



Tropical Cyclone Laura (AL132020)

Wind and Storm Surge

Final Event Briefing

Haiti

2 September 2020

1 SUMMARY

Tropical Cyclone Laura was the thirteenth tropical cyclone in the 2020 Atlantic Hurricane Season and the earliest twelfth named storm on record in the North Atlantic basin. On 21 August it was upgraded from a tropical depression to a tropical storm while it was over the tropical Atlantic, just to the east of the northern Leeward Islands. After the passage over the northern Leeward Islands, Tropical Storm Laura headed for the island of Hispaniola. On 23 August, its centre passed over Haiti, spreading tropical-storm-force winds over the country.

The final runs of the CCRIF loss model for wind and storm surge produced government losses for Haiti. For this country's Tropical Cyclone policy, the government losses were below the attachment point. Therefore, no payout under the policy for Haiti is due.

However, the Aggregated Deductible Cover (ADC) for Haiti's Tropical Cyclone policy was activated because a disaster alert declaration from ReliefWeb related to Tropical Cyclone Laura was issued for Haiti and the modelled losses were above 10 per cent of the minimum payment of the policy for this country's Tropical Cyclone policy. Therefore, the final analysis shows that a payment of US\$290,925 is due under to Haiti the ADC feature.

This event briefing is designed to review the modelled losses due to wind and storm surge calculated by CCRIF's models for Haiti, to be analyzed with respect to the country's Tropical Cyclone policy. As reported in a separate event briefing that addressed loss and damages from excess rainfall "Covered Area Rainfall Event: Haiti" dated 2 September 2020, Haiti experienced heavy rains from the Tropical Storm Laura. The final runs of the CCRIF excess rainfall loss model produced losses above the attachment point of Haiti's Excess Rainfall policy and payment of US\$7,163,958.28 is due under to the Excess Rainfall policy.

Other Tropical Cyclone event briefing reports have been issued for CCRIF member countries: Antigua and Barbuda, St. Kitts and Nevis and Montserrat.

2 INTRODUCTION

On 16 August, the US National Hurricane Center (NHC) started to monitor a tropical wave located over the eastern Atlantic, as a potential genesis of a tropical cyclone. On 18 August, a low pressure system developed within the tropical wave and on 20 August, a well-defined closed circulation was evidenced at the surface around the centre of the disturbance. Consequently, on 20 August at 0300UTC the NHC reported that the system developed into a tropical depression, and it was named Tropical Depression Thirteen. Its centre was located at 14.6N 47.9W over the central tropical Atlantic. The environmental conditions were moderately favourable for the depression to strengthen as it presented a low to moderate wind shear and a moist air mass surrounding the depression. These conditions promoted the gradual strengthening of the tropical cyclone and on 21 August at 1305UTC, the NHC reported that it was upgraded to a tropical storm, and named Tropical Storm Laura. At this stage, the system was located over the tropical western Atlantic and presented both a poorly organized structure and convective band and a general ragged appearance of the cloud pattern. The estimated centre of circulation was located at 17.0N 59.8W, to the east-southeast of the northern Leeward Islands. The minimum central pressure was 1008 mb and the maximum sustained winds were estimated at 45 mph (75 km/h). Tropical-storm-force winds extended outward for 150 miles (240 km) from the centre, primarily over the north quadrant. The system moved towards the west along the south periphery of the Bermuda-Azores high pressure system located over the Atlantic Ocean. Its forward velocity was estimated at 18 mph (30 km/h) and it was directed towards the northern Leeward Islands.

On the same day at 2100UTC, the centre of Laura passed over the northern Leeward Islands (17.1N 61.2W), with a force and an appearance generally unchanged. In the following hours, the tropical storm left the Leeward Islands heading for the Caribbean Sea. The system moved with slightly increased forward velocity (21 mph, 33 km/h) towards the west-northwest in the direction of the island of Hispaniola.

On 23 August at 0600UTC, the centre of Tropical Storm Laura was at 18.6N 70.1W, at a distance of 145 mi (230 km) from Port-au-Prince, Haiti (Figure 1). The cloud pattern of the system appeared more organized (as shown in Figure 2), the estimated maximum sustained winds were slightly increased to almost 50 mph (85 km/h) and the minimum central pressure decreased to 1004 mb. Tropical-storm-force winds extended outward up to 140 miles (220 km) from the centre, primarily over the north-eastern quadrant (Figure 3). Starting from this time, tropical-storm-force winds affected Haiti. The system moved toward the west-northwest near 18 mph (30 km/h) and six hours later at 1200UTC, the centre of Laura was located over Haiti at 19.1N 72.1W (Figure 1). Tropical-storm-force winds affecting the country until 1800UTC, when the tropical storm left Hispaniola, heading for Cuba.

On 25 August at 1215UTC, Laura became a hurricane, when its centre was located over the southeastern Gulf of Mexico with maximum sustained winds near of 75 mph (120 km/h) with significant strengthening during the following hours. Twenty four hours later, Hurricane Laura intensified, becoming a category 3 hurricane as the first major hurricane of the 2020 Atlantic Hurricane Season while it was moving over the central waters of Gulf of Mexico.

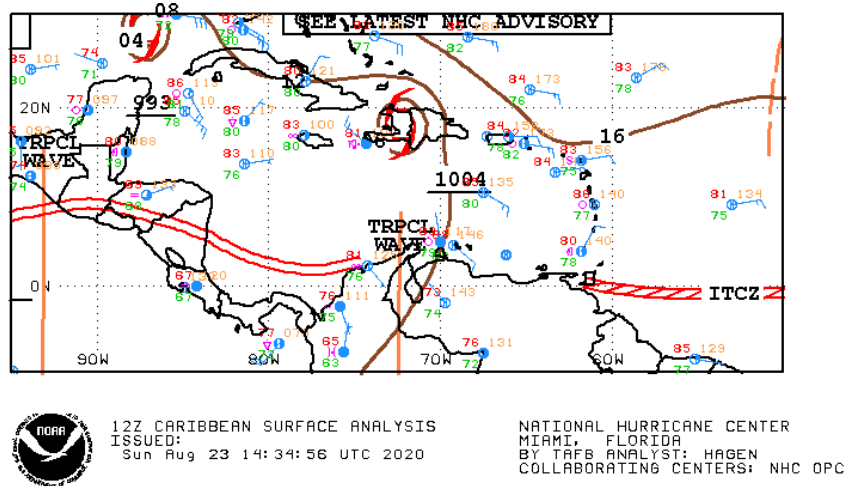


Figure 1 Surface analysis over the Caribbean area on 23 August at 1200UTC. Tropical Storm Laura is visible over Haiti. Source: US National Hurricane Center¹

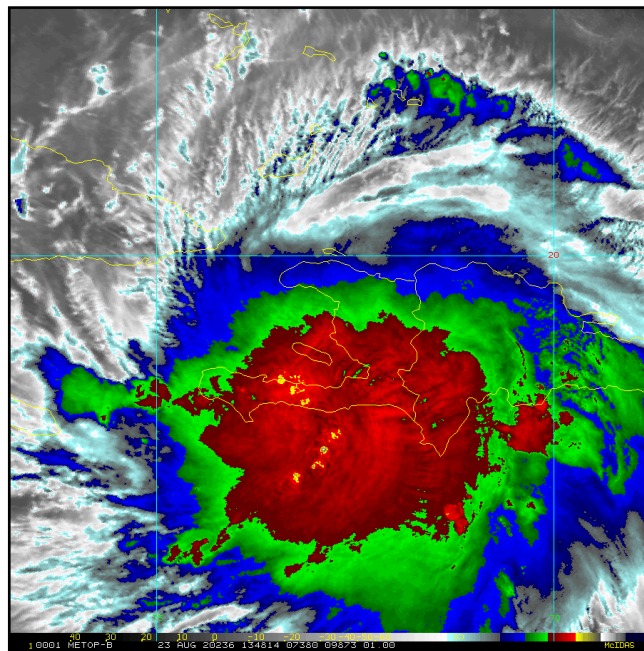


Figure 2 Satellite imagery on 23 August at 1348UTC from thermal infrared channel enhanced with colour. Blue/green colours represent high altitude clouds (top cloud temperature between -50°C and -70°C), while the red/yellow colours represent very high altitude clouds (top cloud lower than -70°C). High altitude clouds indicate strong convection associated with intense precipitation. Source: NOAA, National Environmental Satellite, Data and Information Service².

¹ National Oceanic and Atmospheric Administration - FTP, National Hurricane Center, review date: 23 August 2020, available at: https://www.nhc.noaa.gov/tafb/CAR_12Z.gif

² RAMSDIS Online Archive, NOAA Satellite and Information Service, review date: 23 August 2020, available at: http://rammb.cira.colostate.edu/ramsdiskonline/archive.asp?data_folder=tropical/tropical_ge_14km_wv&width=640&height=480

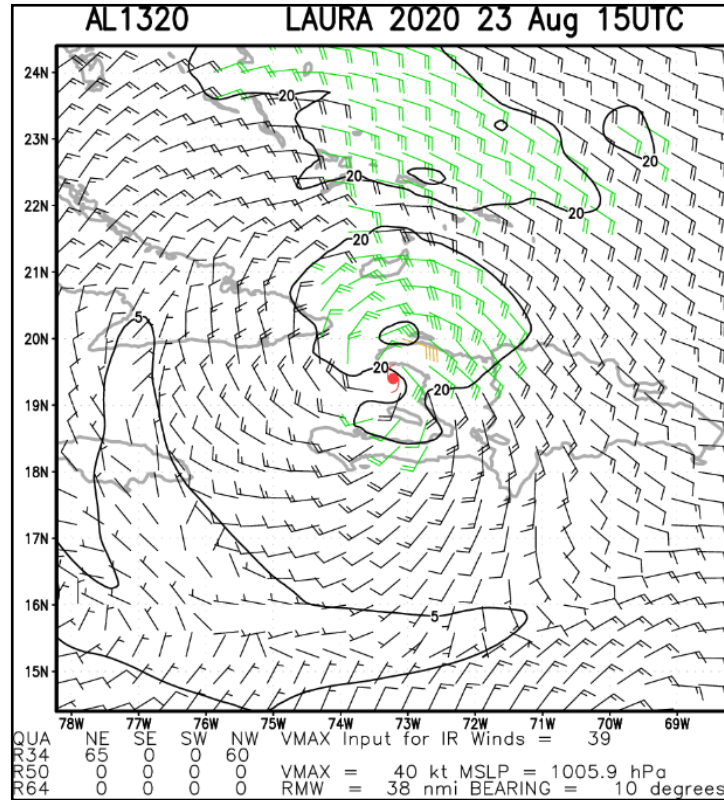


Figure 3 Multiplatform satellite based tropical cyclone surface wind analysis estimated on 23 August at 1500UTC. Contouring indicates wind intensity at 20 kn (23 mph, 37 km/h) and at 35 kn (40 mph, 65 km/h). Source: NOAA, National Environmental Satellite, Data and Information Service³.

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).

Based on the SPHERA footprint for this tropical cyclone, winds speed between 19 mph (31 km/h) and 47 mph (76 km/h) were estimated in Haiti, which generated government losses, which were below the attachment point of Haiti’s Tropical Cyclone policy. However, Tropical Cyclone Laura qualified as a Triggering Event by Aggregated Deductible Cover (Endorsement) for Haiti (see section on CCRIF Loss Model below).

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 Laura in Haiti. Due to the physical conditions of Tropical Storm Laura, storm surge was insignificant, did not contribute to the damage, and is therefore not shown on a hazard map.

³ RAMSDIS Online Archive, NOAA Satellite and Information Service, review date: 23 August 2020, available at: https://rammb-data.cira.colostate.edu/tc_realtime/storm.asp?storm_identifier=al132020

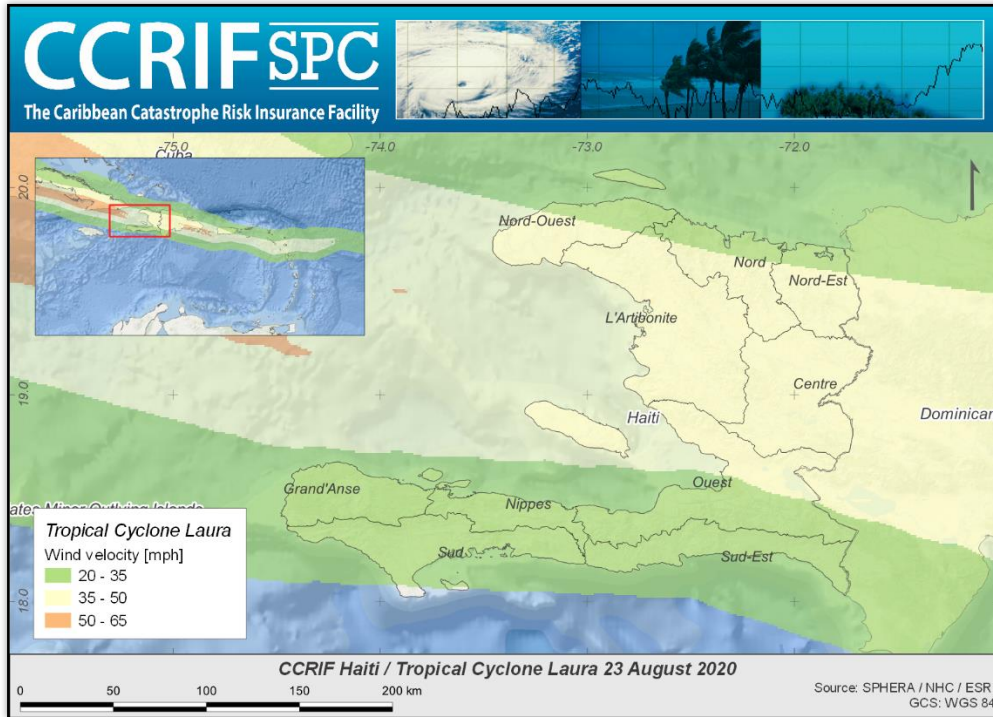


Figure 4 Map showing the wind field associated with Tropical Cyclone Laura in Haiti.
Source: NHC & CCRIF/SPHERA

4 IMPACTS

According to the assessments provided by Haiti's Direction de la Protection Civile, development partners and other sources^{4 5}, the entire country was affected in some way by wind and rainfall due to Tropical Storm Laura, with the most significant impacts due to rainfall.

Reported impacts at the time of this report include the following:

- 31 persons lost their lives, with another 8 persons missing
- Approximately 44,175 persons from 8,835 households were affected
- 28 cities/parishes in 4 departments were impacted:
 - Nippes: Miragoane, Baradères
 - Ouest: Port-au-Prince, Carrefour, Cité Soleil, Delmas, Léogane, Fond Verrettes Ganthier, Tabarre, Pétionville
 - Sud : Cayes, Chardonnières, Côteaux, les Anglais, Port Salut, Port à Piment, Roche à bateau, Saint jean du Sud, Tiburon
 - Sud-Est: Anse à Pitres, Bainet, Belle-Anse, Cayes-Jacmel, Jacmel, Marigot, La Vallée, Thiotte

⁴ New Orleans, LA Local news – NOLA.com, review date: 26 August 2020, available in: <https://www.nola.com/>

⁵ ZIZ Broadcasting Corporation – zizonline, review date: 26 August 2020, available in: <https://zizonline.com/>

- 6,272 homes were flooded, including 2,320 which suffered some damage and 243 which were destroyed
- Several communities were evacuated
- Destruction of agricultural crops and the death of livestock occurred in the Sud Est, Sud, Artibonite, Grand'Anse, Nippes, Nord, Ouest, and Nord Ouest departments
- Numerous roads and bridges were damaged, destroyed or blocked
- Telecommunication services were temporarily interrupted
- Port-au-Prince's Toussaint Louverture International Airport was flooded
- Several hospitals were short-staffed due to impassable roads
- A health centre in Anse-à-Pitre was flooded

Prior to the arrival of Tropical Storm Laura, Haiti's authorities took precautionary measures such as activating a Tropical Storm Warning and opening the official emergency shelters.

Figure 5 shows some of the wind damage caused by Tropical Storm Laura in Haiti.



Figure 5 Some of the wind damage caused by Tropical Storm Laura in Haiti – August, 2020.
Source: *Protection Civile Haiti*

5 CCRIF LOSS MODEL

For Haiti, the final runs of CCRIF's loss model for wind and storm surge generated government losses, but these losses were below the attachment point of the country's Tropical Cyclone policy and therefore no payout under the policy is due. However, the Aggregated Deductible Cover (ADC) for the Tropical Cyclone policy for Haiti was activated because a disaster alert declaration for Haiti from ReliefWeb related to Tropical Cyclone Laura was issued and the modelled losses were above 10 per cent of the minimum payment for the policy. Therefore, the final analysis shows that a payment of US\$290,925 is due under the ADC feature.

CCRIF expresses sympathy with the Government and people of Haiti for the loss of life and impacts on communities and infrastructure caused by this event.

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