



Tropical Cyclone Karen (AL122019)

Wind and Storm Surge

Event Briefing

British Virgin Islands

27 September 2019

1 SUMMARY

Karen was the twelfth tropical cyclone in the 2019 Atlantic Hurricane Season. On 22 September it developed as a tropical storm to the northeast of Trinidad and Tobago. On the same day, it passed over the waters between Grenada and Saint Vincent and the Grenadines, heading for the southeastern Caribbean Sea. On 24 September, Tropical Storm Karen approached Puerto Rico and the US and British Virgin Islands. It passed approximately 30 km (18 mi) to the east of Puerto Rico and 80 km (50 mi) to the west of the British Virgin Islands and it affected the US and British Virgin Islands with tropical-storm-force winds.

Preliminary run of the CCRIF loss model for wind and storm surge produced government losses for the British Virgin Islands, but these losses were below the attachment point of this country's Tropical Cyclone policy. Therefore, no payout under the main policy is due for this country.

The Aggregated Deductible Cover (ADC) for this country's policy was not activated because the modelled losses were less than 50 per cent of the attachment point and there was no disaster alert declaration for this country from ReliefWeb related to Tropical Cyclone Karen. Therefore, no payment under the ADC is due.

This event briefing is designed to review the modelled losses due to wind and storm surge calculated by CCRIF's models for affected CCRIF member countries, to be analyzed with respect to members' Tropical Cyclone policies. The modelled losses due to rainfall for affected CCRIF member countries and the relationship of these losses to members' Excess Rainfall policies are described in a different event briefing.

2 INTRODUCTION

On 22 September at 0900UTC, the US National Hurricane Center (NHC) reported that the low pressure system located to the north east of Trinidad and Tobago developed as a tropical storm, and it was named Karen. The tropical storm presented a poorly organized and fragmented pattern of convection, with minimum central pressure of 1005 mb. The estimated centre of circulation was located at 11.9N, 60.2W, approximately 100 mi (165 km) from Grenada and approximately 120 mi (190 km) SE of Saint Vincent and the Grenadines. The maximum sustained winds were estimated at 40 mph (65 km/h) and tropical-storm-force winds extended about 125 miles (205 km) outward from the centre. The system was moving towards the west northwest along the southwestern periphery of the Bermuda-Azores high pressure system located over the Atlantic Ocean. Its forward velocity was estimated at 9 mph (15 km/h) and it was directed towards the southern Windward Islands.

In the following hours, the intensification of the tropical storm was hindered by the presence of dry air and northeasterly wind shear and after 6 hours, at 1500UTC, the force of the tropical storm was approximately unchanged. At this time, the centre of the tropical storm was located at 12.5N 61.7W, while it passed over the waters between Grenada and Saint Vincent and the Grenadines at a distance of approximately 30 mi (45 km) from both countries. Afterwards, the tropical storm left the Windward Islands, moving across the southeastern Caribbean Sea towards the northwest at the same forward velocity. Over these waters, the environment was less conducive for the tropical storm, and on 23 September at 2100UTC it was downgraded to a tropical depression.

On 24 September at 0600UTC, the tropical depression steered north heading for Puerto Rico and the US and British Virgin Islands. Over this portion of the Caribbean Sea, the environment conditions were more favourable for the intensification of the system and at 0900UTC, Karen was upgraded again to a tropical storm. At this time, the centre of Karen was located at 16.8N 65.8W, approximately 200 km (124 mi) SW of the British Virgin Islands (Figure 1). The maximum sustained winds were estimated at 40 mph (65 km/h) and tropical-storm-force winds extended outward up to 80 miles (130 km) from the centre. The system was moving with forward velocity of approximately 14 mph (22 km/h) and between 2100UTC and 0000UTC, its centre passed approximately 30 km to the east of Puerto Rico and 80 km to the west of the British Virgin Islands (Figure 2). The maximum sustained winds were estimated at 45 mph (75 km/h), with tropical-storm-force winds extending outward up to 80 miles (130 km) mainly to the southeast of the centre (as shown in Figure 3). The satellite-based wind analysis indicated that winds between 23 mph (37 km/h) and 40 mph (64 km/h) affected the British Virgin Islands from 24 September at 1800UTC to 25 September at 0900UTC, with maximum values around 25 September at 0000UTC.

On 25 September, the tropical storm moved away from the British Virgin Islands heading north. At the time of writing this report, Karen is forecast to become a low pressure system in the western Atlantic Ocean.

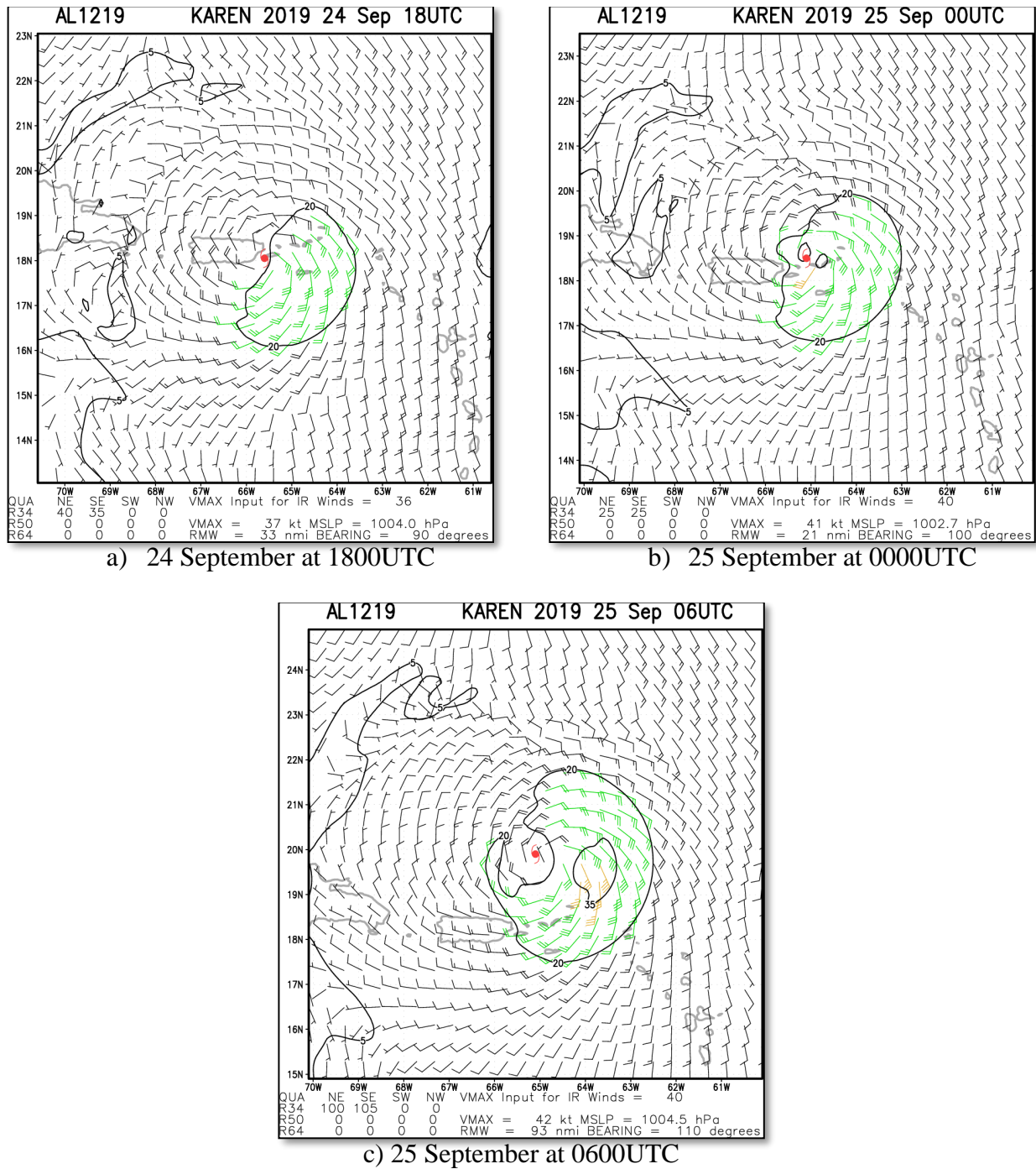


Figure 3 Multi-platform satellite surface wind analysis estimated at different times as indicated in the labels. Contouring indicates wind intensity at 20 kn (23 mph, 37 km/h) and 35 kn (40 mph, 64 km/h). Source: NOAA, National Environmental Satellite, Data and Information Service

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 Karen qualified as a Loss Event¹ for the British Virgin Islands.

The wind footprint (Figure 4) and surge field are two of the outputs from the CCRIF model, which show the regions affected by certain extents of Tropical Cyclone Karen in the British Virgin Islands. Given that Karen remained only as a tropical storm, the storm surge values computed by the model were technically null values close to zero, which are too low to be represented on a hazard map.

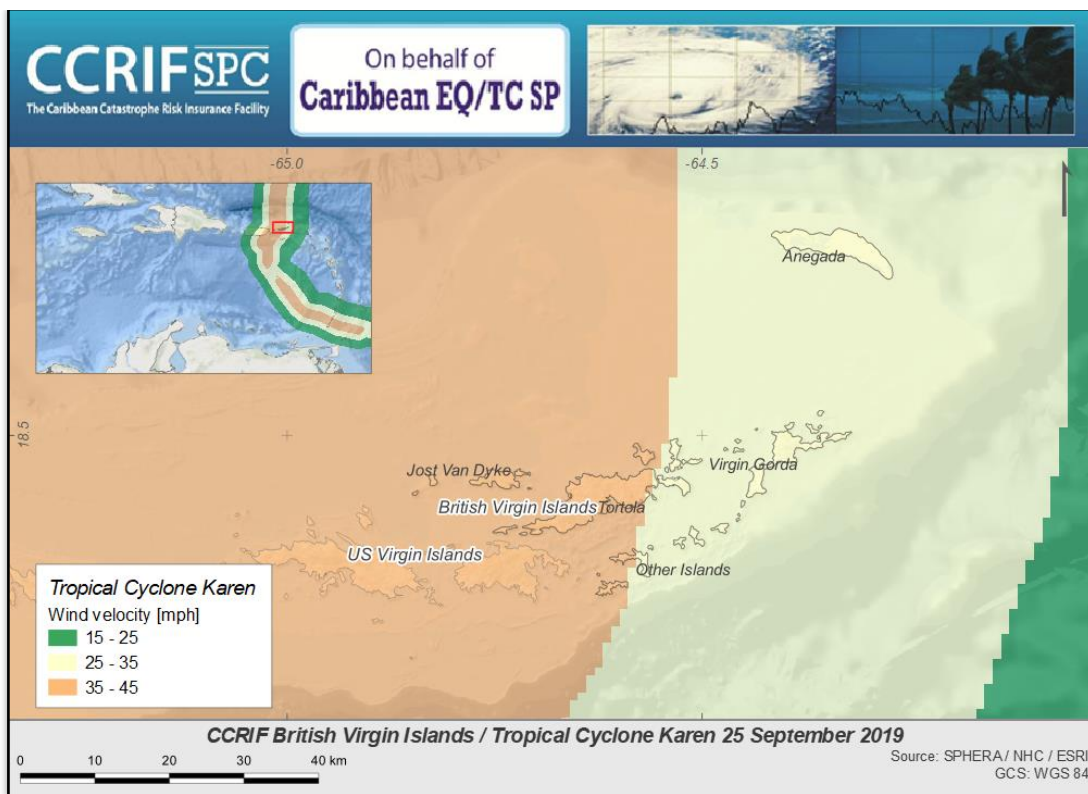


Figure 4 Map showing the wind field associated with Tropical Cyclone Karen in the British Virgin Islands. Source: NHC & CCRIF/SPHERA

¹ Any Tropical Cyclone event which produces a modelled loss greater than zero in one or more policyholder countries.

4 IMPACTS

The Caribbean Disaster Emergency Management Agency (CDEMA) reported roads with minor damage caused by Tropical Cyclone Karen; no surge in injuries or persons seeking medical assistance was observed; little to no damage to the Territory was reported.

Prior to the arrival of Karen, the British Virgin Islands' authorities took precautionary measures such as:

- The National Emergency Operations Centre was activated.
- Airports and sea ports were closed.
- Businesses and schools were closed.
- Electricity service was suspended.

5 CCRIF LOSS MODEL

For the British Virgin Islands, the preliminary run of CCRIF's loss model for wind and storm surge generated government losses, but these losses were below the attachment point for its Tropical Cyclone policy and therefore no payout under the main policy is due. The Aggregated Deductible Cover (ADC) for this country's policy was not activated because the modelled losses were less than 50 per cent of the attachment point and there was no disaster alert declaration for the British Virgin Islands from ReliefWeb related to Tropical Cyclone Karen. Therefore, no payment under the ADC is due to this country.

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

Evaluación de Riesgos Naturales

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