



Tropical Cyclone Kirk (AL122018)

Wind and Storm Surge

Event Briefing

Windward and Leeward Islands

30 September 2018

1 SUMMARY

Kirk was the 12th tropical cyclone in the 2018 Atlantic Hurricane Season. It formed as a tropical storm over the eastern tropical Atlantic Ocean on 22 September 2018 at 1500UTC. Along its movement toward the east north-east, it was downgraded to an open trough on 24 September at 1500UTC and regenerated as a tropical storm on 26 September at 0900UTC. Kirk presented a strong vertical sheared shape, with the maximum winds at the north and east of the centre. Kirk made landfall on the Lesser Antilles islands on 28 September at 0000UTC, affecting with tropical storm winds Martinique, Dominica, Guadeloupe (likely), Barbados, Saint Lucia, Saint Vincent and the Grenadines and Grenada.

The preliminary runs of CCRIF's loss model for wind and storm surge generated government losses for Saint Lucia and St. Vincent and the Grenadines, but these losses were below the attachment point for the Tropical Cyclone policies for each country and therefore no payouts are due. The Aggregated Deductible Cover (ADC) for Saint Lucia and St. Vincent and the Grenadines' policies was not activated because the modelled losses were less than 50 per cent of the attachment point and there was no disaster alert declaration from ReliefWeb related to TC Kirk and therefore no payment is due under the ADC.

The preliminary runs of CCRIF's loss model for wind and storm surge generated zero government losses for Barbados, Dominica and Grenada and therefore no payouts are due on their Tropical Cyclone policies.

This event briefing is designed to review the impact and damages from wind and storm surge but not rainfall for CCRIF member countries. A separate report on rainfall impacts on affected CCRIF member countries will be issued.

2 INTRODUCTION

On 22 September 2018 at 1500UTC, the US National Hurricane Center (NHC) reported that a small area of low pressure south of the Cape Verde Islands (at 8.3N, 23.6W) became a tropical storm, with a well defined centre and maximum wind intensity at 34-40 mph (55-64 km/h). It was named Kirk. Initially, the tropical storm moved toward the west-northwest at 13 mph (22 km/h), experiencing a slight strengthening due to the passage over warm sea waters in a low-shear environment.

After 48 hours however, on 24 September at 1500UTC, Kirk dissipated due to the strong easterly winds that pushed the system toward the west at a very high speed (24 mph, 39 km/h) and damped the cyclone convection. After another 48 hours, on 26 September at 0900UTC, the remnants of Kirk steered a little north of due west, moving along the south side of the strong Bermuda-Azores high pressure system. Thus, the forward velocity reduced to approximately 18 mph (30 km/h). The low vertical shear of the environment and the warm sea surface favoured a re-intensification of the system, which regenerated as tropical storm. At this time, Kirk was located at 11.8N, 52.7W and it presented a maximum wind speed of 45 mph (72 km/h).

On 27 September at 0000UTC, Kirk was at the eastern edge of the Caribbean Sea and it started to experience the strong upper-level westerly or southwesterly winds flowing over the entire Caribbean area (Figure 1). The unfavourable condition increased the vertical shear between the upper level and the low level (see the wind speed shear in Figure 2) and shifted the thunderstorm activity to the east of the low-level cyclone centre as reported by the satellite imagery in Figure 3. Figure 4 shows the comma shape of Kirk with the strongest winds on the east and north quadrants. The maximum sustained winds were near 50 mph (85 km/h) with higher gusts. Tropical-storm-force winds extended outward up to 140 miles (220 km), mostly east and north of the centre. The intensity was unvaried when Kirk moved through the Lesser Antilles. On 27 September at 1800UTC, the centre of the tropical storm passed to the north of Barbados (14.0N 59.9W) and on 28 September at 0000UTC it made landfall on Saint Lucia. Tropical-storm-winds affected Martinique, Dominica, Guadeloupe (likely), Barbados, Saint Lucia, Saint Vincent and the Grenadines and Grenada from 27 September at 1800UTC up to 28 September at 600UTC.

Once the storm left the Lesser Antilles, the unfavourable environmental conditions (high upper-level wind shear, Figure 1) led to a rapid weakening of the tropical storm, which dissipated on 28 September at 1500UTC.

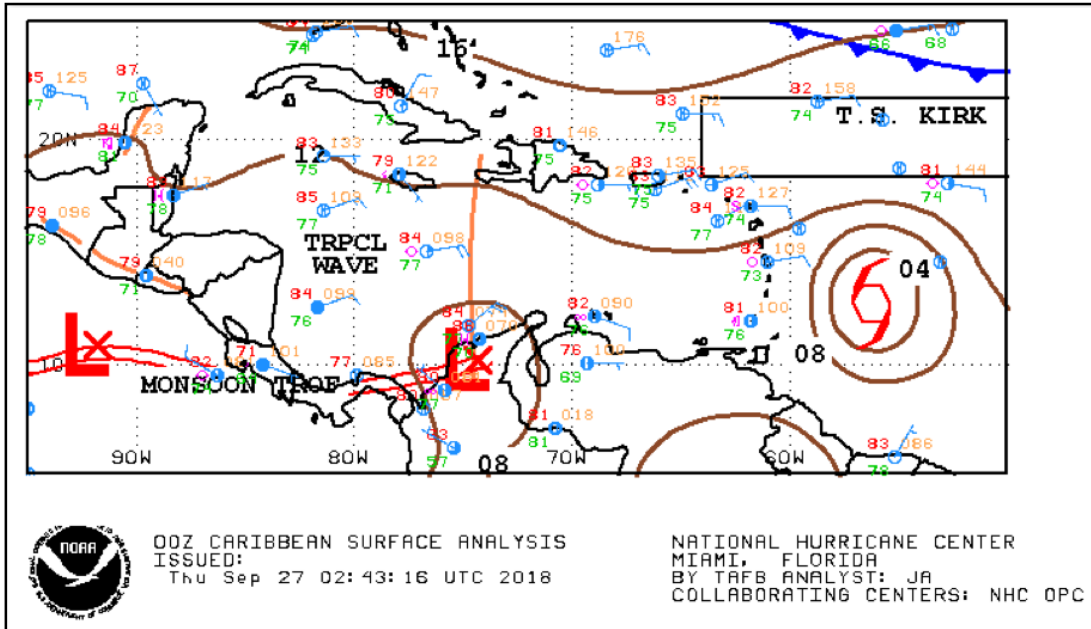


Figure 1 Surface analysis over the Caribbean area at 27 September at 0000UTC
 Source: US National Hurricane Center (NHC)

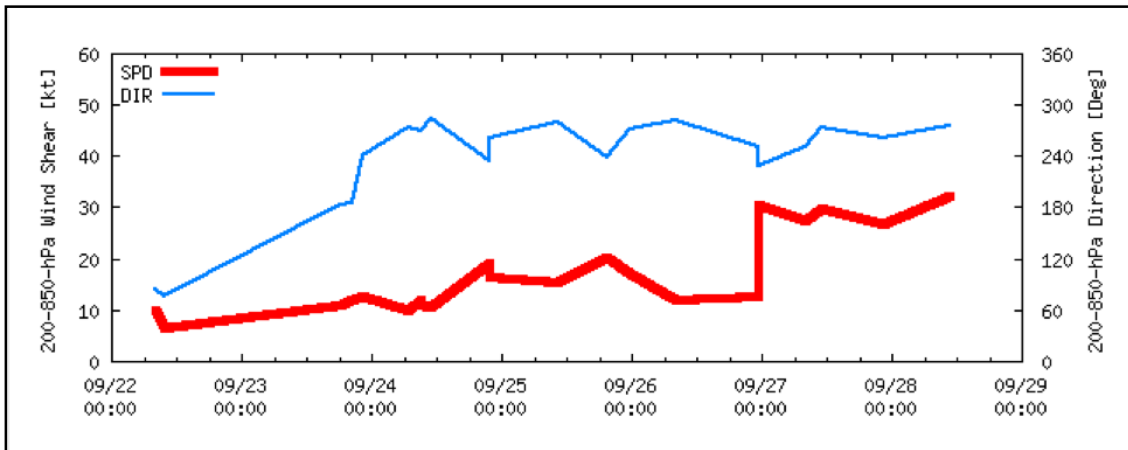


Figure 2 Vertical wind shear between 200 hPa (approximately 12 km of altitude) and 850 hPa (approximately 1.5 km of altitude) in speed (red) and direction (blue). The sudden increase in the speed shear on 27 September at 0000UTC caused the steady weakening of the TS Kirk. Source: NOAA, National Environmental Satellite, Data and Information Service

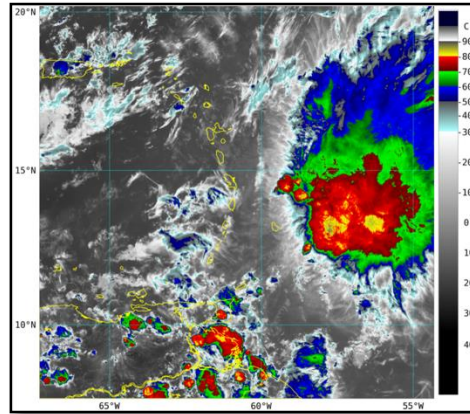
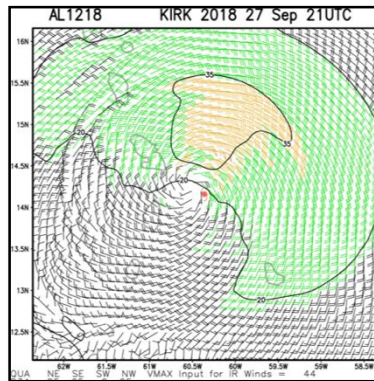
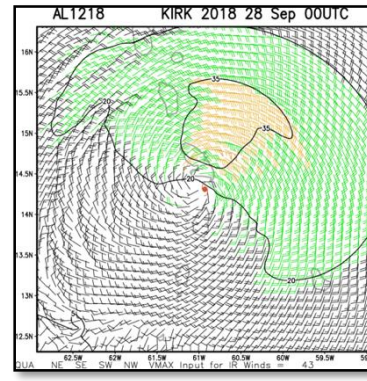


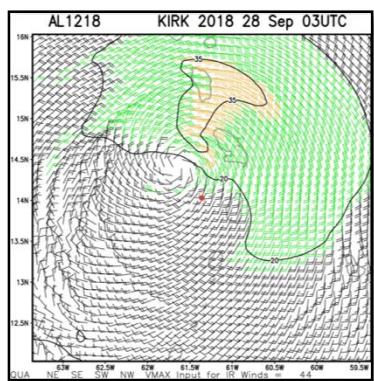
Figure 3 Enhanced infrared imagery over the western tropical Atlantic Ocean, collected on 27 September at 1740UTC. Colours indicate the cloud canopy temperature, with yellow to red colours indicating the colder canopy and green to blue the warmer canopy. Cold cloud canopy indicates deep convection. The approximate location of the TS centre is indicated by the blue cross. Source: NOAA, National Environmental Satellite, Data and Information Service.



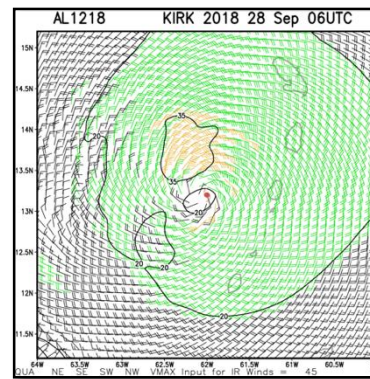
a) 27 September at 2100UTC



b) 28 September at 0000UTC



c) 28 September at 0300UTC



d) 28 September at 0600UTC

Figure 4 Multi-platform satellite surface wind analysis estimated at different times. Contouring indicates wind intensity higher than 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 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 Saint Lucia and St. Vincent and the Grenadines Tropical Cyclone Kirk qualified as a Loss Event¹, for Barbados, Dominica and Grenada; Tropical Cyclone Kirk qualified as a Reportable Event².

The wind footprint (Figure 5, Figure 6, Figure 7, Figure 8 and Figure 9) and surge field (Figure 10, Figure 11, Figure 12, Figure 13 and Figure 14) are two of the outputs from the CCRIF model, which show the regions affected by certain magnitudes of wind velocity and storm surge in each country.

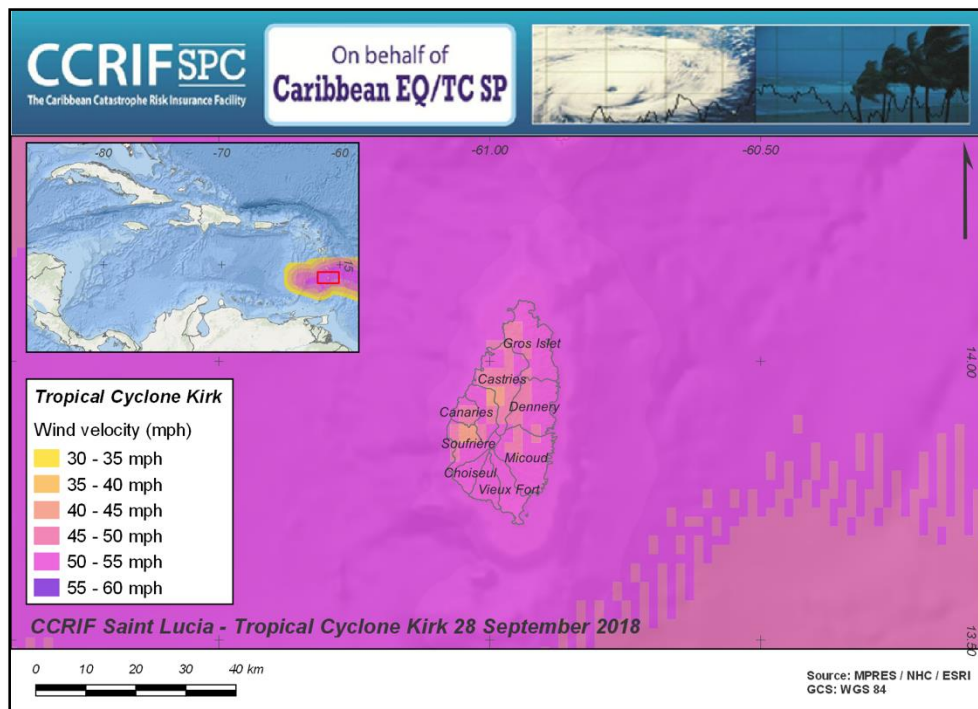


Figure 5 Map showing the wind field associated with Tropical Cyclone Kirk in Saint Lucia.
Source: NHC & CCRIF/MPRES

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

² Any named Tropical Cyclone event (i.e. one that reaches Tropical Storm status or higher) which produces modelled winds of at least 39 mph in one or more grid cells of at least one CCRIF policyholder country but does not generate a modelled loss greater than zero.

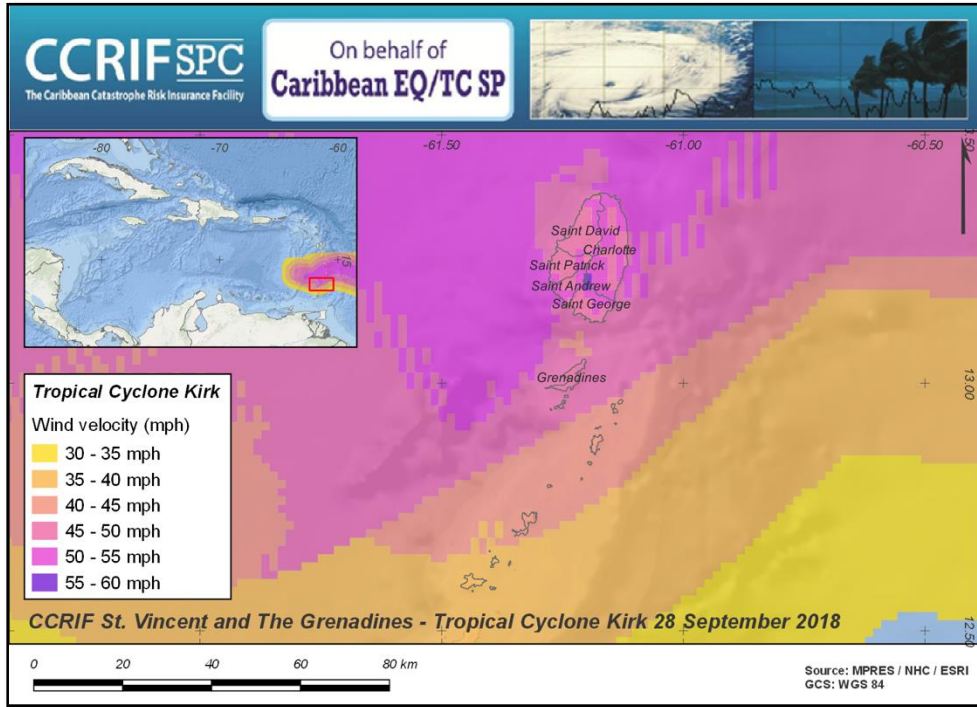


Figure 6 Map showing the wind field associated with Tropical Cyclone Kirk in St. Vincent and The Grenadines.
Source: NHC & CCRIF/MPRES

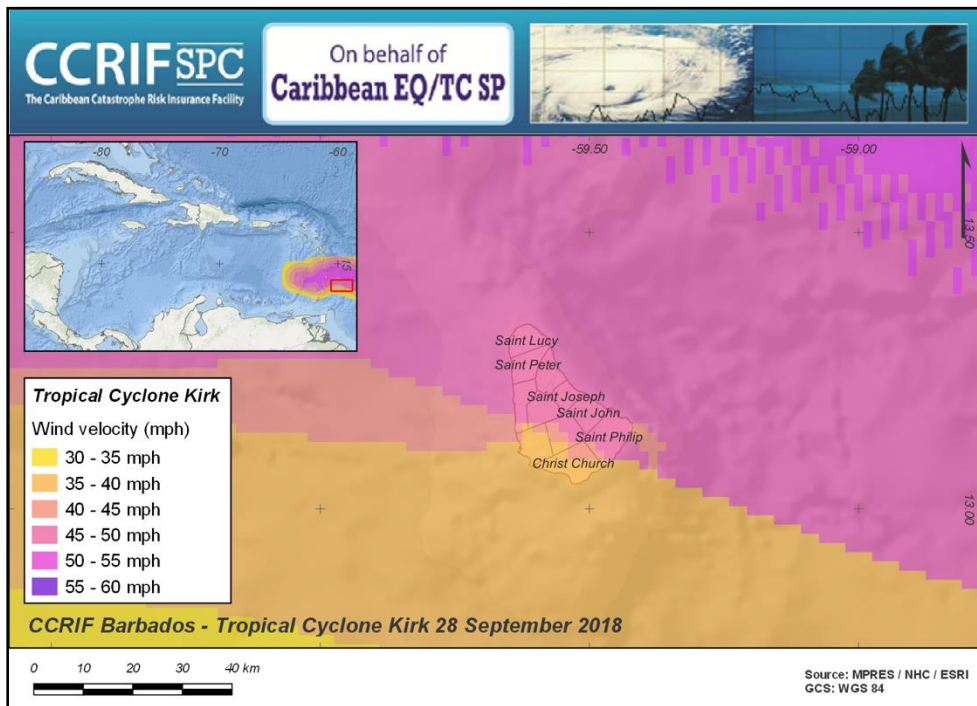


Figure 7 Map showing the wind field associated with Tropical Cyclone Kirk in Barbados.
Source: NHC & CCRIF/MPRES

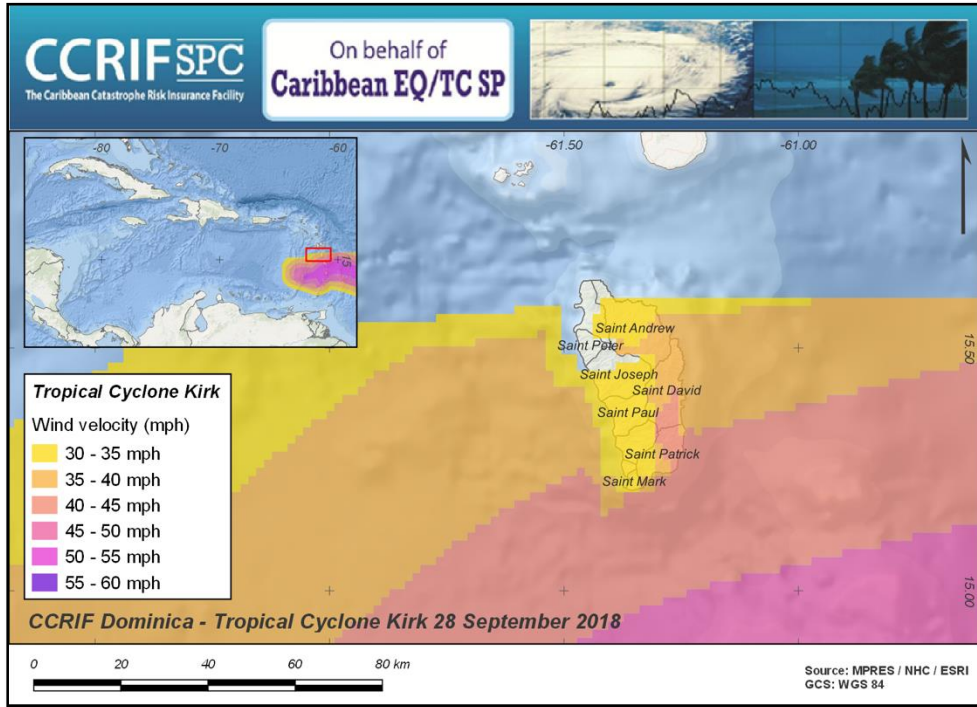


Figure 8 Map showing the wind field associated with Tropical Cyclone Kirk in Dominica.
Source: NHC & CCRIF/MPRES

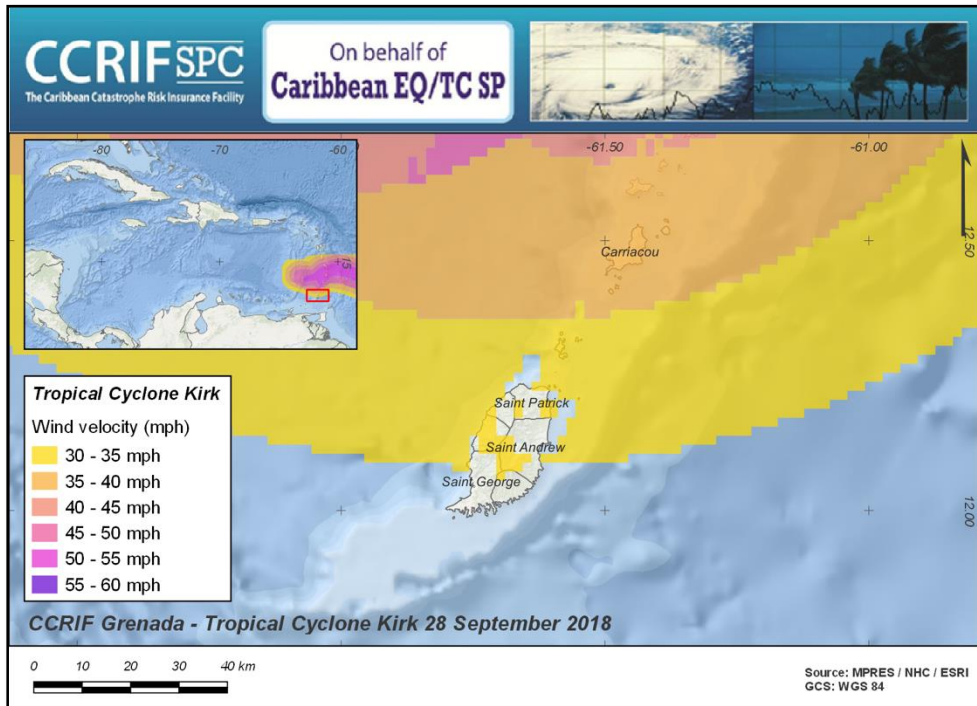


Figure 9 Map showing the wind field associated with Tropical Cyclone Kirk in Grenada.
Source: NHC & CCRIF/MPRES

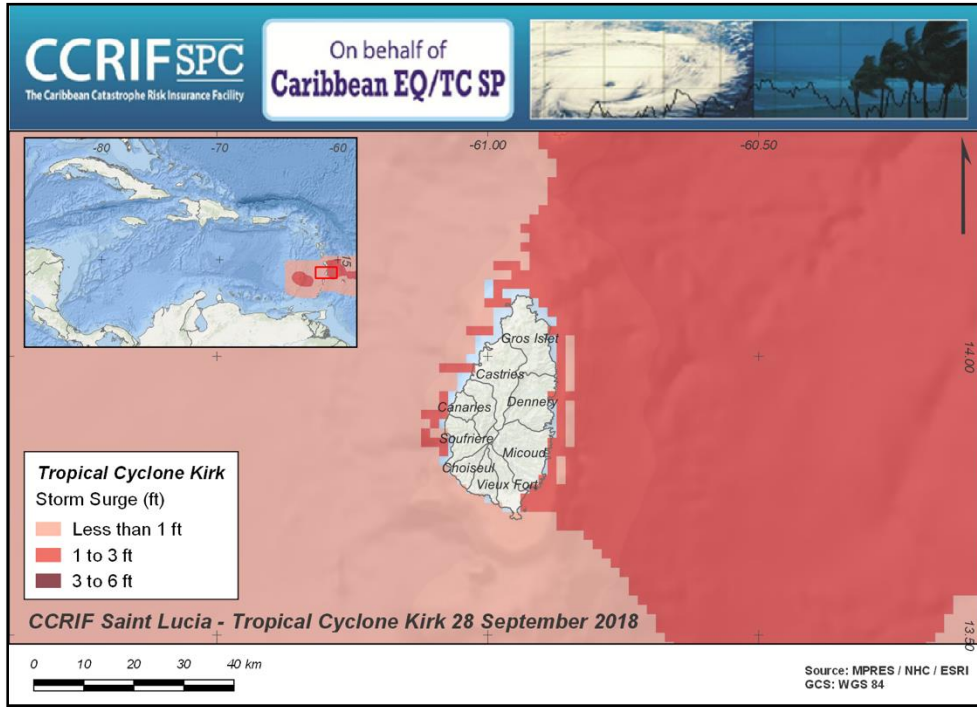


Figure 10 Map showing the storm surge field associated with Tropical Cyclone Kirk in Saint Lucia. Source: NHC & CCRIF/MPRES

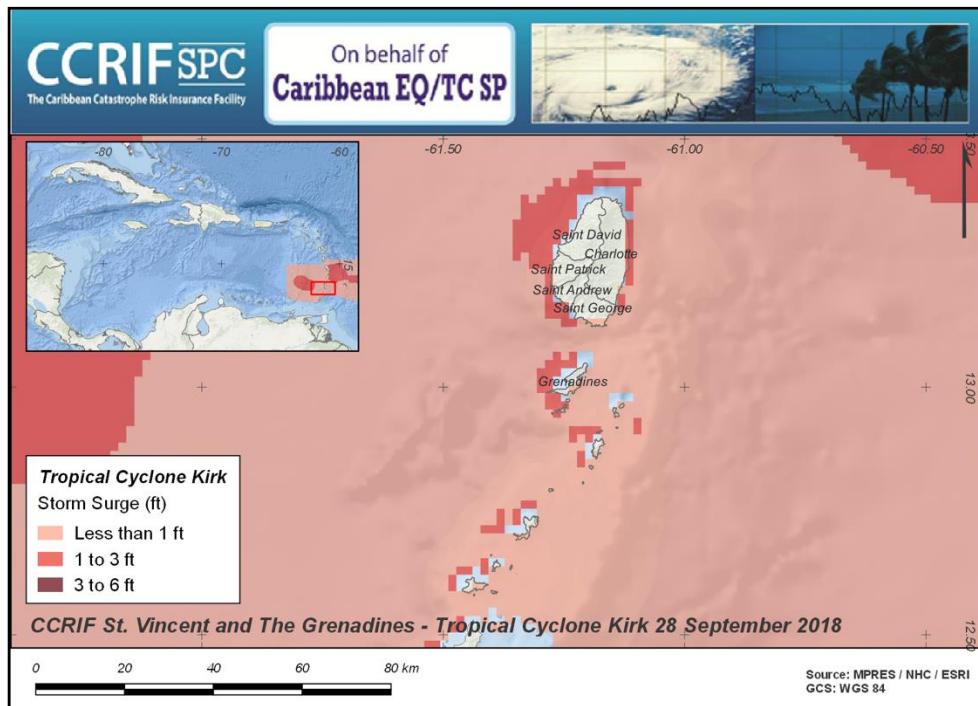


Figure 11 Map showing the storm surge field associated with Tropical Cyclone Kirk in St. Vincent and the Grenadines. Source: NHC & CCRIF/MPRES

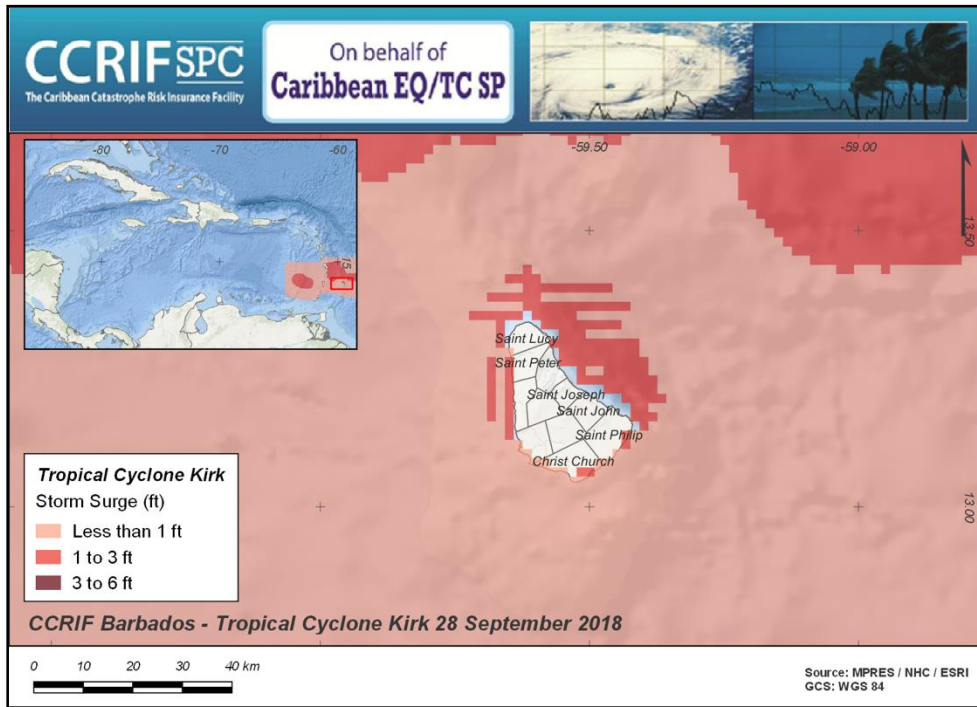


Figure 12 Map showing the storm surge field associated with Tropical Cyclone Kirk in Barbados.
Source: NHC & CCRIF/MPRES

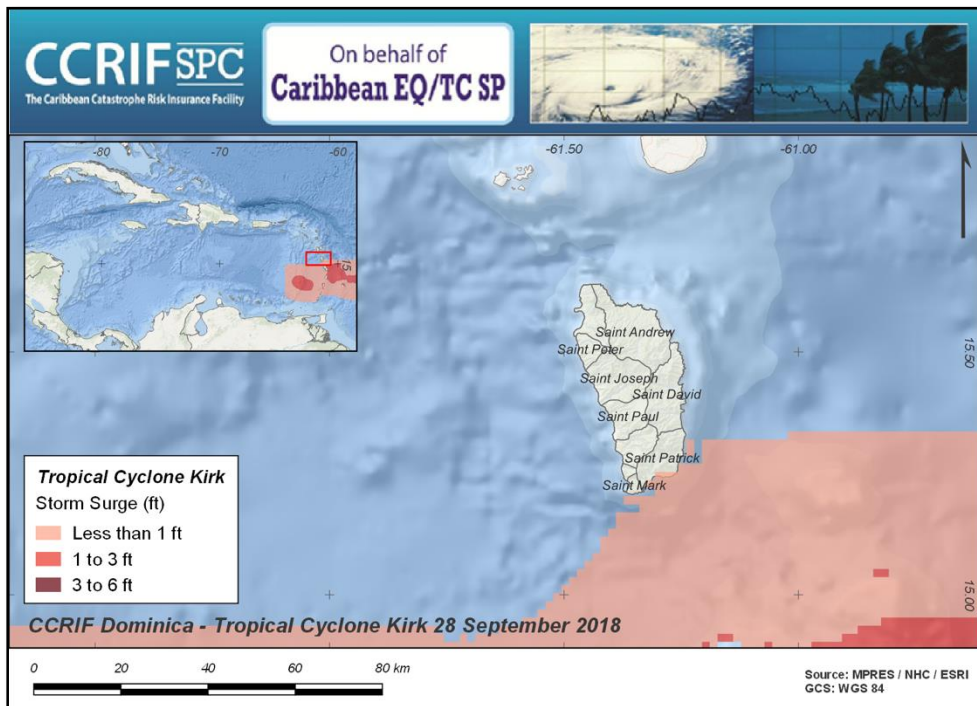


Figure 13 Map showing the storm surge field associated with Tropical Cyclone Kirk in Dominica.
Source: NHC & CCRIF/MPRES

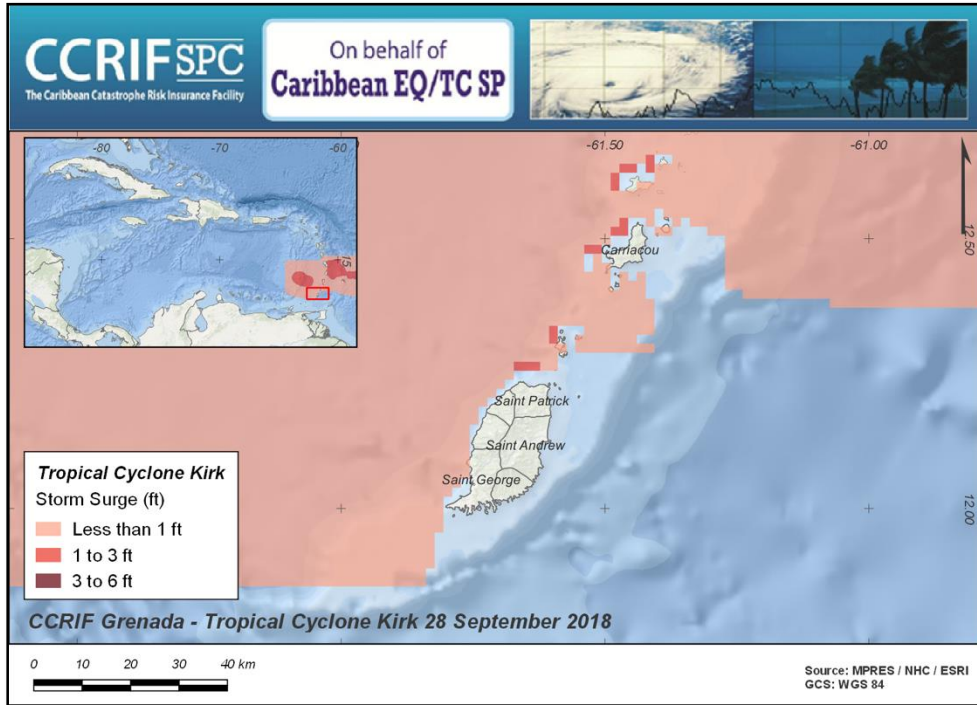


Figure 14 Map showing the storm surge field associated with Tropical Cyclone Kirk in Grenada.
Source: NHC & CCRIF/MPRES

4 IMPACTS

Saint Lucia

At the time of this report and according to the initial information and assessments provided by the Caribbean Disaster Emergency Management Agency (CDEMA), a few roofs and two collapsed structures were reported as damaged; there was some damage in the agriculture sector and some fallen trees. The Ministry of Infrastructure will clear fallen debris. According to reports the major electricity infrastructure was not damaged.

St. Vincent and the Grenadines

At the time of this report, there were no reports of damage or injuries. Prior to the arrival of Tropical Cyclone Kirk, the authorities of St. Vincent and the Grenadines carried out precautionary measures such as opening shelters and closure of all schools. The National Emergency Operating Center was activated on 27 September.

Barbados

At the time of this report, no information was available related to damages or losses in Barbados due to Tropical Cyclone Kirk.

Dominica

At the time of this report there were no reports of damages or casualties. Prior to the arrival of Tropical Cyclone Kirk, the authorities of Dominica carried out precautionary measures such as opening shelters and closure of schools and businesses in public and private sectors. The National Emergency Operations Centre was activated.

Grenada

According to the President of Grenada's Red Cross, Tropical Storm Kirk did not affect Grenada and its dependencies. No damage reports were received.

5 CCRIF LOSS MODEL

The preliminary runs of CCRIF's loss model for wind and storm surge produced government losses for Saint Lucia and St. Vincent and the Grenadines, which were below the attachment point of the countries' Tropical Cyclone policy. The Aggregated Deductible Cover (ADC) for these countries' policies was not activated because the modelled losses were less than 50 per cent of the attachment point and there was no disaster alert declaration from ReliefWeb related to TC Kirk in Saint Lucia or St. Vincent and the Grenadines; therefore no payment is due under the ADC.

The lack of impact reports corroborates the preliminary runs of CCRIF's loss model that generated no government losses for Barbados, Dominica and Grenada related to TC Kirk, and therefore no payout is due.

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

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