

HURRICANES AND TROPICAL STORMS THAT HAVE MADE LANDFALL IN TRINIDAD AND TOBAGO

During the period of 1850 - 2000, two (2) hurricanes and five (5) tropical storms have made landfall on Trinidad and Tobago.

Hurricane Flora (30th September 1963) made landfall on Trinidad and Tobago. It was a category three (3) hurricane with winds estimated to be 195km/hr. Roofs were blown off houses. Of the 7,500 houses on the island, 2,750 were destroyed and 3,500 were damaged. Eighteen (18) people were killed in Trinidad and two (2) were killed in Tobago due to drowning. Fifty percent (50%) of all cash crops were destroyed including cocoa, banana and other vegetables. Seventy five percent (75%) of the trees in the forest reserve were destroyed and the rest damaged. It was estimated that \$30 million dollars worth of damages were incurred.

Tropical Storm Alma (14th August, 1974) made landfall over Trinidad. Extensive rainfall accompanied by winds of 74km/hr caused damage to the Plum Mitán Strip in California and left one (1) dead directly and another indirectly during its passage over Trinidad. Wind gusts of 91km/hr were measured in Matura and 147 km/hr in Savonetta.

Tropical Storm Arthur (26th July 1990) made landfall over Tobago.

Tropical Storm Fran (14th August 1990) made landfall over south Trinidad.

Tropical Storm Bret (7th September 1993) caused trees to fall and flooding to occur.

Tropical Storm Joyce (1st October 2000) produced significant wind damage and primarily affected Tobago

HURRICANES THAT DID NOT MAKE LANDFALL BUT PASSED CLOSE ENOUGH TO INFLECT DAMAGE UPON THE TWIN ISLANDS

Hurricane Felix (31st August 2007) caused widespread flooding in the Central and Southern regions of Trinidad.

Hurricane Emily (13th July 2005) caused widespread flooding and landslides to occur in the Northern Range. One (1) house was swept away by flood waters in Arima.

Hurricane Ivan (6th September 2004) this was a category four (4) hurricane that severely affected Tobago, though it did not make landfall. There was extensive rain as well as winds of 110mph that caused heavy flooding. One (1) home collapsed and forty five (45) roofs were blown off houses. Thirty percent (30%) of Tobago was left without electricity and there was one (1) reported fatality. It was estimated that US \$4.9 million dollars worth of damages were as a direct result of the hurricane.



Hurricane Ivan affected Tobago

Hurricanes

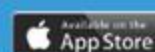


The obliteration of the bridge that connects Kingston to St. Thomas by the raging waters of the Hope River after Hurricane Gustav made landfall in Jamaica in 2008.



A Division of the Ministry of National Security

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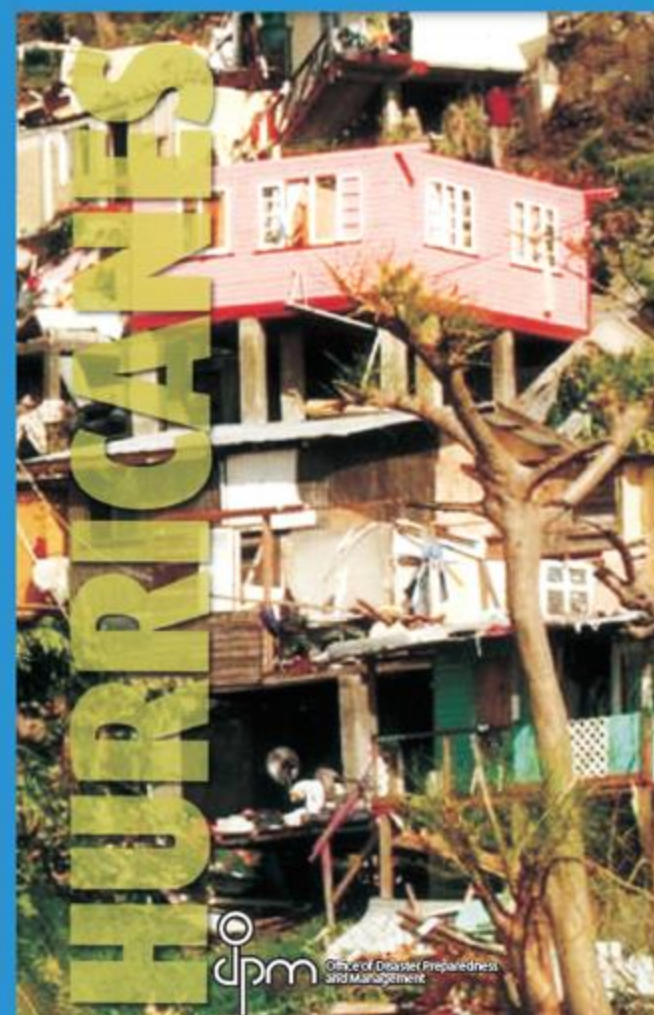
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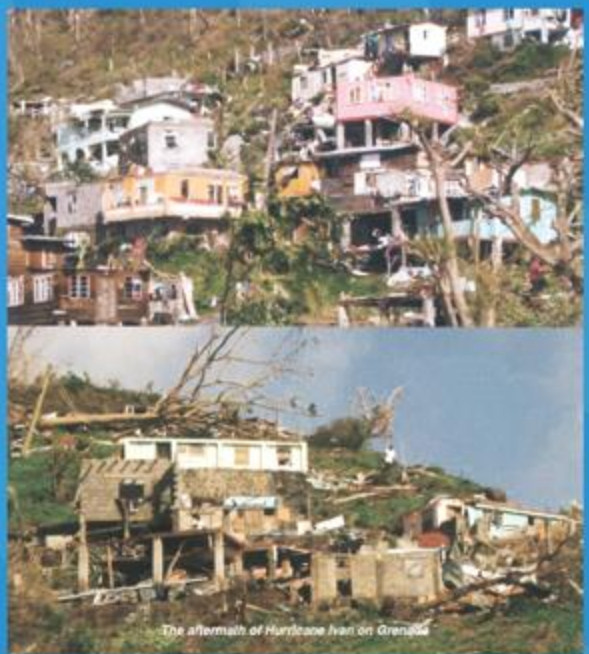
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Everything you need to know about HURRICANES



HURRICANES



The aftermath of Hurricane Ivan on Grenada

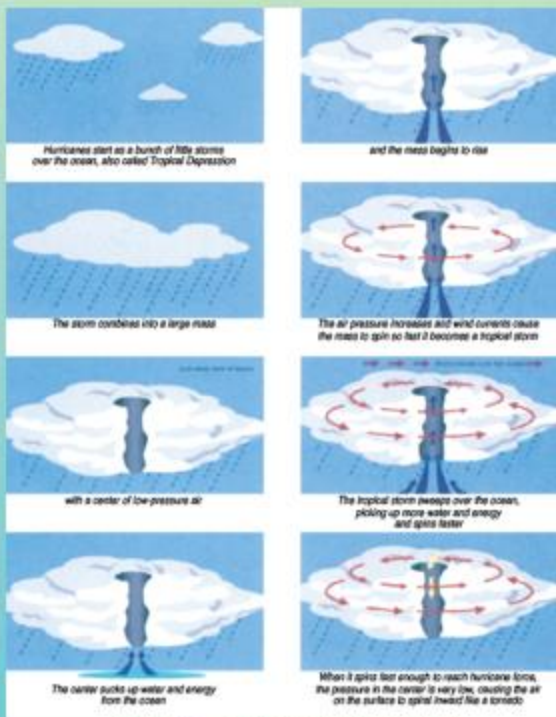
HURRICANES

WHAT IS A HURRICANE?

A warm core tropical storm in which maximum average surface wind is 118km/hr (74mph) or greater. A well defined eye (the central area of relative calm surrounded by wall clouds) may be associated with this tropical system type.

HOW IS IT FORMED?

Hurricanes gather heat and energy through contact with warm ocean waters. The addition of moisture by evaporation from the sea surface, powers them like giant heat engines. Winds near the ocean surface spiral air inward and thunderstorms form following the air to warm further and rise higher into the atmosphere.



Hurricane images courtesy North Carolina's Statewide Television Network

FEATURES OF HURRICANES:

- ◆ **WINDS, 118km/hr (74mph) or more** can destroy poorly constructed buildings and mobile homes. Debris such as signs, roofing material and any small items can become missiles during hurricanes. They can uproot trees and power lines and can cause massive disruption.
- ◆ **HEAVY RAINS/FLOODS** - Widespread torrential rains often in excess of six (6) inches can produce deadly and destructive floods. This is a major threat to areas inland and can cause destruction to infrastructure, agriculture and in some cases lead to loss of life.

SAFFIR SIMPSON HURRICANE WIND SCALE

Cat.	Wind Speed (Km/hr)	Damage
1	119-153	Older mobile homes could be destroyed. Poorly constructed homes could have their roofs blown off. Unprotected windows may break if struck by flying debris. The branches of large trees would snap and shallow rooted trees can be toppled.
2	154-177	Extremely dangerous winds can cause extensive damage. Substantial risk of injury or death due to flying debris. Older mobile homes have a high chance of being destroyed. Well constructed homes can sustain major roof damage. Near total power loss is expected with outages that could last from several days to weeks. Potable or drinkable water may become contaminated and therefore scarce.
3	178-209	Devastating damage will occur. High risk of injury and even death to people and livestock. Nearly all older mobile homes would be destroyed. Poorly constructed homes can sustain complete collapse of walls as well as the loss of roof structure. Well built homes could also sustain damage with a loss of most of the roof structure. Numerous windows will be blown out of high rise buildings resulting in falling glass, which could pose a threat from days to weeks after the storm passes. Electricity and water would be unavailable for several days to weeks after the hurricane passes.
4	210-249	Catastrophic damage will occur. High risk of injury or death due to flying debris. Nearly all older mobile homes would be destroyed. A high percentage of newer mobile homes would also be destroyed. Poorly constructed homes can also sustain severe damage with loss of most of the roof structure. Well built homes could also sustain severe damage with loss of most of the roof structure and some exterior walls. There would be a high percentage of structural damage to top floors of tall buildings.
5	Over 250	People and livestock are at a very high risk of injury or death from flying and falling debris, even if indoors! There would be almost complete destruction of mobile homes regardless of age or construction. All unprotected windows and even protected windows would be affected by flying debris. Nearly all windows of high rise buildings would be blown off. Nearly all trees will be snapped or uprooted and power lines downed. Long term water shortages will increase human suffering.

Source: NOAA

Common terms associated with Tropical Cyclones (Tropical Cyclones Classifications)

- ◆ **TROPICAL DEPRESSION** - An organized system of clouds and thunderstorms with a defined circulation and maximum sustained winds of 61km/hr (38mph) or less.
- ◆ **TROPICAL STORM** - An organized system of clouds and thunderstorms with a defined circulation and maximum sustained winds of 63-117 km/hr (39-73 mph).
- ◆ **STORM SURGE** - Storm surge is a large dome of water often 50 -100 miles wide that sweeps across the coastline near where a hurricane makes landfall. 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.

METEOROLOGICAL TERMS

TROPICAL STORM WATCH:

Tropical storm conditions are possible in the specified area of the watch, usually within forty-eight hours (48hrs).

TROPICAL STORM WARNING:

Tropical storm conditions are possible in a specified area of the watch, usually within thirty-six hours (36hrs).

HURRICANE WATCH:

Hurricane conditions are expected in the specified area of warning, usually within forty-eight hours (48hrs). During a hurricane watch, prepare to take immediate action to protect your family and property in case a hurricane warning is issued.

HURRICANE WARNING:

Hurricane conditions are expected in the specified area of the warning, usually within thirty-six hours (36hrs). Complete all storm preparations and evacuate if directed by local officials.

SHORT TERM WATCHES AND WARNINGS:

These provide detailed information on specific hurricane threats, such as floods and high winds.

SEVERE WEATHER BULLETIN:

this is limited to weather which can cause serious disruptions and possessions damage due to one or more of the following: Flooding, Damaging Winds, Severe Thunderstorms, Choppy Seas.



Hurricanes affecting other Caribbean islands

BEFORE THE HURRICANE SEASON

- ◆ Know the hurricane risks in your area. Familiarize yourself with places or situations in your immediate surroundings that can cause negative effects during a hurricane. This includes trimming loose branches of the trees in your yard, properly securing loose boards and outdoor items which can become flying missiles by the forceful hurricane winds.
- ◆ Learn safe routes inland.
- ◆ Learn the location of the official shelters in and around your area by contacting your municipal corporation or the ODPM.
- ◆ Review needs and verify the condition of emergency equipment such as flashlights, battery powered radios, etc.
- ◆ Ensure that enough food and water supplies (one gallon per person per day) are stored (for up to two weeks). Keep a well stocked first aid kit in the house.
- ◆ Obtain and secure material such as plywood which is necessary to properly secure your home (strong winds could easily shatter windows that are not protected by plywood)
- ◆ Use hurricane straps to safely secure roofs.
- ◆ Clear loose and clogged rain gutters and downspouts.
- ◆ If you have a boat, determine where to move your boat in an emergency.
- ◆ Review your insurance policy.



DURING THE HURRICANE

- ◆ Stay indoors and away from open doors and windows since glass can shatter and cause damage.
- ◆ Continue to listen to your radio for official word that it is safe to leave your home.



AFTER THE HURRICANE

- ◆ Stay indoors and continue to listen to your radio to know if dangerous winds are out of your area. If injured, seek medical attention at first aid stations, hospitals or clinics.
- ◆ Beware of outdoor hazards such as downed power lines, weakened bridges and washed out roads.
- ◆ Boil ALL drinking water for 10-15 minutes before consumption and eat only dry or canned foods that need no refrigeration, preparation or cooking and very little water.
- ◆ Check your home for structural damage.
- ◆ Report any broken sewer or water mains to the authorities.
- ◆ Help other members of the community who may have been affected.

Trinidad and Tobago Meteorological Services

The Trinidad and Tobago Meteorological Services is a division of the Ministry of Public Utilities. It is classified as an essential service by the Government of Trinidad and Tobago and is specialized and technical in nature. The Trinidad and Tobago Meteorological Services constantly monitors, studies, analyzes and records the weather and weather activity.

Additionally, the Trinidad and Tobago Meteorological Services provides weather and climate information. The most important aspect of a meteorologist's duties is the provision of early warning in the event of a natural disaster in order to save lives and protect property.



Ministry of Public Utilities
Trinidad & Tobago
Meteorological Service