

## Tropical cyclone safety rules

- Make sure you have a response plan for your family;
- Check emergency equipment and battery-powered equipment, such as flashlights, radios and cell phones. Make sure you have spare batteries;
- Store non-perishable foods and drinking water (supply for 3 days );
- Buy plywood or other material to protect your home;
- Trim trees so branches don't fly into your home and tidy your garden so that loose objects wont be turned into projectiles;
- Review your insurance policy;
- Be aware of the location of your home and whether you are living in an area prone to flooding and or inundation;
- Make sure you have an emergency kit, with all the necessary tools;
- During the event, frequently listen to the radio and follow the bulletins issued by MDS;
- Don't leave your home or go to the beach if it has been advised not to.
- If you come upon a flooded road, turn around, don't venture through the flooded area since you may drown.

## Forecasting Tropical Cyclones at MDS

The Meteorological Department St. Maarten (MDS) communicates weather events for St. Maarten through its daily forecasts. This is the lowest level of alert at the MDS. In the event of a possible threat due to a tropical cyclone (TC), the MDS will issue Tropical Cyclone Bulletins (TCB).

### Tropical Cyclones Bulletins issued at MDS:

#### **Advisory TCB**

Issued if a Tropical Cyclone poses a possible threat to the community in the upcoming 48 to 72 hours. **Be Alert**

#### **Watch TCB**

Issued if wind conditions from a Tropical Cyclone are possible within the next 48 hrs. **Prepare yourself**

#### **Warning TCB**

This TCB will be issued if Tropical Cyclone wind conditions are expected in the next 36 hrs. **Protect yourself**

#### **Strike TCB**

This TCB will be issued if Tropical Cyclone wind conditions are imminent in the next 6 hours or are already occurring. **Seek Cover**

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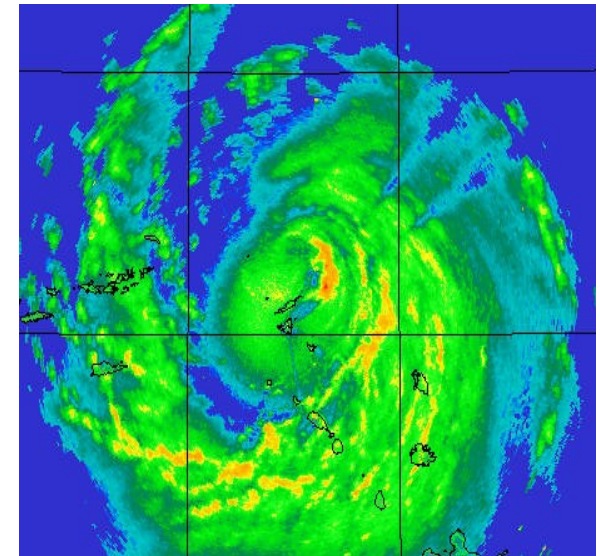
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Last Revised: 2 January, 2013



Ministry of Tourism, Economic Affairs,  
Traffic & Telecommunications

# Tropical Cyclones



*Radar image of Hurricane Earl, while its center was passing just north of Sint Maarten during the morning of August 30, 2010.*



**Meteorological Department  
St. Maarten**

***Protecting lives and property  
against natural hazards***

# Tropical Cyclones

## ◆ Tropical Cyclones explained ◆

A tropical cyclone is a rotating, organized system of clouds and thunderstorms, with a closed low-level circulation that develops over tropical or subtropical waters. In the Northern Hemisphere these storms have a wind pattern that rotates counter-clockwise at sea level and a rotation which is clockwise in the higher levels of the atmosphere. The Atlantic Tropical Cyclone Season runs from June 1st up to November 30th. Tropical cyclones have different names, depending upon the location of their formation. In the Atlantic and the Caribbean region they are called **Hurricanes**, whereas the Western Pacific referred to as **Typhoons**.

**Tropical cyclones** are classified according to their maximum sustained winds in 3 main groups, namely: **Tropical Depression**, **Tropical Storm**, and **Hurricane**.

1. Tropical Depression	< 62 km/h	< 38 mph
2. Tropical Storm	63-118 km/h	39-73 mph
3. Hurricane		

### Saffir-Simpson Scale

- Category 1	119-153 km/h	74-95 mph
- Category 2	154-177 km/h	96-110 mph
- Category 3	178-209 km/h	111-130 mph
- Category 4	210-249 km/h	131-155 mph
- Category 5	250+ km/h	156+ mph

The main parts of a tropical cyclone are the **rain bands** (these are thunderstorm bands also known as spiral bands), **the eye**, and **the eye wall**. Figure 2 shows the structure and the direction of the airflow in a tropical cyclone.

## ◆ How are tropical cyclones formed? ◆

There are several favorable environmental conditions that must be in place before a tropical cyclone can form.

They are:

- Warm ocean waters (at least 27°C/81°F) throughout a certain depth;
- An unstable atmosphere;
- Relatively moist air;
- Relatively weak winds in the upper levels of the atmosphere, and
- A pre-existing near-surface disturbance, like for example a tropical wave (combined with a closed low-level circulation).

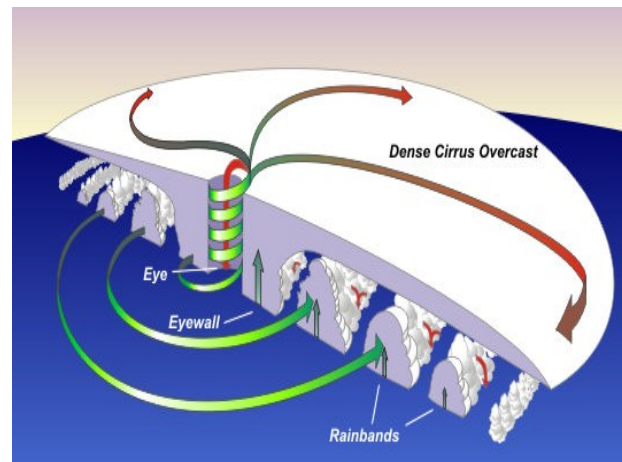


Figure 2: A cross-section of a hurricane, showing the direction of the airflow (arrows). Also depicted are the three main parts of a tropical cyclone: the rain bands, eye and eye wall.

Warm water plays a vital role in the existence of a tropical cyclone as it is the one that powers the tropical cyclone. Once a disturbance forms and constantly produces clouds, it can become more organized if it stays over warm water and upper level winds remain weak, developing into a depression.

As water vapor (water in the gaseous state) rises, it cools. This cooling causes the water vapor to condense into a liquid we see as clouds. In the process of condensation, heat is released.

This heat warms the atmosphere making the air lighter, which then continues to rise into the atmosphere. As it does, more air moves in near the surface to take its place, which is the strong wind we feel from these storms.

Tropical cyclones often begin to weaken rapidly, once the eye of the storm moves over land. This is due to the fact that the moisture and heat provided by the warm waters is cut off.

## ◆ Tropical Cyclone Hazards ◆

Tropical Cyclones are one of the most devastating forces of nature. While most people know that tropical cyclones can contain damaging wind, many do not realize that they also produce several other hazards, both directly and indirectly, affecting the weather, and sea conditions.

The dangers associated with tropical cyclones are:

### • Storm Surge & Breaking Swells

storm surge is water that is pushed toward the shore by the forces of the winds swirling around the storm. Furthermore, swells breaking near shore in shallow waters can cause hazardous seas.

### • Winds, Gusts and Squalls

hurricanes are known for their damaging sustained winds, but can also produce short, rapid bursts in wind speeds (aka gusts) and also longer periods of increased wind speed (squalls) associated with the spiral bands around the hurricane.

### • Heavy Rainfall

tropical cyclones can also cause torrential rains, which can lead to flash flooding. It is often believed that the stronger a storm the greater the potential for flooding. However, a weak, slow moving tropical storm can cause more damage due to flooding than a more powerful fast moving hurricane.