A bond to fix any poor work they refuse to address, just in case
  - At least three local references you can call
  - Examples of recently completed projects

Get everything you want to be done in written bids on company letterhead.

- Do not leave anything out and ask that they plan for additional costs, such as replacing rotted wood or other typical items they might find. You may not end up paying for these but having them in the contract protects you from "surprise" costs.

Ideally, work with local, reputable companies and contractors.

- Once you select a contractor, get your contract in writing with everything you want and agreed upon on company letterhead; do not forget those possible additional costs.
- It is okay for contractors to request a certain percentage of the costs up front if you are under contract. However, the Georgia Department of Law's Consumer Protection Division recommends not paying more than 25% of the contract price as a down payment. For more tips, look at Choosing and Working with a Contractor (https://consumered.georgia.gov/your-home/home-improvement/choosing-working-contractor).

- Never pay in cash, and never pay in full upfront. The contract should include a schedule for payments in installments as work is satisfactorily completed. Issue the final payment only after all work has been completed to your satisfaction and passes any required code inspection. Upon receipt of final payment, the contractor should sign a lien waiver or release of lien indicating they have been fully paid and give up any rights to place a lien on your property in the future.
- Ensure the contractor pulls all necessary permits for your job (check with local building department on what is required) and that all are properly closed out once the job is complete.

5.5.2 Avoid Being a Victim of a Fraud

The demand for qualified contractors after a large-scale disaster exceeds the supply, and many trustworthy, licensed home repair companies can be booked solid for months. Frustrated and anxious homeowners eager to get their property repaired may not take the necessary precautions when hiring contractors. Fraudulent contractors know this and flock to disaster-struck communities to make quick money for shoddy workmanship. This form of theft takes place when contractors overcharge, do not provide promised services, or use faulty materials when working on homes. Contractor jargon, details of complex building systems, and the unpredictable scope of work make choosing the right contractor a challenge. Additionally, it is important to distinguish the difference between contractor fraud and surge demand. Natural hazards can cause significant damage throughout communities, which leaves a large portion of people looking for help at the same time. Contractors may have to increase their prices in order to meet the demand.

Here are some tips to follow in order to protect yourself from fraudsters and identity theft:

- Ask contractors for references and proof of insurance. Check with those references regarding the contractor's dependability and quality of work.
- Get written estimates with a description of work to be done, time schedules and payment schedules. Get estimates from more than one contractor.
- Read and understand all contracts before you sign. Never sign any forms with blanks. Keep copies of everything you sign.
- Do not sign an AOB (Assignment of Benefits). You are essentially turning over your rights on your insurance claim.
- Never pay a contractor in full until the work is complete and acceptable.
- Check your bank and credit card statements for purchases you have not made. If you suspect you are the victim of identity theft, report it immediately to your bank, credit card company and local law enforcement.

Follow the St. Bernard Project's (SBP) **7 Tips to Avoiding Contractor Fraud** on their website and use their Contractor Fraud Checklist to avoid being scammed. Learn more and download additional disaster recovery and homeowner resources at *www.sbpusa.org/start-here*.

Appendix A

Emergency Management Agencies

LOCATION	ADDRESS	CONTACT NUMBER
Appling	259 West Parker Street Baxley, GA 31515 United States	912-367-8170
Atkinson	664 Austin Avenue East Pearson, GA 31642 United States	912-422-3968
Bacon	307 South Dixon Street Alma, GA 31510 United States	912-632-7979
Baker	167 Baker Place Newton, GA 39870 United States	229-734-3000
Baldwin	312 Allen Memorial Drive Milledgeville, GA 31061 United States	478-445-3406
Banks	557 Thompson Street Homer, GA 30547 United States	706-677-3163
Barrow	222 Pleasant Hill Church Road NE Winder, GA 30680 United States	770-480-5504 770-307-2897 ext. 1996
Bartow	10 Elizabeth Street Cartersville, GA 30120 United States	770-387-5089
Ben Hill	255 - B Appomattox Road Fitzgerald, GA 31750 United States	229-426-5161
Berrien	201 North Davis Street Nashville, GA 31639 United States	229-686-6588
Bibb	700 Poplar Street Macon, GA 31201 United States	478-832-6300
Bleckley	112 North Second Street Cochran, GA 31014 United States	478-230-7300

Brantley	Post Office Box 398 Nahunta, GA 31553 United States	912-462-7874
Brooks	702 Barwick Road Quitman, GA 31643 United States	229-263-4262
Bryan	5995 Highway 204 Ellabell, GA 31308 United States	912-858-2799
Bulloch	17245 Highway 301 North Statesboro, GA 30458 United States	912-489-1661
Burke	277 Highway 24, South Waynesboro, GA 30830 United States	706-554-6651
Butts	625 West Third Street, Suite 14 Jackson, GA 30233 United States	770-277-8897
Calhoun	57 Calhoun Street Morgan, GA 39866 United States	229-310-5124
Camden	131 North Lee Street Kingsland, GA 31548 United States	912-510-5993
Candler	Post Office Box 74 Metter, GA 30439 United States	912-685-2568
Carroll	896 Newnan Road Carrollton, GA 30117 United States	770-830-5882
Catoosa	800 Lafayette Street Ringgold, GA 30736 United States	706-935-2323
Charlton	426 Rosa Parks Road Folkston, GA 31537 United States	912-486-1081
Chatham	124 Bull Street, Room 140 Savannah, GA 31401 United States	912-201-4500
Chattahoochee	213 McNaughton Street Cusseta, GA 31805 United States	706-989-0417

Chattooga	170 Farrar Drive Summerville, GA 30747 United States	706-857-3400
Cherokee	150 Chattin Drive Canton, GA 30115 United States	678-493-4033
City of Forest Park	4539 Jonesboro Road Forest Park, GA 30297 United States	404-608-2372
City of Smyrna	2620 Atlanta Road Smyrna, GA 30080 United States	678-631-5364
Clarke	700 College Avenue Athens, GA 30601 United States	706-613-3410
Clay	124 Thomas Street, Suite 1 Fort Gaines, GA 39851 United States	229-768-2505
Clayton	7810 Highway 85 Riverdale, GA 30274 United States	770-473-7833
Clinch	313 West Dame Avenue, Suite F Homerville, GA 31634 United States	912-487-3700
Cobb	140 North Marietta Parkway Marietta, GA 30060 United States	770-499-4567
Coffee	941 Mahogany Road Douglas, GA 31533 United States	912-389-1705
Colquitt	Post Office Box 1835 Moultrie, GA 31776 United States	229-616-7417
Columbia	650-B Ronald Reagan Drive Evans, GA 30809 United States	706-868-3333
Cook	3295 County Farm Road Adel, GA 31620 United States	229-896-1196
Coweta	195 International Park Newnan, GA 30265 United States	770-254-2650

Crawford	640 Georgia Highway 128 Roberta, GA 31078 United States	478-836-2616
Crisp	196 Highway 300 Cordele, GA 31015 United States	229-276-2600
Dade	71 Case Avenue Trenton, GA 30752 United States	706-657-4111
Dawson	393 Memory Lane Dawsonville, GA 30534 United States	706-334-3666 ext. 226
Decatur	309 Airport Road Bainbridge, GA 39817 United States	229-248-3011
DeKalb	1950 West Exchange Place Tucker, GA 30084 United States	678-406-7768
Dodge	Post Office Box 818 Eastman, GA 31023 United States	478-374-8136
Dooly	211 West Union Street Vienna, GA 31092 United States	229-268-4395
Dougherty	320 North Jackson Street Albany, GA 31701 United States	229-431-3266
Douglas	8480 Earl D. Lee Boulevard Douglasville, GA 31034 United States	770-949-3007
Early	18610 East South Boulevard Blakely, GA 39823 United States	229-723-3029
Echols	Post Office Box 365 Statenville, GA 31648 United States	229-559-8500
Effingham	601 N. Laurel Street Springfield, GA 31329 United States	912-754-8200
Elbert	Post Office Box 6010 Elberton, GA 30635 United States	706-283-2003

Emanuel	101 North Main Street Swainsboro, GA 30401 United States	478-237-3169
Evans	Post Office Box 425 Claxton, GA 30417 United States	912-739-1611
Fannin	20 Station Ridge Blue Ridge, GA 30513 United States	706-632-1958
Fayette	140 W. Stonewall Avenue, Suite 214 Fayetteville, GA 30214 United States	770-305-5169
Floyd	409 East 12th Street Rome, GA 30161 United States	706-236-5002
Forsyth	3520 Settingdown Road Cumming, GA 30028 United States	770-205-4528
Franklin	7011 Highway 145 Carnesville, GA 30521 United States	706-384-7118
Fulton	130 Peachtree Street, Suite G 157 Atlanta, GA 30303 United States	404-612-5660
Gilmer	325 Howard Simmons Road Ellijay, GA 30540 United States	706-635-1333
Glascock	Post Office Box 68 Gibson, GA 30810 United States	706-598-2811
Glynn	1725 Reynolds Street, Suite 224 Brunswick, GA 31520 United States	912-554-7826
Gordon	4543 Fairmount Highway SE Calhoun, GA 30701 United States	706-602-2905
Grady	03 17th Avenue Northwest Cairo, GA 39827 United States	229-377-0628
Greene	1034 Silver Drive, Suite 201 Greensboro, GA 30642 United States	706-453-7716

Gwinnett	800 Hi Hope Road Lawrenceville, GA 30043 United States	770-513-5610
Habersham	175 EOC Drive Mount Airy, GA 30563 United States	706-778-9500
Hall	Post Office Box 907730 Gainesville, GA 30501 United States	770-503-3215
Hancock	52 Spring Street Sparta, GA 31087 United States	706-444-5388
Haralson	3997 Highway 120 Buchanan, GA 30113 United States	770-646-2036
Harris	Post Office Box 365 Hamilton, GA 31811 United States	706-628-7161
Hart	800 Chandler Street Hartwell, GA 30643 United States	706-376-2024
Heard	11816 Highway 100 Franklin, GA 30217 United States	706-675-6186
Henry	526 Industrial Boulevard McDonough, GA 30253 United States	770-288-7870
Home Office	935 United Ave. SE Atlanta, GA 30316-0055 United States	404-635-7000 1-800-879-4362
Houston	200 Carl Vinson Parkway, Suite A Warner Robins, GA 31088 United States	478-542-2026
Irwin	Post Office Box 501 Ocilla, GA 31774 United States	229-468-9616
Jackson	368 Curtis H. Spence Drive Jefferson, GA 30549 United States	706-367-1232 706-612-0185
Jasper	77 Mack Tillman Drive Monticello, GA 31064 United States	706-468-4930

Jeff Davis	10 Public Safety Drive Hazlehurst, GA 31539 United States	912-375-6628
Jefferson	Post Office Box 658 Louisville, GA 30434 United States	478-625-4102
Jenkins	Post Office Box 797 Millen, GA 30442 United States	478-982-2563
Johnson	6785 East College Street Wrightsville, GA 31096 United States	478-864-9759
Jones	Post Office Box 237 Gray, GA 31032 United States	478-986-6672
Lamar	118 Academy Drive, Suite G Barnesville, GA 30204 United States	770-358-5166
Lanier	6 Park Drive Lakeland, GA 31635 United States	912-368-2201
Laurens	650 County Farm Road Dublin, GA 31021 United States	478-277-2911
Lee	342 Leslie Highway Leesburg, GA 31763 United States	229-759-6090
Liberty	100 Liberty Street Hinesville, GA 31313 United States	912-368-2201
Lincoln	Post Office Box 340 Lincolnton, GA 30817 United States	706-359-4855
Long	285 S. McDonald Street Ludowici, GA 31316 United States	912-302-4432
Lowndes	Post Office Box 1349 Valdosta, GA 31603 United States	229-671-2790
Lumpkin	57 A Pine Tree Way Dahlonega, GA 30533 United States	706-974-1034

Macon	718 South Plum Street Montezuma, GA 31063 United States	478-472-3575
Madison	Post Office Box 278 Danielsville, GA 30633 United States	706-795-2174
Marion	Post Office Box 481 Buena Vista, GA 31803 United States	706-575-1308
McDuffie	1061 Salem Road SE Thomson, GA 30824 United States	706-595-2045
McIntosh	1019 Production Row Darien, GA 31305 United States	912-437-5170
Meriwether	17234 Roosevelt Highway, Buliding B Greenville, GA 30222 United States	706-672-3468
Miller	Post Office Box 504 Colquitt, GA 39837 United States	229-758-4122
Mitchell	26 North Court Street Camilla, GA 31730 United States	229-336-2000
Monroe	507 Montpelier Avenue Forsyth, GA 31029 United States	478-994-7004
Montgomery	Post Office Box 295 Mount Vernon, GA 30445 United States	912-583-2840
Morgan	1380 Monticello Road Madison, GA 30650 United States	706-342-2459
Murray	810 G.I. Maddox Parkway Chatsworth, GA 30705 United States	706-695-2088
Muscogee	510 Tenth Street Columbus, GA 31901 United States	706-225-4072
Newton	8134 Geiger Street, Suite 10 Covington, GA 30014 United States	678-342-5326

Oconee	Post Office Box 563 Watkinsville, GA 30677 United States	706-310-3601
Ogelthorpe	2703 Elberton Road Carlton, GA 30627 United States	706-614-0121
Paulding	165 North Johnston Street Dallas, GA 30132 United States	678-383-3428
Peach	Post Office Box 570 Fort Valley, GA 31030 United States	478-825-3687
Pickens	1266 East Church Street, Suite 4152 Jasper, GA 30143 United States	706-253-8829
Pierce	Post Office Box 421 Blackshear, GA 31516 United States	912-449-2040
Pike	Post Office Box 377 Zebulon, GA 30295 United States	770-468-9531
Polk	55 Cline Ingram Jackson Road Cedartown, GA 30125 United States	770-748-3439
Pulaski	Post Office Box 475 Hawkinsville, GA 31036 United States	478-783-9261
Putnam	111 Ridley Drive Eatonton, GA 31024 United States	706-485-8557
Quitman	Post Office Box 114 Georgetown, GA 39854 United States	229-334-0903
Rabun	25 Courthouse Square, Suite 201 Clayton, GA 30525 United States	706-782-5821
Randolph	123 North Webster Street Cuthbert, GA 39840 United States	229-310-6649
Richmond	3117 Deans Bridge Road Augusta, GA 30906 United States	706-821-1640

Rockdale	1496 Rockbridge Road Conyers, GA 30012 United States	770-278-8401
Schley	Post Office Box 352 Ellaville, GA 31806 United States	229-937-2567
Screven	618 Frontage Road West Sylvania, GA 30467 United States	912-564-8956
Seminole	200 South Knox Avenue Donalsonville, GA 39845 United States	229-524-8956
Spalding	1005 Memorial Drive Griffin, GA 30223 United States	770-288-2129
Stephens	Post Office Box 386 Toccoa, GA 30577 United States	706-898-5395
Stewart	Post Office Box 157 Lumpkin, GA 31815 United States	229-942-3070
Sumter	901 Adderton Street Americus, GA 31719 United States	229-815-9531
Talbot	Post Office Box 155 Talbotton, GA 31827 United States	706-741-1076
Taliaferro	Post Office Box 114 Crawfordville, GA 30631 United States	706-456-2494
Tattnall	Post Office Box 905 Reidsville, GA 30453 United States	912-557-1911
Taylor	Post Office Box 278 Butler, GA 31006 United States	478-862-5176
Telfair	274 Willow Creek Drive McCrea-Helena, GA 31055 United States	229-868-5672
Terrell	3110 Albany Highway Dawson, GA 39842 United States	229-995-5381

Thomas	1202 Remington Avenue Thomasville, GA 31792 United States	229-225-4190
Tift	316 West 2nd Street Tifton, GA 31794 United States	229-388-6060
Toombs	321 North West Broad Street Lyons, GA 30436 United States	912-526-6424
Towns	48 River Street, Suite B Hiawasee, GA 30546 United States	706-896-2228
Treutlen	1830 Martin Luther King Jr. Drive Soperton, GA 30457 United States	912-529-3664
Troup	2471 Hamilton Road LaGrange, GA 30241 United States	706-884-0326
Turner	625 E. Washington Avenue Ashburn, GA 31714 United States	229-567-2926
Twiggs	Post Office Box 202 Jeffersonville, GA 31044 United States	478-945-3357
Union	507 Shoe Factory Road Blairsville, GA 30512 United States	706-439-6091
Upson	Post Office Box 348 Thomaston, GA 30286 United States	706-647-5600
Walker	10054 North Highway 27 Rock Spring, GA 30739 United States	706-375-7810
Ware	3395 Harris Road, Suite 300 Waycross, GA 31503 United States	912-287-4394
Warren	Post Office Box 46 Warrenton, GA 30828 United States	706-465-3351
Washington	125 Warthen Street Sandersville, GA 31082 United States	478-552-5477

Wayne	155 North Wayne Street Jesup, GA 31546 United States	912-427-5979
Webster	Post Office Box 138 Preston, GA 31824 United States	229-829-5600
Wheeler	Post Office Box 497 Alamo, GA 30411 United States	912-568-7007
White	1241 Helen Highway, Suite 100 Cleveland, GA 30528 United States	706-865-9500
Whitfield	804 Professional Boulevard Dalton, GA 30720 United States	706-876-2510
Wilcox	Post Office Box 516 Abbeville, GA 31001 United States	229-322-9607
Wilkes	105 Marshall Street Washington, GA 30673 United States	706-678-7837
Wilkinson	Post Office Box 161 Irwinton, GA 31042 United States	478-946-2236
Worth	203 East Willingham Street Sylvester, GA 31791 United States	229-776-8223

(Source: Georgia Emergency Management Agency)

Appendix B

Weather Related Broadcast / Radio Stations and Apps

NOAA Weather Radio
NWS Stations

CALL SIGN	SITE NAME	FREQUENCY
KEC80	Atlanta	162.550
KEC85	Savannah	162.400
KPS506	Washington	162.500
KWN50	Ashburn	162.450
KXI22	Brasstown Bald	162.500
KXI28	Sandersville	162.450
KXI75	Blue Ridge	162.475
KXI76	LaGrange	162.450
KXI77	Eastman	162.400
KXI81	Clayton	162.450
KXI89	Eatonton	162.525
KZZ70	Blakely	162.525
WWH23	Buchanan	162.425
WWH24	Toccoa	162.425
WWH25	Metter	162.425
WWH31	Valdosta	162.500
WWH39	Brunswick	162.425
WXJ28	Jesup	162.450
WXJ30	Americus	162.425
WXJ31	Thomaston	162.500
WXJ53	Cleveland	162.525
WXJ72	Summerville	162.450
WXK52	Chatsworth	162.400
WXK53	Pelham	162.550
WXK54	Augusta	162.550
WXK56	Athens	162.400
WXK71	Macon	162.475
WXK75	Waycross	162.475
WXM65	Baxley	162.525
WXM88	Waynesboro	162.425

(Source: NOAA – NWS) For more information, visit https://www.weather.gov/nwr/stations?State=GA.

For those who experience hearing difficulties, the National Weather Service has a receiver system that provides specialized alerts. See the "NWR Special Needs" page for additional information https://www.weather.gov/nwr/special_needs.

Georgia Public Broadcasting Radio Stations

FM STATION	LOCATION	FREQUENCY
WUNV	Albany	91.7
WUGA	Athens	91.7
WRAS	Atlanta	88.5
WACG	Augusta	90.7
WWIO	Brunswick	88.9
WUWG	Carrolton	90.7
WNGH	Chatsworth	98.9
WJSP	Columbus	88.1
WNGU	Dahlonega	89.5
WPPR	Demorest	88.3
WJWV	Ft. Gaines	90.9
WRGC	Macon	89.7
WRGC	Milledgeville	88.3
WGPB	Rome	97.7
WSVH	Savannah	91.1
WABR	Tifton	91.1
WWET	Valdosta	91.7
WXVS	Waycross	90.1

(Source: Georgia Public Broadcasting)

Weather Apps

Below is a list of weather apps that can be used for severe weather alerts and weather forecast. Many have the option to be used on smartphones, desktops, tablets, and televisions depending on your need and preference. Most of these apps are free, however some have the option for in-app purchases. For more information on weather apps, visit https://www.weather.gov/enterprise/sw-alerts-app-1e.

- Accuweather
- AlertFM
- American Red Cross Disaster Apps
- Disaster Alert by Pacific Disaster Center
- FEMA Mobile App
- NWS Mobile Weather
- Storm Shield Severe Weather App
- The Weather Channel Notifications
- WeatherBug
- Weather Information Network
- Weather USA
- Weather Underground

Appendix C

Weather Related Broadcast / Radio Stations and Apps

NAMI Crisis Resources

RESOURCE	ABOUT	CONTACT INFORMATION
Georgia Crisis and Access Line	Provides assistance to people experiencing mental health crises and provides access to mental health resources located throughout Georgia.	1-800-715-4225
National Crisis Text Line	Talk to a trained counselor through text messaging.	Text "GA" to 741-741
National Suicide Prevention Lifeline	Talk to local crisis centers for help with suicidal thoughts and emotional distress.	1-800-273-TALK or 1-800-SUICIDE TTY: 1-800-799-4889
Georgia Coalition Against Domestic Violence	Provides information on domestic violence centers in Georgia.	1-800-334-2836
Veterans Crisis Line	A hotline for veterans or concerned loved ones.	1-800-273-8255
Georgia Peer Support and Wellness Centers	Provides support through talking and daily wellness activities. Find a respite center for up to 7 days as an alternative to a psychiatric hospital.	Decatur: 404-371-1414 White County: 706-865-3601 Bartow County: 770-276-2019 Colquitt County: 229-873-9737 Henry County: 678-782-7666
SAMHSA Treatment Locator	Find local treatment centers for mental health and substance abuse.	1-800-662-4357 TTY: 800-487-4889
National Child Abuse Hotline	Provides crisis intervention, information, resources and support services for child abuse.	1-800-422-4453
Covenant House	Find a local shelter that provides support services for homeless youth in Georgia.	404-713-0954
Ok2talk Hotline	Provides a space for individuals to talk about mental health concerns.	1-800-273-talk

Georgia Cares Hotline	Provides information, law enforcement assistance, and resources for survivors of sexual exploitation.	1-844-842-3678
National Child Traumatic Stress Network	Provides information and resources on childhood traumatic stress.	https://www.nctsn.org/what-is-child-trauma/about-child-trauma
Girls and Boys Town National Hotline	Provides resources and referrals to local support services.	1-800-448-3000
National Sexual Assault Hotline	Provides support and resources for individuals who have experienced sexual assault.	1-800-656-4673
SafeQuest Crisis Line	Provides crisis intervention services for individuals experiencing domestic or sexual abuse.	1-866-487-7233
National Domestic Violence Hotline	Provides support, resources and information for people experiencing domestic violence.	1-800-799-7233 TTY: 1-800-787-3224
Elder Abuse	Provides resources and information on elderly caregiving and support services.	https://www.caregiver.org/state-list-views?field_state_tid=69
National Disaster Distress Helpline	Provides crisis counseling and support for individuals who experience emotional distress after a disaster.	1-800-985-5990 Text "TalkWithUs" to 66746
National Drug Helpline	Provides support for drug and alcohol addictions and information on treatment and recovery resources.	1-844-289-0879

(Source: National Alliance of Mental Illness)

For more information, see https://namiga.org/community-resources/.

See the Community Mental Health Agencies page from United Way of Greater Atlanta for a list of local agencies (*http://211online.unitedwayatlanta.org/MatchList.aspx?k;;0;;N;0;0;Community%20Mental%20Health%20Agencies;;;0;N*).

For additional help finding an agency, use this search tool provided by the Georgia Collaborative Organization Administrative Services Organization and the Georgia Department of Behavioral Health and Developmental Disabilities (DBHDD) *https://www.valueoptions.com/referralconnect/doLogin.do?e=Z2FjbSAg*.

Regional Field Offices

The Georgia DBHDD has established Regional Field Offices across the state that can provide help answering questions and finding mental health services in your area. The offices are broken up into six regions listed below. Contact your specific region for mental health resources within your community.

REGION	CONTACT	COUNTIES SERVED
Region 1	1230 Bald Ridge Marina Road Suite 800 Cumming, GA 30041 Primary: 678-947-2818 Toll Free: 877-217-4462	Banks, Bartow, Catoosa, Chattooga, Cherokee, Cobb, Dade, Dawson, Douglas, Fanin, Floyd, Forsyth, Franklin, Gilmer, Gordon, Habersham, Hall, Haralson, Hart, Lumpkin, Murray, Paulding, Pickens, Polk, Rabun, Stephens, Towns, Union, Walker, White, Whitfield
Region 2	3405 Mike Padgett Highway Building 3 Augusta, GA 30906 Primary: 706-792-7733 Toll Free: 866-380-4835	Baldwin, Barrow, Bibb, Burke, Clarke, Columbia, Elbert, Emanuel, Glascock, Greene, Hancock, Jackson, Jasper, Jefferson, Jenkins, Jones, Lincoln, Madison, McDuffie, Monroe, Morgan, Oconee, Oglethorpe, Putnam, Richmond, Screven, Taliaferro, Twiggs, Walton, Warren, Washington, Wilkes, and Wilkinson
Region 3	3073 Panthersville Rd. Building 10 Decatur, GA 30034 Primary: 404-244-5050 Primary: 404-244-5056	Clayton, Dekalb, Fulton, Gwinnett, Newton, and Rockdale

Region 4	400 S. Pinetree Boulevard Thomasville, GA 31792 Primary: 229-225-5099 Toll Free: 877-683-8557	Baker, Ben Hill, Berrien, Brooks, Calhoun, Colquitt, Cook, Decatur, Dougherty, Early, Echols, Grady, Irwin, Lanier, Lee, Lowndes, Miller, Mitchell, Seminole, Terrell, Thomas, Tift, Turner, and Worth
Region 5	1915 Eisenhower Drive Building 7 Savannah, GA 31406 Primary: 912-303-1670	Appling, Atkinson, Bacon, Bleckley, Brantley, Bryan, Bulloch, Camden, Candler, Charlton, Chatham, Clinch, Coffee, Dodge, Effingham, Evans, Glynn, Jeff Davis, Johnson, Laurens, Liberty, Long, McIntosh, Montgomery, Pierce, Pulaski, Tattnall, Telfair, Toombs, Treutlen, Ware, Wayne, Wheeler and Wilcox
Region 6	3000 Schatulga Road Building 4 Columbus, GA 31907-2435 Primary: 706-565-7835	Butts, Carroll, Chattahoochee, Clay, Coweta, Crawford, Crisp,Dooly, Fayette, Harris, Heard, Henry, Houston, Lamar, Macon, Marion, Meriwether, Muscogee, Peach, Pike, Quitman, Randolph, Schley, Spalding, Stewart, Sumter, Talbot, Taylor, Troup, Upson and Webster

(Source: Georgia Department of Behavioral Health and Developmental Disabilities)

For more information, visit the Regional Field Offices page from the Georgia DBHDD (*https://dbhdd.georgia.gov/regional-field-offices*).

Appendix D

Useful Links

Weather Related Broadcast / Radio Stations and Apps

Before a Drought
https://www.ready.gov/drought

Environmental Protection Division Water Conservation
https://epd.georgia.gov/watershed-protection-branch/water-conservation

Federal Emergency Management Agency (FEMA)
https://www.fema.gov/

FEMA's Floodplain Management Agency
https://www.fema.gov/floodplain-management

Georgia Department of Transportation (GDOT)
http://www.dot.ga.gov/

Georgia Emergency Management Agency (GEMA)
https://gema.georgia.gov/

Georgia Forestry Commission
http://www.gfc.state.ga.us/

National Drought Monitor
https://droughtmonitor.unl.edu/

National Oceanic and Atmospheric Administration (NOAA)
https://www.noaa.gov/

National Storm Surge Weather Map
https://www.nhc.noaa.gov/nationalsurge/

National Weather Service (NWS)
https://www.weather.gov/

National Weather Service (NWS) Wind Chill
http://www.nws.noaa.gov/om/winter/windchill.shtml

Ready Georgia Website
https://www.ready.gov/

United States Department of Agriculture (USDA) Drought Designations
https://www.fsa.usda.gov/programs-and-services/disaster-assistance-program/disaster-designation-information/index

Winter Weather
https://www.ready.gov/winter-weather

Preparedness and Disaster Assistance Resources

Airbnb Open Homes Program
https://www.airbnb.com/openhomes/disaster-relief

American Red Cross – Atlanta
http://www.georgiaredcross.org/

American Red Cross – Georgia Locations
https://www.redcross.org/local/georgia/about-us/locations.html

Atlanta Autism Consortium
https://atlautism.org/

Center for Advanced Communications Policy – Georgia Institute of Technology
https://cacp.gatech.edu/

Dekalb Emergency Management Agency (DEMA)
https://www.dekalbcountyga.gov/dema/dekalb-emergency-management-agency

Department of Human Services – Division of Aging Service (DAS)
https://aging.georgia.gov/

Department of Human Services, Office of Facilities and Support Services (OFSS)
https://dhs.georgia.gov/division-offices/office-facilities-support-services

Federal Emergency Management Agency (FEMA)
https://www.fema.gov/

FEMA's *Are You Ready?*
https://www.fema.gov/media-library/assets/documents/7877

Friends of Disabled Adults and Children (FODAC)
https://www.fodac.org/

Georgia Center for the Deaf and Hard of Hearing
https://www.gcdhh.org/

Georgia Advocacy Office (GAO)
http://thegao.org/

Georgia Department of Behavioral Health and Developmental Disabilities
https://dbhdd.georgia.gov/portal/site/DBHDD/

Georgia Department of Human Services
https://dhs.georgia.gov/

Georgia Department of Public Health – Division of Health Protection – Office of Emergency Preparedness and Response
https://dph.georgia.gov/emergency-preparedness

Georgia Emergency Management Agency (GEMA)
https://gema.georgia.gov/

Georgia Forestry Commission Fire Permit
http://www.gatrees.org/

Georgia Housing Search Tool
https://www.georgiahousingsearch.org/

Georgia Legal Aid
https://www.georgialegalaid.org/

Georgia State Financing and Investment Commission – State ADA Coordinators Office
https://ada.georgia.gov/

Gwinnett Coalition for Health and Human Service Emergency Preparedness Committee
https://www.gwinnettcounty.com/web/gwinnett/Splashpages/GwinnettCoalitionforHealthandHumanServices

Gwinnett, Newton, and Rockdale County Health Departments
http://www.gnrhealth.com/

Long-Term Disaster Recovery Toolkit for Individuals with Disabilities
https://redd.tamu.edu/long-term-disaster-recovery-toolkit-for-individuals-with-disabilities

Pet Friendly Hotels
https://www.bringfido.com/

Project Independence: A Function of the Georgia Vocational Rehabilitation Agency
https://gvs.georgia.gov/

Salvation Army
https://salvationarmygeorgia.org/

Shepherd Center
https://www.shepherd.org/

Southeast ADA Center
http://www.adasoutheast.org/

Tools for Life – The Alternative Media Access Network – Georgia Institute of Technology Enterprise Innovation Institute
https://gatfl.gatech.edu/index.php

Mental Health and Sexual Assault Resources

Coping with Disaster
https://www.ready.gov/coping-with-disaster

Coping with Traumatic Stress Reactions
https://www.ptsd.va.gov/gethelp/coping_stress_reactions.asp#two

Disaster Distress Helpline
https://www.samhsa.gov/find-help/disaster-distress-helpline

Georgia Crisis and Access Line
https://dbhdd.georgia.gov/

Georgia Disaster Mental Health
http://www.georgiadisaster.info/

National Alliance on Mental Health National Resource Directory
https://www.nami.org/Support-Education/NAMI-HelpLine/NAMI-Resource-Library

National Alliance on Mental Illness Resource Directory
https://namiga.org/community-resources/

National Domestic Abuse Hotline
https://www.thehotline.org/is-this-abuse/abuse-defined/

Navigating a Mental Health Crisis
https://www.nami.org/Support-Education/Publications-Reports/Guides/Navigating-a-Mental-Health-Crisis

Rape, Abuse and Incest National Network (RAINN)
https://www.rainn.org/

Construction Resources

CDC's Healthy Housing Resource Manual – Plumbing
https://www.cdc.gov/nceh/publications/books/housing/cha09.htm

Certified Arborist
http://www.treesaregood.org/findanarborist/findanarborist

Don't Goof When You Reroof
www.dontgoof.org

EPA's Septic Systems – What to do after the Flood
https://www.epa.gov/ground-water-and-drinking-water/septic-systems-what-do-after-flood

EPA's What to do after the Flood
https://www.epa.gov/privatewells/what-do-your-private-well-after-flood

Federal Alliance for Safe Homes Roof Installation Resource
https://flash.org/protect.php#3

FEMA's Coastal Construction Manual
https://www.fema.gov/media-library/assets/documents/3293#

FEMA's Design and Construction Guidance for Community Safe Rooms
https://www.fema.gov/media-library/assets/documents/3140

FEMA's FloodSmart
https://www.floodsmart.gov/

FEMA's Free of Obstruction Requirements
https://www.fema.gov/media-library/assets/documents/3490

FEMA's Home Builder's Guide to Coastal Construction
https://www.fema.gov/media-library/assets/documents/3293#

FEMA's Home Builder's Guide to Coastal Construction Factsheet
https://www.fema.gov/media-library/assets/documents/6131

FEMA's Homeowner's Guide to Retrofitting
https://www.fema.gov/homeowners-guide-retrofitting

FEMA's Protect Your Home from Flooding
https://www.fema.gov/media-library/assets/documents/165910

FEMA's Recommended Residential Construction for Coastal Areas
https://www.fema.gov/media-library/assets/documents/3972

FEMA's Taking Shelter from the Storm
https://www.fema.gov/fema-p-320-taking-shelter-storm-building-safe-room-your-home-or-small-business

Floodplain Management in Georgia Quick Guide, 2015
https://epd.georgia.gov/watershed-protection-branch/floodplain-management

FORTIFIED Home website
https://fortifiedhome.org/

FORTIFIED Roofing Checklist
https://fortifiedhome.org/standards/

FORTIFIED Technical Bulletin
https://disastersafety.org/fortified/resources/#standards

Georgia Building Codes – Georgia Department of Community Affairs
https://www.dca.ga.gov/local-government-assistance/construction-codes-industrialized-buildings/construction-codes

Georgia State Amendments to the International Plumbing Code
https://www.columbusga.gov/InsCode/codes2020.htm

Hawaiian Electric Handbook
https://www.hawaiianelectric.com/safety-and-outages/storm-center/emergency-preparedness-handbook

Hawaii Homeowners Handbook
http://seagrant.soest.hawaii.edu/homeowners-handbook-to-prepare-for-natural-hazards/

Institute for Business and Home Safety (IBHS)
https://ibhs.org/guidance/policyholders/

Institute for Business and Home Safety (IBHS) Opening Protection Selection Guide
https://ibhs.org/wind-driven-rain/hurricane-resources/

International Window Film Association (IWFA)
https://iwfa.com/

Standard for the Design and Construction of Storm Shelters
https://codes.iccsafe.org/content/ICC5002014

Insurance and Contracting Resources

Choosing and Working with a Contractor
https://consumered.georgia.gov/your-home/home-improvement/choosing-working-contractor

Georgia Board of Residential and General Contractors
https://sos.ga.gov/index.php/licensing/plb/46

Georgia Department of Natural Resources (DNR) Flood Map Viewer
http://map.georgiadfirm.com/

Georgia Underwriting Association
https://www.georgiaunderwriting.com/

How to File a Flood Claim
https://www.floodsmart.gov/flood/how-do-i-file-my-flood-claim

National Flood Insurance Program (NFIP) Information
https://www.fema.gov/media-library/assets/documents/272

St. Bernard Project (SBP) Disaster Recovery and Homeowner Resources
https://sbpusa.org/index.php?p=start-here/

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Floodproofing.com


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