



Tropical Cyclone Maria (AL152017)

Wind and Storm Surge

Preliminary Event Briefing

Leeward Islands

21 September 2017

1 SUMMARY

Maria is the fifteen named storm of the 2017 Atlantic Hurricane Season. It formed as a tropical storm on 16 September at 2100UTC, east-southeast of the Lesser Antilles and it was upgraded to hurricane status on 17 September at 2100UTC. Maria intensified moving across the Atlantic Ocean and reached the Leeward Islands near Dominica as a major hurricane (category 5) on 18 September at approximately 2345UTC.

This report presents the impacts of Maria on CCRIF member countries Antigua and Barbuda, Anguilla and St. Kitts and Nevis. Another Event Briefing Report will be issued for other CCRIF countries that are affected.

The preliminary runs of CCRIF's loss model for wind and storm surge produced government losses for Antigua and Barbuda, Anguilla and St. Kitts and Nevis. These losses were below the attachment point of these countries' TC policies but they activated the Aggregate Deductible Cover (ADC) for each policy. Preliminary calculations show that payouts are due to each country as follows:

Antigua and Barbuda (ADC)	US\$ 32,400
Anguilla (ADC)	US\$ 29,250
St. Kitts and Nevis (ADC)	US\$ 27,150
Total	US\$ 88,800

This event briefing is designed to review the CCRIF modelled losses from wind and storm surge but not rainfall. A separate briefing that addresses loss and damages from excess rainfall will be issued.

2 INTRODUCTION

On 16 September 2017 at 2100UTC, the US National Hurricane Center (NHC) reported that a tropical storm named Maria had developed over the far eastern Atlantic, with maximum sustained winds of 50 mph (85 km/h). In the next 24 hours, Maria moved toward the west-northwest at almost 15 mph (24 km/h) and it rapidly intensified due to the favourable thermodynamic environment: low-shear, humid layers and the passage over warm sea. At that time Maria was upgraded to a category 1 hurricane on the Saffir-Simpson Hurricane Wind Scale and was located at 13.8N, 57.5W. It featured maximum sustained winds of 75 mph (120 km/h), and the estimated minimum pressure was 982 mb (Figure 1).

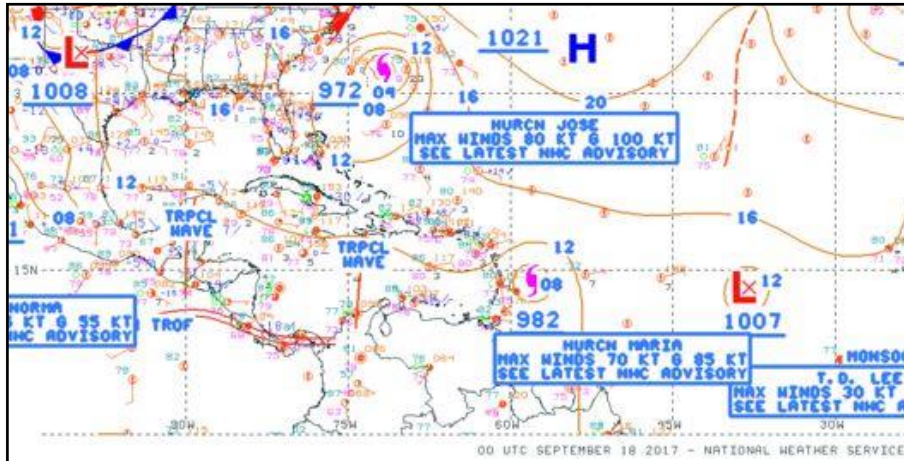
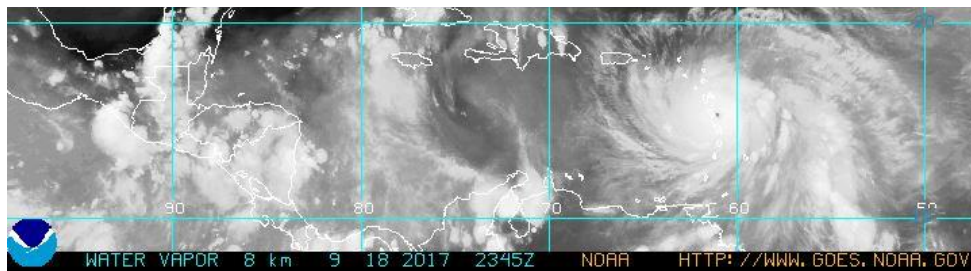
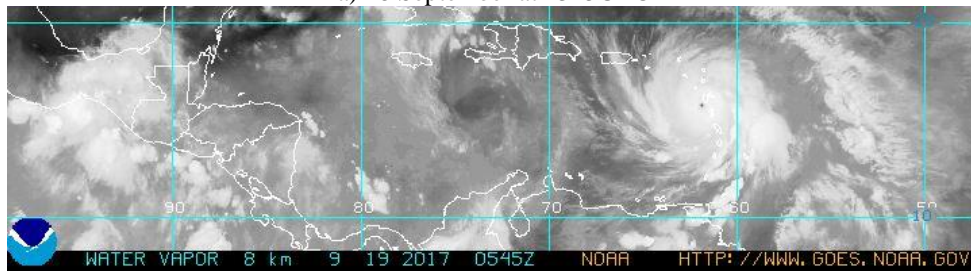


Figure 1 Surface analysis of the tropical Atlantic on 18 September 00UTC. Source: NOAA Ocean Prediction Center

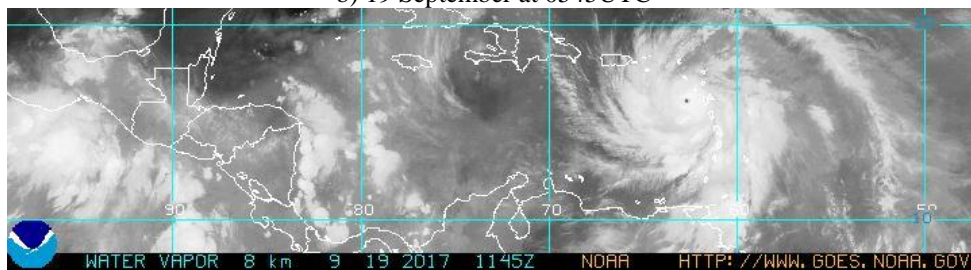
On 19 September at approximately 0900UTC, Maria, previously upgraded to a category 5 hurricane, headed for the Virgin Islands and Puerto Rico with maximum sustained winds of 150 mph (250 km/h). At that time, the eye of the hurricane was located near 16.0N, 62.3W and the hurricane structure was well defined, showing a clear eye and a symmetrical cloud with an overcast ring around it, with very high top cloud (Figure 2b and Figure 2c).



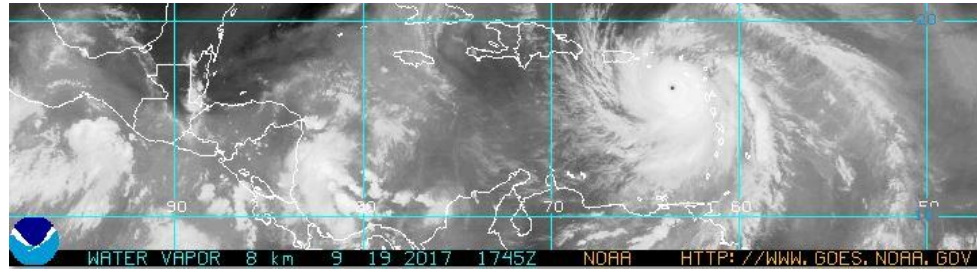
a) 18 September at 2345UTC



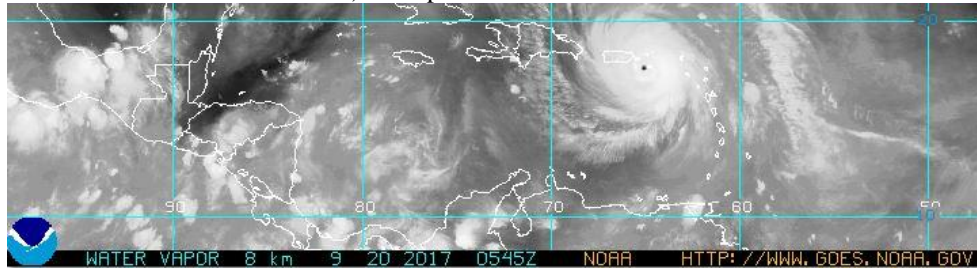
b) 19 September at 0545UTC



c) 19 September at 1145UTC



d) 19 September at 1745UTC



e) 20 September at 0545UTC

Figure 2 Maria's evolution over Leeward Islands. Source: <https://www.goes.noaa.gov/>

At 2045UTC, Maria (as a potentially catastrophic category 5 hurricane) was located south-east of the U.S. Virgin Islands and east-southeast of Puerto Rico with maximum sustained winds of almost 165 mph (270 km/h) with higher gusts. The system was moving toward the west-northwest at almost 10 mph (17 km/h) and the minimum central pressure reported by the National Hurricane Center was 916 mb (Figure 3).

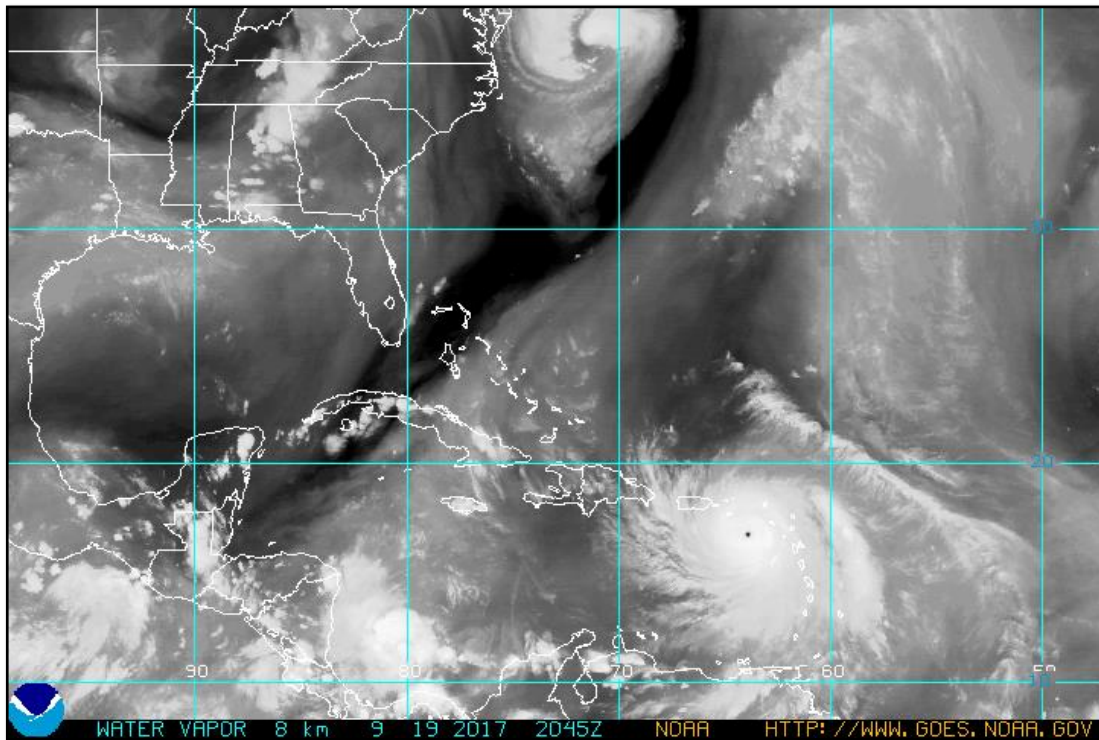


Figure 3 GOES infrared satellite image on 19 September at 2045UTC. Source: <https://www.goes.noaa.gov/>

After 24 hours, at 2100UTC, the centre of Maria passed over Puerto Rico, also affecting the U.S. Virgin Islands, Dominican Republic and Leeward Islands with tropical-storm-force winds. Maria affected Puerto Rico with hurricane-force winds; the National Hurricane Center reported that the maximum sustained winds were almost 140 mph (220 km/h) (Figure 4).

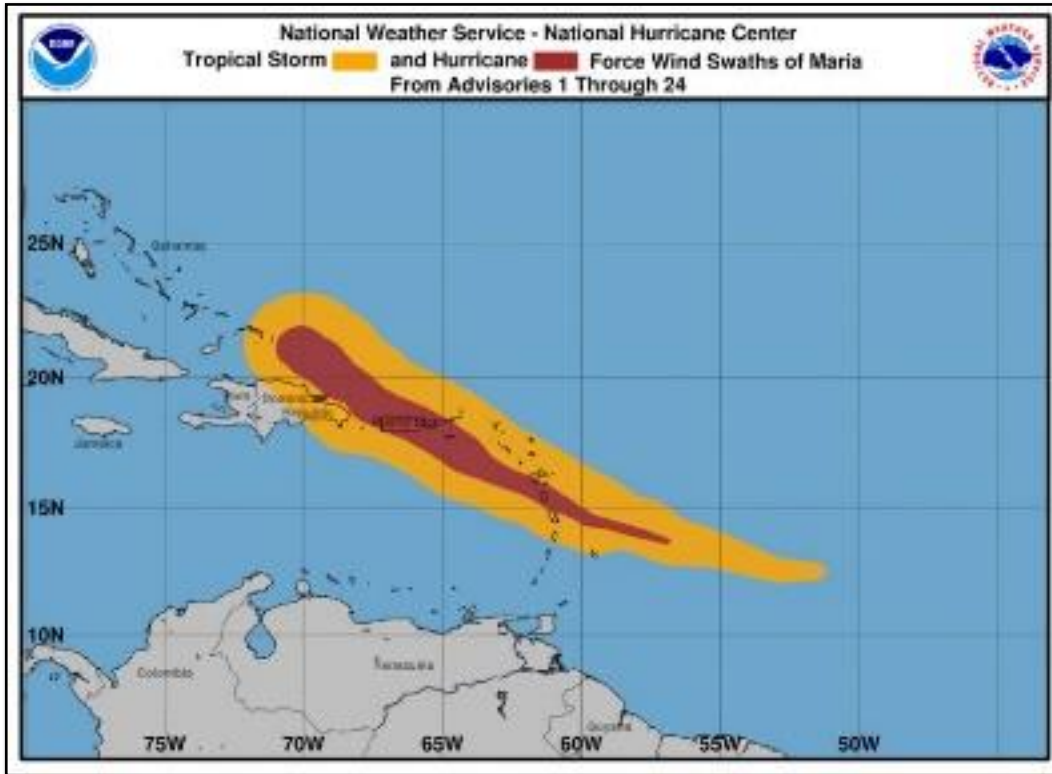


Figure 4 Maria's track and contouring of the wind speed intensity. Source: NHC

At the time of this report, Maria is forecasted to affect the Turks and Caicos Islands and some regions of The Bahamas before finally dissipating. An additional Event Briefing Report will be issued for the CCRIF countries affected.

3 CCRIF SPC MODEL OUTPUTS

Under CCRIF's loss calculation protocol, a CCRIF Multi-Peril Risk Estimation System (MPRES) report is required for any tropical cyclone affecting at least one member country with winds greater than 39 mph (62.7 km/h). For Antigua and Barbuda, Anguilla and St. Kitts and Nevis, Tropical Cyclone Maria qualified as a Triggering Event¹ by Deductible Cover (Endorsement).

The wind footprint (Figure 5, Figure 7 and Figure 9) and surge field (Figure 6, Figure 8 and Figure 10) are two of the outputs from the CCRIF model. These figures show the regions affected by different magnitudes of wind velocity and storm surge in each country.

¹ An event occurs and triggers one or more policies.

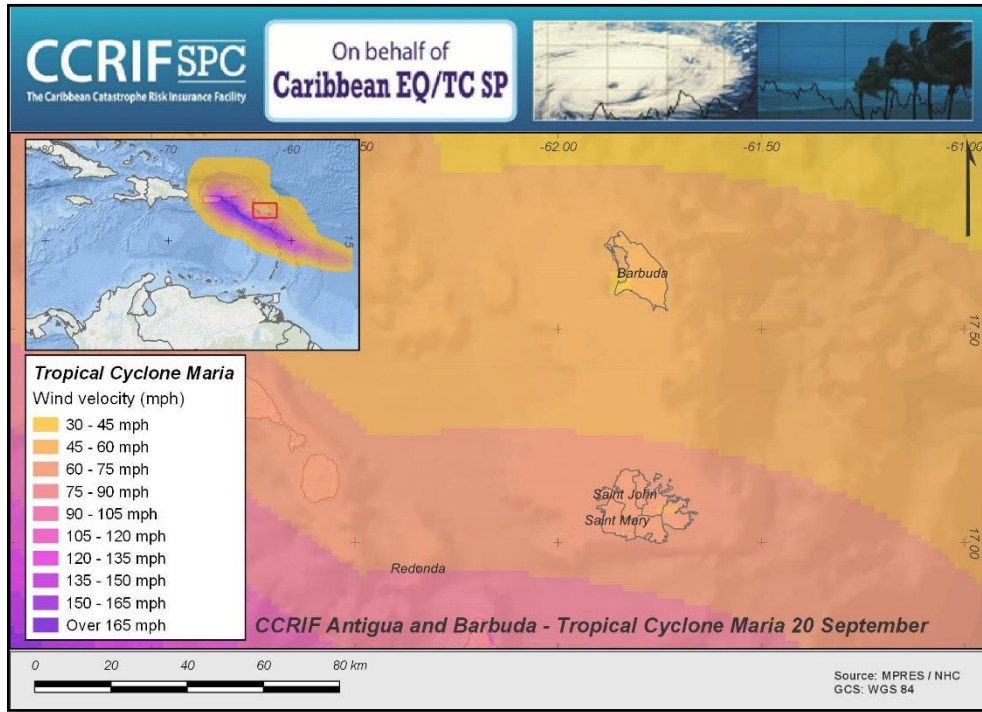


Figure 5 Map showing the wind field associated with Tropical Cyclone Maria on Antigua and Barbuda.
Source: NHC & CCRIF/MPRES

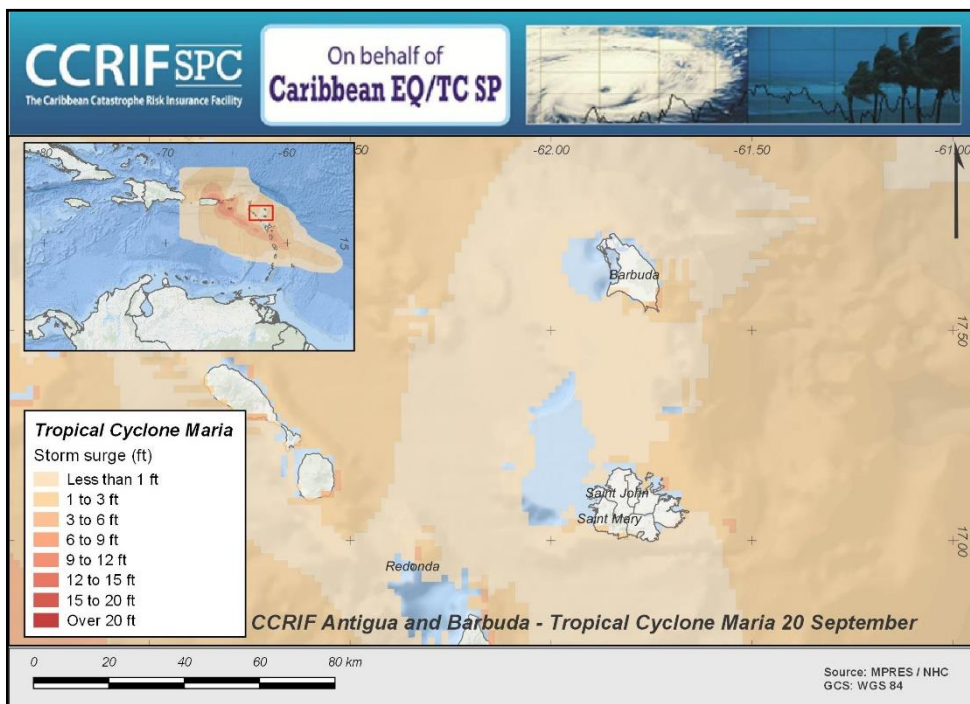


Figure 6 Map showing the storm surge field associated with Tropical Cyclone Maria on Antigua and Barbuda.
Source: NHC & CCRIF/MPRES

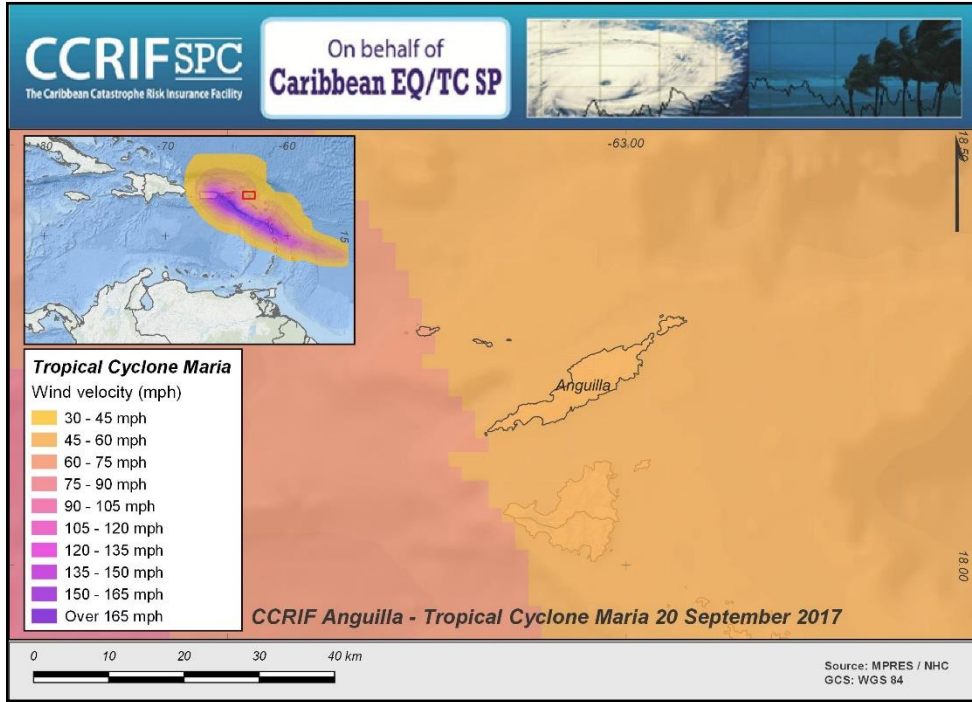


Figure 7 Map showing the wind field associated with Tropical Cyclone Maria on Anguilla.
Source: NHC & CCRIF/MPRES

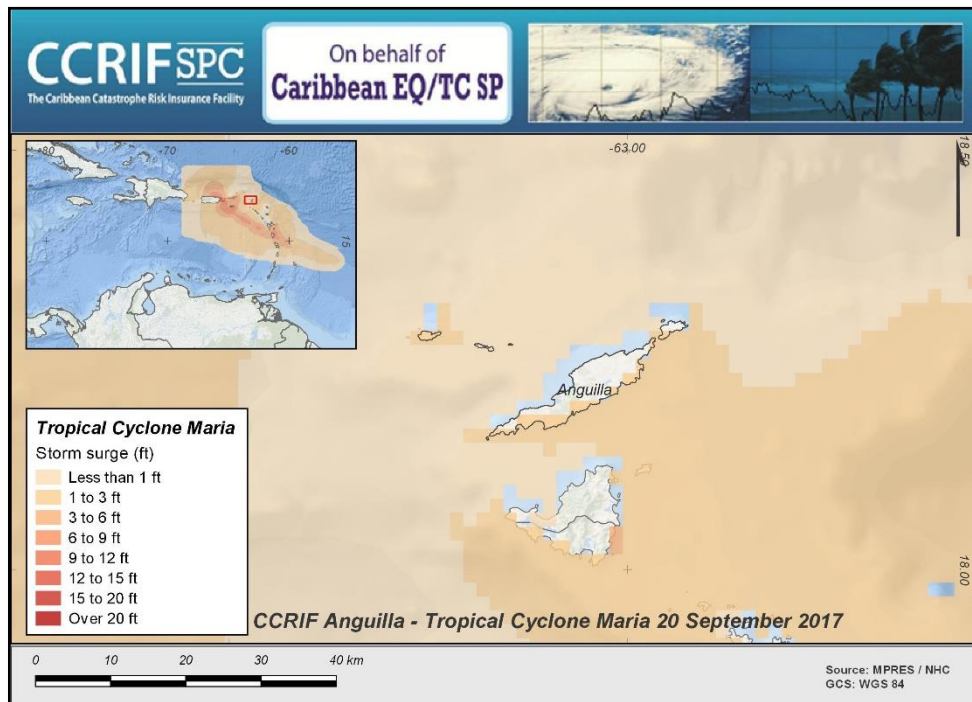


Figure 8 Map showing the storm surge field associated with Tropical Cyclone Maria on Anguilla.
Source: NHC & CCRIF/MPRES

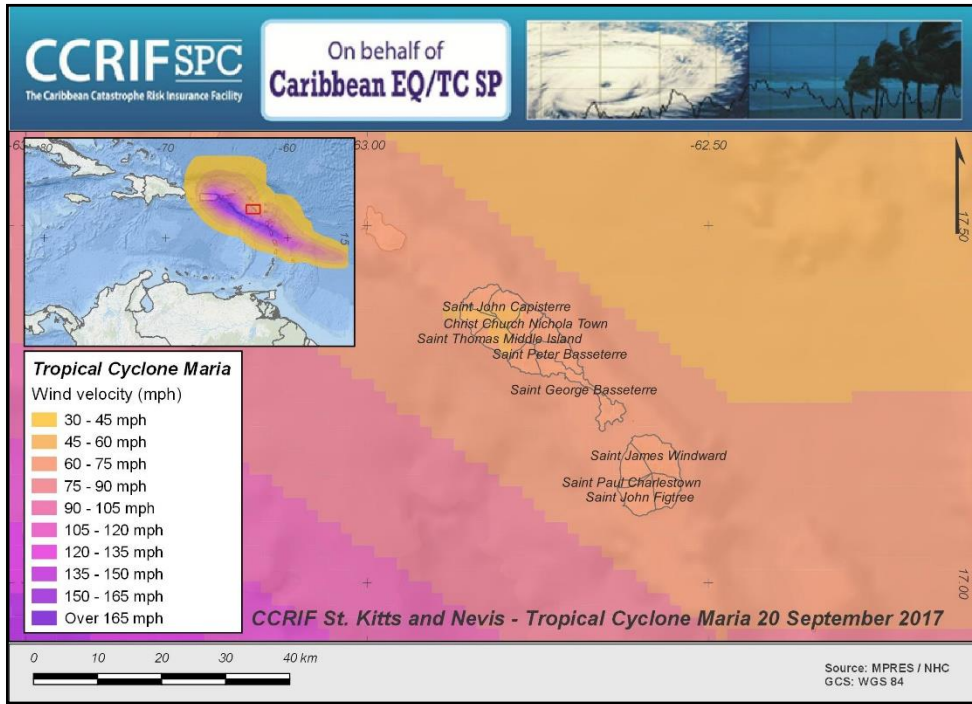


Figure 9 Map showing the wind field associated with Tropical Cyclone Maria on St. Kitts and Nevis.
Source: NHC & CCRIF/MPRES

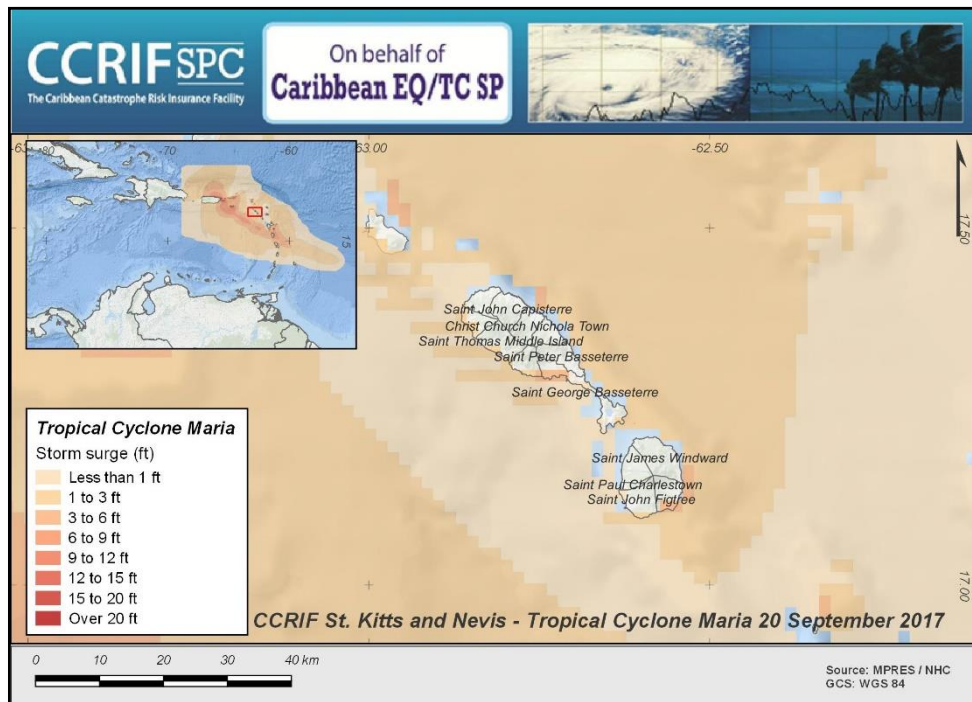


Figure 10 Map showing the storm surge field associated with Tropical Cyclone Maria on St. Kitts and Nevis.
Source: NHC & CCRIF/MPRES

4 IMPACTS

In Antigua and Barbuda, Anguilla and St. Kitts and Nevis, it is difficult to evaluate the impacts of Hurricane Maria and to differentiate those from the impacts of hurricanes Irma and Jose. The passage of Irma, the most powerful Atlantic Ocean hurricane in recorded history, left total devastation with regard to these islands as reported by authorities of these nations.

Antigua and Barbuda

At the time of this report, according to Caribbean Times News (local news), Antigua and Barbuda experienced only some minor wind damage in Hurricane Maria. There were a number of fallen trees and utility poles, flooded buildings. Barbuda did not report any additional damage from Maria.

Anguilla

At the time of this report, Mr. Trevor Queeley, a member of the Anguilla Red Cross, reported that fortunately Anguilla experienced only the outer edges of Hurricane Maria and that the island did not have any reports of injuries.

St. Kitts and Nevis

According to the initial reports and assessments provided by the Caribbean Disaster Emergency Management Agency (CDEMA), there was damage to housing and agriculture and electric poles were damaged and trees uprooted. The whole island was without electricity.

Prior to the arrival of Hurricane Maria, St. Kitts and Nevis' authorities took precautionary measures, including closing schools, business and government offices and opening eleven shelters for approximately 100 evacuees.

5 CCRIF LOSS MODEL

Modelled losses due to wind and storm surge and any resultant payouts are based on the conditions selected by member countries for their Tropical Cyclone policies.

The preliminary runs of CCRIF's loss model for wind and storm surge produced government losses for Antigua and Barbuda, Anguilla and St. Kitts and Nevis. These losses were below the attachment point of these countries' TC policies but they activated the Aggregate Deductible Cover (ADC) for each policy. Preliminary calculations show that payouts are due to each country as follows:

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Total	US\$ 88,800

CCRIF expresses sympathy with the Government and people of Antigua and Barbuda, Anguilla and St. Kitts and Nevis for the impacts on communities and infrastructure caused by this event.

For further information, please contact ERN-RED, the CCRIF SPC Risk Management Specialist.

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