



Tropical Cyclone Dorian (AL052019)

Fisheries Model

Final Event Briefing

Saint Lucia

11 September 2019

1 SUMMARY

Dorian was the fifth tropical cyclone of the 2019 Atlantic Hurricane Season. It made landfall on Barbados and Saint Lucia on 27 August as a tropical storm. The neighboring islands Martinique and St. Vincent and the Grenadines also experienced tropical-storm-force winds. On 28 August, the eye of the tropical storm moved to the north north-west, passing approximately 100 km away from Saint Kitts and Nevis and Sint Maarten. These islands were marginally affected by tropical-storm-force winds. During the same day, Dorian strengthened to hurricane, affecting the US Virgin Islands with hurricane-force winds and the British Virgin Islands with tropical-storm-force winds.

The COAST product for fisheries is based on a 3-tier payment scheme that considers losses caused by Adverse Weather on fisherfolk and other stakeholders in the fisheries sector (Adverse Weather component linked to Tier 1) and the assessment of direct damages caused by tropical cyclones to fishing vessels, fishing equipment and fishing infrastructure (Tropical Cyclone component linked to Tiers 2 and 3). The COAST policy thus comprises two components: Adverse Weather – based on wave height and rainfall that occurs for at least 3 consecutive days; and Tropical Cyclone – based on wind and storm surge.

This event briefing is designed to review the modelled losses calculated by CCRIF’s fisheries model for both components of the COAST¹ policy for affected CCRIF member countries².

2 INTRODUCTION

On 24 August 2019 at 2100UTC, the US National Hurricane Center (NHC) reported that a tropical storm, later named Dorian, developed over the Atlantic Ocean. Its centre was located at approximately 10.7°N and 49.1°W, with estimated minimum central pressure of 1008 mb, maximum sustained winds of 40 mph (65 km/h) and a small radius (about 30 km). The storm moved westward at 12 mph (19 km/h). In the following 48 hours, Tropical Storm Dorian continued to move west and north-west with approximately the same forward speed (14 mph, 22 km/h) along the south side of the Bermuda-Azores high pressure system, heading to the Windward Islands (Figure 1). Afterwards, the cyclone experienced a gradual but slow increase in strength, limited by the presence of a dry air mass surrounding the cyclone system. The tropical storm showed a compact structure without a well-defined eye on 26 August at 2100UTC. The maximum sustained wind speed was 60 mph (95 km/h) and the most intense winds were located in the northern quadrant, as reported in Figure 2. At this time, the centre of Dorian was located approximately 95 km (59 mi) SE of Barbados (12.7N, 58.8W) when tropical-storm-force winds started to affect the island (Figure 2). A few hours later, on 27 August between 0000UTC and 0300UTC, the tropical storm made landfall on Barbados (Figure 1). Satellite-based estimates reported that winds with intensity greater than 39 mph (63 km/h) completely invested Barbados from 26 August at 2100UTC to 27 August at 0300UTC, mostly in the east and north sectors of the island (Figure 2).

¹ Caribbean Oceans and Aquaculture Sustainability Facility

² Two CCRIF member countries have COAST policies – Grenada and Saint Lucia

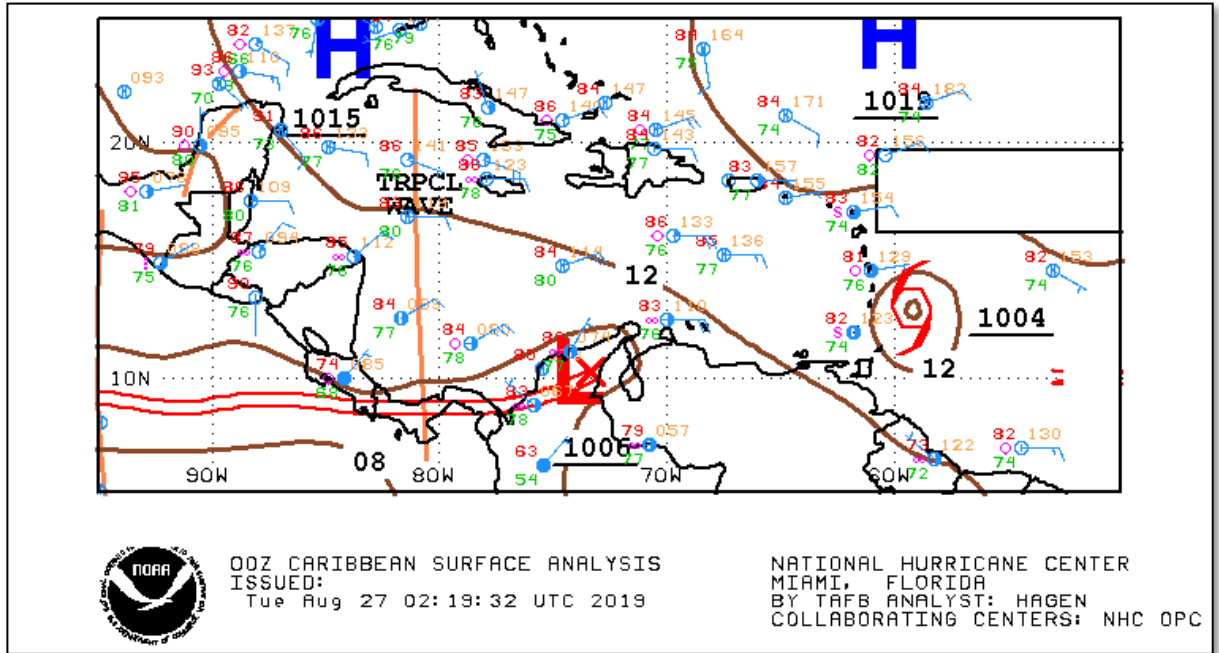
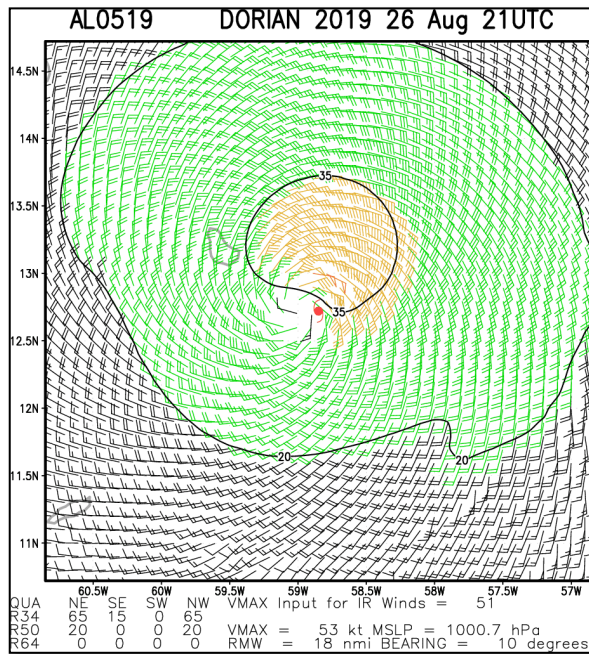
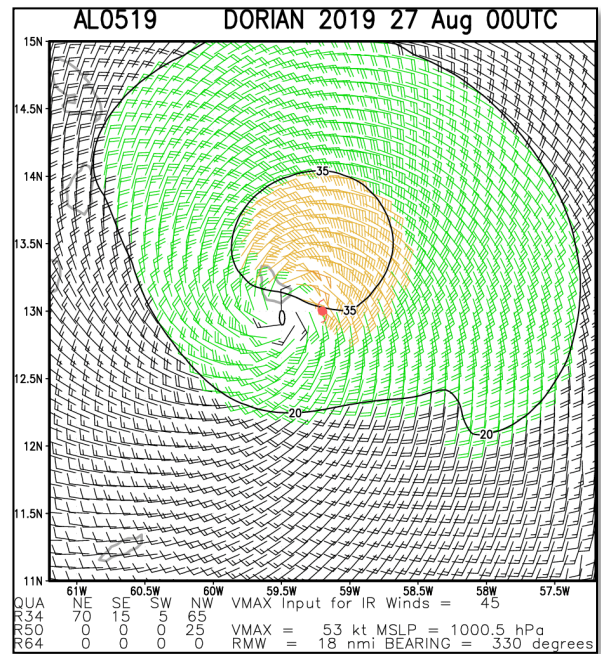


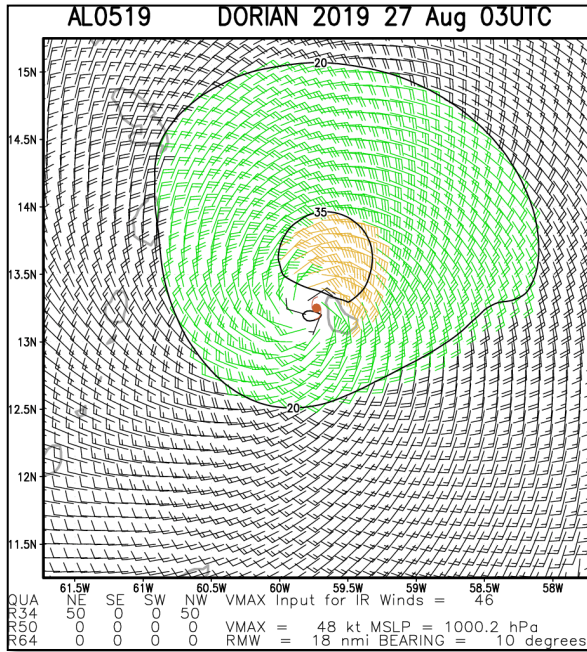
Figure 1 Surface analysis over the Caribbean area on 27 August at 0000UTC
 Source: US National Hurricane Center (NHC)



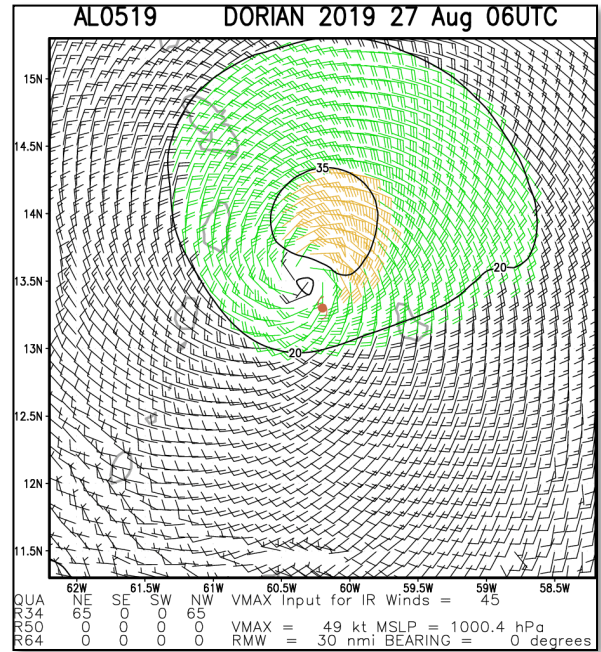
a) 26 August at 2100UTC



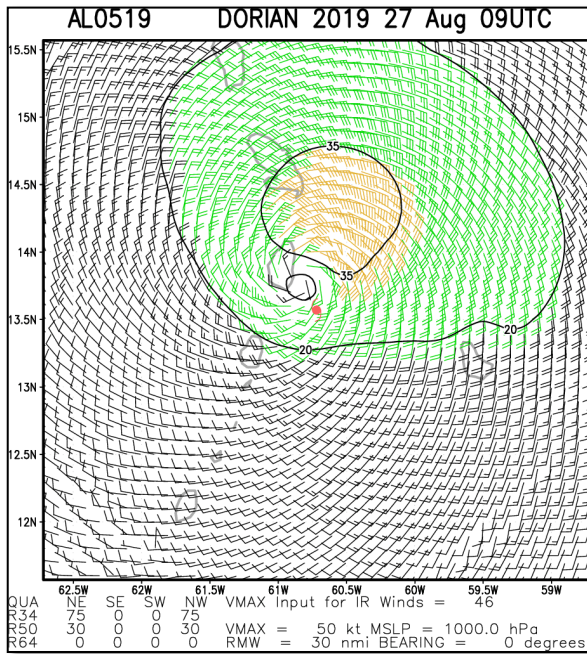
b) 27 August at 0000UTC



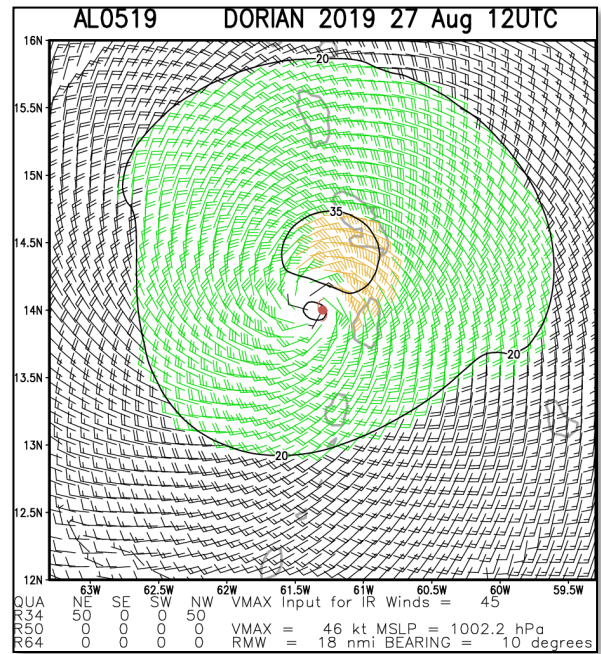
c) 27 August at 0300UTC



d) 27 August at 0600UTC



e) 27 August at 0900UTC



f) 27 August at 1200UTC

Figure 2 Multi-platform satellite surface wind analysis estimated at different times as indicated in the labels. Contouring indicates wind intensity higher than 20 kn (23 mph, 37km/h) and 35 kn (40 mph, 64 km/h). Source: NOAA, National Environmental Satellite, Data and Information Service.

The intensity of the tropical storm decreased due to the interaction with Barbados inland and the intrusion of dry air. A few hours later at 1000UTC on 27 August, Dorian moved directly towards Saint Lucia. Maximum sustained winds of 50 mph (85 km/h) with higher gusts and tropical-storm-force winds extended outward up to 45 mi (75 km) from where the centre was recorded. Saint Lucia was engulfed by tropical-storm-force winds from 0900UTC until 1500UTC (Figure 2). Martinique and St. Vincent and the Grenadines were also impacted by tropical-storm-force winds. Dorian continued to move across the north-eastern Caribbean Sea towards the northwest with unchanged forward speed and maintaining approximately the same strength.

3 CCRIF FISHERIES MODEL TC COMPONENT OUTPUTS

Under the Tropical Cyclone (TC) component of CCRIF’s fisheries model loss calculation protocol, a 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, Tropical Cyclone Dorian qualified as a Loss Event³ under TC component of the country’s COAST policy.

The wind footprint (Figure 3) is one of two outputs from the TC component of CCRIF’s fisheries model, which show the regions affected by certain magnitudes of Tropical Cyclone Dorian in Saint Lucia.

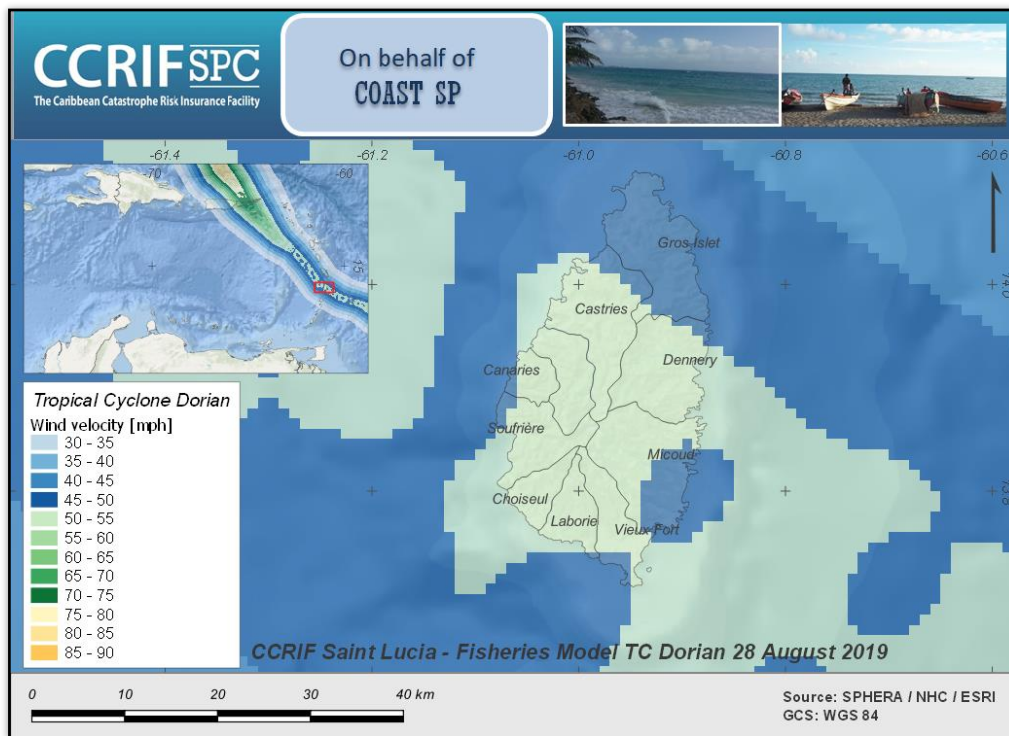


Figure 3 Map showing the wind field associated with Tropical Cyclone Dorian in Saint Lucia. Source: NHC & CCRIF’s fisheries model TC component

³ An event registers a loss in one or more policyholder countries but does not trigger the CCRIF policy in any policyholder country.

4 CCRIF FISHERIES MODEL AW COMPONENT OUTPUTS

Under the Adverse Weather (AW) component of the CCRIF fisheries model, an adverse weather event is defined as the occurrence of a maximum 24-hour-moving-window daily rainfall over any of the exposed assets above a pre-defined threshold, or of a maximum daily significant wave height close to any of the exposed assets⁴ above a pre-defined threshold, for at least three consecutive days. With TC Karen, these conditions did not occur, and therefore the calculation of the losses was not triggered (i.e., this event did not generate adverse weather losses).

Figure 4 below shows the daily time series of country average maximum 24-hour accumulated rainfall (left) and country average maximum daily significant wave height (right) are shown. These plots show the variation of these two variables before, during and after the event. The maximum rainfall occurred on the 27th of August 2019, and the average value over the exposed assets was 50.8 mm. The maximum significant wave height occurred on the 27th of August 2019, and the average value close to the exposed assets was 2.6 m.

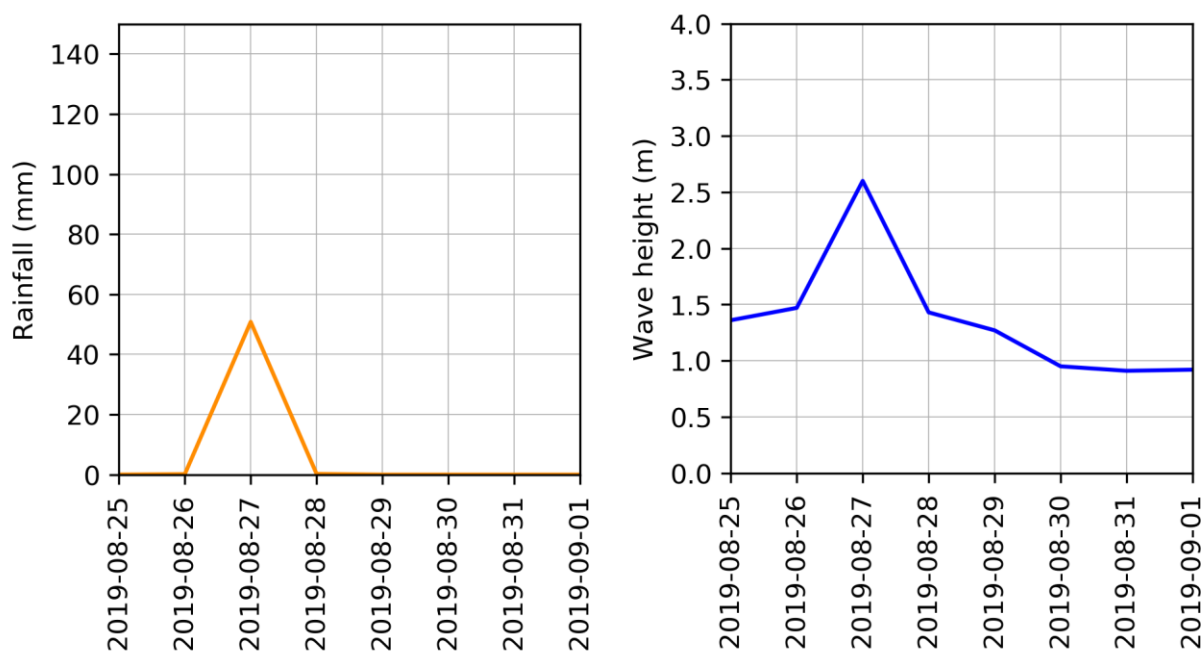


Figure 4 Daily time series of country average maximum 24-hour accumulated rainfall (left) and country average maximum daily significant wave height (right)

The model did not report any adverse weather event since the beginning of the policy year.

⁴ If, for a given day, the value of the rainfall depth is above a rainfall threshold or the value of sea wave height is above a wave height threshold in a port or landing sites, all the revenues of the day are considered lost, i.e., the fisherfolk are unable to perform their usual activities.

5 IMPACTS

At the time of this report, no information was available related to damages or losses on the fisheries sector in Saint Lucia due to Tropical Cyclone Dorian. Prior to the arrival of Dorian, the authorities in Saint Lucia carried out precautionary measures such as:

- A mandatory national shutdown was declared.
- The National Emergency Operation Centre (NEOC) and a Tropical Storm Warning were activated.
- Sea ports were closed.
- Two shelters were opened.

Maritime traffic restriction and the national shutdown carried out by authorities helped to minimize the impacts to the fisheries sector, this is corroborated with the lack of damage reports at the time of this writing.

6 CCRIF FISHERIES MODEL TC COMPONENT

The modelled loss for the TC component (Tiers 2 and 3), computed for Saint Lucia using the CCRIF fisheries model, was below the Tier 2 attachment point (and hence below the Tier 3 attachment point), therefore no payout is due under the TC component.

7 CCRIF FISHERIES MODEL AW COMPONENT

The sum of the losses caused by adverse weather since the start of the policy year are below the attachment point (tier 1) and therefore no payout is due.

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

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