

Surviving a Hurricane



By Robert Tarzwell

**All proceeds from this book
are donated to**

Grand Bahamas Air Sea Rescue

Written for Florida & Bahamas

About the Author

Robert Tarzwell, a member in good standing of the Grand Bahamas Red Cross, was an assistant manager and coordinator of the Red Cross medical FAST teams, which respond to

medical emergencies and is a trained Red Cross hurricane shelter manager. As an active member of BASRA, Bahamas Air Sea Rescue Association, Robert is regularly seen out on the rescue boat assisting people in trouble. Robert has extensive boating and automotive knowledge, as his hobbies are fishing and car racing. Robert is also very knowledgeable in all construction techniques, having built many residential homes as well as commercial buildings.

Robert has first-hand experience in disaster survival. He and his wife rode out 15 days in Ottawa, Canada with no electrical power and limited supplies, during a major ice storm where the outside temperature was a very cold -25°C . As well, he has survived two major hurricanes and a tropical storm in Florida in a motor home. Robert has written and published ten books on electronics, car racing and other subjects.

What makes Robert able to write this book? The fact, that at age 54, he has experienced all types of weather, dangerous situations and extreme conditions. Robert has the ability to read, study and talk to people with first-hand knowledge about a subject and filter out the important data from the unnecessary, and of course, the ability to get it to print.

Acknowledgment

Without the help of my dear wife and companion of many years, this book would never become reality. She typed and edited my poor English for many hours and by her grace, allowed me the time to write this book. Also, my many thanks to my daughter, who created the web page, prints and mails the books and puts up with her Dad's constant complaints and problems with Word.

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Foreword

The purpose of this book is to try to educate you on how to survive a hurricane. People typically have had a non-caring attitude for years in their personal preparation for a major hurricane. Now that Florida and the Bahamas have experienced a back-to-back series of hurricanes, it is time to get prepared. The next one could be a monster category 5 storm. Living in the southern climate of Florida and Bahamas, it is not a question of if a category 4 or 5 hurricane hits us, but only a matter of when.

The overwhelming problem that you will face in trying to get prepared is how to get over the mental barrier and the “I don’t want to deal with it now, attitude.” By *planning* ahead, you can minimize the dangers of these storms. By *planning* now, you also reduce the discomforts of recovery and the time required to return your life to normal. Please read this guide thoroughly and discuss it with your family - you should develop your *family plan* together. The contents of your *survival kit* should be personalized for *you*. My suggestions are just a starting point. Think about your needs, whether you stay or evacuate, and include these additional items in your checklist.

I have found it very effective when formulating a hurricane plan to list all the possible options. Then, upon a hurricane's approach, choose the options that best fit the particular circumstances.

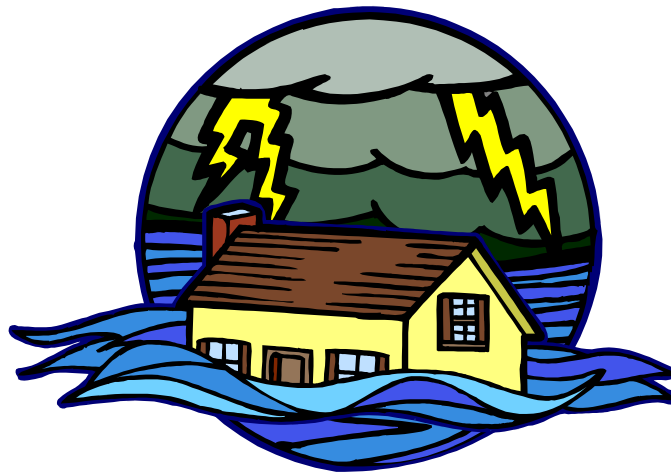
Robert Tarzwell, October 2004

Chapter 1

Overview of a Hurricane

A hurricane is a tropical storm with winds that have reached a constant speed of 74 miles per hour or greater. Hurricane winds blow in a large spiral around a relative calm center, known as the "eye." The "eye" is generally 20 to 30 miles wide and the storm may extend outward up to 400 miles. As a hurricane approaches, the skies will begin to darken with a greenish tinge and winds will grow in strength. As a hurricane nears land, it can bring torrential rains, high winds, and storm surges. A single hurricane can last for more than 2 weeks over open waters and can run a path across the entire length of the eastern seaboard. August and September are peak months during the hurricane season, which lasts from June 1 through to November 30.

Hurricanes can spawn tornadoes, which add to the destructiveness of the storm. Floods and flash floods generated by torrential rains also cause damage and loss of life. Following a hurricane, inland streams and rivers will flood and trigger landslides. Even more dangerous than the high winds of a hurricane is the storm surge; a wall of ocean water that can be 20 feet at its peak and 50 to 100 miles wide. The surge can devastate coastal communities, as it sweeps ashore. Nine out of ten hurricane fatalities are attributable to the storm surge.



Hurricane Winds

Coastal communities need to consider the strength of hurricane winds and the pressure they generate, when deciding how strong to build their structures. As winds increase, pressure against objects is added at an increasing rate. Pressure against a wall mounts by the square of the wind speed, so that a threefold increase in wind speed gives a nine-fold increase in pressure. Thus, a 25 mph wind causes about 1.6 pounds of pressure per square foot.

A at 25 mph four by eight sheet of plywood will be pushed by a weight of 50 pounds. In 75 mph winds, that force becomes 450 pounds, and in 125 mph winds, it becomes 1,250 pounds. For some structures, this force is enough to cause failure. Winds will weaken after landfall due to the loss of a warm water energy source and the encountering of greater friction over land caused by the buildings and trees.

Rainfall and Flooding

Heavy rains and ocean waters brought ashore by strong winds can cause flooding in excess of 20 inches (50 cm.) over a 24-hour period. The runoff systems in many cities are unable to handle such an increase in water flow because of the gentle topography in many of the coastal areas where hurricanes occur. Hurricanes are capable of producing large amounts of flash flooding rainfall. During landfall, a hurricane rainfall of 10 to 15 inches or more is common. If the storm is large and moving slowly (less than 10 mph), the rainfall amounts from a well-organized storm are likely to be even more excessive. To get a general estimate of the rainfall amount (in inches) that can be expected, divide the storm's forward motion into 100.

i.e. $100 / \text{forward speed} = \text{the estimated inches of rain.}$

Rainfall and Flooding Fact: Tropical Storm, Claudette (1979) brought 45 inches of rain to an area near Alvin, Texas, contributing to more than \$600 million in damage.

The heaviest rain usually occurs along the coastline, but sometimes, there is a secondary maximum further inland. This heavy rain usually occurs slightly to the right of the hurricane track and usually occurs between 6 hours before and 6 hours after landfall. The amount of rain depends on the size of the hurricane, the forward speed of the hurricane and whether it interacts with a cold front. Interaction with a cold front will not only produce more tornadoes but more rainfall as well.

Tornadoes

Hurricanes also produce tornadoes, which add to the hurricane's destructive power. Typically, the more intense a hurricane, the greater the tornado threat. When a hurricane brings its winds inland, the fast-moving air hits terrain and structures, causing a frictional convergence which enhances lifting. Frictional convergence may be at least a contributing factor to tornado formation in hurricanes. The greatest concentration of tornadoes occurs in the right front quadrant of the hurricane. A number of theories exist about their origin, but in the case of Hurricane Andrew, severe damage was inflicted by small, spin-up vortices that developed in regions of strong wind-shear found in the hurricane's eye wall. The strong, damaging winds of the hurricane frequently cover the smaller tornado paths, making the separation of their damaging effects very difficult.

Hurricane Spawned Tornadoes Facts

10% of deaths in the United States associated with hurricanes are a result of tornadoes. Most tornadoes occur within 24 hours after hurricane landfall. The exception is when there is interaction with a cold front after landfall. Then, more tornadoes will occur two or three days after landfall, well inland. Most tornadoes occur within 150 miles of the coastline. More tornadoes occur during the morning and afternoon, rather than evening or night due to the need for a tornado to have a heat source. The Gulf of Mexico hurricanes produce more tornadoes than Atlantic storms. The majority of tornadoes occur within 30 miles of the center of the hurricane, but there is a secondary maximum further away in the outer rain bands (100-150 miles away from the center). Tornado winds can reach up to 300 mph at a forward speed of 60 mph and are usually 100-300 yards wide.

Storm Surge

Storm surge is an abnormal increase in the ocean's level, sometimes in excess of 10 feet high and hundreds of miles wide, that sweeps across the coastline near where a hurricane makes landfall. Storm surges can come ashore up to five hours before the storm and destroy low-elevation coastal areas. It is especially damaging when the storm surge occurs during high tide and consequently, is often responsible for most hurricane related deaths. Storm surge can range from 4 to 8 feet for a minimal hurricane, to greater than 20 feet, for the stronger ones. The surge of high water topped by waves and high tide is devastating. The stronger the hurricane and the shallower the offshore water, the higher the surge will be. Along the immediate coast, storm surge is the greatest threat to life and property, even more so than the high winds.

Storm surge is simply water that is pushed toward the shore by the force of the winds swirling around the storm. This advancing surge combines with the normal tides to create the hurricane storm tide, which can increase the mean water level 15 feet or more. In addition, wind driven waves are superimposed on the storm tide. This rise in water level can cause severe flooding in coastal areas, particularly when the storm tide coincides with the normal high tides. Because much of the densely populated Atlantic and Gulf Coast coastlines of the United States and the Caribbean, lie less than 10 feet above mean sea level, the danger from storm tides is tremendous. The level of surge in a particular area is also determined by the slope of the continental shelf. A shallow slope off the coast, like the flats on Grand Bahama's north shore will allow a greater surge to inundate coastal communities. Communities with a steeper continental shelf, like off the south shore of Grand Bahama, will not see as much surge inundation, although large breaking waves can still present major problems. The deeper shelf dissipates the waves energy faster as it tries to climb the steep shelf and prevents the wave from running a great distance, where as the flats allow a wave to continue inland because it does not have to climb the shelf and nothing to slow it down on shore.

Storm surge typically retreats quickly after the eye passes over due to the change in the wind direction.

One tool Emergency managers use to evaluate the threat from storm surge is the SLOSH model, this data determines which areas must be evacuated for storm surge. Storm surge also affects rivers and inland lakes, potentially increasing the area that must be evacuated.

In general, the more intense the storm, and the closer a community is to the northwest side of the approaching hurricane, the larger the area that will experience sea surge and must be evacuated. The problem is always the uncertainty about how intense the storm will be when it finally makes landfall. The island of Grand Bahama has seen this phenomena twice; once with Floyd and again with Frances. The combination of the proximity to the flats, no appreciable height for the surge to climb and a direct hit of the northwest quadrant of the storm, left residents flooded with over 10 feet of water. I have heard reports of the water rising 8 feet in one hour in their homes.

Where the storm hits can make a considerable difference in the destruction. The strongest hit is, as the hurricane comes ashore in the northwest quadrant of the storm. The hurricane then travels across, with a direct hit of the eye and unfortunately, you get the stronger wind gusts of the backside, as it leaves.

Wave and current action associated with the tide also causes extensive damage. Water weighs approximately 1,700 pounds per cubic yard. Extended pounding by frequent waves can demolish any structure not specifically designed to withstand such forces. The currents created by the tide combine with the action of the waves to severely erode beaches and coastal highways. Many buildings withstand

hurricane force winds until their foundations are undermined by erosion and then they are weakened, and fail. Grand Bahama's West End suffered massive damage from Frances when the tidal surge reached 12 feet, pounding concrete homes into shambled blocks, laying in heaps, where once a proud Bahamian home stood.

In Florida's estuaries and bayous, intrusions of salt water endanger the public health and send animals, such as snakes, fleeing from flooded areas, taking refuge in urban areas.

Local officials balance the uncertainty of a hurricane with the human and economic risks to their community. This is why, a rule of thumb for emergency managers, is to plan for a storm one category higher than what is forecast. This is a reasonable precaution to help minimize the loss of life from a hurricane. Over the last 30 years, more deaths have occurred from a hurricane's flooding than any other hurricane hazard. Both hurricanes and tropical storms are capable of creating this type of flooding.

Chapter 1 preceding information was provided by FEMA 500 C Street, SW Washington, D.C. 20472 Phone: (202) 566-1600

Because we have not experienced a large hurricane in the Bahamas in many years, we have become very lazy about hurricane preparation. The people who stored away extra water and food were better off than the majority who did not. Frances was unique, in that it sat in one place, unfortunately, the city of Freeport, for 50 hours. It's not a normal storm that catches people unprepared but the unexpected events that cause people to realize the power of nature. Prepare today to keep your families safe.

Chapter 2

The Ultimate Reality Show

What's it like during, and more important, after a major hurricane. Working hard to get ready after the call goes out. You are in the path of a hurricane and only have 2 days to get ready, including quick trips to buy food, water and plywood; long lines, short tempers, and price increases.

Fear: If you are not afraid during a hurricane, then you should be!

Wind: Howling, noisy wind, pounds at everything, that is unfortunate to be in its path. Projectiles are striking the house. The feeling of fear when the house cracks and groans under the strain of 140 miles per hour wind.

Danger: The front door is buckling under the relentless pressure of the wind; heavy furniture is moved to keep it closed, the door fails; the family abandons the living room and heads to the bathroom with a mattress.

Calm: Suddenly, the howling wind settles; the eerie feeling of the calm of the eye; the knowing that the worst is soon to follow.

Eye of the storm: Getting doors re-secured, cleaning up the water on the floor ; all done before the awesome powerful backside of the hurricane hits. Don't go outside .

The awakening, Seeing the damage; the denial, it is all gone; trees stripped of leaves and branches; the power lines strewn over the street; debris and garbage everywhere; homes and businesses gone.

Heat: After the hurricane, it's hot and stifling under the intense humidity; no air conditioning, no fans, no breezes; the flies start a day later; mosquitoes soon follow in droves.

Clean up: Lack of services, no electricity, no water, no food; stores not open, businesses destroyed, no gasoline, no phones. You're on your own. You now know what a survivor of a nuclear bomb must feel like.

Food: Cold, canned soup, even tastes good. How many ways can you fix cold Spam? What you would give for a hot chicken dinner with mac and cheese right about now.

Handyman: Becoming an expert in generator operation; learn today, they don't run without oil.

Information: Or more, the lack of it; can't contact friends and family to tell them that you're ok and send cash and water. Can't get water out of customs; they want money you don't have, for duty. Store shelves are bare.

Money: The frustration of no money; the banks are not open; the ATMs don't work; but it does not matter much, because there is nothing to buy, with the money that you don't have.

Chapter 3

Prepare Before The Hurricane Season

Develop an emergency communication plan with your family, friends and relatives.

Discuss the type of hazards that could affect your family. Know your home's vulnerability to **storm surge, flooding** and **wind**. Locate a safe room or the safest areas in your home for each hurricane hazard. In certain circumstances, the safest areas may not be your home but within your community. Determine escape routes from your home and places to meet. These should be measured in tens of miles rather than hundreds of miles. Post emergency telephone numbers by your phones and make sure your children know how and when to call 911.

In case family members are separated from one another during a disaster, (a real possibility during the day when adults are at work and children are at school) have a plan for getting back together. Arrange for a password in case children have to be picked up or contacted by a stranger.

Use a password that can be easily remembered, by both the parent and the children. A password gives the child a sense of security, knowing whomever you send, will know the password. For kids keep it fun; like **boomerang**, or some other funny sounding word. Make sure that you remind your kids never to reveal the word to anyone, and change it at least once a year. Ask an out-of-state relative or friend to serve as the "family contact". After a disaster, it's often easier to call long distance because many local phones are out. Make sure everyone in the family knows the name, address, and phone number of that contact person.

Check into flood insurance: In the USA, you can find out about the National Flood Insurance Program through your local insurance agent or emergency management office. There is normally a 30-day waiting period before a new policy becomes effective. In Florida, homeowners policies normally do not cover damage from the flooding that accompanies a hurricane. However, some Bahamian insurance policies do have flood coverage, if insured for hurricane loss.

House preparation: The best time to prepare your home, yard and business for a hurricane is now, while there is no immediate hurricane danger and you have time to think and get ready. You may not want to do it right now or spend the money, but as I write this Frances (2004) just wiped out the Bahamas and Florida, Charley went through Florida a week ago and Ivan is tormenting the Florida panhandle again and Jeanne is bearing down on the Bahamas.

Now is definitely the time to look at your situation and do something to get prepared. Most Bahamians and Florida residents now know that their preparations for the last round of hurricanes were simply not good enough. The weather experts are predicting 10 to 15 years of increased hurricane activity. Now is the time to take this seriously.

The first line of defense - shutters: If you live in an apartment, does your landlord have storm shutters ready for your windows? If not, insist he get prepared.

Does your house have a ready-to-go shutter system? If not, what's holding you back? The shutters on your home can prevent the windows from blowing in, which causes a sudden increase in pressure in the house and the wind velocity literally rips the roof off, from the inside out. Your first line of defense is to keep the windows intact, and shutters are the best way to do that job. Taping over a window is a waste of time and does nothing to protect the window, house or you. Tape is no match for 150 mph winds. The theory is that the tape will prevent the glass from flying. However, it is just not strong enough nor does it cover enough area of the window. If a window comes smashing in because a tree branch or brick which just flew through, do you believe a few crosses of tape will stop the glass from flying? Spend the money and time to have proper shutter protection.

Nailing on plywood is not the best solution, however, it will suffice in most situations to a maximum of a category 3 hurricane, depending on the installation method. In the Bahamas, we use cut concrete nails, due to the concrete construction. Although strong, it damages the concrete walls and pulls out too easily. A better idea is to use a series of Tap-con concrete screws or lag bolts, spaced at 18 inch intervals. They are much stronger and the screw is removable, without damage. The home-owner only has to get out the pre-marked and pre-drilled plywood, locate it over the holes or lag bolts, attach the washers and nuts and his house is protected.

Always use large washers on large lag bolts or Tap-con screws to help spread the wind loads across the plywood. Use at least ½ inch plywood, paint, and store vertical to prevent warping. Mark the plywood with the orientation, door or window for which it was pre-drilled. A typical three bedroom house would require about 10 sheets of plywood, at a cost of only \$300. with lag bolts and washers. Plywood is so inexpensive, why would you not prepare before the hurricane season? Why wait until there are line-ups around the block; praying for a few sheets of whatever is left. You could be left with no protection, when the stores run out. **GO BUY THEM NOW**

The most popular shutter system features an aluminum frame bolted to the house and corrugated steel or aluminum panels, which click or bolt in place. They are quite strong and go up easily and quickly. They can cover windows, doors and sliding patio doors. The ones on my house, rated at 140 mph, survived two direct hit hurricanes without any damage.

There are hurricane shutters with aluminum panels in a roller frame with hinges, so they fold up against a wall or side when not in use. Although more expensive, they work well, and are quite satisfactory for a apartment slider door, or where you don't have room to store the panels. The roller shutter units which feature a top canister are big, cumbersome, very expensive and typically reserved for larger garage doors and commercial buildings. A widely seen, shutter system is a canopy style cover which hinges from the top above a window and is usable as a sun canopy when not used as a shutter. I question its strength and ability to survive in a strong storm.

Roof preparation: Roof bracing is needed in all roofs. I have seen many homes that lacked any 2x4 braces or only a few poorly placed braces. Have a licensed contractor go up into the roof, examine the braces present and add a sufficient number of properly secured braces. Braces provide lateral cross support across multiple trusses. When the wind pushes on a building, the lateral pressure is enormous.

Without braces, the roof truss system can collapse like an accordion. New building codes specify a minimum number of braces, their placement and securing system. If you need a new roof or shingle job, do yourself a favor and find the money to put on an interlocking steel roof system. During the last hurricanes, I saw almost no damage to any of the steel interlocking roofs, whereas the concrete slate, Spanish tile and asphalt shingles were all badly damaged.

Yard clean-up: Clear out older or over grown trees. Trim them back, especially the damaged or broken limbs. Have a professional perform the task, if you're not familiar or capable of operating a chainsaw, or if the trees are near electrical lines or roofs. Remove any rubbish piles as well as rocks, concrete blocks or anything else that can be picked up by the wind.

Anchor objects that cannot be brought inside. Items such as small utility trailers, if left outside may blow against the house damaging it. Secure with strong ropes, chains or tie downs to a utility pole or strong fence. Be careful, the object you're securing does not damage the fence or pole to which it's attached. Never attach large items to a porch post, in fear it removes the post and causes your porch to collapse. Leave your above-ground pool full of water and remove pool objects such as solar covers, play toys and pool furniture.

If storage space is lacking, one good way to store pool furniture is to sink them to the bottom of the pool, where they will remain relatively safe. Outside air conditioning compressors, heat pumps or package units (single units that include a furnace and air conditioner) can be placed on a base of masonry, concrete or pressure treated lumber to raise it above a small flood level. All work must conform to state and local building codes.

Propane fuel tanks should be securely anchored to the concrete pad. Because they're lighter than water, they can float away, ripping out the connection, and posing an extreme fire explosion danger. Make sure vents and fill line openings are above projected flood levels. Propane tanks are the property of the propane company. You'll need written permission to anchor them. Ask whether the company can do it first. Be sure all work conforms to local building codes.

Flooding: Install a floating floor drain plug at the current drain location. If the floor drainpipe backs up, because the flood water is flowing back through the septic or sewer system, the float will rise and plug the drain. If flood water enters the sewer system, sewage can back up and enter your home. To prevent this, have a licensed plumber install an interior or exterior backflow valve. Check with your building department for permit requirements. You may have other options for avoiding flood damage depending on your needs and financial resources.

These include building drainage systems around the property, sealing openings such as low windows, building levees, constructing exterior floodwalls around basement doors and window wells, improving exterior walls, elevating buildings above projected flood levels and relocating buildings away from floodplains. For more information, talk to a professional builder, architect or contractor. Ask your building department about building permit requirements.

Safety items: Hurricane buckets are a real easy, cheap hurricane item. A bunch of normal 5 gallon buckets, are very handy. You can collect and store rain water for the toilet or keep sensitive items dry, if sealed inside.

They can be stored when not needed, in a small area by stacking 5 or 6 together. Remember to clean them after each use.

After the hurricane, one of the shortages will be gasoline. The electricity will be out and the garages can't pump gas. Flood waters can contaminate the gas or gas stations will suffer wind damage and not be able to open. It is therefore important, to store a significant amount of gas for your requirements until the stations are once again, pumping gas. In the case of Florida and Bahamas, that time period was as long as twelve days. If you have a safe storage area, I would store 10 to 15 gallons, in legal 5 gallon gasoline containers.

The gas containers need to be safely stored in the garage or deck, away from any direct rainfall, sunlight or possible ignition source. Gasoline fumes travel low on the floor. Make sure your gasoline is not stored near a gas fired water heater, dryer or other source of flame. If you plan to use a generator after the hurricane, you must store enough gasoline for its use as well as automotive use.

Personal preparation: The following items are better pre-prepared, than looking at bare store shelves. Searching for needed items during a hurricane watch is not the time to be doing this. Prepare or buy a suitable First-aid kit. Its contents will depend on your personal situation and location. If you are located in a city or area with good hospital service, your kit may only need the basic items. If you are situated on a remote island or in the keys (or cays), then I would recommend a comprehensive medical kit and the proper training to use it effectively.

Other pre-prepared items to get ready:

Quick grab bag of valuable papers and items

A fire extinguisher and make sure your family knows where to find it and how to use it.

Emergency food box

Emergency items box

Water storage containers

Clothing - seasonal / rain gear/ sturdy shoes

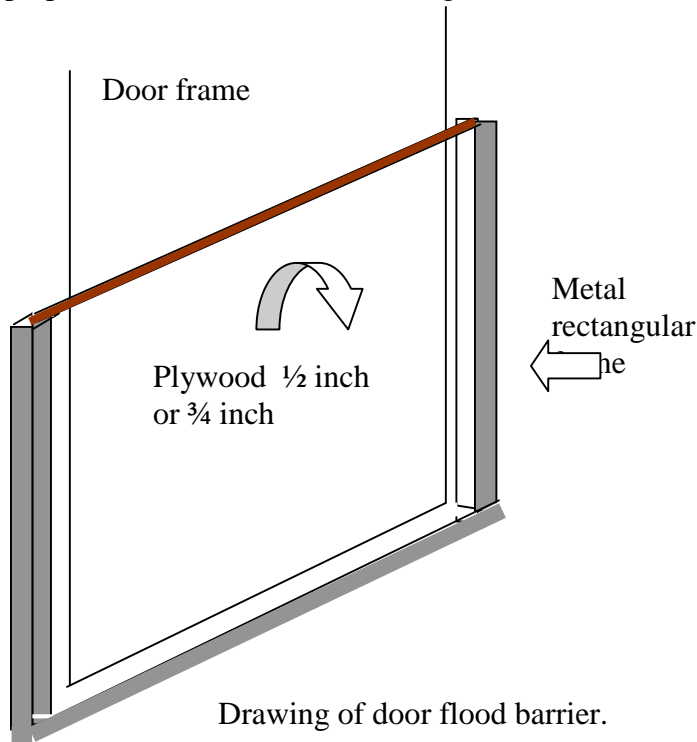
Small hand tools

Extra keys to the cars, house, etc.

Charging a cell phone without electricity, is difficult. The best pre-planning idea, is to purchase a car charging adaptor, so you can keep the cell phone charged when you don't have electricity. After a hurricane the phone lines will be down. It will be relatively easy to get the cell phone system up and working. In fact, after the hurricanes of 2004, the cell system worked almost non-stop. The land lines were months getting back working. Ten weeks after Frances, many land phones on Grand Bahama are still not working

House preparation: Go around the house looking for holes where water can seep and caulk them shut with silicon seal. Caulk around the windows. Add sealing strips to the outside doors, as well as good sill seal plates. Prepare sand bags, if you suspect you are susceptible to floods. The general idea is that you can make a house reasonably waterproof.

My house which was sealed up very tight, received only three inches of water inside when there was as much as three feet outside. The house was sealed with ½ inch plywood, fastened in front of the garage doors and one sheet covered the front door. Tight door seals and some easy preparation work saved us from significant water damage.



An effective flood barrier can be made from a few pieces of angle iron and a sheet of plywood. You can have a metal fabricator make a metal heavy duty slot system, which is fastened around the lower half of an outside door. Precut and rubber sealed plywood panels are inserted into the slots providing a near perfect waterproof barrier. Four feet high, ½ inch plywood is strong enough for most floods. Hurricane clips really do work to keep the roof trusses on during a hurricane. However, it is difficult to add them after the house is built. End plate type clips are made to be added after, but some drywall would need to be removed before adding the clips. There was considerable damage to the soffits (boxing) in Grand Bahama after the two hurricanes. The only known solution, is to replace the soffit boards with thicker sturdier ones. Typically, the soffit is ¼ inch thick plywood. I would replace them with ½ inch plywood, screwed in position with 3 inch wood screws and add a few backer boards to the trusses for additional anchorage.

If you are replacing your rotted out 1x6 fascia boards, consider a 2x6 replacement board. Add a few, well placed backer boards and screw the fascia on, so it will never come off again. Nails have limited pull up power, whereas the same size screw need many more times the effort to remove. During any new or repair construction, I would recommend that you use a few more screws, and not nails to secure the boards in place.

Chapter 4

Hurricane Watch; It's On The Way

Your preparation time is almost up. You can't do as much as you would like. The storm will be here in 24 to 36 hours. With some knowledge, you can get the best results for the limited time you have left. Shutters are very important. Spend what time you have left on them. Next, clean up the yard and anything that the wind can pick up and use to destroy your home.

Delegate the jobs between family members. Send spouses out with shopping lists. Have children help around the yard, picking up toys and lawn items. Don't cut branches at this time. As the storm approaches, you will have nowhere to store them and there will be no garbage pick up for disposal for a few days or more.

If, however, you did pre-prepare the necessary items as mentioned in Chapter 3, you will be able to get more done in the last few hours. Store away any adult toys, barbecues and lawn furniture. Take down any small satellite dish antennas; their meager mounting system will not withstand a hurricane; a fact proven during Frances. Backup your computer and take the CD's with you in your quick grab bag. Locate and check your emergency safety box. Collect any canned or dry boxed food items that you have on hand and put them in a waterproof box, in case you need to quickly go to a shelter. Put important documents in a quick-grab, waterproof container. Freeze as much water as the freezer will take. Use 2 liter plastic soda bottles or other freezable containers. Turn your freezer temperature to the coldest temperature. Do not turn the fridge temperature down lower as it will freeze and ruin any perishable items, such as fruit and vegetables.

Vehicles: An exposed car is in great peril during a hurricane. High speed missiles from roof tiles, trees and yard articles can break windows and damage panels on the car. Flooding of seawater into a car destroys the electronics in very short order. Try to park your car inside a garage, as high up as possible. If a closed area is not available, park your car as close as possible to an inside corner concrete wall to help deflect the wind.

Water: Collect as much tap water as you can. Fill every cleaned container that you have; fill the bathtub. To prevent the water from leaking out, line the tub with clean plastic or if you have time, seal the drain with silicon seal (let dry for 6 hours). Then, fill the tub. Fill as many five gallon buckets, pots and containers as you have, for washing and toilet water. Remember, you cannot have too much water and you can easily dump any excess water.

Evacuation orders: Listen to the radio and TV. Do what the officials ask, as long as it makes sense to you. Get out, if you live near the sea, in a low-lying, flood-prone area, or in an older, unsafe house. Go to a shelter or make arrangements to stay with friends or family elsewhere, in a safe location.

If you're going to drive away from a storm, pick your route carefully. Remember, there will be thousands, possibly millions, doing the same thing. Massive traffic jams occurred in Florida during Frances; 2 million people left, roads were clogged; gas stations were out; cars broke down in the heat while idling. There were stories of 15 to 24 hour trips to go from the Keys to Tampa. Then, they had to drive even farther when the hurricane took an unexpected turn, right for Tampa, where people had been directed for the evacuation.

Sitting in a line with the engine running not only wastes gas but it can overheat a engine. Your engine is sucking the hot gases from the car in front. Always leave some room to the next car to allow your fan to pull in enough cool, clean air, and supply less fumes to you and your family. To prevent the fumes entering your car, don't ride the bumper of the guy in front. To save gas, turn off the engine after sitting for a few minutes or more. Air-conditioner usage also heats up the engine and consumes gas. Turn it off, if the heat is bearable or if you're stalled in traffic. If you see a convenient opportunity to fill up with gas, do so, even if your gas tank is still half full or more. It's one less problem to worry about later down the road. Take extra gas in approved gas containers, extra water and food, and money.

It is not uncommon to be traveling, or more likely sitting in traffic, for 2 days, so bring enough fresh water and non-perishable, easy to eat food for the family and pets. You should plan for in-car survival of 4 to 5 days, when you head out, just in case. Also, bring blankets and pillows for a possible sleep in the car. Most hotels and motels along the escape route will be sold out, or possibly closed.

As bathroom facilities may be scarce, bring a couple of rolls of toilet paper and small garbage bags to dispose of the waste. Bring games and toys for children. Play "I Spy" and other games to keep them happy. Evacuation, however displeasing it sounds, is better than sitting, scared to death, in a poorly constructed home during a 150 mph hurricane.

When you can't evacuate easily because you live on an island, you must therefore pick a safe place to make your stand against the storm. As the island receives a hurricane warning, the planes will fly out to be stored safely away from the storm. The ships will head out to sea to get as far away as possible and ride it out, bow into the wind. The lack of safe transportation means it may be impossible to evacuate off the island, even if you wanted to. Have maps to your place of evacuation and keep the cell phone charged.

Prior to evacuation: Buy and fill, two or three, 5-gallon gas cans as part of your hurricane preparations. Also, buy bungee cords to fasten them to roof racks or secure the cans in the trunk. Be very careful when filling your car from a gas can. They all seem to leak at the joint of the nozzle. After you exit the car, ground yourself to metal on the car to discharge any static, before you pick up the gas can. Tighten the nozzle, so it does not leak. Have all family members leave the vehicle, so they will be safe in case of a fire. Always, turn off the car before refueling out of a can. Check that the nozzle of the gas can fit the car's fuel opening before you buy it. Some new cars have a very small gas opening.



Money will be a problem. With power off or phones lines down, credit cards won't work and ATM's will be out of service.

The only way to buy something is CASH. If you are warned that a hurricane is coming, go to an ATM or bank while they still work and take out a few hundred, minimum (\$500 to \$700 would be better). If you don't have that type of money, get what you can. Believe me, CASH will be short and it will be the only way to operate for a few days. In the Bahamas after Frances, CASH was king, for two weeks as there was no power, the banks were closed. The ATM's and businesses could not accept credit cards without a phone line and power. In fact, even 8 weeks later, we were refused a Visa card purchase because the store did not yet have phone service.

While you are out getting your CASH, buy water, canned food, flashlights, batteries, bug spray and antiseptic wipes. Get your supplies ASAP, if you do not have them pre-prepared. Do not wait! Every hour that you delay means less on the store shelves. I have just watched footage from the Florida panhandle. The first day that it was announced that Ivan was headed straight for the area, the stores were out of all water, milk, canned goods, bread, fresh produce and camping supplies. You're late buying your supplies, you go to the store and it looks empty. Buy any food that you can, and especially, buy anything with liquid as it's main ingredient. They may not have water, but soda, fruit drinks, canned milk, etc. are all liquids and all will help.

Storing water: Remember, anything that we put in our bodies can harm us, if it contains bacteria, salt, larva, or little bugs. People experience more diarrhea, dysentery and stomach problems after a hurricane, which is possibly caused by contact with bad water. Before you fill any container, make sure it did not previously have dangerous liquids in it. Plastic can leach enough chemicals out of whatever was in it last, to make you sick, even if you carefully wash out the container.

Two liter soda bottles and five gallon water jugs make good storage containers. The two liter soda bottles can be frozen to increase your freezer's cold time and can be reused as drinkable water afterward. Wash every container out with hot water, then rinse with a solution of 6 drops of unscented chlorine bleach per gallon. Further rinse out with fresh water, including the cap and threads. Let the containers drain for 10 minutes, then fill to within an inch of the top. Screw the top on tightly. Mark with a waterproof marker, the date and "*clean drinking water*". Store enough water for all your family for at least one week. If you are on an island, store two weeks worth of fresh water. Each person needs ½ gal of drinking water a day as a minimum, and a big person working hard in the heat, can easily need ¾ gal per day.

For two people, store 15 gallons minimum and 25 gallons would be better. Buy empty water containers, sanitize them, fill them with drinkable water and store them in a dark closet during hurricane season. Dark locations slow down the growth of bacteria. Renew the water every month to keep it fresh. We are only talking about a few dollars to protect your health. Additional buckets and bottles of water for sanitary washing and toilets will add to your comfort.

If you have talked with people in Freeport, Bahamas after Frances, there were many people crying for water, for many weeks or more. People did not understand how long it takes to get water systems working after a direct hit.

A few dollars and a few minutes of preparation will make a big improvement in the quality of your life after a big hurricane. You can't have too much fresh water. It is not uncommon to have to wait three to six weeks to get municipal tap water flowing to remote towns after a really devastating hurricane.

Change your level of preparation depending on your location. The farther out from town, the more supplies of all the necessities you will need. In Grand Bahama, it was announced five weeks after Frances that the water was safe to drink. That was a long time for residents to buy drinking water. Six weeks later, emergency workers were still delivering water to the devastated ends of the island.

Securing dangerous yard items: Have a last look and pick up potential missiles and store away inside. Remove and store any yard article you can. Items like flower pots, wood pieces, plywood, concrete blocks, garden decorations and other items all need to be put away. Trim any dead or leaning tree branches. Cut down any large dead trees (carefully). Most people would be surprised to know a Category 2 hurricane can lift and propel a full size concrete block out of your back yard and hurl it at your house or windows.

Aluminum carports, tool sheds and screened porches: Those small aluminum tool sheds and screened porches are very near useless in even a medium storm. They are not secured to the ground well enough and they are not structurally strong enough to withstand 50 mph winds for 8 hours, let alone 100 mph winds. The aluminum walls will start to tear apart and fly up becoming missiles. Best bet is to take them apart and store them away in the garage or house. Most come in a box in pieces that you put together and thus, you can take them apart. If the bolts are rusted, spray them with oil or de-rust spray before the hurricane season starts. Left up, it may be the very thing that destroys your house.

To prepare the house, add a couple of dead bolts or strong latches to the inside of each outside door. I heard many a story of the wind blowing in the front or side door and scared people trying to unsuccessfully prop it closed with a chair. If the front door suddenly blows in, the quick pressurization of the inside can literally push the roof up and right off. Place the latches at the bottom and top edge to secure the door into the frame. Use extra long screws into something solid. I have added an extra thick plate to the front and rear door dead bolts, and screwed it to the block wall. I will be adding a couple of bolt type latches to the top and bottom of the door. The extra bolts keep the door in the frame tighter and the addition of a few rubber-sealing strips can decrease the amount of water leaking around the door. It's amazing how water, driven by 150 mph winds can penetrate a small hole.

For insurance purposes, make a list of personal items such as furnishings, clothing and valuables. Take photos of the inside and outside of the house, car and boats. Use a video recorder, or digital camera, if you have one. If you do not own a camera, buy a \$15 disposable one and take all the pictures needed to satisfy the insurance company. Develop it later, if you have damage.

To protect your valuables, make a quick-grab waterproof hurricane box. Buy a small watertight Rubbermaid container, mark your name and phone number on the box.

Place into this box, insurance policies, list of personal items, your birth certificates, wedding certificates and wills. Also, put a few extra dollars and any other important documents or priceless mementoes. Seal all items in zip lock bags for extra water protection. Add any life threatening medication such as insulin, heart pills and such. Keep your quick grab box near by, in case you need to evacuate in short notice. For safe keeping of expensive valuables such as jewelry and stock certificates, place them in a safety deposit box.

YOU ARE ORDERED TO EVACUATE AWAY FROM AN ONCOMING HURRICANE

- Gas up the car and extra emergency gas containers.
- Listen to the radio for evacuation information.
- Take your portable food and survival kit with you.
- Close all interior doors. Secure and brace external doors, particularly, double inward-openings and garage doors.
- Take your quick-grab important items bag with you.
- Fill a cooler with ice water bottles and easily prepared food from fridge and freezer.
- Shut off water at the meter; turn off the main electrical breakers to everything but the fridge and freezer and turn off the gas or propane.
- Put up your shutters.
- Lock up your home.
- Travel in daylight, if possible.
- For medical problems or pregnancy, check with your doctor or hospital, before you head out.
- If you have no transportation, make plans to travel with neighbors or friends.

Chapter 5

Storm Paths and Predictions

Don't just follow where the eye is going. Hurricanes can and do change direction quickly and with disastrous results. Look at hurricane Jeanne; she did a complete 360 degree turn, way out in the ocean and headed back directly at the Bahamas and Florida, after everyone was sure she was headed north out to sea. And, she pounded the already damaged Bahamas and Florida residents with yet another hurricane.

The weather network took so much flack over the path of Charlie that they have changed their method of prediction to a broader, wider path chart all for the better, thank you weather channel. Even though the point of landfall was shown within the orange band of "here is the danger area", residents took a lack-a-daisy attitude and did not prepare and got walloped. Learn from their mistake. If you are within the predicted path cone or even close to it, start your preparations. Be safe and plan ahead.

Listen to the radios and TV and plot the path on a map. Pay close attention to the predicted path. If you are anywhere near it, start to prepare.



Chapter 6

In The Eye Of Danger; Riding Out The Hurricane

The hurricane is now upon you. Sit tight and stay away from windows and doors. Have your quick evacuate box ready in case, and ride out the storm. Remain indoors and listen for advisories on the radio. Keep an eye on the water levels outside, looking for signs that a flood is approaching. Doors will leak more water and dryer vents and concrete walls will spring leaks. More people are killed by flood than by wind in a hurricane.

In Grand Bahama, we had massive flooding of the northwest side of the island. Areas that were considered safe inland points, were dangerously flooded, causing shelters and homes to be evacuated during the middle of the hurricane. People were literally forced out of their home by the rising water. Stories abound of young and old alike jumping into a large, front-end loader to be hoisted away from their flooded home. During the storm eye, emergency calls went out to people who owned jet skis and Boston Whalers, to get out and rescue stranded people.

Bahamas Air sea rescue was now operating on land.

If you have to emergency evacuate, the police will be banging on your door or the call will be heard on the local radio station. You will have little time to gather your valuables. Have the quick plastic evacuation container ready, with all important papers and CASH, just in case.

If you do evacuate in the middle of the storm, you may not get back to the house for a few days, or even weeks, if it is totally flooded. You will have only what you carried out. Choose well and pre-pack. Do not go out in the brief calm during passage of the hurricane's eye, unless ordered to evacuate. The lull sometimes ends suddenly and winds return from the opposite direction. Winds can increase in seconds to 100 mph or more. Stay inside. Do not wander outdoors unless it's a dire emergency.

The safest place to be during a hurricane is in an inside room, with no windows or outside doors, preferably on a second story, if there is a flood danger. Choose an area with the walls close together such as a hallway, closet or an inside bathroom. In really dangerous situations, in the bathtub with a mattress over you and family is about as safe as it gets.

Keep a supply of flashlights and extra batteries handy. Avoid open flames, such as candles and kerosene lamps, as a source of light, as a sudden breakage of a window could cause the flame to flare, setting fire to curtains or other flammable items nearby. If in a condominium, apartment or hotel, avoid elevators. Ask the landlord or desk clerk where is the safest area and then use your own judgment to ascertain if they're right. Avoid areas with large plate glass windows or patio sliding doors.

Make sure that all family members know how to respond during and after a hurricane. Teach family members how and when to turn off gas, electricity, and water. Teach children how and when to call 911, police, or fire department and which radio station to tune to for emergency information.

Chapter 7

Evacuating With Style

If you know your options in advance, and you have followed your emergency preparation plan, evacuation will progress in a much smoother fashion. Before a hurricane hits, contact the local emergency management office or American Red Cross chapter, and ask for the community hurricane preparedness plan. This plan should include information on the safest evacuation routes and nearby shelters. Make arrangements for pets. Pets may not be allowed into emergency shelters for health and space reasons. Contact your local humane society for information on local animal shelters.

Local officials balance that uncertainty with the human and economic risks to their community. This is why a rule of thumb for emergency managers is to plan for a storm one category higher than what is forecast. This is a reasonable precaution to help minimize the loss of life from hurricanes.

Minimize the distance you must travel to reach a safe location; the further you drive the higher the likelihood of encountering traffic congestion and other problems on the roadways. Remember, what you determine as a safe location now, may become a direct hit on the hurricane path. Hurricanes travel through interaction of upper atmosphere winds and lows and highs around the hurricane.

The path can change dramatically at any moment. Select the nearest possible evacuation destination, preferably within your local area, and map out your route. Do not get on the road without a planned route, or a place to go.



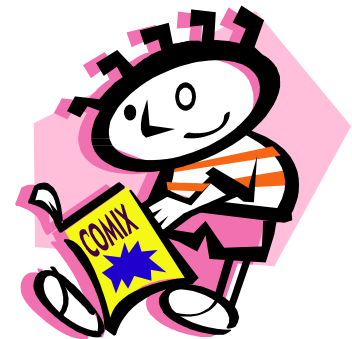
Choose the home of the closest friend or relative outside a designated evacuation zone and discuss your plan with them before hurricane season. You may also choose a hotel/motel outside of the vulnerable area but confirm with reservations. If neither of these options is available, consider the closest possible public shelter, preferably within your local area.

Use the evacuation routes designated by authorities and, if possible, become familiar with your route by driving it whenever possible on trips. Look for alternate paths to the desired location, before an evacuation order is issued. Contact your local emergency management office to register or get information regarding anyone in your household who may require special assistance in order to evacuate.

*Prepare your home prior to leaving by boarding up doors and windows, securing or moving indoors, all yard objects, and turning off all utilities.

*Tell someone outside of the storm area where you are going.

- *Before leaving, fill your car with gas and withdraw extra money from the ATM.
- *Turn off water and gas supplies, unplug any unnecessary electrical appliances, and turn off any unused breakers such as stove, hot water heater.
- *Take all prescription medicines and special medical items, such as glasses and diapers.
- *Place an ice cube in a glass and place in the freezer and surround with food. If it's melted or re-frozen in the shape of the glass when you return, your fridge got too warm and you need to discard all food.
- * If time permits, and you live in an identified ocean surge zone, elevate furniture to protect it from flooding or better yet, move it to a higher floor.
- *Take pre-assembled emergency supplies, warm protective clothing, blankets and sleeping bags to shelter
- *Lock up home and leave
- *If you live in an evacuation zone and are ordered to evacuate by state or local officials, do so as quickly as possible. Do not wait or delay your departure. To do so will only increase your chances of being stuck in traffic, or even worse, not being able to get out at all.
- *Expect traffic congestion and delays during evacuations. Expect and plan for significantly longer travel times than normal to reach your family's intended destination.
- *Avoid flooded roads and watch for washed-out bridges.
- *Stay tuned to a local radio or television station and listen carefully for any advisories or specific instructions from local officials. Monitor your NOAA Weather Radio
- *Keep abreast of road conditions through the news media.
- *Move to a safe area before access is cut off by flood water.
- *Do not attempt to cross flowing water. As little as six inches of water may cause you to lose control of your vehicle.
- *Develop a flood emergency action plan



Always remember family members with special needs. For children, you should have plenty of necessary baby formula, diapers, bottles and medications. Adults with medications such as insulin or other prescription drugs should have their prescriptions filled before the storm. Don't forget any denture needs and eyeglasses or contacts. You should also have some form of entertainment for everyone including books, cards or games.

Chapter 8

Shelter Survival

The last option is public shelters. Space is very limited and conditions can be deplorable. If you plan to evacuate to a public shelter, be prepared for very crowded conditions, hot environment and limited services. Pre-pack a special waterproof box when you first hear of an approaching hurricane and know you will need to go to a shelter.

Bring folding chairs, cots, pillows and blankets, special dietary needs, prescription medications, baby diapers, formula, etc. Bring books, puzzles and other quiet games.

In Florida, some shelters will provide food and water, possibly, a cot and medical aid. The islands of the Bahamas however, do not provide food, or a cot, due to a lack of resources. What you have in a shelter, is what you bring.

Buildings used for evacuation shelters are normally public schools that are staffed by Red Cross volunteers and other organizational volunteers. Shelters are sometimes crowded, and hot, because there is no ventilation, long lines to use restrooms and to get food, and very noisy, making it difficult to rest or sleep. Keep in mind you may have to stay in the shelter for several days. However, they are safer than your home.

If you go to a public shelter, you will need to take the following items: identification, important personal papers, change of clothing, rain gear and sturdy shoes, toiletries and personal items, blankets or sleeping bags, games or toys for children, books for adults, special items for infants or elderly family members, any special dietary needs and non-perishable foods for snacks, battery operated radio, flashlights and plenty of spare batteries, prescription medications or any over-the-counter medications.

At most Bahamas shelters, you will need food where in the USA they provide food for you . . . Plan on at least 4 to 5 days per person. Shelters are normally only needed for 24 to 48 hours. During Frances, the storm sat on Grand Bahama for 3 days. So, be ready and prepared for the unexpected. There is limited cooking facilities at most shelters, so pack canned and prepackaged meals that do **not** require cooking. As you are not active during your stay in the shelter, the amount of food that you need per day will be less, but if you're like most people who are penned up and frightened, you will want to snack.

Shelters will have rules regarding food. You will not be able to eat in your sleeping area. They do this for two reasons, you may disturb the people next to you and the food will possibility contaminate the sleeping area with crumbs and residue causing problems with bugs. There will be a designated preparation and eating area, as well as designated times, when you will be allowed to eat. If the shelter does not have cooking facilities, you may not be allowed to use grills, charcoal barbeques, sternos or any other flame sources. This rule is there to prevent fumes and fire.

If you live in a trailer home or in a known evacuation area, the best option is to make arrangements, either with friends, relatives, or co-workers, or at your place of employment. In a non-evacuation area, use the shelters as a last resort.

WHAT TO BRING TO A SHELTER

Suggested items to pack for a family of two adults and two small children. Adjust your list for your families dietary needs and size.

Food: Bahamas shelters, but good idea to bring snacks and other food for your own diet

Jar of peanut butter

Jar of jam

Small container of margarine

2 loaves of bread

4 cans of cooked tuna or other cooked fish

4 cans of cooked ham or other tinned meat

Packet of cookies or something containing sugar as a “pick-me-up”

Bag of chips or snacks

6 cans of milk

2 box of cereal

4 cans of cooked stew or soup

Box of crackers

Hard cheese

Fruit

Munchy vegetables (eat right away so they do not go bad)

6 - 1 gal water containers (2 Quarts per day per person)

Manual can opener

Plastic eating utensils

Plastic plates, bowls

Plastic glasses

Drinking packets of juice or fruit drinks

Tea or coffee, if you feel there will be hot water available.

Remember this list is from your cupboards as you will not have time to go out and buy specialty foods for the shelter.

Clothes and other essentials to take to a shelter:

2 sets of clothing per person (keep it simple), blanket for each person, air mattress or extra blanket for each person, pillow for each person.

A few toys for the kids (simple, non-noisy, non-dangerous)

A deck of cards, or a board game, couple of books

5 rolls of toilet paper (believe me, the toilet paper was in demand at quite a few Bahamas shelters after 4 days.

Container of baby or alcohol wipes

Flashlight, extra batteries

Garbage bags

Important items not to forget:

Medicine, critical pills, drivers license, passports, legal papers, extra cash, insurance papers, back-up CD.

All the stuff in the panic bag that you need to prepare.

All these goods can fit into a couple of plastic water proof boxes. Remember, you can't bring the whole house; only what you need for a few days or have to protect, in case your house is destroyed. If you have extra food or water, please share with those less fortunate.

Wear sturdy shoes and layered clothing, so you can choose which to wear depending on the temperature of the shelter. It may become quite warm due to the number of residents and the lack of air-conditioning, due to power outages.

No pets, unless the shelter is designated as such. Do not leave your pet in the car. During one hurricane, the flood waters were over the roof of the cars at the shelter. You don't want to hurt your pet.

Things which are **not** allowed or you **cannot** do in a shelter:

Drugs, alcohol or illegal substances.

Guns, knives, weapons of any kind.

Pornography, or adult material.

Pets

Smoking, of any kind

Loud music

Love making, necking or excessive passion.

In the shelter debriefing meetings after the two back to back hurricanes, we heard horror stories on how badly some people acted, from sane normal people throwing a desk on a shelter volunteer, to fights between children involving knives, even police causing a panic when they rushed into a shelter screaming, "You dead, get out!" and blowing their whistles. Yet, we also heard of calm, normal people, suffering in peace, at a well run, Eight Mile Rock shelter.

If you have life threatening, medical needs, there may be a special shelter set up to better assist you, staffed with medical personnel. Listen to the radio for locations.

When you are ready to head out to the shelter, do not go until it is announced they are open. Pick a shelter near your home, bring the necessities of life only. You will be registered, so that the shelter organization knows how many persons they have and who. The shelter management team will post the rules and counsel people as to the expected behavior while in the shelter. I highly recommend that you volunteer for some task. First, it will make your time cooped up go faster and second, it will help the overburdened shelter workers cope with the situation.

Above all, please conduct your actions in the shelters in a sane and controlled manner.

Due to the widely spread, small settlements on the islands of the Bahamas, it is not uncommon to have only three or four shelter volunteers for shelters containing up to 150 people. It would then be obvious that the shelter residents need to be very helpful and cooperative for the situation to stay civilized. Adequate water and food may become a problem for some less privileged families. Please be a good Samaritan and share. Florida shelters are better equipped and staffed to serve the residents, due to their larger population density, much bigger budgets, and resources base.

Staying at relatives and friends - rules and suggestions:

Remember, you're a guest. Be polite and helpful. Bring what you can to feed yourself. Do not expect a four star hotel. The hurricane will be very demanding on everyone's nerves. Help prepare the food, clean up after yourself, and leave the bathroom clean.

Chapter 9

Surviving After A Hurricane

- Stay tuned to local radio station for information.
- Return home only after authorities advise that it is safe to do so. Some areas may be restricted.
- Avoid loose or dangling power lines and report them immediately to the power, police, or fire department.
- Enter your home with caution. There may be structural damage.
- Open windows and doors to ventilate and dry your home.
- Check refrigerated foods for spoilage. Look at the ice cube in the glass. Look at page 33
- Take pictures of the damage to cars, boats and the house and its contents for insurance claims.
- Drive only if absolutely necessary and avoid flooded roads and washed-out bridges.
- Use telephone only for emergency calls.

Help injured or trapped persons and give first aid, where appropriate. Do not move seriously injured persons unless they are in immediate danger of further injury. Call for help.

If your area is under a curfew, allow travel time to and from your home. Following a hurricane, crime may also increase. If your area is under martial law, obey all orders by authorities because they will be armed.

Your toilet can be flushed only once after the water is off. If you have no water then line the toilet with a heavy-duty trash bag so the bag opening is held in position by the seat and disinfect with a few spoonfuls of chlorine bleach after each use. When the bag is full or stinky, tie shut and remove to an outside location.

During the cleanup after a hurricane, injuries are bound to occur. To avoid injury, use common sense and wear proper clothing, including clothes with long sleeves and long pants, and safety shoes or boots. Slow down, as your reflexes and strength will be greatly weakened by the ordeal.

After the storm be suspicious of all fuel, especially of gas stations close to the coast, as their underground tanks may be contaminated. Ask if they have checked their tanks (most people are honest). Bring an approved gas container and pump a half a gallon into it first and let it settle, then look for water and sediment near the bottom.

Inspecting utilities in a damaged home: Check for gas leaks. If you smell gas, hear a blowing, or hissing noise, open a few windows and quickly leave the building. Turn off the gas at the outside main valve, if you can and call the gas company from a neighbor's home. If you turn off the gas for any reason, it must be turned back on by a professional to relight the pilots.

Look for electrical system damage. If you see sparks or broken or frayed wires, or if you smell hot insulation, turn off the electricity at the main fuse box or circuit breaker. If you have to step in water to get to the fuse box or circuit breaker, call an electrician before doing so.

Check for sewage and water lines damage. If you suspect sewage lines are damaged, avoid using the toilets and call a plumber. If water pipes are damaged, contact the water company or a plumber and turn off the incoming water supply.

Turn off the breakers for all but essential lights and radio. Electrical voltage surges from overloaded transformers blowing up can destroy all sorts of electronic equipment such as computers, television sets and air conditioners.

Caution: live wires are a major hazard. Do not handle or walk in water where a downed high voltage wire is located.

Don't drive through floodwaters, as you never know how deep the water really is. Don't go sightseeing. Leave the roads clear for the emergency personnel. Bugs, snakes, and small critters come out after a big flood or storm. Be wary.

Contact your friends and family to tell them you're ok, which can be tough. After Frances, it took 4-5 days to get through to anyone by phone, cell phone, or internet. Even for weeks after the hurricanes, the phone system was very troublesome. It's now seven weeks after Frances and we just got the phone restored today. Many waited much longer.

Chapter 10

Insurance

If your car was flooded: Even though a car may start, once the electronics have dried out, anytime water comes into contact with the computer chips, it's advisable to have the system checked out by a mechanic with the proper diagnostic equipment. Other areas that may need attention include the exhaust system and the brakes. The salt water may have rusted the iron brake rotors and will cause them to grab or lock. The exhaust system will rust from water sitting in the muffler. High pressure wash the underside of the car to remove any remains of salt or flood debris, and if possible, have the underside coated with proper oil type rust spray.

If water entered the interior, take out all of the carpeting and let it dry thoroughly. If you leave damp carpeting inside the car, it will lead to rust and mildew that could cause major problems several years later. Most full coverage, car insurance covers flood damage. If the water reaches the inside of your car, your insurance company will probably declare the car a total loss. If your car has been subject to salt water to the floor level it will be a problem with rust and corrosion of any parts that the salt water touched. Wash the car foot wells, inside and out, as well as the underside and engine bay with fresh water for a considerable time to flush any salt away.

If your home has sustained damage: Get the insurance company's approval for any repairs, other than those necessary for protection of the property until the insurance company can be contacted. In the Bahamas, we were many days before the insurance companies could be contacted, due to lack of phones and the flooding in the downtown business area. People were fixing roofs as best as possible to contain the damage before the insurance adjuster even saw the building.

Wet upholstered furniture should be moved to a covered patio or carport to dry. If the upholstery was really soaked, rent a vacuum to extract the water. However, most furniture today will be garbage if it gets wet. The pressboard wood will expand, crack and fall apart. Fabric that has stayed wet for any length of time will be moldy and probably not worth saving. Soaked wall-to-wall carpeting should be lifted up and the padding removed as soon as possible as it acts like a sponge. Get rid of the padding and rent a special vacuum to extract water from the carpet. If your flood was from salt water, remove and replace the carpet. You will never get the salt out. Insist the insurance company pay for new carpet or better yet, tile the floors .

After having our house flooded by only four inches of water, I was amazed at how much damage was inflicted. We have had to remove the carpets; the bottom of the kitchen cupboards are coming apart; most of the furniture is moldy, warped and needs replacing. Even the ceiling fan blades were affected by the moisture, as they are now sagging and warped.

Most electronic devices do not like to be in a very high humidity, salt environment. The corrosion from the saltwater will cause the electronics to stop working. Check out all TV's computers, radios, fax and phone machines before settling with the insurance company. Almost all of ours were damaged by the corrosion of the humid air.

If you're concerned about any unsafe electrical conditions in your house, call a licensed electrician. Standing in water or on a damp floor near an electrical outlet can result in a dangerous shock. If you have water in the house, turn off the main breaker at the electrical box. Check appliances for water damage and make sure cords aren't wet before you plug them in. If you plug in an appliance and the circuit breaker trips, a fuse blows or you smell a burning odor, unplug the appliance and have it checked by a qualified repairperson. If salt water gets as high as the outlets, you will need to replace the outlets and possibly the wires as well. Salt water eats everything metal that it contacts.

List every item damaged and supply original bills, if possible. Most insurance company adjusters will normally ask for 1 or 2 written quotes and will do an inspection before settling the claims.

Beware of consumer fraud. Contractors in Florida need a state or county license. Don't sign a contract until you see the company's license and references. Be certain everything you've discussed is written into the contract. Be sure the completion date, cost of materials, labor rate and permit fees are included. Never make a final payment until all work is completed. Remember, most state law gives you a three-day right to cancel a home improvement or repair contract that involves financing. Never give a builder a deposit until they start the work.

Co-insurance, property values, deductibles: If you under insure your building and contents, the insurance company will proportion your claim payment by that ratio.

The deductibles are applied for each claim. Example: your house was flooded by hurricane Frances and the roof was damaged by hurricane Jeanne. When the insurance adjuster asks if the damage was done by which storm, they are trying to determine if multiple deductibles will apply. The difference to your settlement check can be quite large.

Example: Hurricane Frances damaged the roof and the house was flooded.

Roof damage	\$10,000
Drywall and floor repair	\$10,000
Contents	\$ 8,000

The contents may have a separate deductible, typically 2% of the policy value for contents. If the total insured contents was \$40,000, then the 2% would be a \$800 deductible. Same applies to the building; if the building was insured for \$120,000, the deductible would be \$2,400. If the building was not under insured, the claim would be \$20,000 for the building - \$2,400 deductible for a possible insurance payout of \$17,600 dollars. The contents would be \$8,000 - \$800, equals a \$7,200 possible claim payout.

If the damage was caused by both Frances and Jeanne, the payout would be as much as \$3,200 less due to applying another deductible, if both building and contents were claimed for each occurrence.

If your house and contents were under insured: Example: The house is 1600 sq. ft.; the average Bahamas building cost would be \$70 per square foot. Your house should have been insured for $\$1600 \times \$70 = \$112,000$. If you only insured it for \$80,000, then the insurance would only pay 80,000 divided by 112,000 or 71 cents on the dollar. If you had a \$20,000 claim, they would decrease it by 71% to \$14,200 and minus the deductible of \$1600, to possibly settle the claim for only \$12,800.

Also, remember, if you do not have replacement value coverage (or you do not replace the item), the adjuster will decrease the amount offered for settlement, which also applies if the goods were old, damaged or of questionable value.

Do not be in a rush to settle. Although you must report a claim promptly, you may have up to a year to settle. If you feel your offered settlement is too low or that they have made a mistake, talk with the manager. Listen to what he or she may say. Don't just rant and rave and argue. Find out how the offer they made was calculated. Maybe some items were missed or valued wrong. If you need more time to get estimates and quotes, ask for an interim payment to help defer the upfront cost that you will have for the repairs.

In the weeks after the two hurricanes, it was very difficult to get contractors to do an estimate. They were very busy, and did not have the time to quote jobs, that they may not ever get. Also, be aware that the amount of store stock damaged was immense. Most stores were bare for months after. It's difficult to shop for a new bedroom set when there are none on the island to buy.

Do not be in a hurry to settle the insurance claim, if you can afford to wait. It is now twelve weeks after the hurricanes and we cannot get our tile floors finished due to the demand for labor and lack of supplies.

If you rent an apartment, you need renters or contents insurance. The landlord is not responsible in any way for your damaged furniture or personal items. After a natural disaster such as a hurricane, the landlord is also not responsible for providing you with a place to live, if your unit or the building was damaged by the storm. Some contents policies will provide you with this coverage. Make sure your policy includes hurricane water damage.

Condo living has different insurance problems. The condo corporation may have rules which limit their responsibility to the building. You should check with your association regarding their specific coverage. Your insurance must cover your own belongings and include your walls, floors and possibly, sliding doors, windows, and balconies. You can purchase policies, which extend coverage for the interior construction of your unit, as well as providing coverage for improvements that you make within your unit. You will be responsible for the damage, even if it was caused by water from another unit. Again, make sure you have purchased the amount of insurance, which reflects the replacement value of your possessions, and that it includes hurricane coverage.

Before the next hurricane season, it would be smart to check with your insurance agent to determine exactly what your policy covers. Questions such as, are you properly insured and not under insured, are you covered for flood damage, do you have replacement value coverage, are you covered for hurricane damage?

Chapter 11

Water Sources & Purification

Water is the liquid of life. You can live for weeks without food, not comfortably, but you will be alive. However, you cannot live but a handful of days without safe water.

How to get water; first, you should have saved as much as you could, in the freezer and in jugs. If not, or you have run out, there is 30 gallons in the hot water tank. It's useable, but I would recommend that you treat it first, before consuming it. First, turn off the breakers labeled **hot water**. The elements can be damaged if the electricity is turned back on with no water in the tank. They should be on a larger twin breaker rated at 20 or more amps. There is a valve on the bottom of the tank. Connect a garden hose and drain it into small clean buckets, be careful emptying the tank; the water may still be hot. Open a hot water sink tap to aid draining by allowing air in, to displace the water running out. Before a hurricane, shut off the water heater from the tap water supply, usually by the valve on top leading to the tank and turn off the breakers. This way it won't get contaminated with bad water after the storm. If you have not shut off the water, you can still use the hot water as non-drinking water.

To properly clean and sterilize a water container, first make sure the container never held any dangerous chemicals. Wash with clean water, then wash with water treated with 16 drops of unscented chlorine per gallon. Let sit for one hour, then drain.

Before the hurricane, fasten a few 5 gallon buckets or even a clean 45 gallon barrel to something substantial to catch the rain off the roof and use it for bathing and toilet use only. Use rain or collected water only as drinking water in an emergency, after filtering and disinfecting. You never know what's been on the roof. Make sure the buckets or barrels are well-secured to the wall, so they won't fly away in the wind

How to clean and disinfect questionable water: If the water has dirt particles, pour through a clean, doubled over sheet or towel into a pre-cleaned and disinfected bucket. Then, disinfect the filtered water before consuming. To disinfect water, add 16 drops of unscented bleach to 1 gallon of clean water and let sit for one hour.

Other methods of disinfecting: Boiling water kills harmful bacteria and parasites. Bringing water to a rolling boil for 1 to 2 minutes will kill most organisms but it will not remove salt. To remove salt, you need a reverse osmosis treatment filter. The membrane has very small holes and allows only pure water to pass; all the salt and bacterial is filtered out. RO water does taste very flat because it is relatively pure. Add a few drops of lime or lemon, and transfer back and forth between a couple of clean containers to add oxygen.

Water may also be treated with chlorine or iodine tablets. Please note: this treatment will not kill microscopic, parasitic organisms such as worms and it does not remove salt.

You should not drink salt water even in low doses; the extra salt makes you even thirstier.

Containers for water should be rinsed with a bleach solution before reusing them. Use water storage tanks and other types of containers with caution. For example, fire truck storage tanks, as well as previously used cans or bottles can be contaminated with microbes or chemicals. Do not rely on untested containers for drinking water. Boil all questionable, improperly bottled water.

Hand pump pressurized water purifiers are highly recommended. They use RO membrane technology, and are available at any good hiking store. They cost from \$40 to \$100. Get one with a rating of 1, which will remove most of the salt, all of the bacteria and microorganisms. The one I bought was \$50. and is good for 120 gallons of water. We used it for a few weeks after the two hurricanes. The water tastes a little flat, but is safe, and can be flavored with a few drops of lime, lemon juice or iced tea powders.

Store water only in disinfected washed containers but for no longer than three months. If you buy bottled water, remember that it generally should be consumed within six months.

There is an additional few gallons of drinkable water in the back of the toilet, if you have not flushed it down. It's safe to drink and does not normally come in contact with fecal matter in the bowl. I would, however, disinfect it by boiling or adding chlorine.

Freeze as much water as you can stuff into the freezer before the hurricane. A full freezer will last longer than an empty one. The frozen water bottles can be used to keep the fridge cool for a few days and then you can continue their usefulness, by drinking them.

Washing and toilet water: Before the hurricane, sponge the tub with a solution of liquid bleach and water. Silicone the drain to make it watertight, allowing time for the silicone to dry and fill the tub. You can use this water for washing, cleaning and flushing the toilet, if the municipal system fails. Store as much water in pots, buckets and tubs as you can, before the hurricane. You may need it for clothes, personal hygiene, as well as toilet flushing. A rule to follow for toilet flushing when water is in short supply, "If it's yellow, let it mellow; if it's brown, flush it down!"

Water Quality: Hurricanes, especially if accompanied by a tidal surge or flooding, can contaminate the public water supply. Drinking contaminated water may cause illness. You cannot assume that the water in the hurricane-affected area is safe to drink until announced safe by the authorities. During and after a hurricane, the public water supply may be non-functional. This is why you saved water. It can last for weeks in some locations. As I write this, it is now nine weeks since hurricane Frances and two towns on the island of Grand Bahama still do not have running water and no immediate solution is at hand.

If your private well has been flooded, it needs to be tested and disinfected after the storm floodwaters recede. Questions about testing should be directed to the Department of Environmental Health Services or the Ministry of Health.

Safe Water for Drinking and Cooking: Safe drinking water includes bottled, boiled, or treated water that has no salt, bacteria, microscopic larva or worms.



Here are some general rules concerning water for drinking and cooking. Do not use contaminated water to wash dishes, brush your teeth, wash, prepare food, or make ice. The microscopic bugs and bacteria in the water can infect you with as little as a few drops. If you use bottled water, know where it came from. Otherwise, water should be boiled or treated before use. It is not uncommon to hear about unscrupulous persons trying to make a fast buck by selling contaminated tap water that they transferred into 1 and 5 gallon containers after a hurricane. Do not buy from a street dealer. Go directly to the outlets or grocery stores and buy brand names. The same theory works for restaurants. It's safer to order a can of diet cola instead of drinking the table water or getting ice cubes in a drink after a hurricane.

Chapter 12

Food Safety

Danger in the freezer - food poisoning: The worse thing to happen, would be to get sick, just as you are needed to help your family survive. Bacteria always seems worse after a big storm. Keep food preparation surfaces clean and sterilized. Wash your hands before any contact with food, especially if you have been in contact with flood waters. Know how long the food has been without refrigeration. If the food smells sour or you suspect the food is bad, **throw it out.**

Eat your stored food in the right sequence to maximize its storage abilities, as it might be weeks before you can buy food at the stores.

Eat from the fridge first, because it's the first to perish. Eat as much as you can, before you start to raid the freezer. Next, eat the frozen freezer food. Hopefully, you added as much water in pre-cleaned and sanitized pop bottles and sealed water bottles as possible to the freezer to keep it frozen longer. Do not open the freezer until you have to. Check it only once a day for 2 days; then twice a day until you see signs of the outer edges thawing. If you have cooking facilities, then take out any meat and cook it, so it will last a few days longer in the fridge. Transfer all the frozen foods to the refrigerator, when they just show signs of melting. The cold bulk can keep the fridge cool for a few more days.

Last, eat the canned goods and dried packaged food that you put away as your emergency supply, and only after all the food is gone from the fridge and freezer. After that, try to buy or get handouts of whatever you can, until the food supply chain starts to restock the stores. In the Bahamas, the food started to appear in the stores about 2 weeks after the first storm and did not really get back to full fresh produce and meat until a staggering 6 weeks after Frances.

Flood Safety For Food

Do not eat any food that may have come into direct contact with contaminated floodwater.

Discard any food not in a waterproof container, if there is any chance that it has come into contact with contaminated floodwater.

Undamaged, commercially canned foods can be saved if you remove the can labels, thoroughly wash the cans, and then disinfect them with a solution consisting of one teaspoon (16 drops) of bleach in one gallon of water. Re-label your cans, including expiration date, with a permanent marker.

Food containers with screw-caps, snap-lids, crimped caps (soda pop bottles), twist caps, flip tops, snap-open, and home canned foods should be discarded, if they have come into contact with floodwater because the small cracks around the caps cannot be properly disinfected.



Do not turn down the temperature in the fridge before a hurricane like some agencies say, as it will freeze the food and it will spoil even faster. Vegetables and other soft foods will be inedible, if frozen. However, do turn down the freezer portion to as cold as possible. For infants, use only pre-prepared canned baby formula, that isn't condensed and doesn't require added water, unless you have a known good supply of water. Do not use powdered formulas prepared with treated water as a baby's system cannot handle any possibility of contaminated food.

Store your still frozen foods in the freezers of relatives or friends, if they have electricity or see if freezer space is available in a store, church, school, or commercial freezer that has electrical service. If you cannot use the food yourself, donate it to a church or shelter.

Your refrigerator will keep foods cool for about twenty-four hours in hot weather, without power, if it is unopened. Add blocks of ice or frozen water bottles to your refrigerator from the freezer to extend the time. Start to add a few blocks or bottles of ice after 4 hours before it gets warm. Add the ice to the top of the refrigerator as cool air sinks. Keep adding more ice water bottles from the freezer every 4 to 8 hours.

Thawed food can usually be eaten, if it is still "refrigerator cold," or can be refrozen, if it still contains ice crystals. To be safe, remember, "WHEN IN DOUBT, THROW IT OUT." Discard any food that has been at room temperature (41°F to 100°F) for two hours or more, and any food that has an unusual odor, color, or texture.

If your home does not have power and your refrigerator has been without electricity for more than 8 hours, you need to worry about the quality of the food. For answers to questions about which foods to throw out, in the USA, call the U.S. Department of Agriculture's Meat and Poultry Hot Line, toll-free, at 800-535-4555. It can answer questions on particular foods and has developed information to cover food-safety issues caused by natural disasters. The phones are open for questions from 10 a.m. to 4 p.m. Monday through Friday. Recorded information is available at all times.

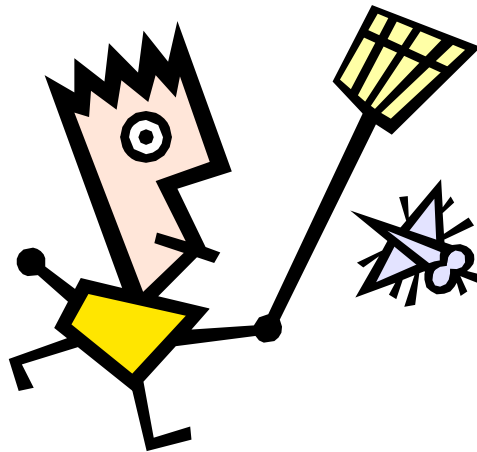
Any uncooked meat, poultry or fish that has reached 40° F for even a few hours needs to be thrown out. Any prepared mayonnaise or salad dressings, should be thrown out. Vegetables usually are good until they go soft or moldy. Check all food with your nose. If it smells at all foul or bad, throw it out. **If in doubt, throw it out!**

Freezer trick: Place an ice cube in a small bowl or glass and put in the freezer surrounded by frozen food before you lose power or before you evacuate. When you come back, check the ice cube. If it's melted and/or re-frozen, you lost electricity long enough to melt the freezer and the ice cube. The contents, therefore, got warm enough to spoil any food in the freezer and refrigerator. Throw everything out except canned drinks or jugs of juice or water. Vegetables and fruit may be ok. Check to see if they're soft, moldy or smelly.

To extend the length of time the freezer will remain cold enough to properly keep frozen foods, cover with a few heavy blankets right after you lose electricity and keep the door closed as much as possible.

How not to cook: Do not start a fire in a pot inside the house. The carbon monoxide a fire or gas grill gives off can kill you. If you have to start a fire, do so outside in a small pit or cleared area. You don't need a house fire to wreck your day even more. For less than \$30, you can buy and store a small gas barbecue. Buy 4 canisters of screw on gas cans and put them in your hurricane box. Do not use any gas or charcoal barbecues indoors because they generate deadly carbon monoxide gas. Carbon monoxide is a clear odorless gas that can kill a human in a few hours exposure, even at very low levels. You can't smell, see or taste it. Carbon monoxide is generated by combustion sources like fire, barbecues, charcoal fires and propane torches.

Extra stringent health and hygiene measures should be maintained not only before and during a hurricane, but should be extended to several days, even weeks afterwards until life is back to normal. Besides the damage that a hurricane can cause to buildings and the city (electricity, telephone, water supply, gas lines) in the affected region, there are many health concerns that can arise as a result of a hurricane. Many of these could lead to severe health problems and even death. Your health can be threatened by water quality, poor hygiene during food preparation, personal hygienic practices and outbreaks of communicable diseases. The large increase in the number of flies and mosquitoes, which can carry germs, can create outbreaks of dysentery and diarrhea. The extra stress and trauma that occur as a result of disasters, will decrease your immune system's ability to fight off infections and viruses.



Chapter 13

Sanitation and Hygiene

It is critical for you to remember to practice basic hygiene during the emergency period. Always wash your hands with soap and water that has been boiled or disinfected:

Before preparing or eating food

After toilet use

After participating in cleanup activities

After handling articles contaminated with floodwater or sewage



If there is flooding along with a hurricane, the waters may contain fecal material from overflowing sewage systems and agricultural and industrial waste. Although skin contact with floodwater does not by itself, pose a serious health risk, there is risk of disease from eating or drinking anything contaminated with floodwater. If you have any open cuts or sores that will be exposed to floodwater, keep them as clean as possible by washing them with soap and applying an antibiotic ointment to discourage infection. If a wound develops redness, swelling, or drainage, seek immediate medical attention.

Children's Health: Do not allow children to play in floodwater areas. Wash your children's hands frequently (always before meals). Supervise the washing with younger children. Do not allow children to play with floodwater contaminated toys that have not been disinfected. You can disinfect toys using a solution of one teaspoon (16 drops) of bleach in one gallon of water, and let sit for one hour.

Immunizations: Outbreaks of communicable diseases, such as dysentery and diarrhea after hurricanes, are normal. However, the rates of other diseases that were present before a hurricane may increase because of a lack of sanitation or overcrowding in shelters, human or animal remains from a flood. There is no reason for infectious diseases that were not present before the hurricane to appear, so mass vaccination programs are usually unnecessary.

If you are injured through a deep scratch or cut, which produces blood, you should be evaluated (seen by a doctor or health professional) for a tetanus booster shot. Rusty, dirty items that cut you can carry deadly bacteria. Cuts contaminated with feces, dirt or floodwaters can and do get infected easily. If the cut or surrounding area shows signs of extended redness, white pus or extreme sensitivity, the area may be infected. If a doctor is available, one should be consulted. If not, treat with 2% hydrogen peroxide, two to three times a day, bandage with clean gauze, apply an antiseptic cream and seek a doctor as soon as available.

Mosquitoes, bees, spiders snakes crocodiles and other nasties: Rain and flooding in a hurricane area will lead to a large increase in mosquitoes, bees, spiders and biting bugs. Mosquitoes and gnats are most active at sunrise and sunset.

In most cases, the mosquitoes will be pests but will not carry communicable diseases. It is unlikely that diseases, such as malaria, West Nile Virus or other nasties, which were not present in the area prior to the hurricane, would suddenly appear. The Department of Public Health will be actively working to control the spread of any mosquito-borne diseases, through spaying programs and public education.

Protect yourself from bugs, by keeping the doors closed, the screens on the house intact and repair any small holes which appear in the screens. Wear protective clothes with long sleeves and long pants. A high concentration DEET bug spray product works well in keeping them at bay. Don't waste your time with so called lotions or home remedies. Get a high powered, over the counter, bug repellent. To reduce mosquito populations, drain all standing water left in open containers outside your home and work at removing any standing water left in your yards and ditches.

Bees can be a substantial problem if they start to swarm due to loss of their hive. Have a few cans of hornet and bee spray available in your hurricane kit. After the last hurricane in Florida, large spiders and snakes were seen which normally avoid human areas. Cockroaches and other bugs will head indoors when they are threatened by large amounts of rain or floods. Although not really dangerous, they are a big nuisance.

After the two hurricanes in Bahamas, we were inundated with houseflies, more of a nuisance than danger, but they can spread communicable disease. Again, screens and good door control will reduce their numbers. It's a great idea to take out your frustrations with a few good whacks with a fly swatter at the pesky, little devils.

Chapter 14

Mental and Physical Health

The days and weeks before, during and after a hurricane are going to be rough on your psyche due to stress from lack of water, money problems and the daily sight of destruction and chaos. You will not even know you're suffering from Post Traumatic Stress Syndrome (PTSS). In fact, most people who show the obvious signs are the very ones who emphatically deny it. People who are in emergency help programs, such as social services, police, health care and Red Cross will be the first to show the signs and the first to ignore it.

Remember that some sleeplessness, hyperactivity, anxiety, anger, mild depression, or lethargy are normal after a hurricane, and should go away with time. If any of these symptoms linger more than a few weeks, seek counseling. It's not a personal shame or disgrace to seek help regarding mental health. Too many people still have the old, "I'm not nuts and I'm never going to talk to a shrink", attitude. Get over it! Everyone who has experienced a major hurricane will be feeling the stress; some recover faster than others.



The signs of PTSS are, drawn out face, lack of smile, humorless, glazed look and an amount of poor decision making ability, irritable behavior towards fellow workers or family, lack of personal safety regard.

If your friends, family or co-workers show these signs, get them help. They will be like a drunk refusing a ride home, but be insistent and get them to a professional who is trained in stress related problems.

Remember that children need extra care, attention and personal time, before, during, and especially after the storm. Be sure to set aside or buy a new or favorite toy or game for your children before the storm arrives to help maintain their sense of normality. Do not frighten your children. Speak in normal tones, even if the situation is bad. Keep your kids calm, as you will need their attention in order to follow instructions. It's ok to ask a child if they are frightened. Hug them, hold them, tell them you're here and all will be ok. Play word games, such as "20 Questions" or other fun games. Don't be too authoritarian and threaten to spank or hurt the child. Now is a time for support not bullying. It was reported by many shelter workers that parents were yelling, "Come here, or I'll spank you!" to their children. This is not a time to act in this manner. Restrain yourself. Get up and go to the problem child hug or play with them, while you speak calmly and rationally to them about their behavior. Treat children, as you would want to be treated yourself.

In addition to your mental health, you need to take some time to consider your physical health as well. During the time of a disaster, your body may need more food, water or first aid.

Workers who do physical labor in hot conditions, like those in Florida and Bahamas, will need much more water and rest breaks to properly continue the given task. Social service workers who are working for long hours under stressful conditions will need extra quality time for relaxation, and special high-energy foods.

During a hurricane, you will have times when you're ravenous and times when you're not hungry. Try to eat something; even if you're so tired that you don't want to eat (worry about the diet after things get back to normal). Keep your fluid levels up. If you find you're not going to the toilet to pee a couple of times during the day, then you're not drinking enough liquid to be properly hydrated. Use a laxative if you go two days without a bowel movement. The strange food may be upsetting your digestive track. Likewise, use a diarrhea preventive such as Imodium, should you get the runs. To properly function, the human body needs plenty of water, some food and sleep. Without these three requirements, problems will set in.

The course of growing up for the average child consists of certain regularities. For most school-age children, regularity involves the presence of parents, awakening in the morning, preparing for school, meeting with the same teacher, the same children, playing with friends, sleeping in the same bed, essentially being able to depend on a series of predictable events. The child expects dependability from adults and certainly from the forces of nature. For the pre-school child, life is much the same. He or she spends the day within a familiar world at home, with a babysitter or at the nursery school. The family environment remains more or less constant. When there is an interruption in this natural flow of life, the child experiences anxiety and fear. How adults help the child to resolve these problem times may have a lasting effect on the child.

Encourage the child to talk and express her or his feelings.
Explain to the child known facts that can be understood.
Listen to what the child tells you about fears.

Listen when your child tells you about personal feelings and his or her interpretation of what has happened. Once things settle down, try to get routines back to normal as quickly as possible. Don't be surprised if your child is afraid to go to bed, will not fall asleep or has nightmares. Be understanding of the fears and flexible to somewhat adjust to the child's needs. School counselors, teachers and other professional help may be needed if situations do not return to normal within a reasonable period of time. Don't wait too long, if problems persist. Seek professional help. A child needs reassurance by the parents' words and actions: "We are all together and nothing has happened to us." "You don't have to worry, we will look after you."

Chapter 15

Personal Safety

Protect you and your family.

Learn what to do before, during, and after a hurricane.

Discuss your family's plans for a disaster.

Identify an out-of-state relative or friend, as your family contact or possible alternate homes outside of risk area.

Learn the storm history and elevation of your area to determine if evacuation would be necessary...contact your local Emergency Management Agency for guidance.

Prepare an emergency plan for family members and those who are elderly, have disabilities or have special needs.

Identify primary and alternate evacuation routes to a safe location.

Learn how to turn off utilities, in case you need to evacuate.

Contact your children's schools or day care centers to find out about their emergency plans.

Take a Red Cross First Aid and CPR course or refresher.

Road Safety: All I can say is, don't drive during a hurricane unless it's a matter of life or death. The rain will be pounding so hard on the windshield that you won't be able to see the road. The chance of driving through a flooded street that is washed out is very high. In fact, there were many news stories of people heading out in the middle of the hurricane for cigarettes or food or whatever and found themselves being rescued days later when they were found down an embankment. Your car will be damaged from the salt water effects. The chance of objects hitting the car while you're trying to drive is high. Imagine the effect of a huge heavy coconut flying through the front windshield while you're driving; no thanks! Stay indoors. Winds can be so powerful that they are capable of lifting your car right off the roadway.

If you have to drive for evacuation purposes, see Chapter 7, Evacuating With Style.

Driving after a hurricane is quite fraught with dangers. After Frances, residents spoke of multiple flat tires from nails and debris, power and telephone lines down across many streets. Many roads were impassable due to fallen trees.

In fact, it's now eight weeks after Frances in the Bahamas and as I look out the window, the clean up trucks have just taken down another low phone line. We are still driving over cables, across many roads.

Do not venture out sightseeing right after a hurricane. Leave the roads open and passable for safety, ambulance and police crews. After Frances, many roads were blocked; the debris had to be cleared by front end loaders, just to open one lane.

Never attempt to drive through floodwater on a road. Water can be deeper than it appears and can rise very quickly. A car can be buoyed by floodwaters and then swept downstream. Floodwaters also can erode roadways. A missing section of road or bridge will not be visible underneath floodwaters. Wade through floodwaters only if the water is not flowing rapidly, and only, in water no higher than the knees. If your car stalls in floodwaters, get out quickly and move to higher ground. The floodwaters may still be rising and cars can be swept away in a moment's notice.

Don't wade through flooded areas with bare feet. Floodwater is contaminated by dog dung, overflowing septic tanks, oil and all sorts of other contaminants. There's also construction debris -- bits of metal, boards with nails, shards of glass and chunks of concrete that can puncture or cut your feet. The result could be a bad infection and a long wait at the emergency room. In fact, try and stay out of the flood water as much as you can.

If your vehicle is stuck in deep water, don't attempt to start it. Wait to have it towed to a mechanic. If you're driving through salt water, the car will probably be a write off due to the very corrosive nature of the salt.

Animal Behavior: Be aware of snakes, insects and animals driven to higher ground. In Florida, the danger of snakes including poisonous ones, increases dramatically. After our family weathered a small tropical storm, while at a racetrack in Florida, the reports of snakes and even alligators increased, with many sightings by the track marshals and racers.

Electrical safety: Never touch a downed electrical wire, even if you know it is off. Never walk in floodwater where downed power lines are immersed. Do not connect your generator to the house main box, unless you have a disconnect switch. Improper connection can send deadly electrical voltage back to an electrical worker and electrocute him. Actually, more linesmen die from improperly wired generators than from most other dangers. One of the first deaths from the hurricane in the Bahamas, was an electrocution from a generator. If the generator is sitting on wet ground, and you attempt to re-gas or check the oil while it is running, the chance of a shock is great. Always turn off the generator before working on it. Let the generator cool down for a few minutes before refueling. Make sure you don't spill gasoline over the hot engine or muffler.

A friend had a generator blow up and burn down the only part of the home that was not damaged by the hurricane. We could not figure out why. Store the gas cans in a different area away from the unit. Run the generator for only a few hours at a time, to lessen the fire danger.

Looting: Bad people are always there to benefit from your troubles. My theory would be to shoot them dead but unfortunately, it's against the law. It is common to have homeowners camped out beside a blown down destroyed house guarding it with a gun until they can rescue their possessions. If you are a looter, I hope I don't catch you, as I might just shoot.



Chapter 16

Medical First Aid Notes

The basic theory of first aid, is to fix the small items, like cuts and sprains. Keep a patient who has severe injuries, calm and secure, and get them to a hospital, or advanced medical aid as soon as possible. I once found a co-worker with all 10 fingers cut off. I proceeded to stop the bleeding as best I could, with a towel and to get him ready to be taken to the hospital with his fingers. But no, a company nurse decided to properly bandage each hand. She took twenty minutes to get his hands bandaged. By the time we got him to the hospital, the time had elapsed to be able to reconnect all his severed fingers. I learned a very valuable lesson; do only what is necessary to keep the patient alive and comfortable in a serious injury and get them to professional medical help, as fast as possible.

A new trick for bad, large burns is to cover with plastic food wrap, and transport to the hospital. Do not apply any creams. The plastic keeps out the germs and air and is easy to remove without the damaged skin sticking to the food wrap. For small burns, cool down the burn, apply a burn cream and keep clean. Check every day for signs of infection. For temporary pain control, toothaches and earaches, Advil or Tylenol works very well.

For small to medium cuts, stop the bleeding with moderate pressure applied directly on the cut. Apply antiseptic cream and bandage to keep clean. Check in 8 hours for infection. If the cut is red, swollen or very sensitive, treat with a 2% hydrogen peroxide solution. For sprains, and muscle injuries, prevent swelling with the application of ice and wrap with an elastic bandage. Do not wrap too tightly as to cut off any blood flow. Check by relieving the tension every few hours and looking for signs of blue skin, which indicates lack of blood flow.

For diarrhea, treat with a change in diet. Add yogurt, if available, to restart the enzymes, your system uses to digest your food. Control excessive diarrhea with drugs, such as Imodium and a BRAT (bananas, rice, applesauce, toast) diet.

Suggestions for a first aid kit, in a waterproof box or bag:

Bandages

Aspirin, Tylenol, Advil, Imodium

Eyewash solution and eyecup

Skin glue to close bad cuts and wounds temporarily

Large gauze pads

First aid tape, 1 inch wide, 2 rolls

Tweezers

Antiseptic cream

2% hydrogen peroxide

Alcohol for cleaning skin

Anti-itch cream

Personal medication

Latex gloves

Elastic bandages for sprains

Scissors, safety pins

Chapter 17

Pet Safety



Your pet will need care, feeding, water and bathroom time, just as you do. They could possibly, also suffer mental problems and stress from a big storm, just like you.

When you plan your emergency kit, include a few weeks of pet food and a couple of gallons of water per week for a moderate sized dog.

Contact your veterinarian or local humane society for information on preparing your pets for an emergency.

Before the disaster: Make sure that your pets are current on their vaccinations. Pet shelters may require proof of vaccinations. Vaccines for dogs: Rabies, Distemper-Parvo-Coronavirus, and Bordetella (kennel cough). Vaccines for cats: Rabies, Feline Distemper combination, and Feline Leukemia.

Have a current photograph. Keep a collar with identification on your pet and have a leash to control your pet. Have a pet carrier, of proper size, for each animal - carriers should be large enough for the animal to stand up and be able to turn around.

When you plan your evacuation strategy, don't forget to include your pet! Specialized pet shelters, animal control shelters, veterinary clinics, friends and relatives, out of harm's way, are ALL potential refuges for your pet during a disaster. If you plan to shelter your pet, work the delivery of "Fido", into your evacuation route planning.

During the disaster:

Bring pets indoor well in advance of a storm; reassure and pet them to help them remain calm. Animals are smart. They can tell when something's not right.

Animals brought to a pet shelter are required to have proper identification collar and rabies tag, clear identification on all belongings, a carrier or cage, a leash, an ample supply of food, water and food bowls, any necessary medications, specific care instructions and newspapers or trash bags for clean-up. Pet shelters will be filled on first come, first served basis. Call ahead and determine availability.

After the disaster:

Walk pets on a leash, until they become re-oriented to their new or old home. Often, familiar scents and landmarks may be altered and pets could easily be confused and become lost. After a disaster, animals can become aggressive or defensive. Monitor their behavior. Also, downed power lines, invading reptiles and debris can all pose threats for pets after a disaster.



If pets cannot be found after a disaster, contact the local animal control office to find out where lost animals are being held. Bring along a picture of your pet, if possible.

Pet Disaster Supply Kit

- Proper identification including immunization records
- Ample supply of food
- Ample supply of water
- A carrier or cage
- Medications
- Muzzle, collar and leash
- Favorite stuffed toy or chew bone

Chapter 18

Boats

Small boats inland: You may want to tow the boat to a safe location, outside of the path of the storm. If not and the boat has to stay in your backyard, remove the air from the trailer tires to prevent them blowing out with the extra weight of the water. Remove all valuables and engine, if possible, and fill the boat with a few feet of fresh water to weigh it down, leaving in the plugs. Insert wood blocks between the trailer frame and the springs for extra support with the added weight. Lash the boat securely to the trailer and use tie-downs to anchor the trailer and boat to the ground, rope off to a sturdy pole. In addition, it may be a good idea to put your anchors out, right there in your backyard. If the storm surge reaches your property, the anchor may help the boat stay in your backyard. Keep in mind; these backyard actions may stop your boat from being blown around, but it will not protect it from falling trees and flying debris. Alternatively, if it's a small runabout and you have nowhere to store it inside, flip it over, remove the plugs, and place sand bags around the perimeter to weigh it down and tie off to a sturdy pole. An upside down boat has a more aerodynamic shape in strong winds. For non-trailer boats, some of the more common options may be to have one of the local marine dealers haul your boat out of the water and place it in protective dry storage upon the approach of a hurricane. Or, you may want to relocate your boat to a previously identified hurricane haven, or you may wish to reinforce your boat's present moorings and put out extra mooring lines.

For boats in a marina: Check and double up on mooring lines of boats that must remain in water. Trailer boats should be removed from the water and stored. Remove all items possible for indoor storage. Add extra side rubbers to help protect the sides of the boat from the dock or other boats. Make sure the bilge pumps are working and the batteries fully charged. Complete this well ahead of the hurricane watch to save time.

Heed and respect National Weather Service watches and warnings. Begin a safe anchorage trip before storm tide arrives. Boat owners unfamiliar with the area should inquire and plan a desirable and convenient location for safe anchorage or follow local boats to safe anchorage areas.

Safe anchor rigging should consist of undamaged mooring or dock lines, with extra length and at least three or four substantial anchors for the craft. If possible, boats should anchor in groups with bow lines individually tied high to a tree or piling on mainland with loose lines for rising tide and the sterns well anchored. Boats in the group should also be tied together at bows and sterns using protective bumpers.

Do not tie up parallel to the bank. Receding tides often breach or capsize a boat in this type of anchorage. Be sure that a navigable passage at the stern of secured boats is made available for late-arriving boats, seeking safe anchorage beyond the first boats that are currently anchored. Safe anchorage boats should be tied high, using a half hitch knot. Line length should be sufficient to take care of excessive high water. Use multiple anchors and lines.

Due to his or her vulnerability, the mariner's images of a hurricane are even more vivid and threatening. This is probably true, due to the fact that hurricane conditions have a tremendous effect upon the ocean. The ocean is no place for the recreational boater to be during the extreme conditions associated with a hurricane. Mariners are faced with a significant challenge when formulating an effective plan to protect their most cherished property. We must keep in mind that, despite their best preparatory efforts, many mariners still have lost their boats to the ravaging effects of these storms.

It would be wise to have your boat properly secured long before any public evacuation notices are issued. Waiting too long to make preparations may trap your boat at its present location, or worse, result in you being in a dangerous location during the storm. Note that the drawbridges are authorized to remain closed upon the approach of gale force winds of 34 knots or greater. Make preparations early and then evacuate to safe location. Due to the various levels of their intensity and the unpredictability of a hurricane's track, I have found it very effective when formulating a hurricane plan to list all the possible options. Then, upon a hurricane's approach, chose the options that best fit the circumstances.

In the Bahamas, the best bet is to moor your boat to pilings as far into the canals as possible. Typically, they are a good safe haven.

The publication "*Hurricane Havens Handbook for the Atlantic Ocean*" (stock # ADA 116103.) can be ordered from the National Technical information Service, 5285 Port Royal Road, Springfield, Va. 22161 (703) 487-4600.

I do not recommend that you get underway on your recreational vessel and head out to sea upon the approach of a hurricane to "**ride out the storm**". Although this may work for large cruise liners, most boats are not designed to withstand the large seas and high winds generated by these severe storms. If you have witnessed 35 foot waves with 130 mph winds taking the top right off the wave, you don't want to be out there in a boat. It is most important for all mariners to obtain a daily updated tropical weather forecast and plan their boating activities accordingly.

Mariners are reminded that aids to navigation, particularly lighted and unlighted buoys, may be moved from charted position, damaged, destroyed, or extinguished due to the effects of hurricanes and storms. Mariners should not rely solely upon the position or operation of an aid to navigation, but should also employ such other methods of determining position such as GPS. Here is a list of the many things to consider before, during and after a hurricane. Some of the safety rules will make things easier for you during a hurricane. If local authorities recommend evacuation, you should leave! Their advice is based on knowledge of the strength of the storm and its potential for death and destruction.

Check your marine insurance carefully to see if you are required to take some action in order to make a valid claim. Check with your marina and find out about their policy for handling hurricanes. Some marinas may order all boats to leave.

If you are going to move your boat, determine where the best place would be ahead of time. Learn the storm surge history and elevation of your area.

Learn safe routes inland and make plans of evacuation sites. If you must move your boat, first inspect the trailer to ensure that it is in proper operating condition. Check tires (including spare), wheel bearings, tow hitch and lights.

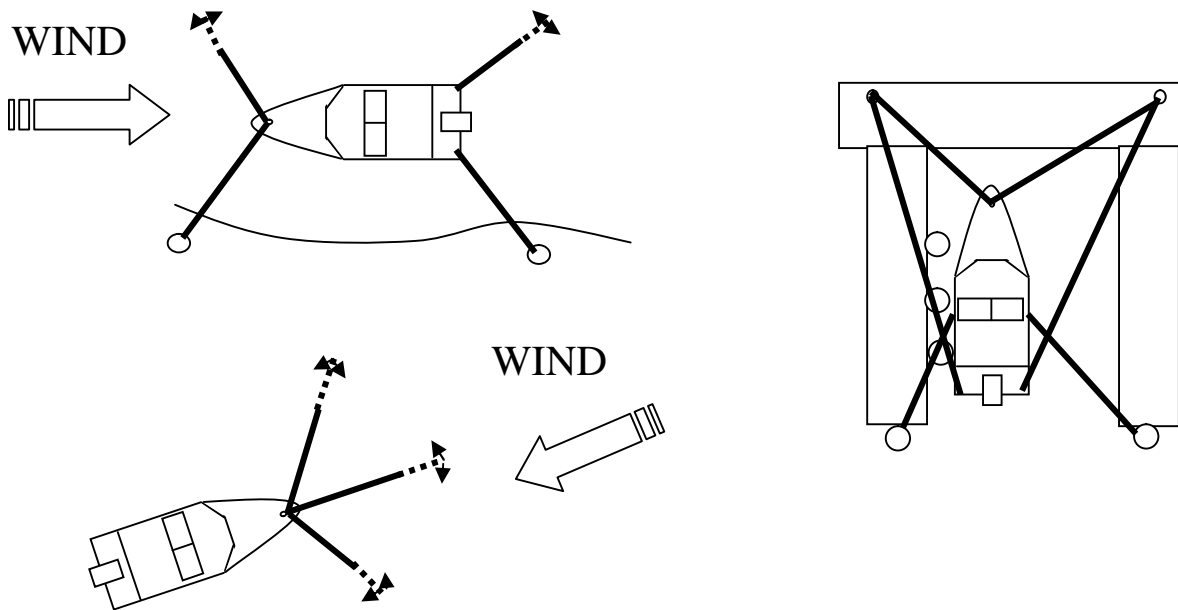
Inventory the property on your boat, with video equipment, if possible. Plan what will be removed from the boat and what must stay. Have the proper tools at hand to remove the items.

Keep all legal documents such as registration, insurance policy, marina rental agreement, radio license etc. in one easily moved, secure container. Make an inventory of documents, photos, and other irreplaceable articles that need to be taken with you, in case of an evacuation.

WHEN A HURRICANE WATCH IS ISSUED: (A Watch means hurricane conditions pose a possible threat to the area within 36 hours.) Wedge sliding glass doors to prevent their lifting from their tracks, possible apply removable silicon seal to the cracks and edges of any window that can open.

GET OFF THE OPEN WATER AS FAR AWAY FROM THE STORM AS POSSIBLE! If this is impossible, keep in mind that the right front quadrant of a hurricane usually, but not always, produces the most violent weather.

If your boat must stay in the water, you have three options:



Once your boat is secured, leave it and don't return until the authorities give the all clear.

Berth at a dock that has sturdy pilings and offers reasonable shelter from open water and storm surge. Double up all mooring lines but provide enough slack so that your boat can rise with the higher tides. Cover all lines with chafe protectors (double thick neoprene garden hose cut along the side) at points where the line is likely to wear and put out extra fenders and fender boards (the more, the better). Put out bow and stern anchors, in case the mooring lines break.

Anchor your boat in a protected harbor where the bottom can allow a good anchor hold. An advantage to anchoring is that the boat can more easily respond to wind and water changes without striking docks or other boats than when moored. Heavy and extra anchors are needed for this option and enough line should be on hand to allow a scope of at least 10:1 for each anchor. Use at least three large anchors tied high, using a half hitch knot (loop knots slip). Anchor rigging should consist of new or good line and chain.

Hurricane holes are ideal locations to moor your boat during a hurricane. These are deep, narrow coves, canals or inlets that are surrounded by a number of sturdy trees which block the wind and that provide a tie-off for anchor lines. The best location for a hurricane hole is one that is far enough inland to avoid the most severe winds and tides, yet close enough to reach under short notice. You may want to scout out a satisfactory hurricane hole well ahead of time!

Your boat should be stripped of anything that can become loose during the storm. This would include removing the mast in sailboats, when possible. Boat documents, radios and

other valuables should be removed from the vessel prior to the storm, since you never know how long it will take for you to get back to your boat, once the storm passes.

Hurricanes are among the most destructive phenomena of nature. Their appearance is not to be taken lightly. Advance planning cannot guarantee that your boat will survive a hurricane safely or even survive at all. Planning can, however, improve the chance of survivability and is therefore, certainly worth the time and money to do so.

General weather tips: Before setting out, obtain the latest available weather forecast for the boating area. Where they can be received, the NOAA Weather Radio continuous broadcasts (VHF-FM) are the best way to keep informed of expected weather and sea conditions. If you hear on the radio that warnings are in effect, don't venture out on the water unless confident your boat can be navigated safely under forecast conditions of wind and sea.

While afloat, keep an eye out for the approach of dark, clouds, which may preclude a squall or thunderstorm. Check radio weather broadcasts periodically for latest forecasts and warnings. Heavy static on your AM radio may be an indication of nearby thunderstorm activity. If a thunderstorm catches you afloat, put on a Personal Flotation Device, if not already wearing one. Stay below deck, if possible. Keep away from metal objects that are not grounded to the boat's protection system. Make heading for the nearest safe harbor. *Some information from the U.S. Coast Guard Boating Education Branch.*

Remember: Never stay with your boat.

Chapter 19

Generators

Portable electric generators can provide near normal life- styles, when power outages affect your home. Below are guidelines for safely connecting and operating portable generators.

Generators come in many sizes and ratings, starting at 1750 watts and up to 20,000 watts. Typically, a good size for an emergency generator is between 4500 and 7500 watts; the larger the wattage, the bigger and heavier the generator. Trying to pull-start a 7500 watt generator is difficult. Some generators come with a 12 volt battery starter, but, of course, cost more. The 5000 watt size with an overhead valve 12 hp motor is a good balance between size, cost, ease of starting and power capability for your home. One point to remember is gas consumption. The bigger the generator, the faster it consumes gas. In the aftermath of a big hurricane, gasoline may be a precious commodity due to unavailability and pricing of local gas. A 5000 watt generator, typically consumes 2.5 gallons per 10 hours at half operating load. To run a generator for 10 hours a day for two weeks, means you will need: $2.5 \times 14 = 35$ gallons of gas. However, most refrigerators and freezers can stay cold, if you power them for one hour every four hours. This would reduce the running time to only 4 hours a day, reducing the gas consumed to about 12 gallons for two weeks. Don't forget to stock up on a few quarts of the right oil, as you will need to change the oil every 20-30 operating hours. Check the owner's manual.

Check the oil level every time you refill the gas. Change the oil as per the instructions in the owner's manual. Use a good quality synthetic oil. Most larger generators have a low oil level shut down circuit. If the generator stops and can't be restarted, check the oil level.

Generator safety

Don't connect your generator directly to your home's wiring. Connecting a portable electric generator directly to your household wiring can be deadly to you and others. A generator that is directly connected to your home's wiring can 'back feed' onto the power lines connected to your home.

Utility transformers can then "step-up" or increase this back feed to thousands of volts—enough to kill a utility lineman making repairs a long way from your house. You could also cause expensive damage to utility equipment and your generator.

The only safe way to connect a portable electric generator to your existing wiring is to have a licensed electrical contractor install a transfer switch. The transfer switch disconnects the utility power lines to the house and therefore, isolates the power coming from

your generator to your house only. Never plug a portable electric generator into a household outlet such as the stove or dryer outlet. Plugging a generator into a regular household outlet can energize "dead" power lines connected to the house and injure neighbors or utility workers.



Connect individual appliances using a three-pronged grounded cord, directly to the receptacle outlet of the generator. Ensure the appropriate outdoor-rated power cord has a sufficient wire gauge rating to handle the electrical load. Don't use extension cords with exposed wires or worn shielding. Make sure the cords from the generator don't present a tripping hazard. Don't run cords under rugs where heat might build up or cord damage may go unnoticed.

Don't overload the generator. Do not power more appliances than the output rating of the generator. Overloading your generator can seriously damage your valuable appliances and generator. Prioritize your needs. A portable electric generator should be used only when necessary, and only to power essential equipment. Respect your neighbor's need for quietness.

Never use a generator indoors or in an attached garage.

Just like your automobile, a portable generator uses an internal combustion engine that emits deadly carbon monoxide gas. Be sure to place the generator where exhaust fumes will not enter the house. Only operate it outdoors in a well-ventilated, dry area, away from air intakes to the home, and protected from direct exposure to rain, preferably under a canopy, open shed or carport.

Read and adhere to the manufacturer's instructions for safe operation. Don't cut corners when it comes to safety. Carefully read and observe all instructions in your portable electric generator's owner manual. To prevent electrical shock, make sure your generator is properly grounded, especially in wet, rainy conditions such as a hurricane. Consult your manufacturer's manual for correct grounding procedures.

Do not store fuel indoors or try to refuel a generator while it's running. Gasoline should be stored outside of living areas in properly labeled, non-glass safety containers. They should not be stored in a garage if a fuel-burning appliance such as a gas fire hot water tank or furnace is in the garage. The vapor from gasoline can travel invisibly along the ground and be ignited by pilot lights or electric arcs caused by turning on the lights. Avoid spilling fuel on hot components. Put out all cigarettes when handling gasoline. Always have a fully charged approved fire extinguisher located 10 feet from the generator. Never attempt to refuel a portable generator while it's running. Turn off all appliances powered by the generator before shutting down your generator. As the generator stops running, the voltage decreases slowly. Many electronics and appliances can be damaged by this decreasing voltage. Remove the cords, let the generator cool down for a few minutes, check oil level, and refuel. Wipe off any spilled gas, let the generator sit for a few minutes to evaporate any gas spilled, start generator and re-insert cords and turn on appliances.

Safety warning: Many generator parts are hot enough to burn you during operation or start a fire. Do not touch the exhaust and engine during operation or keep near combustibles.



Keep children away from portable electric generators at all times.

Chapter 20

Flood Proofing Your House

If you have a wood frame house with vinyl siding or brick veneer, the only method of waterproofing is to build concrete walls around the house. They can be 4 to 6 feet high and can be made to look like a fence or replace an existing fence. The concrete walls must have adequate rear mounted reinforcing to withstand the water pressure. If you have gates and driveways, use a temporary flood barrier, and sand bags. Expensive? Somewhat, but worth the cost if you avoid just one insurance claim. We have just experienced a flooded home from Frances, and we only had four inches of water. The cost of the deductible on the insurance policy would have paid for a floodwall and floodgates, but nothing can pay us back for the time, work and personal anguish that we suffered, as a result of the flood.

For concrete houses, like those built in the Bahamas, a few changes can result in a virtually flood proof house, good for four feet of water. The basic house is already waterproof for the most part. The exceptions are the doors, dryer vents, electrical boxes that go outside, and water hose bibs. The electrical boxes can be made waterproof with an application of silicon seal inside the box, where the wires go inside. The dryer vent will need to be moved up, to six feet high. Water hose outlets can be sealed off with silicon seal. I also sealed up the cable wire and the air conditioner cables and tubes.

The doors can be waterproofed by bolting on a floodgate, which is a three-sided steel frame, in which a painted sealed sheet of plywood with rubber around the edges is inserted. The frame holds the plywood in firmly while the rubber gives you a waterproof seal. The application of a caulking to the rubber will help improve the water seal. Additionally, sand bags can be placed around the base of the plywood to further seal from water. These floodgate water panels are used throughout the south plains where sudden flash floods produce a lot of damage.

A trick to use to seal all unused doors before a hurricane is to use removable silicon seal. The seal, which will keep most of the water out of sliding doors and garage doors, is easily peeled off afterward, Duct tape also works.

In new construction, building up is the best way to prevent damage from flooding. If you are in a known flood plain of say 18 inches, building your house up 3 to 4 feet, will give you a reasonable safety margin. However, if you live in the Grand Bahama Queen's Cove area, where hurricanes Floyd and Frances, flooded you out by 9 feet, I can only offer you the solution of relocating or building on stilts.

Do what you can! Move household items up, bag any pictures and valuable items. During the last flood, I lost a lot of tools and items, which were left laying on the floor of the garage. I built shelves up five feet, for the next one. Now all I have to do is remember to put the darn tools back on the shelves.

Chapter 21

Hurricane Proofing Your House

Build it stronger, not necessarily more expensive. I am just finishing the design of a hurricane proof house. The house is all concrete, reinforced, block construction, two stories high. The walls are designed to be both waterproof and windproof to 175 mph. The extra cost of such construction is minor compared to the inconvenience and ever rising expense of repair, after a hurricane.

The house is only 400 feet away from the ocean, so a sea wall is needed as a line of first defense against sea surge. The beach drops off quickly to a deep shelf after a short, sandy section, so the surge is not as bad as on the other side of the island where the flats are located. The sea wall will look like a fence, be 8 feet high, and made from reinforced concrete. Every 15 feet, a back facing reinforcing pier will be integral with the wall. The ocean side will feature a rock garden at the bottom to help break up the waves and stop the undermining of the footings. The footings are pinned into solid rock with rebar. Where the entry gates are located, the wall features a floodgate system. Behind the sea wall, will be solid large boulders, 10 feet deep and 4 feet high, retained by steel wire mesh, all filled with smaller rocks and gravel. The boulders will help support the wall and give it mass. The house will be built up 6 feet from the rock base, which is a further 6 feet from high tide. As the house will be waterproof to 4 more feet, it will give a total of 16 feet safety from sea surge and flooding.

To reinforce the roof section, I am using two truss tie-downs per truss, and also adding tie-downs to the center concrete walls for additional truss support. The trusses will be designed stronger to take larger loads. As well, the nail plates will be bigger for more strength. The roof will feature glued and screwed on plywood, waterproof membrane, and then a steel interlocking roofing material. I will use twice as many roof clips as specified. The edges will be further secured with waterproof washer screws, to prevent the wind from ripping at the edges. The fascia boards will be 2 x 6 and be screwed on, not nailed. The soffits will be upgraded to ½ inch plywood and will be glued and screwed on. The trusses will have additional bracing, both laterally and horizontally, as will the fascias and soffits, in order to increase attachment strength.

To further assist in hurricane survival comfort, the house will have a 6 KW generator and transfer switch. The windows will be protected with steel security bars, which are designed to accept plywood sheets behind the bars. The steel bars protect against flying objects and the tight fitting wood helps keep out the rain and more importantly, the wind.

The house will feature a 60 gallon internal emergency water tank under the stairs, with a 12 volt RV type, water pump. A reverse osmosis water purification system will be included, to supply the house in times of poor water quality.

Additionally, the toilets and showers will be separately plumbed so that, with a turn of a valve, a 200 gallon tank under the outside stairs, fed by the roof gutters, can supply flushing and bathing water during the aftermath of a storm, until the local water system is working.

This system during non-storm periods will be used as a rainwater cistern, which can be used for garden watering.

The stove, water heaters and dryer will be gas-fired, which allows the household functions to continue after a hurricane, before the electrical power is restored. The gas appliances allow us to live with only a 6 KW generator, as the major electrical load will be replaced with propane.

To further reduce the chance of water getting into the house, there will be troughs built into the concrete floor just behind the doors. During a hurricane, the fancy plate covering the troughs will be removed, exposing the trough. The troughs are connected via PVC pipe to a central sump hole in the concrete and a 12 volt pump will suck up any water that does get past the door seals. A 12 volt emergency battery system will also be fitted.

To provide safety during a hurricane, I have designed two all concrete bathrooms, one on each floor. The six-sided, concrete reinforced rooms with steel doors, will protect against flying debris. If the house does flood, we can evacuate to the second floor into the second safety room.

All this extra work and internal emergency systems cost less than one deductible in a claim after a major hurricane. These changes are much easier to do with a new house design but not impossible to retrofit in an older house.



Chapter 22

Hurricane Supplies

Be prepared: Purchase necessities and store in waterproof boxes before the beginning of the hurricane season. Dump the water, use the food, batteries, medication, pet and baby food and any other dated product, after the hurricane season ends. But, don't forget to replace before the next hurricane season!

Items may include the following: Sand bags to stop flow of flood water, plywood for doors and windows, plastic or wood to repair roofs, caps or plastic to plug floor drains overflow, plastic tarps or roll of thick plastic sheeting for water-proofing, heavy duty duct tape.

Put together a portable survival kit including:

Non-perishable food to last for 14 days

Pet food, if you have pets

Basic plastic cooking and eating utensils

Manual can opener

First Aid kit

Flashlights and 3-4 sets of batteries. Better yet, buy a rechargeable large flashlight with a 12 volt car charger.

Drinking water (at least 1 quart/person/day for 14 days)

Seal water containers tightly, label and date them when filled, and store in a cool, dark place.

Containers(2 or more) for sewage - 5-gallon buckets, with covers

Heavy-duty trash bags

Bleach (pure, unscented, liquid) 1 gallon for treating water Portable cooler

Matches or lighters

Rope for repairs, clothesline or securing items.

Duct tape - the wonder product!

Tarp and nails to cover damaged roof

Baby food, diapers and formula (if needed)

Extra prescription medicine (4-week supply)

Battery-powered radio and extra batteries

List of important phone numbers

Hammer and nails and plywood sheets for the windows

Sleeping bags or blankets and pillows

Candles and butane lighter, for use after the hurricane

Aluminum foil

Toiletries, feminine supplies

Important over the counter medication

Baby wipes, for quick waterless clean up.

Detergents for clean up and disinfecting items

Basic clothing

Charcoal or a small gas grill and extra canisters.
Valuables wrapped in plastic bags i.e. deeds, licenses, insurance documents, list of personal items, etc.
Computer back up CD's
Clean containers for water
Plastic sheet to line the bath tubs with
Emergency money on hand.
Full tank of gas in car, extra in approved containers
Insect repellent
12 volt car charger for cell phone

Information Sources

NOAA www.nws.noaa.gov (weather)

Red Cross, USA
Broward County Chapter 6710 West Sunrise Blvd, Suite 111
Plantation, FL 33313 954-797-3800

Red Cross, Bahamas
John F. Kennedy Drive, P.O. Box N-8331
Nassau 242-323-7370

Red Cross, Grand Bahama Island
Jobson Ave., P.O. Box F42534
242-352-7163

FEMA
500 C Street, SW Washington, D.C. 20472
202-566-1600

Web Sites of Interest

www.redcross.org/services

disaster/keepsafe/readyhurricane.html

www.fema.gov/hazards/hurricanes

www.floridadisaster.org

www.disastercenter.com/guide/hurricane.html

www.stormsurvival.homestead.com