



Tropical Cyclone Lisa (AAL152022)

Wind and Storm Surge

Final Event Briefing

Belize

11 November 2022

1 SUMMARY

Tropical Cyclone Lisa was the twelfth named storm and the sixth hurricane of the 2022 Atlantic Hurricane Season. On 2 November at 2120 UTC, the centre of Lisa made landfall near Belize City, Belize, as a category 1 hurricane. It remained at hurricane strength for the next three hours, while moving across Belize. It was then downgraded to a tropical storm, continuing to move across Belize. On 3 November at 0300 UTC, Lisa left Belize, moving over northern Guatemala and southeastern Mexico. On 4 November, it dissipated over the Bay of Campeche.

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

Final calculations show that the Endorsement of Deductible Cover was activated and a payment of USD\$53,569.60 is due. This additional coverage was triggered because: (i) a Disaster Alert (51374) for Belize from ReliefWeb related to Tropical Cyclone Lisa was issued and (ii) the modelled losses were above 10% of the minimum payment for this country's Tropical Cyclone policy.

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. Belize was the only CCRIF member country for which the CCRIF loss model for wind and storm surge produced government losses due to Tropical Cyclone Lisa. A separate report on rainfall impacts on affected CCRIF member countries will be issued if applicable.

2 INTRODUCTION

On 31 October at 1500 UTC, the US National Hurricane Center (NHC) indicated that a tropical storm had formed over the central Caribbean Sea, and was named Lisa. Its centre was approximately sited near latitude 15.5° North, longitude 77.3° West, about 175 mi (285 km) South of Jamaica. The system was proceeding with estimated forward velocity of 14 mph (22 km/h) towards the west, as it was moving along the southern side of a high pressure area located over the southern United States of America. The minimum central pressure was 1003 mb and the maximum sustained winds were estimated at 40 mph (65 km/h).

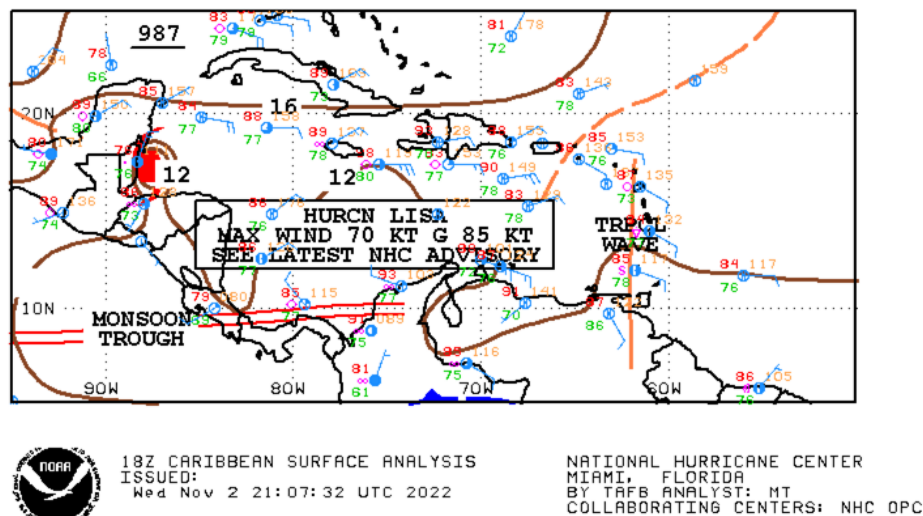
In the next 24 hours, the tropical storm continued to move west-northwestward over the very warm waters of the central western Caribbean Sea, where the oceanic heat content and the low to moderate wind shear favoured intensification of the system. However, the infiltration of dry air into the circulation slowed down the intensification. Starting from 1 November at 1200 UTC, the system steadily strengthened, due to the level of humidity in the environment. Therefore, the minimum central pressure gradually decreased and the system improved in organization and intensity, while it was heading towards Belize.

On 2 November at 1200 UTC, the NHC reported that Lisa became a category 1 hurricane. At this time, the centre of Hurricane Lisa was located near latitude 17.2° North, longitude 86.7° West, about 100 mi (165 km) ESE of Belize City, the capital of Belize (Figure 2). The minimum central pressure was 988 mb and the maximum sustained winds were estimated at 75 mph (120 km/h). The satellite imagery showed that Lisa was a small hurricane, with the inner-core hurricane-force wind area only about 15 mi (30 km) across (Figure 2). Tropical-storm-force winds extended outward up to 70 mi (110 km) from the centre. Tropical-storm-force winds started to affect the Atlantic Coast of Belize at this time (Figure 3a).

In the next 9 hours, Lisa continued to strengthen due to the favourable environmental conditions and at 2120 UTC, it made landfall along the coast of Belize, near the mouth of the Sibun River, about 10 mi (16 km) SW of Belize City (Figure 2). The maximum sustained winds were estimated at 85 mph (140 km/h), and the minimum central pressure was estimated at 990 mb. Hurricane-force winds extended outward up to 15 mi (30 km) from the system centre and particularly over the northern sector (Figure 3c). An observation station at the port of Belize City reported a sustained wind of 68 mph (109 km/h) with a wind gust of 86 mph (138 km/h).

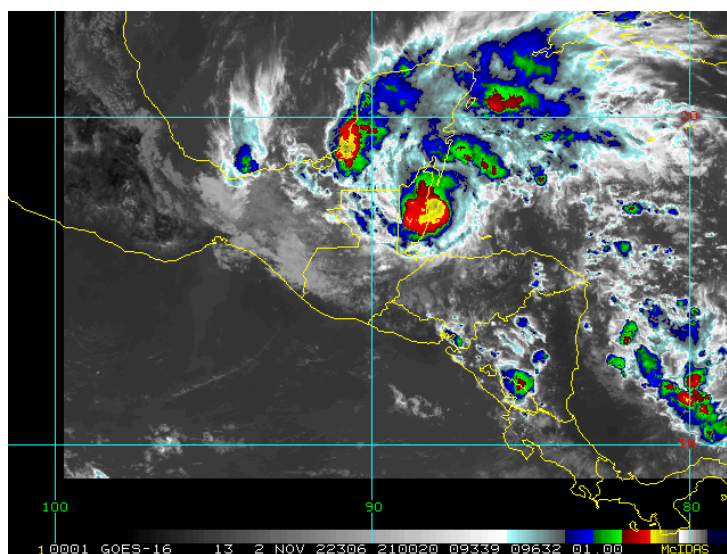
After landfall, Lisa continued to move westward over Belize inland at about 12mph (19km/h), while losing rapidly intensity due to the land interaction. After three hours, on 3 November at 0000UTC, the maximum sustained winds reduced to 75mph (120km/h), while Lisa's centre was sited about 20mi (30 km) ESE of Belize City. At this time, most of northern Belize was affected by tropical-storm winds, while a small area of about 15 mi (30 km) around the hurricane eye experienced hurricane-force winds (Figure 3d). At 0300UTC, 6 hours after landfall, Lisa was downgraded to a tropical storm. At this time, only the northwestern edge of Belize was still affected by tropical-storm-force winds while Lisa's centre was moving away from Belize towards northern Guatemala.

In the next 6 hours, Lisa continued to weaken, becoming a tropical depression at 1500UTC, while it was over southeastern Mexico. On 4 November, Lisa emerged over the Bay of Campeche, and at 0900UTC it dissipated.



2 November at 1800UTC

Figure 1 Surface analysis over the Caribbean area on 2 November at 1800UTC. Source: US National Hurricane Center¹



2 November at 2100UTC

Figure 2 Satellite imagery on 2 November at 2100UTC 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.

¹National Oceanic and Atmospheric Administration - FTP, National Hurricane Center, review date: 2 November 2022, available at: https://www.nhc.noaa.gov/tafb/CAR_18Z.gif

²RAMSDIS Online Archive, NOAA Satellite and Information Service, available at: https://rammb-data.cira.colostate.edu/tc_realtime/storm.asp?storm_identifier=al152022

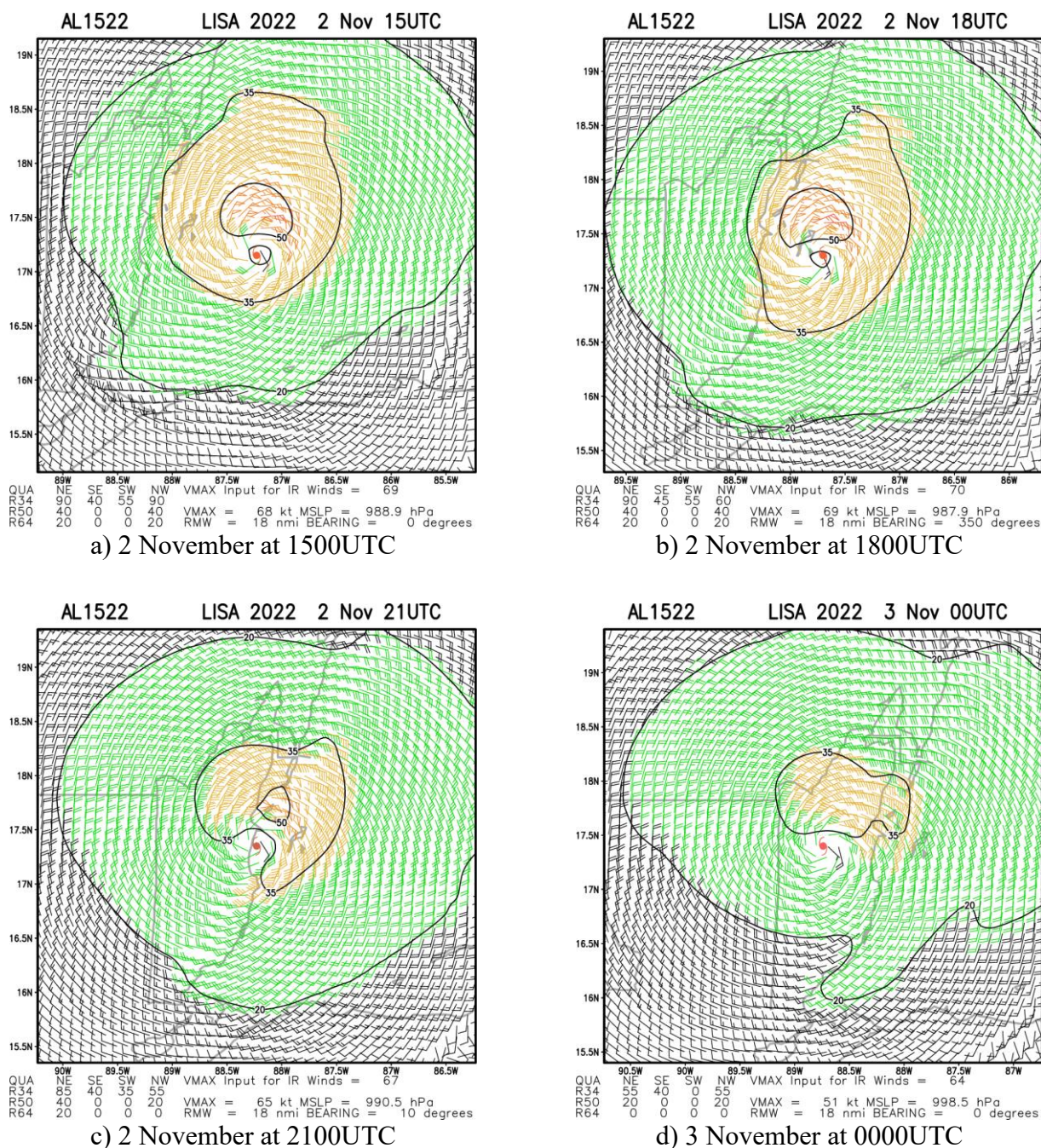


Figure 3 Multi-platform satellite based tropical cyclone surface wind analysis estimated on 9 October at different times as indicated by the labels. Contouring indicates wind intensity at 20 kn (23 mph, 37 km/h), at 35 kn (40mph, 65km/h) and 50kn (56mph, 92km/h). Source: NOAA, National Environmental Satellite, Data and Information Service³

³RAMSDIS Online Archive, NOAA Satellite and Information Service, available at:
https://rammb-data.cira.colostate.edu/tc_realtime/storm.asp?storm_idenfier=al152022

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). Belize was affected by Tropical Cyclone Lisa, which qualified as a Triggering Event by Aggregated Deductible Cover (ADC – Endorsement)⁴.

The wind footprint is one of the outputs from CCRIF's model. Figure 4 shows the wind footprint for the regions affected by Tropical Cyclone Lisa around Belize.

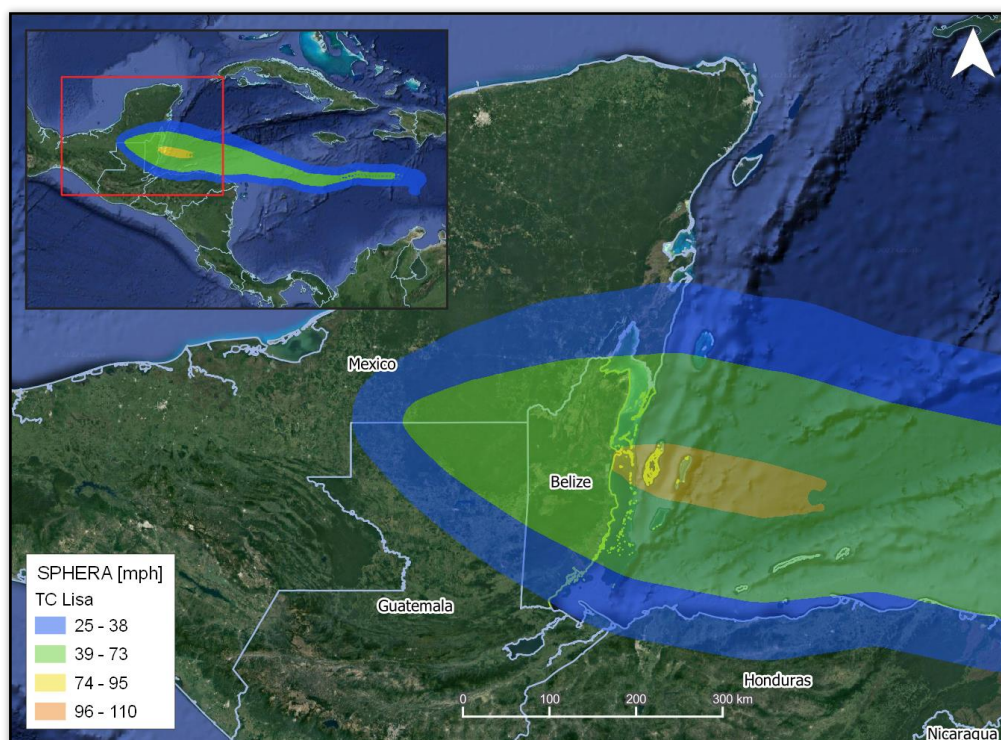


Figure 4 Map showing the wind field associated with Tropical Cyclone Lisa around the Belize.
Source: NHC & CCRIF/SPHERA

⁴ The Aggregated Deductible Cover (ADC) is a special feature of CCRIF's tropical cyclone (TC) and earthquake (EQ) parametric insurance policies. The ADC is designed to potentially provide a payment for TC and EQ events that are objectively not sufficient to trigger the country's main policy because the modelled loss is below the Underlying Policy Attachment Point.

4 IMPACTS

At the time of writing this report, online news agencies⁵⁶ reported that Belize City was without power and water after Lisa caused fallen trees and toppled electric posts. Also, some roofs sustained damage and bungalow houses were flooded.



a) Flooded area



b) Utility poles fallen down



c) Fallen down trees



d) Fallen roof tops

Figure 5 Damage in Belize City

5 CCRIF LOSS MODEL

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

Final calculations show that the Endorsement of Deductible Cover was activated and a payment of USD\$53,569.60 is due. This additional coverage was triggered because: (i) a Disaster Alert

⁵ [Lisa weakens to tropical storm after leaving Belize's main port in dark](#)

⁶ [Tropical Storm Lisa causes floods in Belize City \(usatoday.com\)](#)

(51374) for Belize from ReliefWeb related to Tropical Cyclone Lisa was issued and (ii) the modelled losses were above 10% of the minimum payment for this country's Tropical Cyclone policy.

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