FIGURE 33

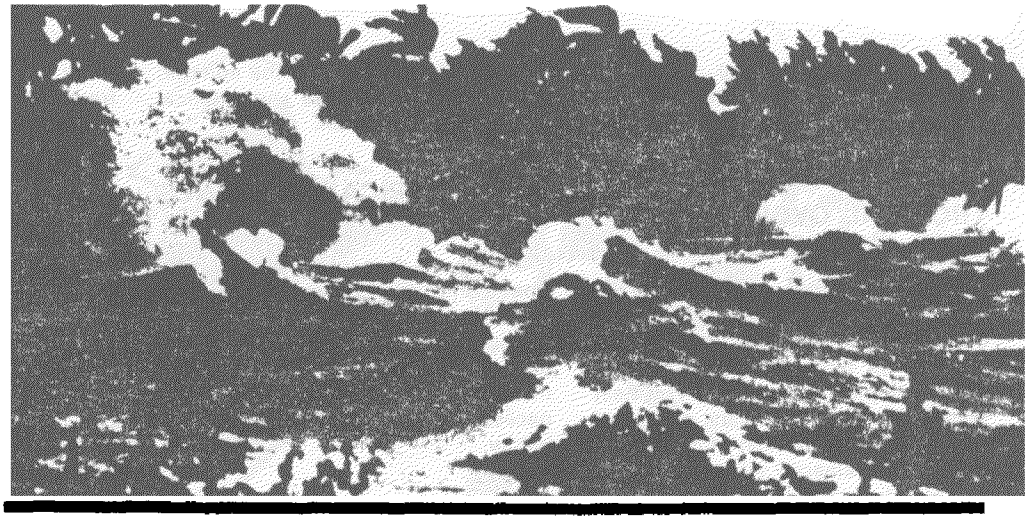
SURVIVING THE STORM

Hurricanes develop from a variety of tropical weather disturbances and pass through several increasingly intense phases, classified as tropical depressions with winds of less than 38 mph, tropical storms with winds between 39-73 mph, and finally, hurricanes with winds 74 mph and more.

Major hurricanes are relatively rare events at any location. Virgin Islands residents have a good chance of living many years without experiencing one. Some residents have experienced the fringes of hurricanes, but few have suffered the fury of a direct hit, and many residents have had no hurricane experience whatsoever.

But no coastal area is immune. "Not here! We haven't had a hurricane in years," could be the most dangerous words you'll ever hear. It's best to be prepared. This could be the year.

What are we up against? How will warnings reach you? What should you do – and when? Can you ride it out safely at home, or should you seek safety at the home of friends or relatives, or go to a public shelter? This publication is intended to help you answer such questions.



What forces are you up against?

Wind and Water
The combination can be lethal

The threat occurs to you in this order. 1) storm surge, the storm's worst killer, 2) wind damage; and 3) inland flooding.

Storm surge

The worst thing about a hurricane is a general rise in sea level called storm surge. It begins over the deep ocean. The low pressure and strong winds around the hurricane's eye raise the ocean surface a foot or two higher than the surrounding ocean surface, forming a dome of water as much as 50 miles across. As the storm moves into shallow coastal waters, decreasing water depth transforms the dome into a storm surge that can rise 20 feet or more above normal sea level, and cause massive flooding and destruction along shorelines in its path. The rise may come rapidly, and produce flash floods in coastal lowlands or may come in the form of giant waves — sometimes mistakenly called tidal waves.

Breakers coming ashore in a hurricane travel at about one half the speed of winds in the storm. Relating this to pressure created by breakers, you have approximately 10,000 pounds per square foot. Just as storm surge is superimposed on the normal tides, the high wind-driven waves of the hurricane are superimposed on the storm surge. Consider, a block of water 2 miles long, 12 feet deep and one mile wide, weighing more than 20 million tons. The result is an extremely effective battering ram, capable of smashing structures to rubble, eroding long stretches of beach and undermining poorly anchored buildings.

The highest and most dangerous portion of the storm surge usually extends from near the center of the hurricane some 50 miles along the coast in the quadrant of the hurricane where winds are blowing toward shore. Hurricane damage is greatest in the northeast quadrant of the storm.

Wind

Wind speeds vary greatly from hurricane to hurricane, and within each storm. Wind gusts may exceed sustained winds by 25 to 50 percent. For example, a storm with sustained winds of 100 miles per hour might have gusts to 150 miles per hour, and one with 150 mile-per-hour-winds might have gusts over 200 miles per hour.

The time between the first rise in wind and rain squalls and a return to moderate winds after the storm is often about 24 hours. But this varies greatly depending on the size of the hurricane, its forward speed, and how close you are to the center.

How does wind cause damage? The wrenching and bending forces imposed by gusting winds do part of the job. Another factor is the rapid increase in wind force as wind speed increases. Wind force increases with the square of the wind speed. This means, for example, that when the wind speed doubles, four times more force is exerted on structures.

That is why the key to reducing wind damage is reinforcing weak spots like windows, exterior glass doors, small trees, and shrubbery.

Wind may break power lines and make a wind-whipped snake out of a hot wire. It damages trees, patio doors and windows, and carries a barrage of debris. But it is usually not the primary killer. While hurricane winds do much damage, drowning is the greatest cause of hurricane deaths.

Flooding

As the storm moves inland and its winds dimish, the flooding caused by these torrential rains then becomes the hurricane's greatest threat.

The amount of rainfall varies with hurricane size, forward speed, and other factors, but there are some relatively constant features. During the "average" 24 hour period it takes a hurricane to pass through a community, as little as 5 to 10 inches of rainfall or better than 12 to 30 inches of rainfall can occur.

Words of Warning

Flash Flood Watch – means possible flooding. Check preparedness requirements, keep informed and be ready for immediate action if a Flash Flood Warning is issued.

Flash Flood Warning – a forecast of impending floods. One of the most urgent types of weather warnings issued. The warning requires prompt reaction by residents in an area subject to flooding.

Tropical Wave – a westward moving trough of low pressure embedded in the deep easterly current. It tends to organize low level circulation and may travel thousands of miles with little change of shape, sometimes producing significant shower and thundershower activity along its path.

Tropical Depression – a tropical cyclone in which the maximum sustained surface wind is 38 miles per hour (33 knots) or less.

Tropical Storm – a well defined weather system with winds of 39-73 miles per hour and strong circulation at the surface.

Hurricane Watch – issued when a hurricane that is nearby may affect the area threatening coastal and inland regions. The watch covers a specified area and indicates that hurricane conditions are a real possibility within 36 hours, but it does not mean that they are imminent. Listen for further advisories.

Hurricane Warning – a warning that one or both of the following dangerous effects of a hurricane are expected in a specified coastal area in 24 hours or less: (a) sustained winds of 74 mph (64 knots) or higher (b) dangerously high water or a combination of dangerously high water and exceptionally high waves, even though winds expected may be less than hurricane force. A hurricane warning is the ACTION notice the time to take all necessary precautions and begin evacuation.

Hurricane Center or "Eye" – the relatively calm area near the center of the storm. In this area winds are light and the sky often is only partly covered by clouds. The "eye" causes a lull in the storm which can last from several minutes to half an hour, but it sometimes ends suddenly as winds return from the opposite direction often with greater force. Do not go out in the "eye" of the storm as winds can increase to hurricane force in seconds.

Storm Surge – the rise of water above mean sea level. The height of storm surge along the open coast depends on a number of factors which include wind speed, depth of water, storm trajectory, and speed of the storm.

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should occur. Annual reminders of this kind may be found to have a cumulative effect in increasing people's awareness of how they can help themselves, as well as others, to live through the event and minimize casualties and property damage.

On the other hand, just because these are annual campaigns—and especially if the anticipated event did not take place in the previous season or seasons—some people may take little notice and even, by a form of counter-suggestion, lower their threshold of confidence in the emergency organization. This is far from promoting the "mutual understanding" of the definition. Attempts must therefore be made to vary the approach from one year to the next.

AWARENESS OF WHAT CAN BE DONE TO PREPARE FOR THE IMPACT AND LESSEN ITS CONSEQUENCES

Many emergency organizations, when designing material for public use, attempt to cover in one document both preparedness and post-disaster instruction In any case, but especially so when the threat comes from different kinds of disaster which are liable to occur at different times of the year, the longer the public are exposed to the message, the greater should be its effect. A purpose-designed poster, or a leaflet which can be displayed may, in some circumstances, be a good way of proceeding. Figure 34 depicts one side of a leaflet "Hurricanes do Happen" which was adapted for regional use by the Pan-Caribbean Disaster Preparedness Project[83] [84] from a leaflet originally produced by the Office of Disaster Preparedness, Jamaica.

A different approach has been adopted in some countries, in offering almost permanent exposure to the message by printing it prominently in telephone directories. Examples are illustrated from Australia (figure 35) and New Zealand (figure 36(*a*) and 36(*b*)). An extremely simple and effective leaflet dealing with all the main aspects of desirable pre- and post-disaster conduct has also been produced in Australia (figure 37). In Canada, more direct action has been taken with the introduction, in September 1982, of a 45-hour course for members of the public, intended to improve public education about emergency measures and disaster prevention, and enhance the knowledge of those already involved in the emergency field or working in related areas. The course, which is given at the Collège d'Enseignement Général et Professionnel de Ste-Foy, Quebec City. emphasizes the transport of dangerous goods, the hazards associated with that activity, and the measures which might have to be taken in the event of an accident. Many other aspects of emergency planning are also dealt with during the course.[85]

The extent to which generalized information and warnings, not associated with a particular event, will be retained is conditioned by a person's perception of the risk, the degree to which the (hypothetical) event is time-predictable, and the degree of confidence which is reposed in the organization which issues the notices to the public. These general considerations apply in part even to notices about specific events. It will be helpful if, as proposed in figure 14, standard, authoritative and unambiguous messages are prepared in advance, leaving only the essential details to be filled in as the nature of the threat becomes apparent, or as it is decided to institute certain actions, such as evacuation. Messages of this kind will of themselves help to instil confidence in the members of the public that the organization which exists to help in times of emergency is in full and calm control The point is illustrated in figure 38, which shows that local emergency authorities scored much higher than the mass media, both as a first and as a most reliable source of information

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[83] Planned and implemented by UNDRO with funds provided by USAID/OFDA and EEC/CARICOM for the first phase of the project

[84] Research findings from two Caribbean countries showed that radio, followed by television, posters and leaflets in that order, had the greatest impact and was the most widely disseminated medium Report by V A Richards, April 1983 (unpublished)

[85] "A First in Canada", by Lieut J Cheruet, published in *Emergency Planning Digest* January/March 1983, by Emergency Planning Canada, Ottawa

FIGURE 34

BEFORE THE HURRICANE

Hurricane season is from June to September.

1 See that galvanised sheeting on the roof of your house is properly fastened.
2. Make a thorough check up of hurricane shutters, hooks, and latches.
3 Wrap all important documents and papers in plastic
4 Store all fluorescent tubes, light bulbs, lamp shades, . broken glass can be dangerous during a hurricane
5 Put up storm shutters or "batten up" windows with good board If there are no storm shutters use masking tape to X glass windows
6 Fill properly cleansed containers with water for domestic purposes. Also have some boiled water ready. At least 2 quarts per person per day for drinking
7 Heavy leaves and branches of fruit or other trees should be cut since these may cause damage from either being blown down or the fruits being transported. e.g. coconuts, bread fruits, oranges, mangoes.
8 If you have a car, fill the tank with petrol as it may be needed in an emergency.
9 Have a flash light in good working order and keep it handy also matches, candles, storm lanterns, water boots and large plastic bags.
10 Have extra food especially the kind which can be eaten without being cooked or with little preparation. Remember that electric power may be off and you may be without refrigeration for sometime.
11 Emergency cooking facilities (e.g oil and coal stoves) may be necessary, be sure they are in good working order. Always have a supply of kerosene and charcoal. Keep the charcoal dry.
12. Have a First-Aid Kit handy, this should include iodine bandages, tweezers and band-aids Know your emergency organizations.
13 Those people living in small wooden huts near to river banks or low lying areas should move further inland to a safe place since flood waters may be high.
14. Have a Transistor radio and extra batteries ready.
15. Listen to all or as many of the bulletins as possible.
16. Pay no attention to rumours listen to your radio station.

DURING THE HURRICANE OBSERVE THE FOLLOWING

1. Do not go outside unless it is absolutely necessary Remember that when the winds get very strong you are in danger of being blown away, or being hit by flying objects.
2 If you are away from home, remain where you are until the hurricane has passed.
3 Keep a hurricane lamp burning as it might make the night more tolerable during the hurricane.
4 If the house shows signs of breaking up, stay under a table or stand in a door frame.
5 If your glass windows have not been boarded up or taped, attach a cloth over the inside of the window to protect yourself and others from splintering glass
6. Switch off the electricity from the main supply, this will reduce the possibility of fire
7 Do not open the refrigerator unless it is absolutely necessary. Frequent openings will increase the possibility of spoilage.
8. Be calm, listen to your transistor radio for information on what is happening.
9. Remember sea surge. Extra high tides may be experienced around coastal areas.
10 It usually takes at least six hours for a hurricane to pass over. There is a calm in the centre called the 'eye', this may last 5-30 minutes Do not go outside unless to do simple emergency repairs, the winds will intensify again and blow from the other direction.

AFTER THE HURRICANE

1. Seek medical aid for persons injured during the Hurricane, also check for missing persons and report it to the proper authorities.
2. Keep listening for instructions from the Committee of Disaster Preparedness.
3. Clear up debris and do emergency repairs to your premises (home or yard).
4. If a tree/trees have fallen across power lines do not attempt to remove them. Call the Public Utilities company.
5. Report broken water mains to the Public Utilities Company.
6. Check food stored in electric refrigerators and deep freezers if power has been off for more than 24 hours.
7. Be alert to prevent fires. Low water pressure after damage to pipes make fire fighting difficult.
8. Report damage to your insurers or to the local Assessment Team.
9. Take down Hurricane Shutters and store the lumber in a safe place for future use.
10. Report to your work place for duties as soon as possible. Your services may be important.
11. DO NOT touch loose of dangling electric wires. Report this to your Public Utilities Company.
12. DO NOT empty water stored in bathtubs or other containers until you are sure that the water supply is back. Do not waste water.
13 DO NOT go outside without shoes. Avoid wearing open shoes, watch out for broken glass.
14. DO NOT go swimming in flood waters.
15. DO NOT go to disaster areas unless you are prepared to give emergency assistance.
16. DO NOT throw garbage, waste food or dead animals in the street. Help protect the health of your community.
17. DO NOT go sightseeing.