CCRIF SPC
The Caribbean Catastrophe Risk Insurance Facility

Tropical Cyclone Grace (AL072021)

Wind and Storm Surge

Final Event Briefing

Montserrat and Saint Kitts and Nevis

25 August 2021

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1 SUMMARY

Tropical Cyclone (TC) Grace was the seventh tropical cyclone in the 2021 Atlantic Hurricane Season. Previously named Potential Tropical Cyclone Seven, this tropical disturbance was reported by the US National Hurricane Center (NHC) on 13 August and it was soon upgraded to Tropical Depression Seven. It was moving toward the west with a velocity of almost 21 mph (33 km/h) approaching the Leeward Islands and the Government of Antigua and Barbuda issued a Tropical Storm Warning for Saint Kitts and Nevis and Montserrat. On 14 August at 0900 UTC, the NHC reported that Tropical Depression Seven was upgraded to Tropical Storm Grace, at first characterized as a small tropical storm. At 1500 UTC it became stronger and produced tropical-storm-force winds which extended outward up to 35 miles (55 km) from the centre. This configuration resulted in stormy weather with heavy rainfall which spread across the Lesser Antilles, affecting Saint Kitts and Nevis and Montserrat.

Final runs of the CCRIF loss model for wind and storm surge produced government losses for Montserrat and Saint Kitts and Nevis. In both cases, these losses were below the attachment point of these countries' tropical cyclone polices. Therefore, no payout under the policy is due for these countries.

The Aggregated Deductible Cover (ADC) for these countries' TC policies was not activated because the modelled losses were less than 10 per cent of the minimum payment therefore, no payment under the ADC feature is due.

This event briefing is designed to review the modelled losses due to wind and storm surge calculated by CCRIF's SPHERA TC model for affected CCRIF member countries, to be analyzed with respect to members' tropical cyclone policies. A separate report on rainfall impacts on affected CCRIF member countries with excess rainfall policies will be issued if applicable.

2 INTRODUCTION

On 13 August at 1500 UTC, the US National Hurricane Center (NHC) informed that a disturbance over the central tropical Atlantic was noticed. The disturbance, named Potential Tropical Cyclone Seven, was centered near latitude 15.3 North, longitude 49.3 West. The formation was moving toward the west with a velocity near 21 mph (33 km/h), maximum sustained winds were approximately 35 mph (55 km/h) with higher gusts and the estimated minimum central pressure was 1010 mb (29.83 inches). The disturbance was soon upgraded to Tropical Depression Seven. During the following 15 hours, the listed parameters of this tropical depression were almost unchanged. As the system approached the Leeward Islands, the Government of Antigua and Barbuda changed the previously issued Tropical Storm Watch for Saint Kitts and Nevis and Montserrat to a Tropical Storm Warning.

On 14 August at 0900 UTC, the NHC reported that Tropical Depression Seven was upgraded to Tropical Storm Grace. The centre of newly formed Tropical Storm Grace was located near latitude 15.8 North, longitude 55.6 West, about 675 km (419 mi) east of the Leeward Islands. Tropical Storm Grace moved toward the west with a velocity near 22 mph (35 km/h). Maximum sustained winds were near 40 mph (65 km/h) with higher gusts and the estimated minimum central pressure was 1007 mb (29.74 inches). At this time, Grace was identified as a small tropical storm. At 1500 UTC, it became stronger as it moved quickly westward toward the Leeward Islands. Its centre was now located near latitude 16.2 North, longitude 57.9 West (Figure 1). Maximum sustained winds were near 45 mph (75 km/h), the estimated minimum central pressure was 1005 mb and velocity was near 23 mph (37 km/h). Despite its poor organization, the storm produced tropical-storm-force winds which extended outward up to 35 miles (55 km) from the centre.

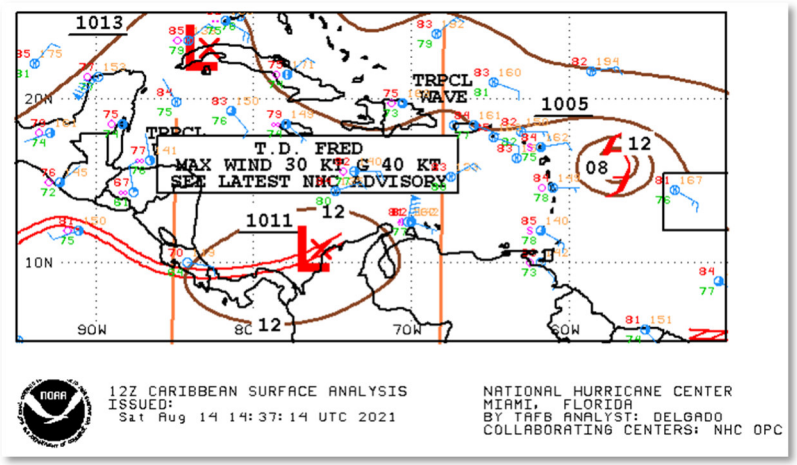


Figure 1 Surface analysis over the Caribbean area at 1437 UTC on 14 August 2021 as indicated by the label. Source: US National Hurricane Center[1]

[1] National Oceanic and Atmospheric Administration - FTP, National Hurricane Center, available at: https://www.nhc.noaa.gov/tafb/CAR_00Z.gif

Over the next 9 hours, the system produced stormy weather with heavy rainfall which spread across the Lesser Antilles, affecting Saint Kitts and Nevis and Montserrat (Figure 3a). A decrease in maximum sustained winds to 40 mph (65 km/h) and increase in minimum central pressure to 1010 mb was noted. The velocity was in the range between 23 mph (37 km/h) and 26 mph (43 km/h). On 15 August at 0300 UTC, it was reported that poorly organized Tropical Storm Grace was losing its speed (Figure 2 and 3b). This decrease in velocity continued during the next several hours as the system moved toward the west-northwest, passing near the Virgin Islands and approaching Puerto Rico. The Government of Antigua and Barbuda discontinued the Tropical Storm Warning for Saint Kitts and Nevis and Montserrat.

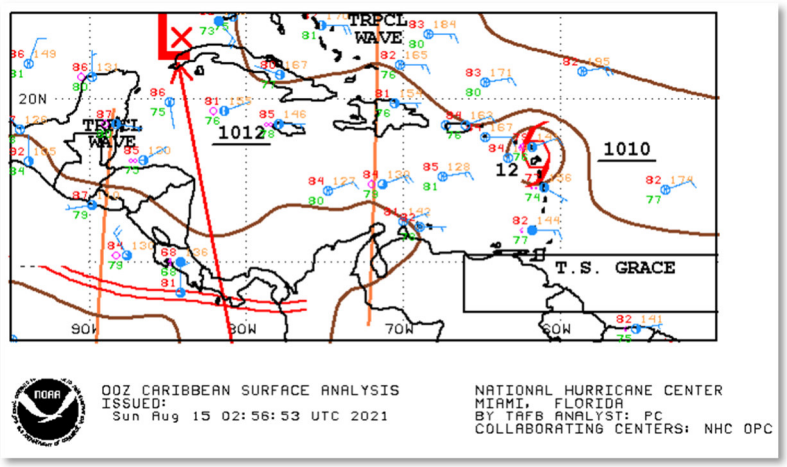
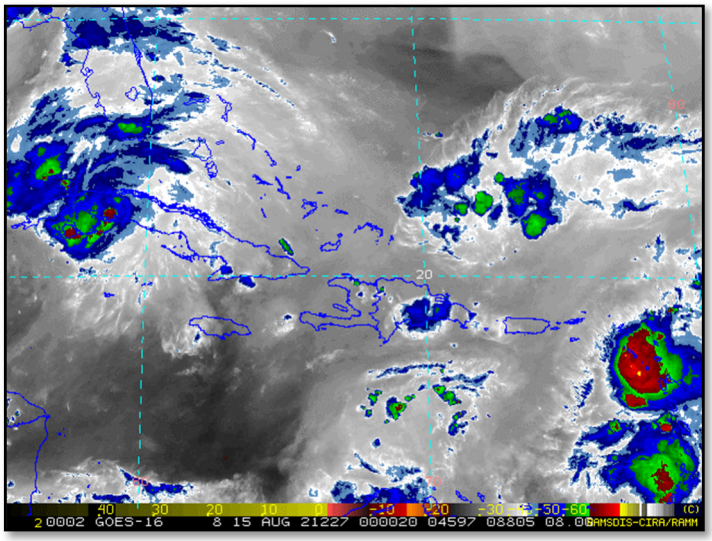


Figure 2 Surface analysis over the Caribbean area at 0256 UTC on 15 August 2021 as indicated by the label. Source: US National Hurricane Center[2]

a)



[2] National Oceanic and Atmospheric Administration - FTP, National Hurricane Center, available at: https://www.nhc.noaa.gov/tafb/CAR_12Z.gif

b)

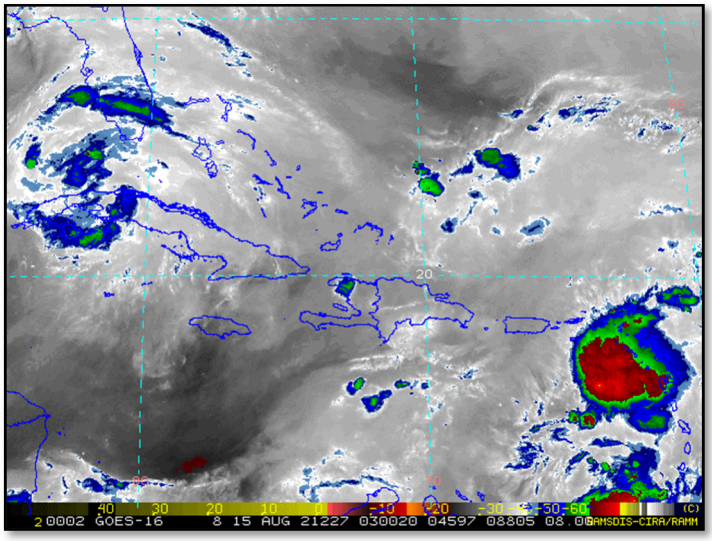


Figure 3 Satellite imagery at 0000 UTC (a) and 0300 UTC (b) on 15 August as indicated in the label from thermal infrared channel enhanced with colour. Blue/green colours represent high altitude clouds (top cloud temperature between -50°C and -70°C), while the red/yellow colours represent very high altitude clouds (top cloud lower than -70°C). High altitude clouds indicate strong convection associated with intense precipitation. Source: NOAA Satellite and Information Service[3].

3 CCRIF SPC MODEL OUTPUTS

Under CCRIF's loss calculation protocol, a CCRIF System for Probabilistic Hazard Evaluation and Risk Assessment (SPHERA) report is required for any tropical cyclone affecting at least one member country with winds greater than 39 mph (62.7 km/h).

Tropical Cyclone Grace qualified as a Loss Event[4] for both Montserrat and Saint Kitts and Nevis.

The wind footprint (Figures 4 and 5) and surge field are two of the outputs from the CCRIF model, which show the regions affected by Tropical Cyclone Grace in each country. Due to the relatively low wind speeds, storm surge was insignificant, did not contribute to the damage, and is therefore not shown on the hazard maps.

[3] RAMSDIS Online Archive, NOAA Satellite and Information Service, available at: *https://rammb.cira.colostate.edu/ramsdis/online/images/rmtc/rmtcsasec4ir304/rmtcsasec4ir304_20210815000020.gif* *https://rammb.cira.colostate.edu/ramsdis/online/images/rmtc/rmtcsasec4ir304/rmtcsasec4ir304_20210815030020.gif*

[4] Any Tropical Cyclone event which produces a modelled loss greater than zero in one or more policyholder countries.

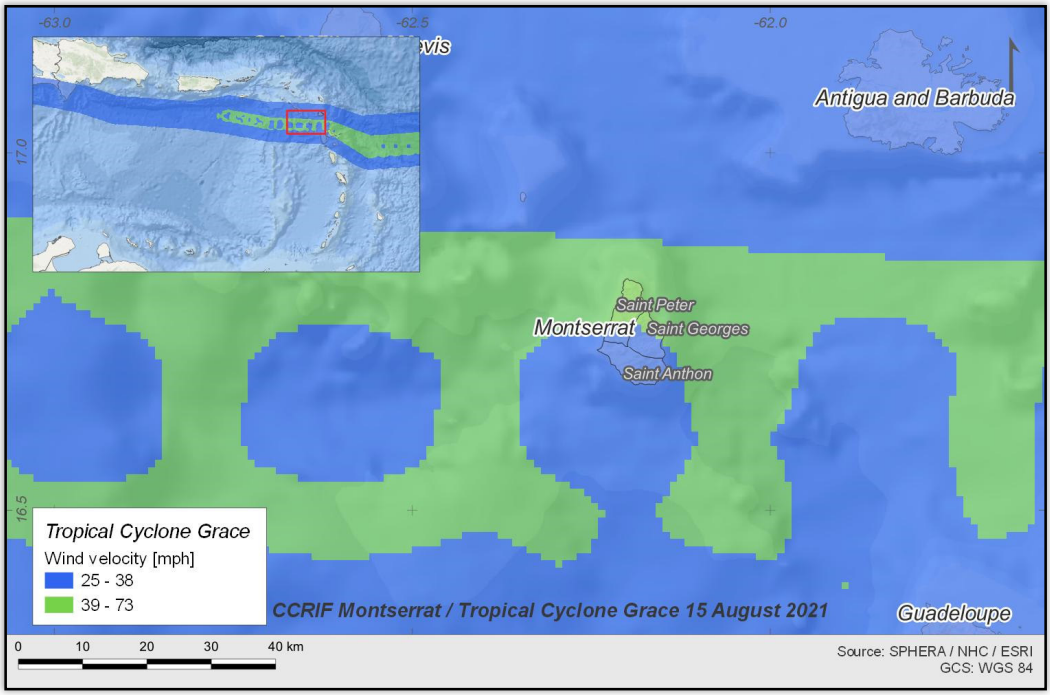


Figure 4 Map showing the wind field associated with Tropical Cyclone Grace in Montserrat.
Source: NHC & CCRIF/SPHERA

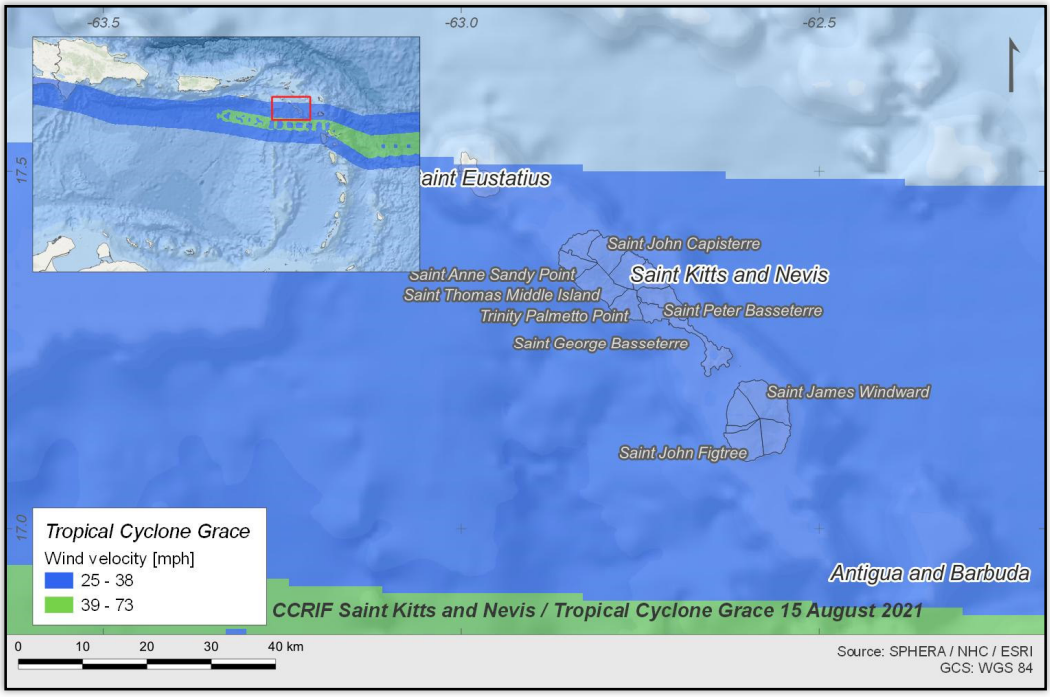


Figure 5 Map showing the wind field associated with Tropical Cyclone Grace in Saint Kitts and Nevis.
Source: NHC & CCRIF/SPHERA

4 IMPACTS

Montserrat

Ten days after the passage of Tropical Storm Grace, no information was available related to damage or loss in Montserrat due to Tropical Cyclone Grace. According to the reports from the Disaster Management Coordination Agency, Tropical Storm Grace was closely monitored. Prior to the arrival of the storm, a Tropical Storm Warning was put into effect. Additionally, Montserrat's authorities took precautionary measures such as activating a Flash Flood Watch for flash-flood prone areas.

Saint Kitts and Nevis

Ten days after the passage of Tropical Storm Grace, no information was available related to damage or loss in Saint Kitts and Nevis due to Tropical Cyclone Grace. Prior to the arrival of the storm, a Tropical Storm Warning was put into effect. Additionally, Saint Kitts and Nevis' authorities, including the National Emergency Management Agency (NEMA), took precautionary measures such as activating the National Emergency Operations Centre (NEOC).

5 CCRIF LOSS MODEL

Final runs of the CCRIF loss model for wind and storm surge produced government losses for both Montserrat and Saint Kitts and Nevis, which were below the attachment point of each country's tropical cyclone policy. Therefore, no payments are due under the policies for Montserrat and Saint Kitts and Nevis.

The Aggregated Deductible Cover (ADC) for these countries' policies was not activated because the modelled losses were less than 10 per cent of the minimum payment therefore, no payment under the ADC feature is due.

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