



**Dominica**

**Meteorological**

**Service**

# Tropical Cyclones

Presenter:

Karen Bazil- Lawrence

- CYCLONES

- HURRICANES

- TYPHOONS

# THE ATLANTIC HURRICANE SEASON

JUNE 1<sup>st</sup> TO NOVEMBER 30<sup>th</sup>

PEAK MONTHS → AUGUST TO OCTOBER

MAXIMUM ACTIVITY → EARLY TO MID  
SEPTEMBER

# Hurricane / Tropical Cyclone

- An organized system of clouds and thunderstorms
- Originates over tropical/sub tropical waters and has a closed low level circulation.
- Rotates in a counter-clockwise direction about the center in the Northern Hemisphere.

# Conditions for Formation

- Warm Sea Surface Temperatures – 26.5 °C / 80 ° F
- Moist atmosphere
- Pre-existing disturbance
- Low wind shear

# STAGES OF DEVELOPMENT

- Tropical disturbance/wave
- Tropical Depression maximum sustained winds of 38mph (33knots) or less
- Tropical Storm\* maximum sustained winds of 39 to 73mph (34 to 63 knots)

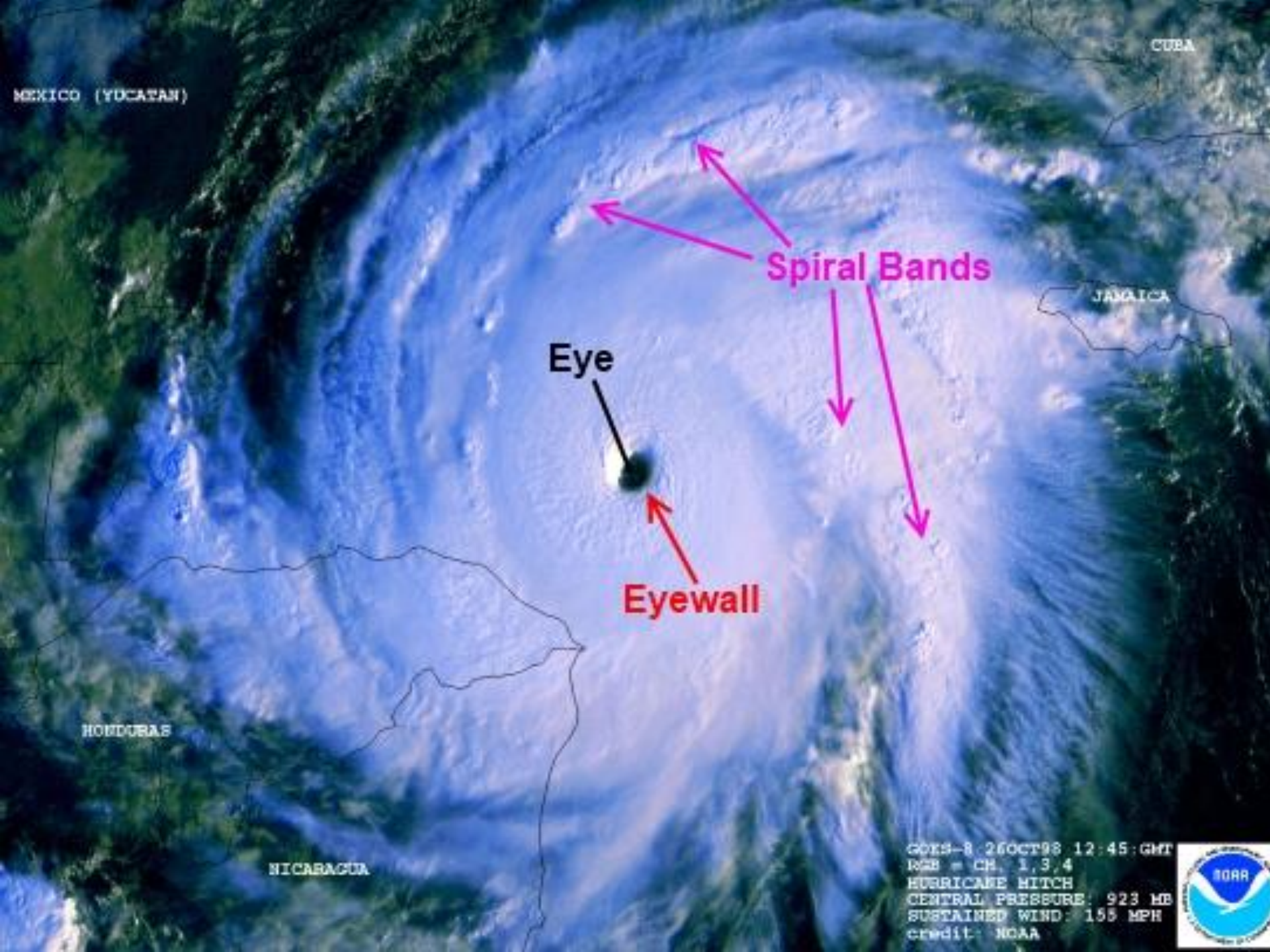
# STAGES OF DEVELOPMENT

- Hurricane\* maximum sustained winds of 74mph (64 knots) or higher.
- Major Hurricane\* maximum sustained winds of 111 mph (96 knots) or higher.

# Basic Components of a Hurricane / Tropical Cyclone

- Eye or Center of the Hurricane it is characterized by being clear and calm.
- Eye wall: the dense wall of thunderstorms in a hurricane, this is where the winds are the strongest.
- Spiral Bands: the outer rain bands of the storm, it usually extends a few hundred miles from the center.





CUBA

MEXICO (YUCATAN)

JAMAICA

Eye

Spiral Bands

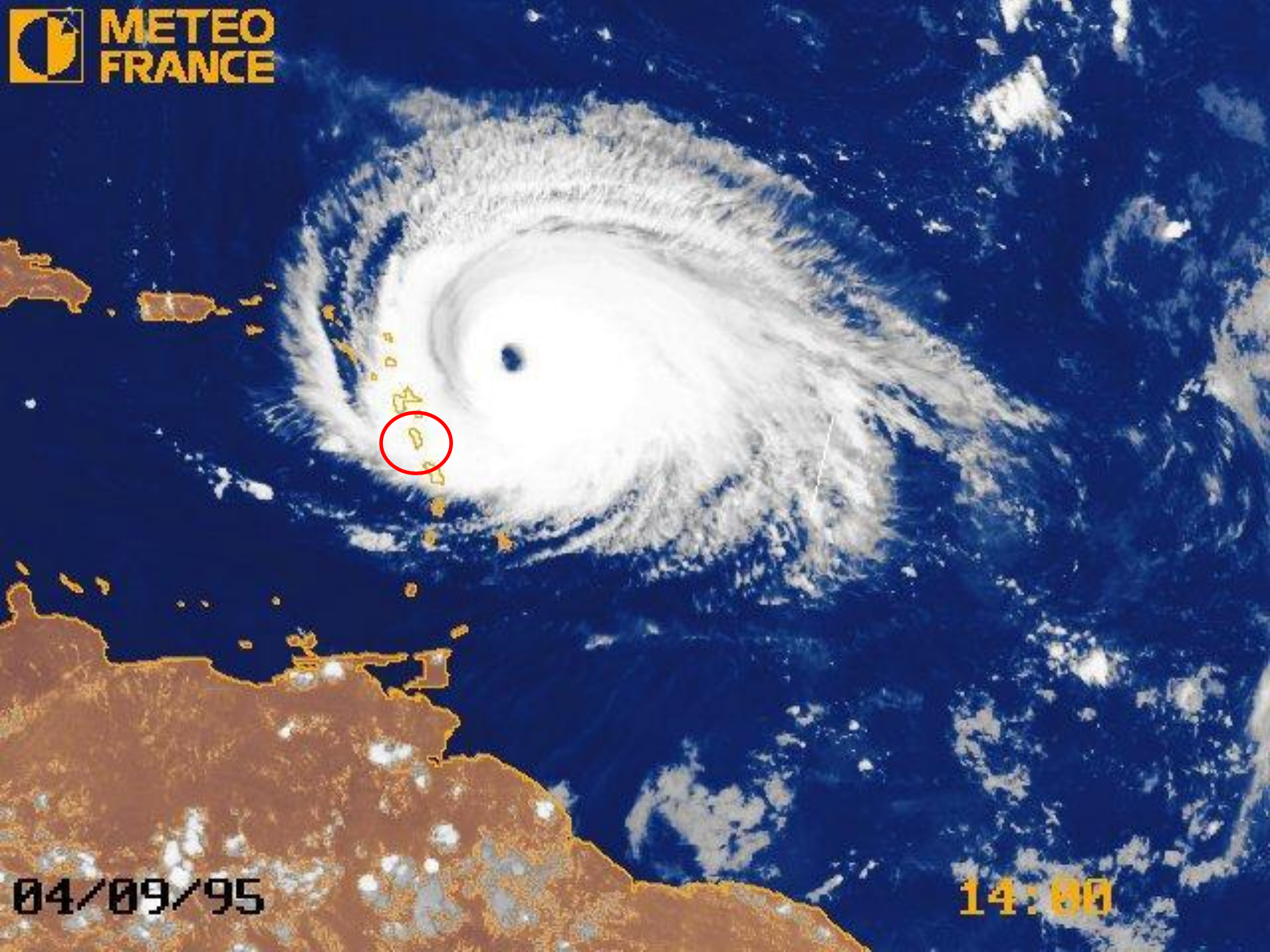
Eyewall

HONDURAS

NICARAGUA

GOES-8 26OCT98 12:45 GMT  
NCB = CH, 1,3,4  
HURRICANE MITCH  
CENTRAL PRESSURE: 923 MB  
SUSTAINED WIND: 155 MPH  
credit: NOAA

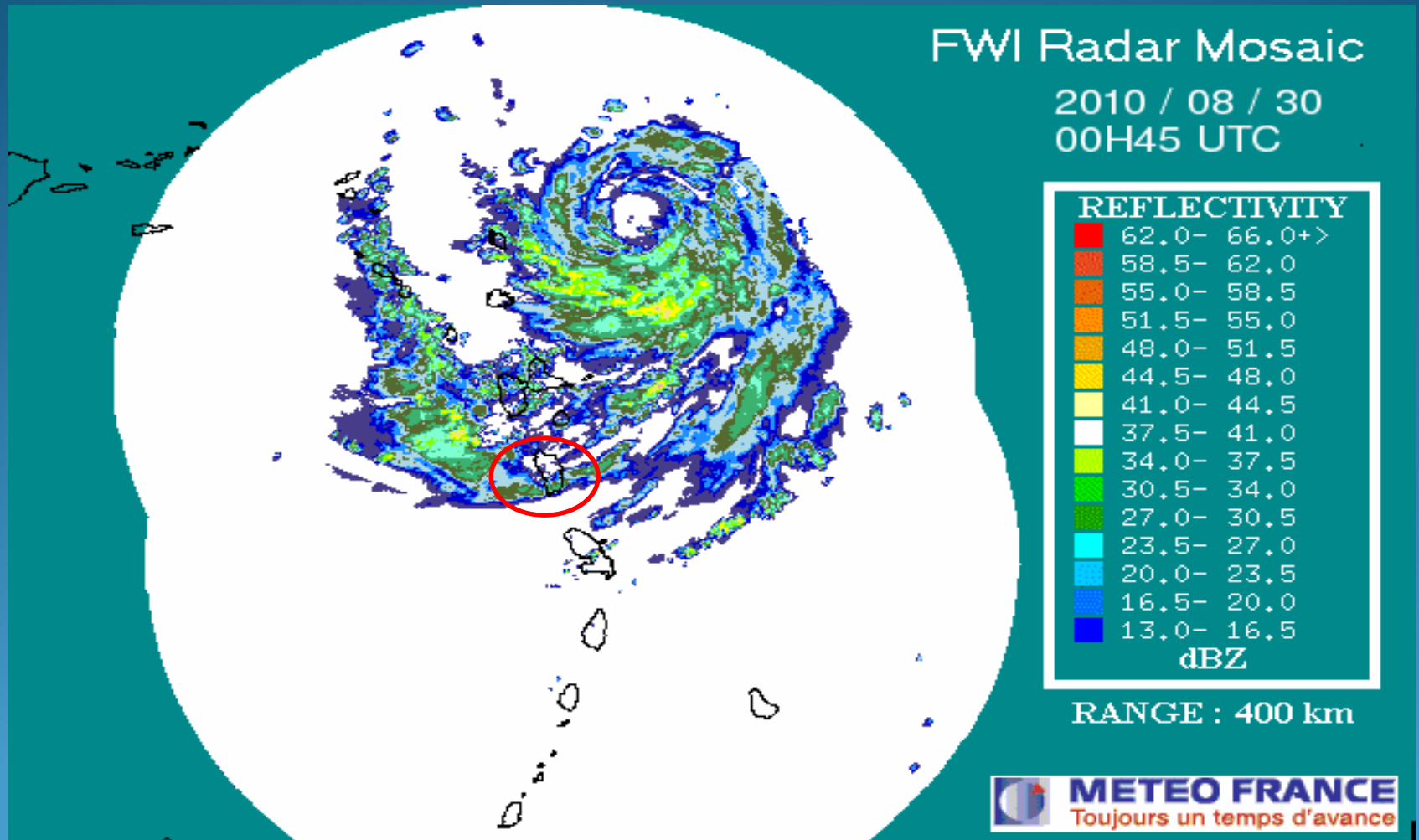




04/09/95

14:00

# RADAR IMAGERY OF HURRICANE EARL



# The Saffir-Simpson Scale of Winds

## Saffir-Simpson Hurricane Wind Scale



Category 1 - 5



**WIND:** 74-95 mph

**DAMAGE:** Very dangerous winds will produce some damage



**WIND:** 96-110 mph

**DAMAGE:** Extremely dangerous winds will cause extensive damage



**WIND:** 111-129 mph

**DAMAGE:** Devastating damage will occur



**WIND:** 130-156 mph

**DAMAGE:** Catastrophic damage will occur



**WIND:** 157 mph or higher

**DAMAGE:** Catastrophic damage will occur



# Watches and Warnings

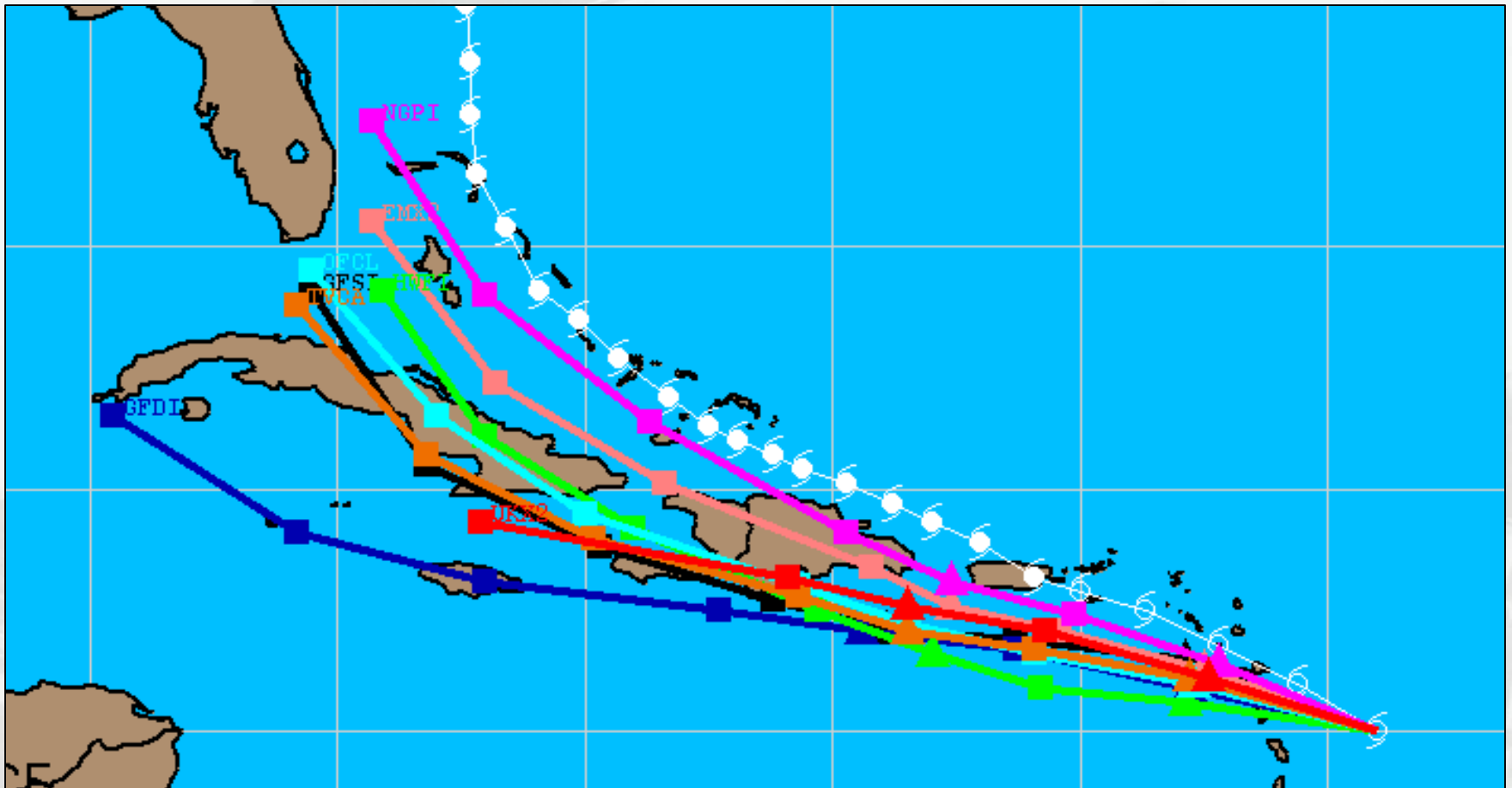
- A watch lets you know that weather conditions are **favourable for a hazard to occur.**
- **A warning requires immediate action.** This means a weather hazard is imminent - it is either occurring (for example flooding has been reported) - or it is about to occur at any moment

# What do tropical storm and hurricane watches and warnings mean?

- Lead time of tropical storm and hurricane watches and warnings are tied to the anticipated arrival time of Tropical-Storm (TS) force winds
  - *Watches issued 48 hours prior to arrival of TS winds*
  - *Warnings issued 36 hours prior to arrival of TS winds*
- Watch means that the conditions are possible somewhere within the watch area
- Warning means that the conditions are expected somewhere within the warning area

# Watch/Warning Considerations

Recognize that tropical cyclone forecasts are not perfect and that there is always some amount of uncertainty



# TRACKING A HURRICANE

- **Hurricane Advisories are numbered consecutively for each storm.**
- **When you receive an advisory, note :**
  - ✓ The advisory number
  - ✓ The center (eye) position
  - ✓ Intensity (minimal central pressure, maximum sustained winds)
  - ✓ Forecast direction of movement.
  - ✓ The extent of the winds from the center (Size of system)
  - ✓ Storm positions are given by latitude and longitude.
  - ✓ Plot the center position on the tracking map.



# Be Aware That....

- **Adverse weather associated with hurricanes and tropical storms occur well in advance of the center or eye.**
- **When plotting the storm/hurricane location, remember that the location given is for the center or eye.**
- **Tropical Storm and Hurricane force winds extend out from this point at the distant stated in the advisories.**

# Getting information...

- **PUBLIC ADVISORY**

- Issued by the National Hurricane Center - provides critical hurricane warning and forecast information.

- **HURRICANE LOCAL STATEMENTS**

- Issued by local National Weather Service Offices - provide greater detail on how the storm will impact your area.
- As a storm approaches, forecasters will issue alerts depending on where the storm is headed and its strength.

# Public Advisory

## Tropical Storm MARIA

ECFC MIATCPATS ALL  
TTAROO KNHC DDHMM

### BULLETIN

Tropical Storm Maria Advisory Number 3  
NWS National Hurricane Center Miami FL AL152017  
1100 PM AST Sat Sep 16 2017

...MARIA MOVING WESTWARD TOWARD THE LESSER ANTILLES...  
...NEW HURRICANE WATCHES ISSUED...

### SUMMARY OF 1100 PM AST...0300 UTC...INFORMATION

-----  
LOCATION...12.5N 53.7W  
ABOUT 545 MI...880 KM ESE OF THE LESSER ANTILLES  
MAXIMUM SUSTAINED WINDS...50 MPH...85 KM/H  
PRESENT MOVEMENT...W OR 280 DEGREES AT 16 MPH...26 KM/H  
MINIMUM CENTRAL PRESSURE...1002 MB...29.59 INCHES

### WATCHES AND WARNINGS

#### CHANGES WITH THIS ADVISORY:

The Government of the Netherlands has issued a Hurricane Watch for Saba and St. Eustatius.

The Meteorological Service of Curacao has issued a Hurricane Watch for St. Maarten.

The Meteorological Service of Antigua has issued a Hurricane Watch for Anguilla.

#### SUMMARY OF WATCHES AND WARNINGS IN EFFECT:

A Hurricane Watch is in effect for...

- \* Antigua, Barbuda, St. Kitts, Nevis, and Montserrat
- \* Guadeloupe
- \* Saba and St. Eustatius
- \* St. Maarten
- \* Anguilla

A Tropical Storm Watch is in effect for...

- \* St. Lucia
- \* Martinique
- \* Dominica
- \* Barbados
- \* St. Vincent and the Grenadines

A Hurricane Watch means that hurricane conditions are possible within the watch area. A watch is typically issued 48 hours before the anticipated first occurrence of tropical-storm-force winds, conditions that make outside preparations difficult or dangerous.

A Tropical Storm Watch means that tropical storm conditions are possible within the watch area, generally within 48 hours.

Interests elsewhere in the Lesser Antilles and the British and U. S. Virgin Islands should monitor the progress of this system. Additional Tropical Storm or Hurricane Watches and Warnings will likely be issued early Sunday.

For storm information specific to your area, please monitor products issued by your national meteorological service.

# Local Statement

## **Weather Outlook**

**Issued by the Dominica Meteorological Service at 6pm on September 18<sup>th</sup> 2017**

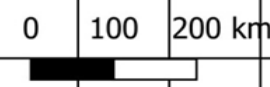
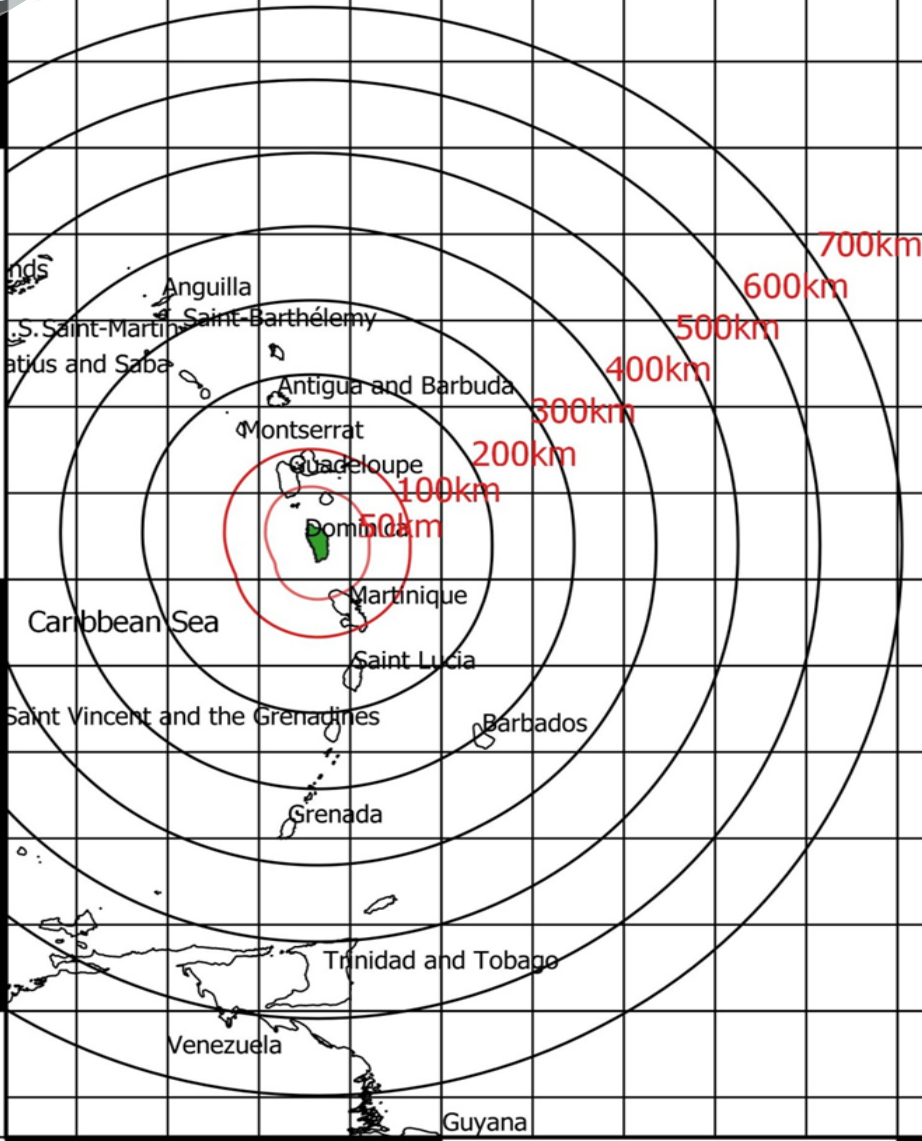
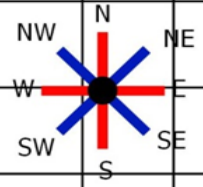
Maria is now a dangerous category 4 Hurricane. Hurricane warning remains in effect for Dominica.

At 5pm, the center of now major category 4 Hurricane Maria was located near latitude 15.1 degrees north and longitude 60.7 degrees west or about 45 miles south east of Dominica. Maria is moving west north-westward at a slightly slower speed of 9 mph with maximum sustained winds near 130mph. On the forecast track, the center of Maria is expected to pass over Dominica during the next few hours.

Residents in Dominica are advised to keep safe and to closely monitor the progress of this system. Deterioration in weather conditions can be expected to continue with pockets of moderate to heavy showers, thunderstorms and gusty winds. Rough to very rough seas are expected to affect Dominica during the next 24 hours. All preparedness activities should be completed.

Rough to very rough seas are expected during the next 24 hours with waves peaking near 12.0 feet. Persons living near the coast and all users of the sea are advised to monitor the progress of this system and to secure life and property as a small craft warning and high surf advisory remains in effect.

# Hurricane Tracking Map



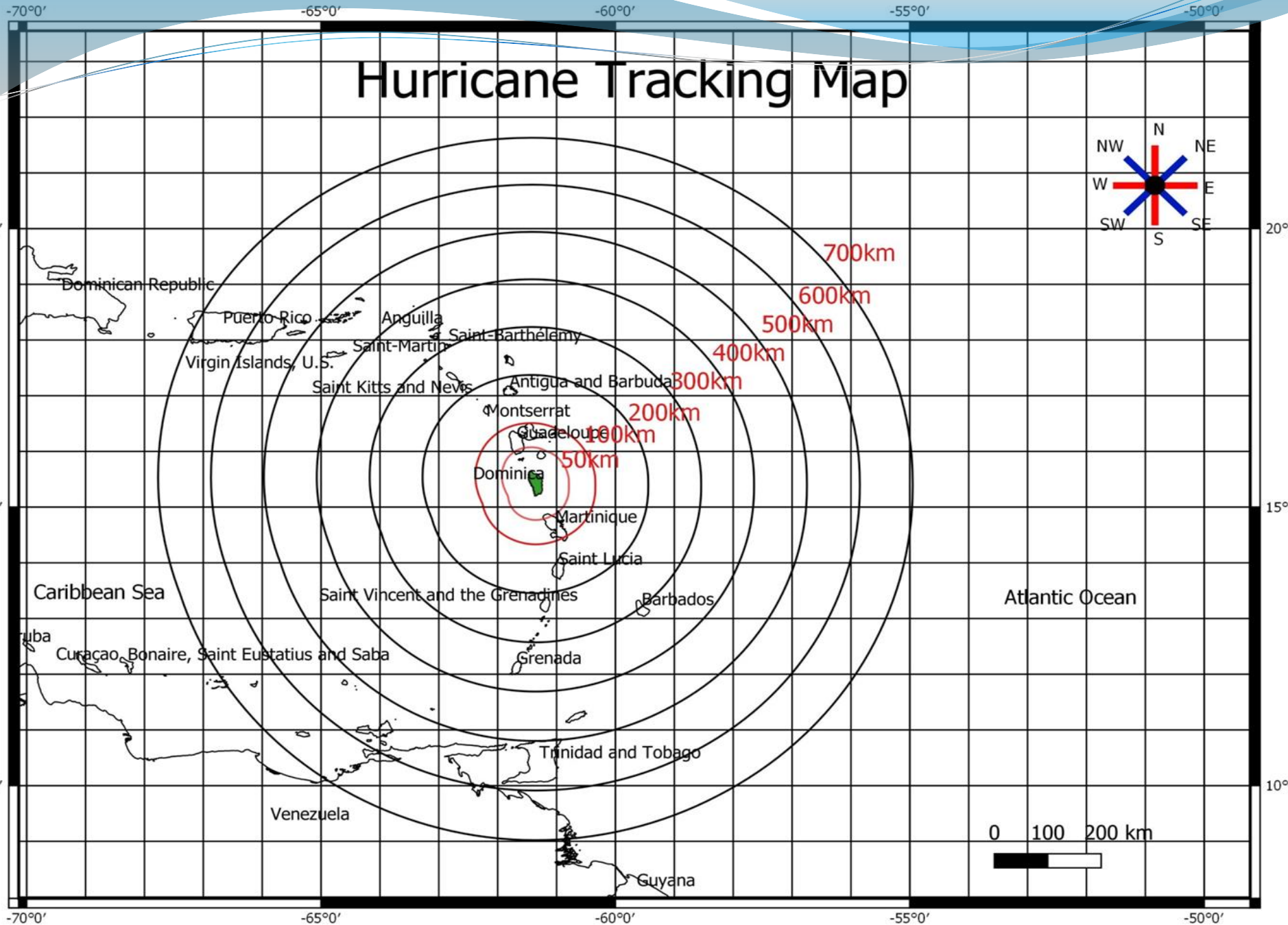
-60°0'

-55°0'

-50°0'

-45°0'

# Hurricane Tracking Map



# Hurricane Tracking Exercise

## Hurricane MARIA

ZCZC MIATCPAT5 ALL  
TTAA00 KNHC DDHHMM

### BULLETIN

Hurricane Maria Advisory Number 7  
NWS National Hurricane Center Miami FL AL152017  
1100 PM AST Sun Sep 17 2017

...MARIA FORECAST TO BECOME A MAJOR HURRICANE AS IT MOVES NEAR  
THE LEEWARD ISLANDS...

SUMMARY OF 1100 PM AST...0300 UTC...INFORMATION

-----  
LOCATION...14.2N 58.4W  
ABOUT 100 MI...165 KM NE OF BARBADOS  
ABOUT 210 MI...340 KM ESE OF DOMINICA  
MAXIMUM SUSTAINED WINDS...85 MPH...140 KM/H  
PRESENT MOVEMENT...WNW OR 290 DEGREES AT 13 MPH...20 KM/H  
MINIMUM CENTRAL PRESSURE...979 MB...28.91 INCHES

# Hurricane Tracking Exercise

## Hurricane MARIA

ZCZC MIATCPAT5 ALL  
TTAA00 KNHC DDHHMM

### BULLETIN

Hurricane Maria Advisory Number 8  
NWS National Hurricane Center Miami FL AL152017  
500 AM AST Mon Sep 18 2017

...MARIA HEADED FOR THE LEEWARD ISLANDS...  
...EXPECTED TO BECOME A MAJOR HURRICANE BY TONIGHT OR EARLY  
TUESDAY...

SUMMARY OF 500 AM AST...0900 UTC...INFORMATION  
-----

LOCATION...14.6N 59.5W  
ABOUT 100 MI...160 KM E OF MARTINIQUE  
ABOUT 130 MI...215 KM ESE OF DOMINICA  
MAXIMUM SUSTAINED WINDS...90 MPH...150 KM/H  
PRESENT MOVEMENT...WNW OR 290 DEGREES AT 13 MPH...20 KM/H  
MINIMUM CENTRAL PRESSURE...977 MB...28.85 INCHES



# Hurricane Tracking Exercise

## Hurricane MARIA

ZCZC MIATCPAT5 ALL  
TTAA00 KNHC DDHHMM

### BULLETIN

Hurricane Maria Advisory Number 9  
NWS National Hurricane Center Miami FL AL152017  
1100 AM AST Mon Sep 18 2017

...MARIA RAPIDLY INTENSIFIES INTO A MAJOR HURRICANE...  
...THE EYE IS EXPECTED TO MOVE THROUGH THE LEEWARD ISLANDS LATE THIS  
AFTERNOON OR THIS EVENING...

SUMMARY OF 1100 AM AST...1500 UTC...INFORMATION

-----  
LOCATION...14.7N 60.1W  
ABOUT 60 MI...95 KM E OF MARTINIQUE  
ABOUT 95 MI...150 KM ESE OF DOMINICA  
MAXIMUM SUSTAINED WINDS...120 MPH...195 KM/H  
PRESENT MOVEMENT...WNW OR 285 DEGREES AT 10 MPH...17 KM/H  
MINIMUM CENTRAL PRESSURE...959 MB...28.32 INCHES

# Hurricane Tracking Exercise

## Hurricane MARIA

ZCZC MIATCPAT5 ALL  
TTAA00 KNHC DDHHMM

### BULLETIN

Hurricane Maria Advisory Number 10  
NWS National Hurricane Center Miami FL AL152017  
500 PM AST Mon Sep 18 2017

...MARIA BECOMES AN EXTREMELY DANGEROUS CATEGORY 4 HURRICANE...  
...THE EYE AND THE INTENSE INNER CORE IS EXPECTED TO PASS NEAR  
DOMINICA DURING THE NEXT FEW HOURS...

### SUMMARY OF 500 PM AST...2100 UTC...INFORMATION

-----

LOCATION...15.1N 60.7W  
ABOUT 45 MI...70 KM ESE OF DOMINICA  
ABOUT 35 MI...55 KM NE OF MARTINIQUE  
MAXIMUM SUSTAINED WINDS...130 MPH...215 KM/H  
PRESENT MOVEMENT...WNW OR 290 DEGREES AT 9 MPH...15 KM/H  
MINIMUM CENTRAL PRESSURE...950 MB...28.06 INCHES

# Hurricane Tracking Exercise

## Hurricane MARIA

ZCZC MIATCPAT5 ALL  
TTAA00 KNHC DDHHMM

### BULLETIN

Hurricane Maria Special Advisory Number 11  
NWS National Hurricane Center Miami FL AL152017  
800 PM AST Mon Sep 18 2017

...MARIA BECOMES A POTENTIALLY CATASTROPHIC CATEGORY 5 HURRICANE...  
...THE EYE AND THE INTENSE INNER CORE IS NEARING DOMINICA...

SUMMARY OF 800 PM AST...0000 UTC...INFORMATION

-----  
LOCATION...15.3N 61.1W  
ABOUT 15 MI...25 KM ESE OF DOMINICA  
ABOUT 40 MI...70 KM N OF MARTINIQUE  
MAXIMUM SUSTAINED WINDS...160 MPH...260 KM/H  
PRESENT MOVEMENT...WNW OR 300 DEGREES AT 9 MPH...15 KM/H  
MINIMUM CENTRAL PRESSURE...925 MB...27.32 INCHES

# Hurricane Tracking Exercise

## Hurricane MARIA

ZCZC MIATCPAT5 ALL  
TTAA00 KNHC DDHHMM

### BULLETIN

Hurricane Maria Advisory Number 12  
NWS National Hurricane Center Miami FL AL152017  
1100 PM AST Mon Sep 18 2017

...EYE OF CATEGORY 5 HURRICANE MARIA MOVING OVER DOMINICA...

SUMMARY OF 1100 PM AST...0300 UTC...INFORMATION

-----  
LOCATION...15.5N 61.4W  
ABOUT 0 MI...0 KM NW OF DOMINICA  
ABOUT 270 MI...435 KM SE OF ST. CROIX  
MAXIMUM SUSTAINED WINDS...160 MPH...260 KM/H  
PRESENT MOVEMENT...WNW OR 300 DEGREES AT 9 MPH...15 KM/H  
MINIMUM CENTRAL PRESSURE...924 MB...27.29 INCHES

# 2021 Tropical Cyclone names

<b>Ana</b>	<b>Kate</b>
<b>Bill</b>	<b>Larry</b>
<b>Claudette</b>	<b>Mindy</b>
<b>Danny</b>	<b>Nicholas</b>
<b>Elsa</b>	<b>Odette</b>
<b>Fred</b>	<b>Peter</b>
<b>Grace</b>	<b>Rose</b>
<b>Henri</b>	<b>Sam</b>
<b>Ida</b>	<b>Teresa</b>
<b>Julian</b>	<b>Victor</b>
<b>Wanda</b>	

# Important reminders...

- The first and most important thing anyone should do when facing a hurricane/tropical storm threat is to USE COMMON SENSE.
- DO NOT listen to rumor...get the FACTS from the RELIABLE SOURCE.
- PREPARE for the WORST and PRAY for the BEST.

# Focus ...

History teaches that a lack of hurricane awareness and preparation are common threads among all major hurricane disasters. By knowing your vulnerabilities and what actions you should take, you can reduce the effects of a hurricane disaster.

It is essential that we are **READY** before a storm approaches.

“Preparation is paramount  
regardless of  
seasonal outlook”

# Thank You!





