Tropical Cyclone Beryl (AAL022024)

Wind and Storm Surge

Final Event Briefing

Windward Islands

11 July 2024

Registered Office: CCRIF SPC c/o Sagicor Insurance Managers Ltd., 198 North Church Street
2nd Floor Sagicor House, P.O. Box 1087, Grand Cayman KY1-1102, Cayman Islands
Email: ccrif@ccrif.org | Website: ccrif.org | Twitter: @ccrif_pr | Facebook: CCRIF SPC

1 SUMMARY

Tropical Cyclone Beryl is the second named cyclone and the first hurricane of the 2024 Atlantic Hurricane Season. On 30 June at 1530UTC, Beryl became a Category 4 hurricane while approaching the Windward Islands. During the next day, 1 July, it crossed the waters between Barbados and Tobago, spreading tropical-storm-force conditions over these countries for several hours. Later on the same day, Hurricane Beryl made landfall on the island of Carriacou (part of Grenada), with its centre passing about 30 mi (50 km) NNE of Grenada. Both Grenada and the island of Carriacou experienced hurricane-force winds on 1 July between 1400UTC and 1600UTC. Saint Lucia and St. Vincent and the Grenadines were affected by tropical-storm-force winds from 0900UTC until 1800UTC. TC Beryl then moved away from the Windward Islands, towards the central Caribbean Sea.

The final runs of the CCRIF tropical cyclone loss model for wind and storm surge have produced government losses for Saint Lucia, Barbados, Saint Vincent and the Grenadines, Grenada, Tobago, and Trinidad[1]. The government losses for Saint Vincent and Grenadines, Grenada, and Tobago are above the Attachment Point of their respective Tropical Cyclone policies and therefore a payout under these policies is due.

For Trinidad, the government losses are below the Attachment Point of its Tropical Cyclone policy and therefore no payout under the policy is due. However, for the tropical cyclone policy, conditions are fulfilled to proceed to an Aggregate Deductible Cover (ADC) [2] payment: (1) modelled losses are greater than 30% of its Attachment Pont, (2) modelled losses are less than 50% of the respective policy Attachment Point, and (3) Disaster Alert is reported by ReliefWeb for Trinidad and Tobago (with code 52063). Therefore, an ADC payment is due to the Government of Trinidad and Tobago.

Although there is a Disaster Alert declaration for Saint Lucia and Barbados from ReliefWeb related to Hurricane Beryl, the ADC feature for the Tropical Cyclone policies for the countries has not been activated because the Modelled Losses is below 30% of the Attachment Point of the country's Tropical Cyclone policy. Therefore, no payout under the ADC feature is due for the Government of Saint Lucia and Barbados.

Final calculations show that payments are due to each country as follows:

Tropical Cyclone Policy	Payment
Grenada	US$42,425,110.30
Saint Vincent and the Grenadines	US$1,862,727.62

[1] The Government of Trinidad and Tobago has two Tropical Cyclone policies: one for the island of Trinidad and one for Tobago.

[2] The ADC is activated if the modelled loss value is between 30% and 50% of a country's policy Attachment Point and a Disaster Alert is issued by ReliefWeb within 7 days after the event.
The ADC can also be activated if the modelled loss value is between 50% of the Attachment point and the Attachment point of the country policy.

Tobago	US$372,752.00
Trinidad (ADC)	US$56,502.30

This event briefing is designed to review the modelled losses due to wind and storm surge calculated by CCRIF's tropical cyclone model for affected CCRIF member countries, to be analyzed with respect to members' Tropical Cyclone policies. Saint Lucia, Barbados, Saint Vincent and the Grenadines, Grenada, Tobago and Trinidad were the only CCRIF member countries for which the CCRIF loss model for wind and storm surge produced government losses due to Tropical Cyclone Beryl at the time of writing this report. A separate report on other CCRIF member countries affected by wind and storm surge, with respect to their Tropical Cyclone policies or rainfall impacts on affected CCRIF member countries will be issued if applicable.

2 INTRODUCTION

On 29 June at 0300UTC, the US National Hurricane Center (NHC) reported that a tropical storm formed in the central tropical Atlantic Ocean, and it was named Beryl. Its centre was sited near latitude 9.3° North, longitude 43.6° West, about 1110 mi (1800 km) ESE of Barbados. The system proceeded with estimated forward velocity of 18 mph (30 km/h) towards the west, along the southern periphery of a strong subtropical ridge. The minimum central pressure was 1006 mb and the maximum sustained winds were estimated at 40 mph (65 km/h).

In the next 18 hours, the tropical storm rapidly intensified due to the low wind shear, the high moisture content and the warm surface temperature over the tropical Atlantic, and on 29 June at 2100UTC, the NHC reported that it became a hurricane. At this time, the centre of Beryl was located near latitude 10.1° North, longitude 49.3° West, about 720 mi (1,110 km) ESE of Barbados. It proceeded westward with increased forward velocity (22 mph, 35km/h). The favourable environmental conditions continued to support the rapid intensification of the hurricane, and few hours later, on 30 June at 0300UTC, it presented a small closed eyewall at the surface and maximum sustained winds estimated at 85 mph (140 km/h).

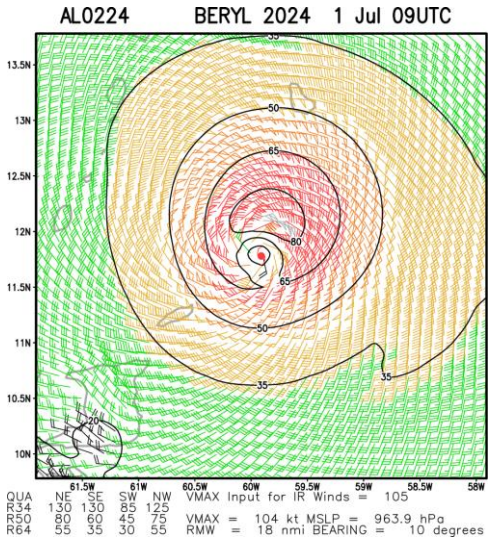
In the next 12 hours, Hurricane Beryl continued to strengthen rapidly and on 30 June at 1530UTC, the NHC reported that it had evolved into a Category 4 hurricane. The maximum sustained winds were estimated at 130 mph (215 km/h) and the minimum central pressure dropped to 962 mb. At this time, Beryl was getting closer to the Windward Islands, as its centre was sited near latitude 10.8° North, longitude 54.9° West, about 350 mi (565 km) ESE of Barbados.

During the final hours of 30 June and the first hours of 1 July, Beryl continued to move closer to the Windward Islands, with almost unchanged intensity and forward velocity. Despite the environmental conditions that were still supportive for the intensification of the hurricane, an eyewall replacement cycle hindered the furtherstrengthening of the system. Indeed, a new outer eye formed outside the small inner core, weakening the latter and gradually becoming dominant. For this reason, when Beryl started to affect the Windward Islands with tropical-storm force winds, on 1 July at 0600 UTC, it had weakened to a Category 3 hurricane, with maximum sustained winds estimated at 120 mph (195 km/h). At this time, Beryl's centre was located near latitude 11.5° North, longitude 59.1° West, about 110 mi (175 km) SSE of Barbados. Hurricane-force winds extended

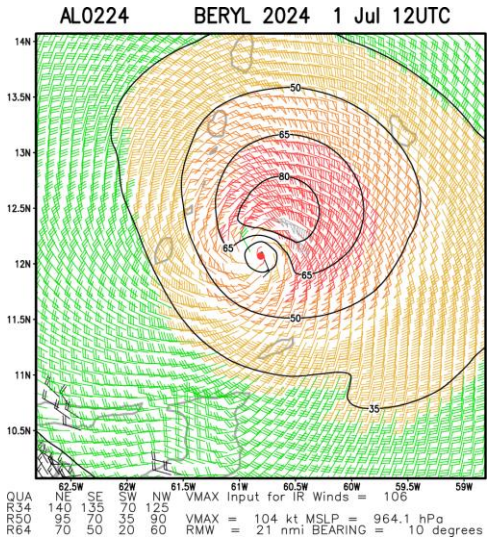
outward up to 30 miles (45 km) from Beryl's centre and tropical-storm-force winds extended outward up to 115miles (185 km).

Barbados was the first country among the Windward Islands to be affected by Beryl's winds. At 0900UTC, tropical-storm-force winds started to affect also Trinidad and Tobago, Grenada and Saint Vincent and the Grenadines (Figure 1a). During the next three hours, the eye replacement completed its cycle and at 1200UTC Hurricane Beryl strengthened again, becoming a Category 4 hurricane again (Figures 2 and 3). At this time, the hurricane's centre was located near latitude 12° North, longitude 60.5° West, about 70 mi (125 km) E of Grenada and about 90 mi (165 km) SSE of Saint Vincent and the Grenadines (Figures 2 and 3). Tropical-storm-force winds continued to affecti Barbados, Tobago, Grenada, and Saint Vincent and the Grenadines, while also beginning to affect Saint Lucia (Figure 1b). Hurricane-force winds started to affect Carriacou (Grenada) at 1400UTC, when the hurricane centre was about 25mi (40 km) SE of the island. One hour later, at 1500UTC, Beryl made landfall on Carriacou , with maximum sustained winds estimated at 150 mph (240 km/h), Figure 1c. At this time the main island of Grenada also began to experience hurricane-force winds. Until 1600UTC, life-threatening winds were were experienced on Carriacou and Grenada, due to the eyewall passing over or very close to these islands. At its closest, the centre of Beryl passed 30 mi (50 km) NNE of Grenada.

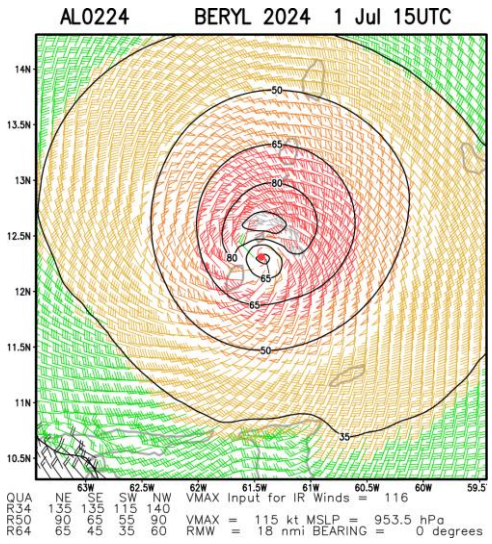
Hurricane Beryl then moved away from the southern Windward Islands, proceeding west-northwestwards at almost 20 mph (31km/h), towards the central Caribbean Sea. Tropical-storm-force winds ceased over Saint Lucia at 1800UTC, but continued to affect Saint Vincent and the Grenadines and Grenada until 2100UTC (Figure 1d).



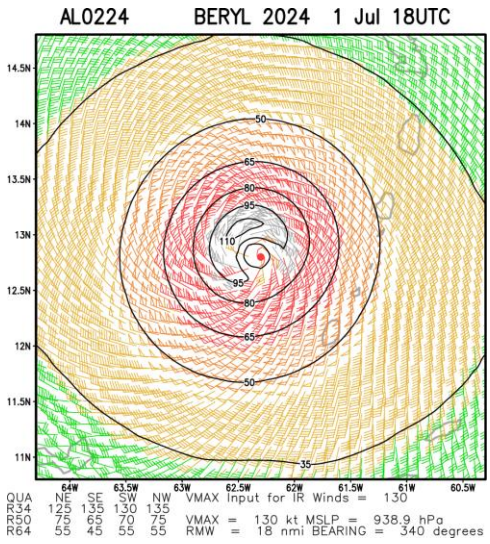
a) 1 July at 0900UTC



b) 1 July at 1200UTC

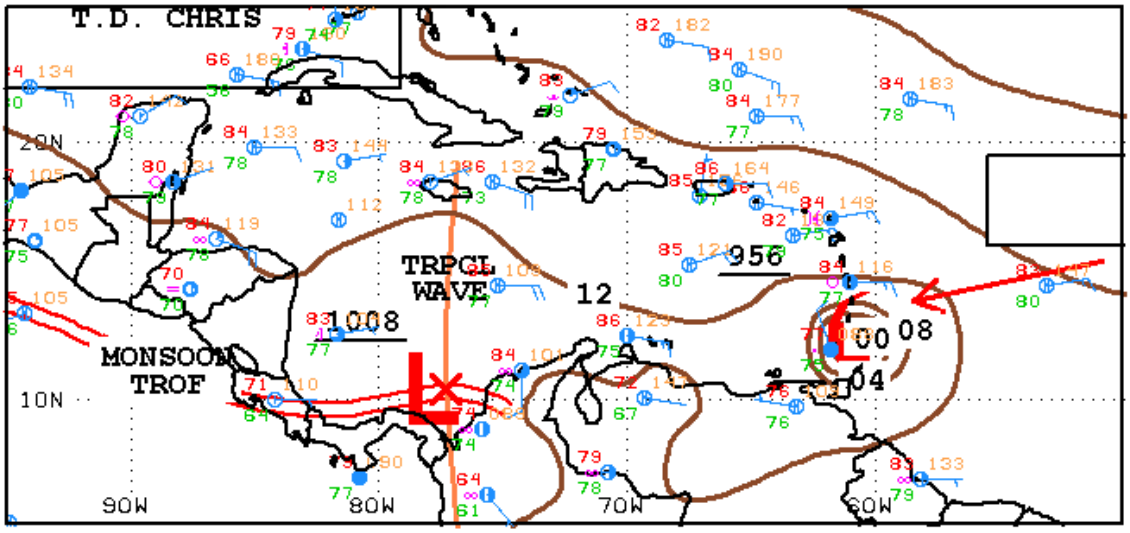


c) 1 July at 1500UTC



d) 1 July at 180UTC

Figure 1 Multi-platform satellite based tropical cyclone surface wind analysis estimated on 1 July, 2024 at different times as indicated by the labels. Contouring indicates wind intensity at 20 kn (23 mph, 37 km/h), at 35 kn (40 mph, 65 km/h), 50 kn (57mph, 93 km/h), 65 kn (75 mph, 120 km/h), 80 kn (92 mph, 148 km/h), 95 kn (109 mph, 176 km/h), 110 kn (127mph, 204 km/h),Source: NOAA, National Environmental Satellite, Data and Information Service[3]



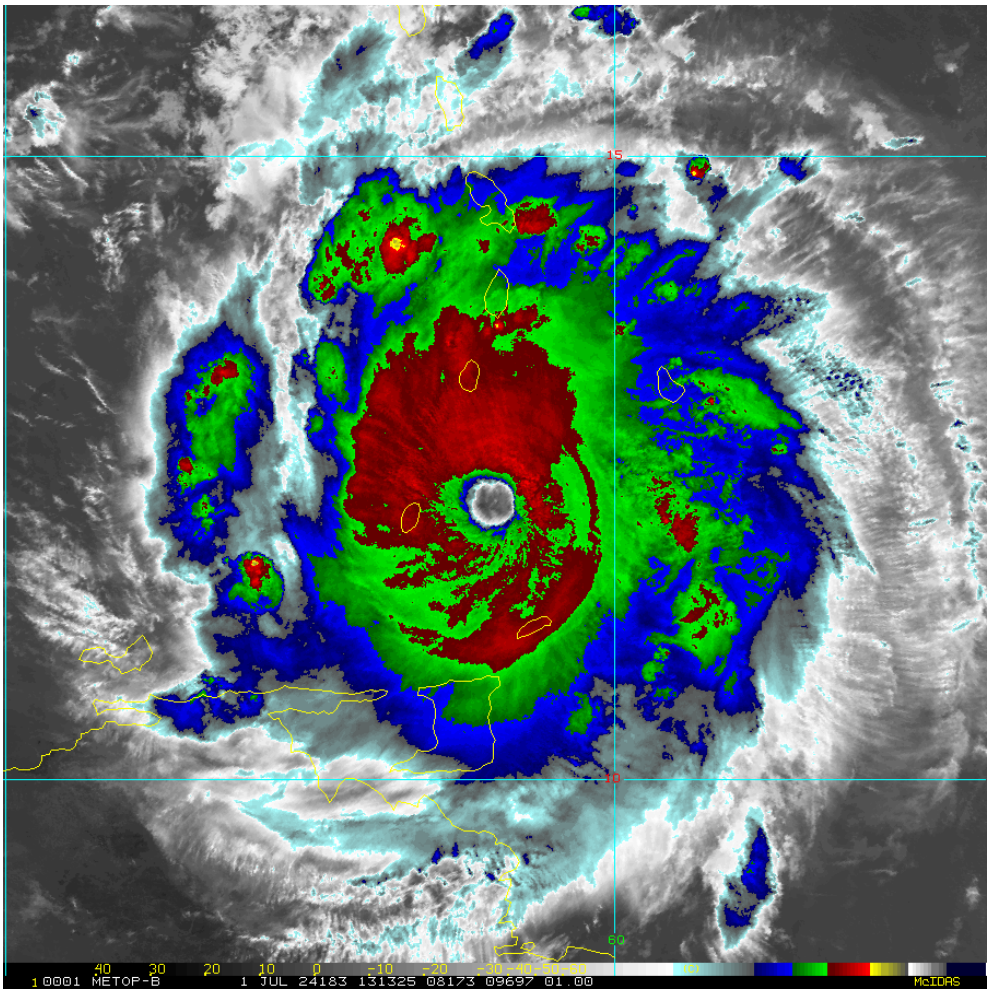
12Z CARIBBEAN SURFACE ANALYSIS
ISSUED:
Mon Jul 1 16:38:19 UTC 2024

NATIONAL HURRICANE CENTER
MIAMI, FLORIDA
BY TAFB ANALYST: PC
COLLABORATING CENTERS: NHC OPC

01 July at 1200UTC

3 RAMSDIS Online Archive, NOAA Satellite and Information Service, available at: https://rammb-data.cira.colostate.edu/tc_realtime/storm.asp?storm_identifier=al022024

Figure 2 Surface analysis over the Caribbean area on 1 July 2024 at 1200UTC. Source: US National Hurricane Center[4]



01 July at 1330UTC

Figure 3 Satellite imagery on 1 July, 2024 at 1330UTC from the thermal infrared channel enhanced with colour. Blue/green colours represent high altitude clouds (top cloud temperature between -50°C and -70°C), while the red/yellow colours represent very high altitude clouds (top cloud lower than -70°C). High altitude clouds indicate strong convection associated with intense precipitation. Source: NOAA, National Environmental Satellite, Data and Information Service[5].

4 National Oceanic and Atmospheric Administration - FTP, National Hurricane Center, review date: 1 July 2024, available at: *https://www.nhc.noaa.gov/tafb/CAR_12Z.gif*

5 RAMSDIS Online Archive, NOAA Satellite and Information Service, available at: https://rammb-data.cira.colostate.edu/tc_realtime/storm.asp?storm_identifier=al022024

3 CCRIF SPC MODEL OUTPUTS

A CCRIF System for Probabilistic Hazard Evaluation and Risk Assessment (SPHERA) report is issued for any tropical cyclone affecting at least one member country with winds greater than 39 mph (62.7 km/h). Several countries were affected by Tropical Cyclone Beryl. For Grenada, Saint Vincent and the Grenadines and Trinidad and Tobago – Tobago, qualified as a Triggering event[6]; for Trinidad and Tobago – Trinidad qualified as a Triggering Event by Aggregated Deductible Cover (ADC) [7]; and for Saint Lucia and Barbados it qualified as Loss Event[8].

The wind footprint is one of the outputs from CCRIF´s model. Figure 4 shows the wind footprint for the regions affected by Tropical Cyclone Beryl.

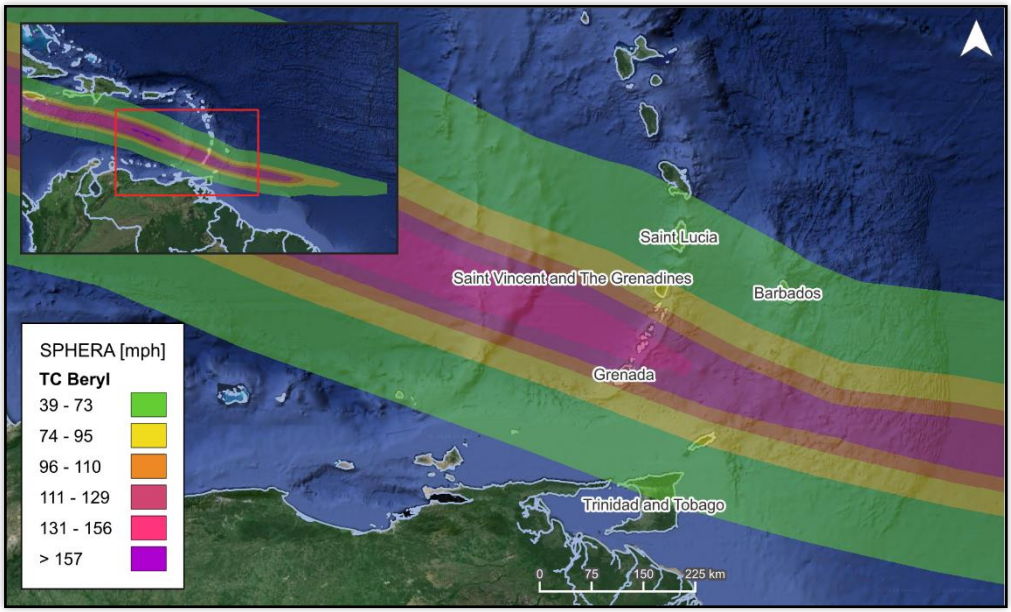


Figure 4 Map showing the wind field associated with Tropical Cyclone Beryl around the Windward Islands. Source: NHC & CCRIF/SPHERA

4 IMPACTS

At the time of writing this report, the available information on damage in the Caribbean countries due to Hurricane Beryl is shown below.

6 Any Tropical Cyclone event which produces a modelled loss sufficiently high to trigger a payout under the CCRIF policy conditions as in force on the date of the event in one or more policyholder countries.
7 The Aggregated Deductible Cover (ADC) is a special feature of CCRIF's tropical cyclone (TC) and earthquake (EQ) parametric insurance policies. The ADC is designed to potentially provide a payment for TC and EQ events that are objectively not sufficient to trigger the country's main policy because the modelled loss is below the Underlying Policy Attachment Point.
8 Any Tropical Cyclone event which produces a modelled loss greater than zero in one or more policyholder countries.

On 30 June, the Governor-General of Grenada declared a state of emergency in the country at 7am, due to the arrival of Hurricane Beryl. [9]

Three persons in Grenada and Saint Vincent and the Grenadines lost their lives due to the passage of Hurricane Beryl[10].

CDEMA reports included damages to structures, including lost roofs, agriculture, and forestry in Northern Grenada.

There were also reports that some gas stations were damaged, resulting in officials in Carriacou and Petite Martinique not being able to use heavy equipment to help with activities. [11]

Figure 5 Rubble-strewn streets of Hillsborough, Carriacou, shows the devastation caused by Hurricane Beryl

The National Disaster Management Agency (NaDMNA) reported that over 90 per cent of buildings on Carriacou and Petit Martinique are damaged or destroyed. [12] Carriacou's airport terminal was destroyed, as well as five of six medical facilities.

The passage of Hurricane Beryl resulted in downed power lines and trees, and other debris along the roads in the south of Saint Lucia and Grenada. [13]

In Saint Lucia, according to CDEMA, there were multiple reports of flooding, infrastructural and housing damage (roof and walls of dwelling houses damaged). The storm surges caused extensive damage to the waterfront areas of Soufriere, Laborie and Vieux Fort. [14]

9 Caribbean Loop News: Hurricane Beryl: Grenada to go on lockdown from 7pm | Loop Caribbean News (loopnews.com)
10 Hurricane Beryl: Deadly storm moves towards Jamaica (bbc.com)
11 Caribbean Loop News: More deaths reported in Grenada following passage of Hurricane Beryl | Loop Caribbean News (loopnews.com)
12 Caribbean Loop News: Grenada PM describes Beryl's impact on Carriacou as 'Armageddon' | Loop Caribbean News (loopnews.com)
13 AP News: Hurricane Beryl strengthens to Category 5 storm | AP News
14 CDEMA Reports: Slide 1 (cdema.org)

Figure 6 Boat that got stuck on rocks in Gros Islet, Saint Lucia (Jarmal Mc Iennon/Reuter)

By 1 July at night, Saint Vincent and the Grenadines reported one casualty and hundreds of damaged homes and buildings, and part of the country was left with no water or electricity.

Figure 7 Damaged dwellings in St. Vincent and the Grenadines. (Lucanus Ollivierre/AP, left - Ralph Gonsalves/Reuters, right)

Reports from CDEMA informed that about 98 per cent of Union Island was devastated. Water tanks for rainwater harvesting were destroyed. The terminal at the airport received critical damage and the tower was destroyed. In Bequia many houses were damaged. [15]

About 95 per cent of Grenada lost electrical power, as reported by Neila K. Ettienne, Press Secretary for the Office of the Prime Minister. Telecommunications were down and some individuals lost internet service. School and business were closed, as well as the airport. However, hospitals and the national police force were operational.

15 CDEMA: Slide 1 (cdema.org)

Figure 8 Buildings with damaged roofs in Grenada (Ian Hughes/Reuters).

In Barbados, more than 400 people moved to shelters. Several floods were reported throughout the country.

Figure 9 Left. Flooded street in Hastings, Barbados (Ricardo Mazalan-AP)
Right. Flooded roads in Bridgetown, Barbados (Instagram/@alaburke_/Reuters)

Airports in Barbados, Grenada and Saint Lucia were closed as Beryl approached and were expected to be open by Tuesday 2 July. [16]

Trinidad and Tobago experienced heavy rainfall and strong winds as well as heavy swells. [17]

16 CNN News: Hurricane Beryl strengthens into the earliest Category 5 Atlantic storm on record after devastating Windward Islands | CNN
17 Trinidad and Tobago Newsday: Hurricane Beryl's impact on Trinidad and Tobago - Trinidad and Tobago Newsday

Figure 10 Heavy swells in Trinidad. Photo by Venessa Mohammed

5 TRIGGER POTENTIAL

The final runs of the CCRIF tropical cyclone loss model for wind and storm surge have produced government losses for Grenada, Saint Vincent and Grenadines, and Tobago above the attachment point of the Tropical Cyclone policies and therefore payouts under the polices are due as follows:

- Grenada: US$42,425,110.30
- Saint Vincent and the Grenadines: US$1,862,727.62
- Trinidad and Tobago: US$372,752.00 on its policy for Tobago.

The Aggregated Deductible Cover (ADC) feature (or endorsement) for the Tropical Cyclone policy for Trinidad has been activated because the modelled losses are between 30 per cent and 50 per cent of the policy attachment point and a Disaster Alert with code 52063 had been reported by ReliefWeb. Therefore, payment under the ADC feature is due for this government as follows:

- Trinidad and Tobago: US$56,502.30 on its policy for Trinidad.

Because the modelled losses in Saint Lucia and Barbados are below 30 per cent of the Attachment Point, and despite a Disaster Alert issued by ReliefWeb for these countries, the ADC feature for the Tropical Cyclone policies is not activated..

For additional information, please contact CCRIF SPC at: pr@ccrif.org