

Tropical Cyclone MATTHEW (AL142016)

Wind and Storm Surge

Preliminary Event Briefing

Windward Islands and Barbados

4 October 2016

1 SUMMARY

Matthew is the 13th named storm of the 2016 Atlantic hurricane season and was formed as a Tropical Storm near the Windward Islands on 28 September 2016. TS Matthew affected five CCRIF member countries: Barbados, Dominica, Grenada, Saint Lucia and St. Vincent & the Grenadines on 28 September. Heavy rains and strong winds were experienced in these countries over a period of 24 hours, resulting in flooding, landslides and some damage to infrastructure.

The preliminary runs of CCRIF's loss model for wind and storm surge produced no government losses in Grenada and Dominica and some government losses in Barbados, Saint Lucia and St. Vincent & the Grenadines. In Saint Lucia and St. Vincent & the Grenadines the loss values were below the attachment values for each country's Tropical Cyclone policy and therefore no payout is due. However, for Barbados the modelled loss was above its Tropical Cyclone policy's attachment point, and preliminary calculations show that a payout of US\$975,000 is due.

Tropical Cyclone policies are designed to cover damages from wind and storm surge but not rainfall. The five member countries affected by Hurricane Matthew also have policies for Excess Rainfall. CCRIF will issue a separate excess rainfall report that describes potential triggering of their Excess Rainfall policies from rain that occurred during Matthew.

Another tropical cyclone report (and excess rainfall report) that describes potential impacts on other CCRIF member countries will be issued after Hurricane Matthew completes its movement through the Caribbean

2 INTRODUCTION

On 28 September 2016, 1500 UTC the National Hurricane Center (NHC) reported that a Tropical Storm had developed in the Windward Islands (Lesser Antilles) and was named Matthew, the 13th storm of the 2016 Atlantic Hurricane Season. The Government of Barbados issued a Tropical Storm Warning¹ for Barbados and the Government of Saint Lucia issued a Tropical Storm Warning for Saint Lucia. The storm was located at 13.4° N and 60.7° W, approximately 35 mi (55 km) SE of Saint Lucia, 35 mi (55 km) ENE of St. Vincent with maximum sustained winds of 60 mph (95 km/h).

¹ A Tropical Storm Warning means that tropical storm conditions are expected somewhere the warning area within 36 hours.

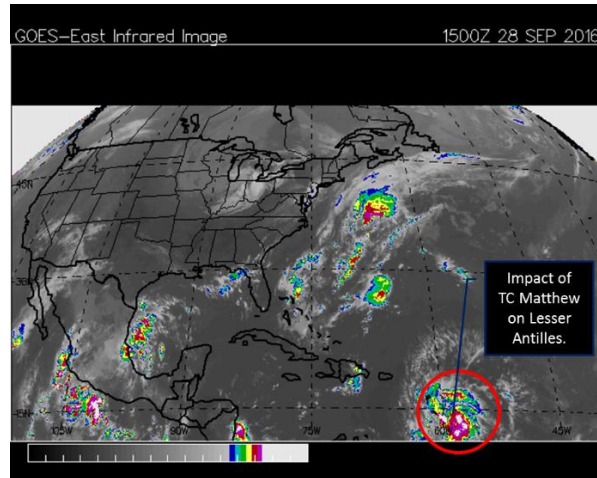


Figure 1 Satellite image of Tropical Storm Matthew impacting in Lesser Antilles

At 1800 UTC Tropical Storm conditions were felt across wide portions of the Lesser Antilles and Matthew was located at 13.6° N and 61.3° W, approximately 25 mi (40 km) SW of Saint Lucia and 20 mi (35 km) NNW of St. Vincent with maximum sustained winds of 60 mph (95 km/h).

At 0000 UTC on 29 September Tropical Storm Matthew was still battering the Lesser Antilles during this westward movement, strengthening across the Eastern Caribbean. Matthew was located 13.9° N and 62.4° W, approximately 90 mi (145 km) W of Saint Lucia and with maximum sustained winds of 65 mph (100 km/h).

At 0600 UTC Matthew moved through the eastern Caribbean Sea and away from the Lesser Antilles.

At 1800 UTC on 29 September, at Hurricane strength, Matthew was located at 14.2° N and 67.0°W, approximately 190 mi (300 km) NE of Curacao, with maximum sustained winds of 75 mph (120 km/h).

At 0600 UTC on 30 September Matthew developed into a Category 2 Hurricane, the center of Hurricane Matthew was located at 14.1°N and 69.3°W, approximately 565 mi (910 km) ESE of Kingston, Jamaica and maximum sustained winds of 100 mph (155 km/h).

At 1500 UTC Hurricane Matthew reached major hurricane strength (\geq category 3) and the center was located at 13.7°N and 70.8°W, approximately 495 mi (800 km) SE of Kingston Jamaica, with maximum sustained winds of 115 mph (185 km/h).

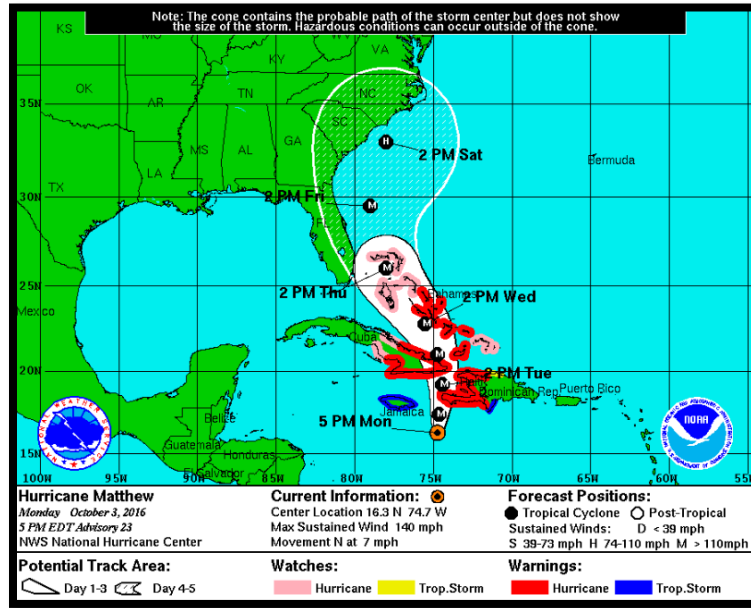


Figure 2 NHC Probability trajectory on 3 October at 1800 UTC. Source: National Hurricane Center (NHC)

At 2100 UTC Matthew rapidly strengthened to a powerful category 4 Hurricane. The Government of Jamaica issued a Hurricane Watch² for Jamaica and a Tropical Storm Watch was issued for the southwestern coast of Haiti. Matthew was located at 13.5°N and 71.6°W, approximately 465 mi (750 km) SE of Kingston, Jamaica with a maximum sustained winds of 140 mph (220 km/h).

At 0300 UTC on 1 October Matthew became a Category 5 Hurricane³ and was located at 13.3°N and 72.3°W, approximately at 440 mi (710 km) SE of Kingston, Jamaica with maximum sustained winds of 160 mph (260 km/h).

At 0900 UTC Matthew was downgraded to a Category 4 Hurricane and a Hurricane Warning was issued for Jamaica and Haiti.

At 1800 UTC on 3 October Matthew was moving Northward still at category 4 strength, and was located at 15.9°N and 74.8°W, approximately 250 mi (400 km) SW of Port-au-Prince, Haiti and 195 mi (315 km) SE of Kingston, Jamaica with maximum sustained winds of 140 mph (220 km/h).

A Hurricane Warning was in effect for Jamaica, Haiti, eastern provinces of Cuba and the south-eastern Bahamas.

² Hurricane Watch means that hurricane conditions are possible within the watch area.

³ Strongest Hurricane in the Atlantic since Felix in 2007.

At 1200 UTC on 4 October, the extremely dangerous Hurricane Matthew made landfall in Haiti, near Les Anglais as a Category 4 hurricane, located at 18.4°N and 74.2°W approximately 10 mi (15 km) E of Tiburon, Haiti and approximately 125 mi (200 km) S of the eastern tip of Cuba, with maximum sustained winds of 145 mph (230 km/h).

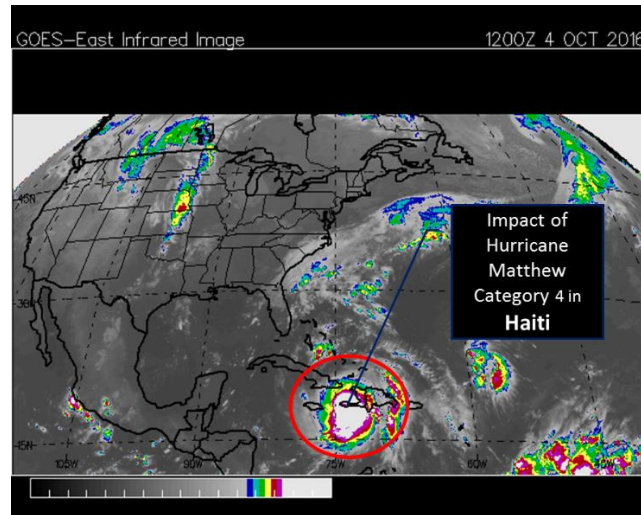


Figure 3 Satellite image of Hurricane Matthew impacting on Haiti

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 km/h). Tropical Cyclone Matthew qualified as a Triggering Event⁴ with Barbados, which experienced Tropical Storm force winds. For Saint Lucia and St. Vincent & the Grenadines, TC Matthew qualified as a Loss Event⁵ and for Dominica and Grenada the Event qualified as a Reportable Event⁶. The wind footprint (Figure 3) and surge field (Figure 9) are two of the outputs from the CCRIF model and show the regions affected by certain magnitudes of wind velocity and storm surge. Figures 4-8 show in detail the wind footprint of TC Matthew in each country and Figures 10-12 show the storm field footprint in detail for each country.

⁴ Triggering Event. Any Tropical Cyclone event which produces a modelled loss sufficiently high to trigger a payout under the CCRIF policy conditions in one or more countries.

⁵ Loss Event. Any Tropical Cyclone event which produces a modelled loss of greater than zero in one or more countries.

⁶ Reportable Event. Any named Tropical Cyclone event which produces modelled winds in excess of 39mph over any territory of any CCRIF member but does not generate a modelled loss greater than zero.

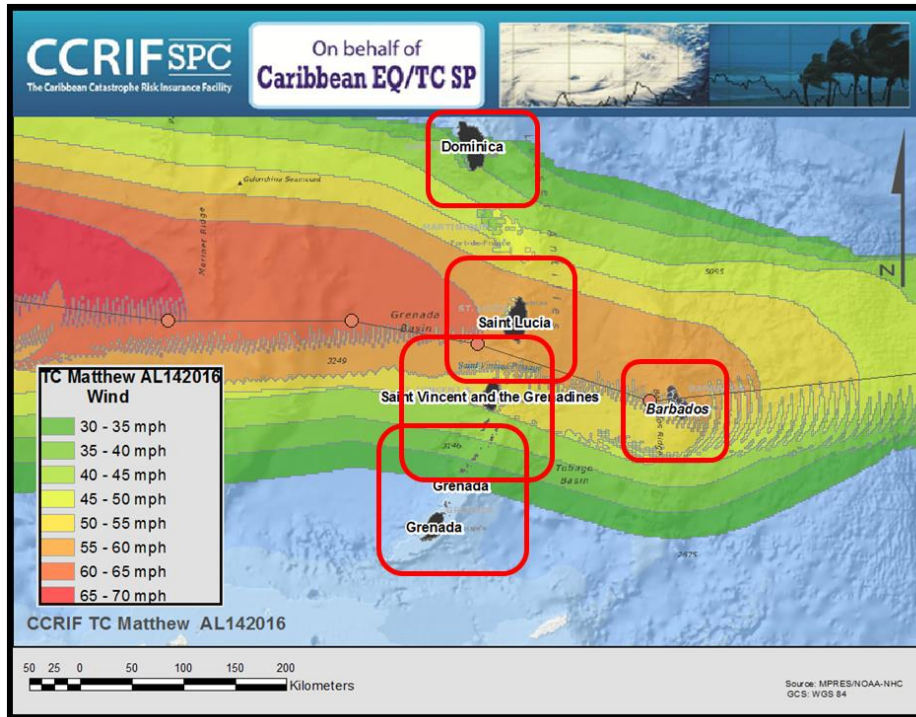


Figure 3 Map showing the path and wind field associated with Tropical Cyclone Matthew.

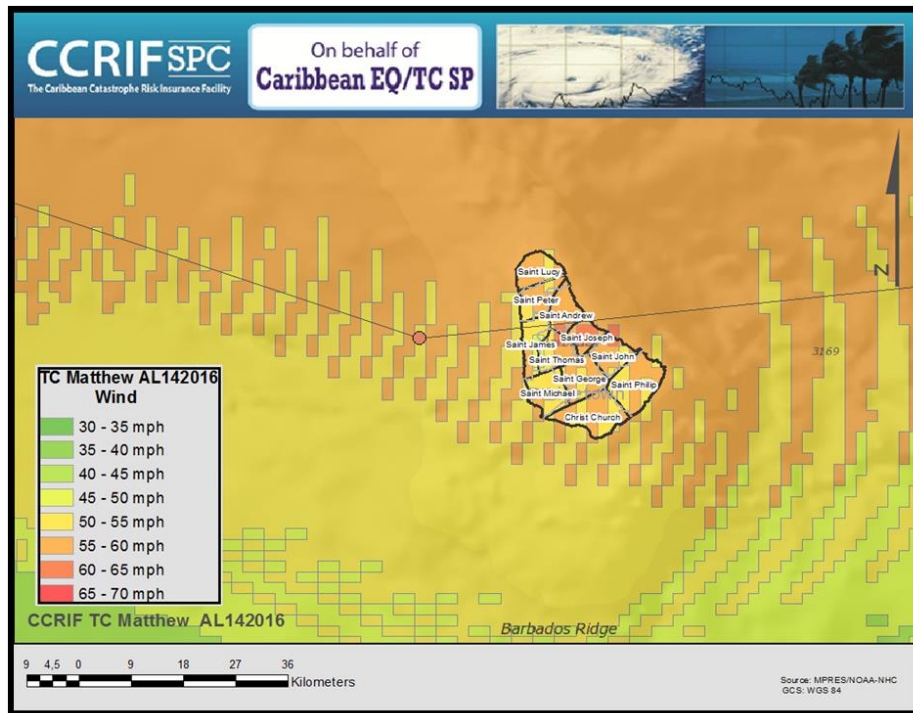


Figure 4 Map showing the path and wind field associated with Tropical Cyclone Matthew in Barbados.

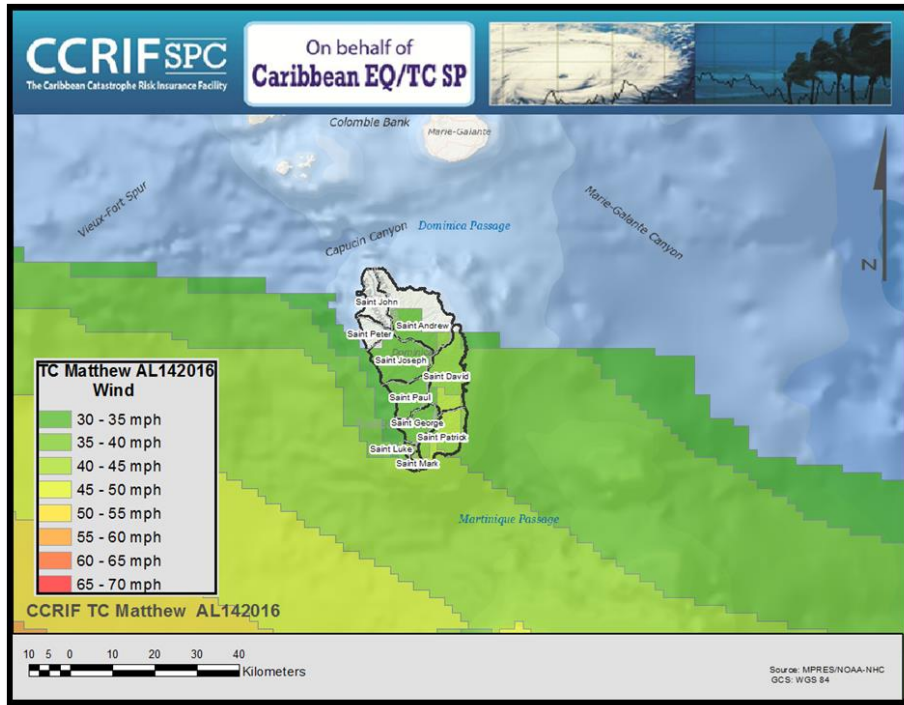


Figure 5 Map showing the path and wind field associated with Tropical Cyclone Matthew in Dominica.

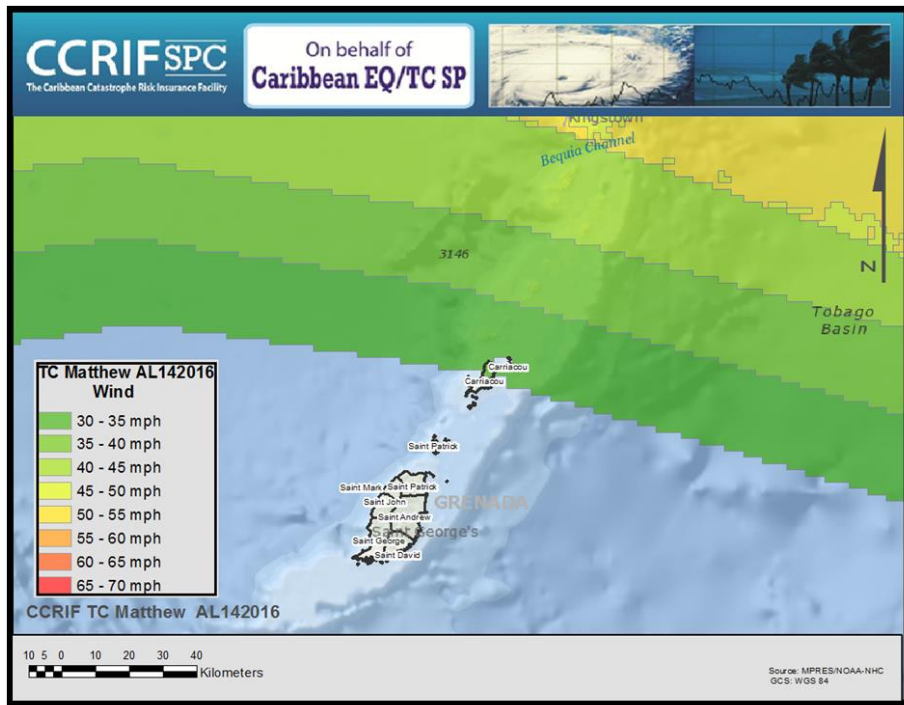


Figure 6 Map showing the path and wind field associated with Tropical Cyclone Matthew in Grenada.

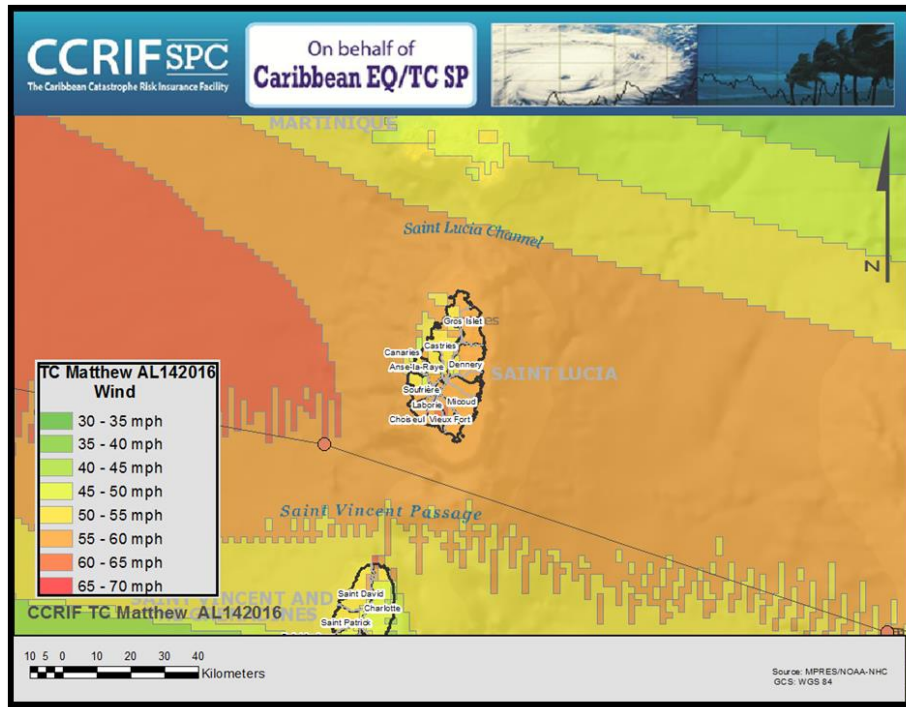


Figure 7 Map showing the path and wind field associated with Tropical Cyclone Matthew in Saint Lucia.

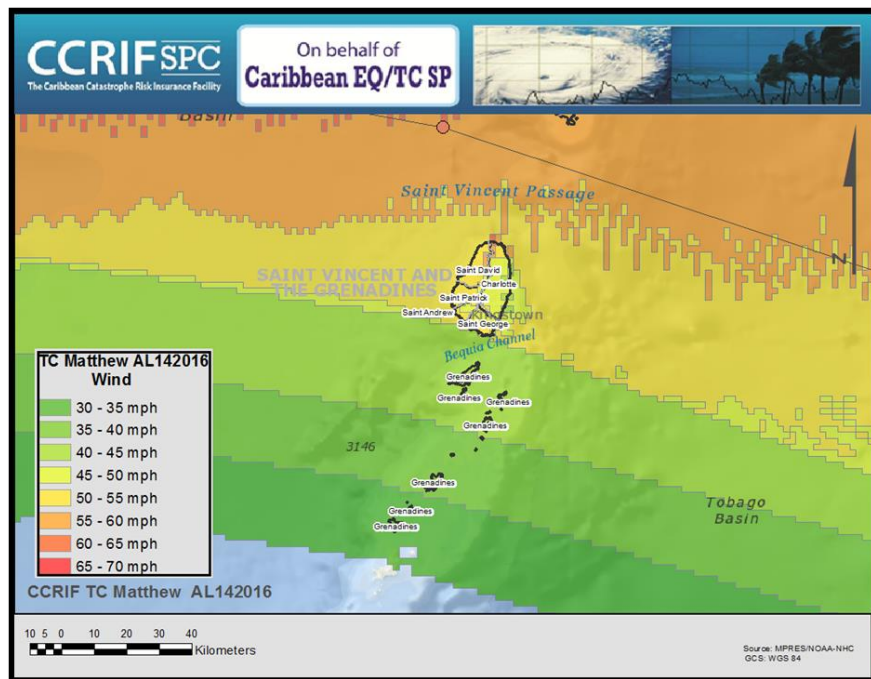


Figure 8 Map showing the path and wind field associated with Tropical Cyclone Matthew in Saint Vincent & the Grenadines.

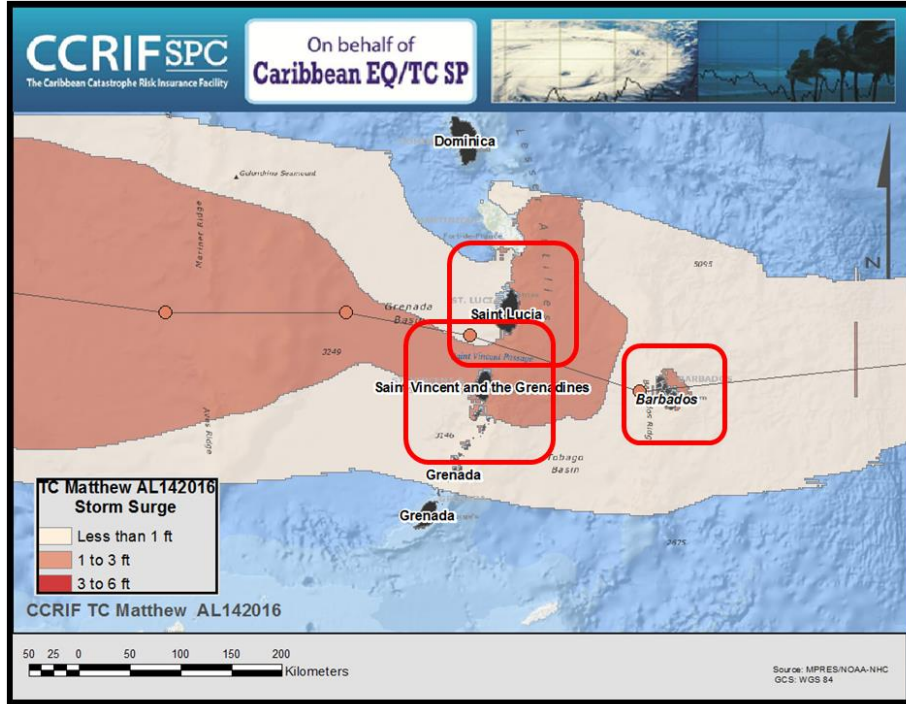


Figure 9 Map showing the path and Storm Surge field associated with Tropical Cyclone Matthew.

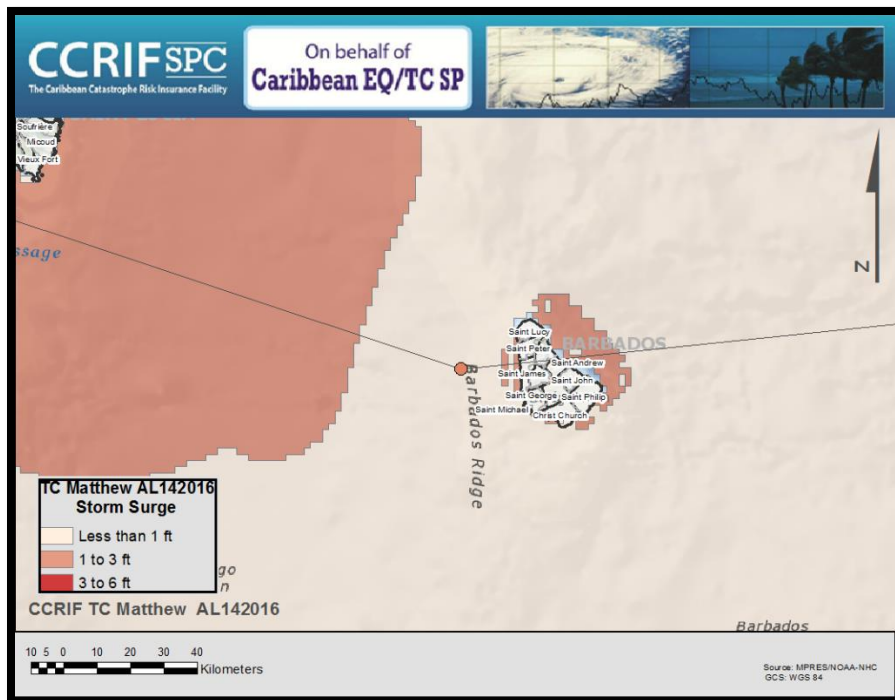


Figure 10 Map showing the path and Storm Surge field associated with Tropical Cyclone Matthew in Barbados.

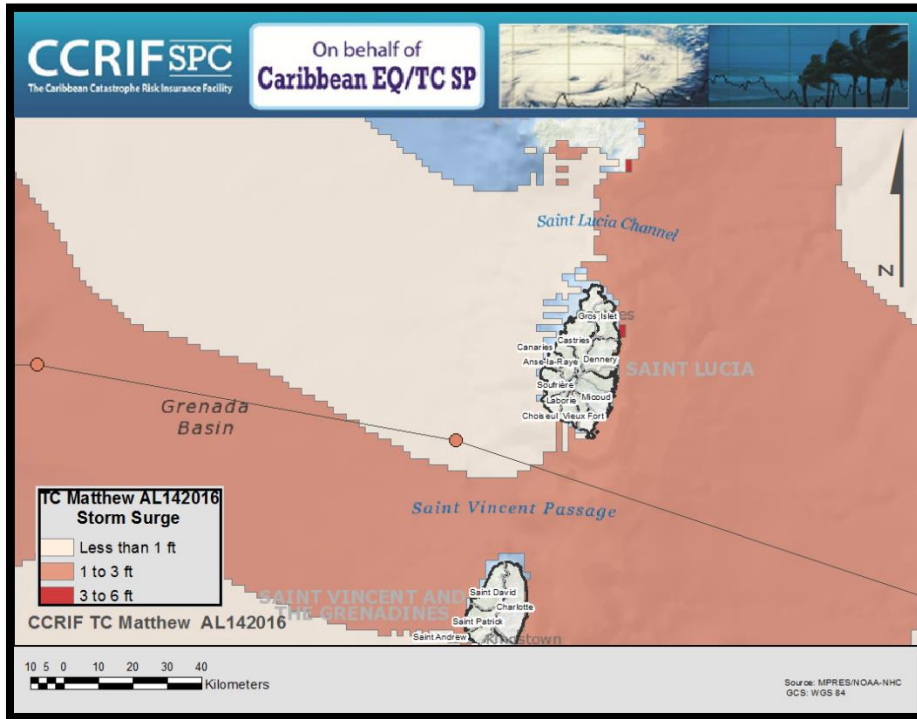


Figure 11 Map showing the path and Storm Surge field associated with Tropical Cyclone Matthew in Saint Lucia.

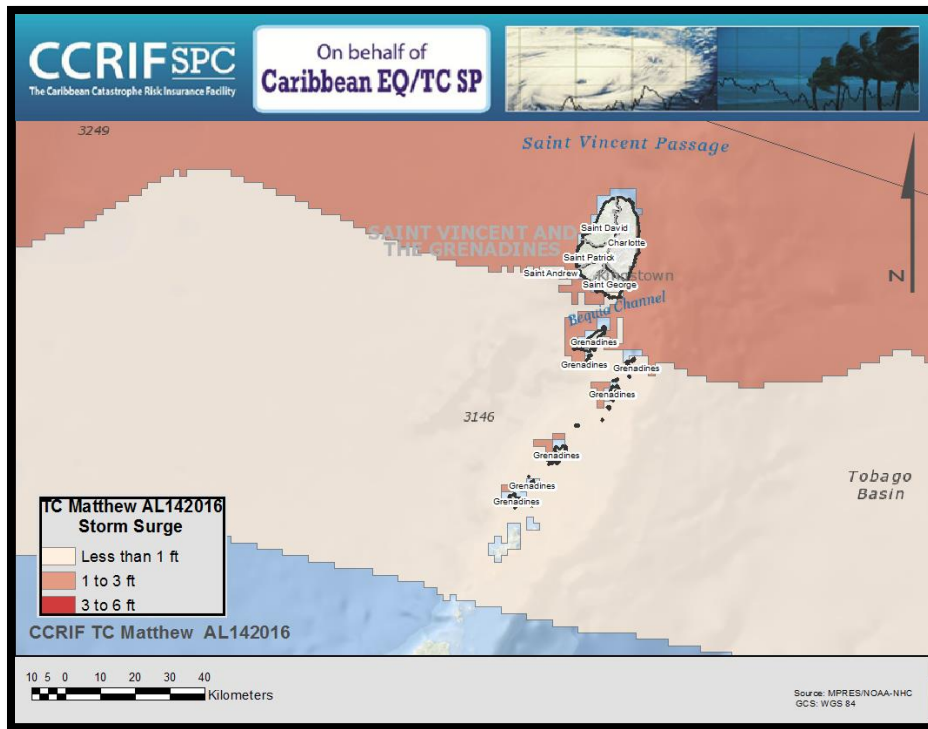


Figure 12 Map showing the path and Storm Surge field associated with Tropical Cyclone Matthew in Saint Vincent & the Grenadines.

3 IMPACTS

Barbados

According to the MPRES footprint, CCRIF member Barbados was affected by Tropical Storm force winds from Matthew, as the center of the Storm crossed over the country.

According to Barbados' Department of Emergency Management (DEM), all businesses closed at 6pm on 27 September, until the all clear declaration on the morning of 29 September. There were reports of fallen trees, power outages and water disruption in some parts of the island. According to ReliefWeb isolated floods were reported but the country did not report any additional damage.



Figure 13 Damage in Barbados. Source: Barbados today.bb

Dominica

According to the MPRES footprint, CCRIF member Dominica was affected by Tropical Storm force winds from Matthew, as the center of the storm crossed approximately 100 mi (160 km) S of the island.

According to Dominica's Office of Disaster Management, the country recorded floods across the East coast and minor landslides causing roadblocks. There are no reports of deaths, missing people or injuries due to TS Matthew.

Saint Lucia

According to the MPRES footprint, CCRIF member Saint Lucia was affected by Tropical Storm force winds from Matthew.

According to Saint Lucia's National Emergency Management Organization (NEMO), 6 shelters were opened and over 130 persons were accommodated during the passage of Tropical Storm Matthew. The event triggered a full activation of the National Emergency Operation Center (NEOC).

All areas of Saint Lucia reported some flooding overnight including Gros-Islet, Castries, Bexon, Dennery, Laborie Micoud, Choiseul, and Vieux-Fort. Landslides occurred in Ti Kaye in Anse-la-Raye, La Caye, Upper Thomazo, and Aux-Lyions in Dennery.

The preliminary assessments indicated that the agricultural sector was the most heavily hit with as much as 85% of farms experiences damages, followed by the water sector, electricity and communication services.

Infrastructure

- There were numerous reports of downed power lines. At the time of this report, 98 per cent of the Saint Lucia Electricity Services have been partially restored.
- Hotels experienced power outages.
- Power outages affected operations of the Water and Sewerage Company's (WASCO's) treatment and distributions plants.
- Landslides and fallen trees hindered access to some drains.
- Several roads were blocked (some made impassable) in Castries, Gros-Islet, Dennery, and Soufriere. Bridges were blocked by debris and landslides.
- Both GFL Charles and Hewanorra Airports were closed during the storm and started operations on 29 September.

Housing

- The housing stock experienced mainly roof and water damage including loss of personal belongings.

The Saint Lucia Red Cross distributed non-food items to 77 households (approximately 247 persons) in Dennery and to five households (approximately 23 persons) in Millet.

The tropical storm warning was discontinued for Saint Lucia on morning of 29 September and the all clear declaration was issued the same day by the Meteorology Office.



Figure 14 St. Lucia floods caused by TC Matthew. Source: Stlucianewsonline

Saint Vincent & the Grenadines

According to the MPRES footprint, CCRIF member St. Vincent & the Grenadines was affected by Tropical Storm force winds from Matthew.

According to St. Vincent & the Grenadines' National Emergency Management Organization (NEMO), the country registered heavy rainfall and isolated floods resulting in roadblocks.

Housing preliminary damage.

- Three homes were destroyed- one each in Redemption Sharpes, Otley Hall and Buddy Gutter.
- 102 homes were damaged from flooding and landslide (79 in St. Vincent, 22 in Bequia and 1 in union Island).
- Twenty five retaining wall collapsed/damaged (24 in St. Vincent, 1 in Bequia)
- Four public buildings were flooded

Agriculture preliminary damage

- 80% of the total damage was caused to bananas crops, the total quantified was EC\$1,432,739 (~530,000 USD).
- Minimal damage or loss to livestock.

Tourism Sector

Damage to the tourism sector was mainly to the tourism sites managed by the National Parks, Rivers and Beaches Authority and the preliminary estimate is EC\$ 624,000 (~231,000USD).

288 persons were accommodated in shelters across the island and the Government has confirmed one death.



Figure 15 Flooding and damage caused by TS Matthew. Source: Jojo Bâe via Iwitness news

4 CCRIF LOSS MODEL

Modelled losses due to wind and storm surge and any resultant payouts are based on the conditions of countries' Tropical Cyclone policies. Preliminary runs of the CCRIF's loss model generated no government losses due to wind and storm surge damage in Dominica and Grenada. In St. Vincent & the Grenadines and Saint Lucia, the model generated loss values below the Tropical Cyclone policy attachment point in each country's policy and therefore no payout is due. In Barbados, the modelled loss was above its Tropical Cyclone policy attachment point and therefore a payout of US\$975,000 is due.

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

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