



# **Tropical Cyclone Nana (AL162020)**

## **Wind and Storm Surge**

### **Final Event Briefing**

#### **Belize**

**11 September 2020**

## **1 SUMMARY**

Tropical Cyclone Nana was the sixteenth tropical cyclone and the fifth hurricane in the 2020 Atlantic Hurricane Season. On 1 September, it was upgraded from a tropical depression to a tropical storm while it was over the central Caribbean Sea, south of Jamaica. On 3 September, Tropical Storm Nana strengthened, becoming a category 1 hurricane, just before making landfall on the coast of Belize, spreading hurricane-force winds over this country.

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 this policy is due.

However, the Aggregated Deductible Cover (ADC) feature for Belize's Tropical Cyclone policy was activated because a disaster alert declaration from ReliefWeb related to Tropical Cyclone Nana was issued for Belize and the modelled losses were above 10 per cent of the minimum payment of the country's Tropical Cyclone policy. The final analysis shows that a payment of US\$35,000 is due to the Government of Belize under 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 affected CCRIF member countries, to be analyzed with respect to members' Tropical Cyclone policies. Belize was the only CCRIF member country where wind speeds, computed with the CCRIF SPHERA model, were greater than 39 mph (62.7 km/h) due to Hurricane Nana. A separate report on rainfall impacts on affected CCRIF member countries will be issued if applicable.

## 2 INTRODUCTION

On 1 September 2020 at 1700UTC, the US National Hurricane Center (NHC) reported that a Tropical Storm named Nana developed South of Jamaica. Its centre was approximately located at 16.6°N and 77.9°W; at about 685 mi (1,100 km) E of Belize City. The minimum central pressure was 1004 mb and the maximum sustained winds were estimated at 50 mph (85 km/h). The system moved towards the west due to a high-pressure system located to the north of Nana. Its forward velocity was estimated at 18 mph (30 km/h), directed towards Belize.

The following day, the intensification of Tropical Storm Nana was hindered by the intrusion of dry air and the presence of a weak wind shear. However, the system gradually intensified and on 3 September at 0300UTC, the NHC reported that the maximum sustained winds increased to 75 mph (120 km/h) and Nana became a Category 1 Hurricane. At this time, the centre of the hurricane was located at 17.0N 87.5W, approximately 60 mi (95 km) south-east of Belize City, Belize (Figure 1). The minimum central pressure was estimated at 995 mb. At this time, Nana was a small hurricane as hurricane-force winds extended outward up to 10 miles (16 km) from the center, primarily over the northern quadrant, while tropical-storm-force winds extended outward up to 70 miles (110 km) from the centre (Figure 2 and Figure 3).

The system continued moving towards the west-southwest at a slightly reduced velocity (16 mph, 26 km/h) and three hours later, at 0600UTC, the centre of Nana made landfall on the coast of Belize, between Dangriga and Placencia, at approximately 16.8N 88.3W (Figure 1).

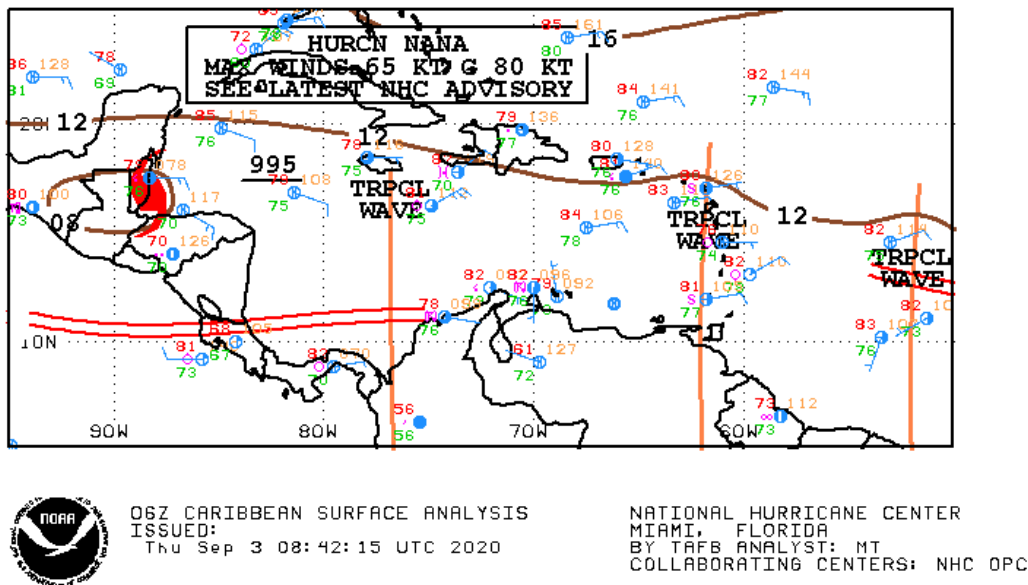


Figure 1 Surface analysis over the Caribbean area on 3 September at 0600UTC. Hurricane Nana was making landfall on the coast of Belize. Source: US National Hurricane Center<sup>1</sup>

<sup>1</sup> National Oceanic and Atmospheric Administration - FTP, National Hurricane Center, review date: 3 September 2020, available at: [https://www.nhc.noaa.gov/tafb/CAR\\_06Z.gif](https://www.nhc.noaa.gov/tafb/CAR_06Z.gif)

Nana moved across southern Belize inland rapidly losing intensity due to the interaction with the land: at 0900UTC, it was downgraded to a tropical storm as the estimated maximum sustained winds decreased to 70 mph (110 km/h) and by 1200UTC further decreased to 60 mph (95 km/h). Hurricane-force winds (maximum sustained winds were near 75 mph, 120 km/h) affected southern Belize in the restricted area surrounding the centre of Nana on 3 September from 0600UTC to 0900UTC, while the southern and central portions of the country experienced tropical-storm-force winds starting from 0300UTC until 1500UTC.

On 3 September at 1200UTC, the centre of Nana had left Belize, and was located over northern Guatemala at 16.6N 89.7W; within a few hours the storm dissipated.

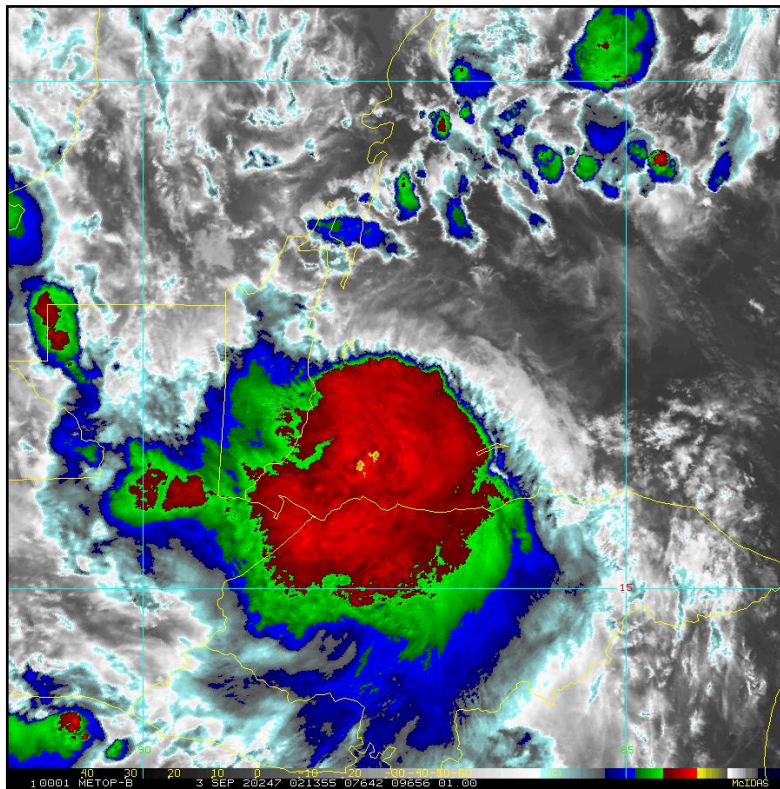


Figure 2 Satellite imagery on 3 September at 0213UTC from thermal infrared channel enhanced with colour. Blue/green colours represent high altitude clouds (top cloud temperature between  $-50^{\circ}\text{C}$  and  $-70^{\circ}\text{C}$ ), while the red/yellow colours represent very high altitude clouds (top cloud lower than  $-70^{\circ}\text{C}$ ). High altitude clouds indicate strong convection associated with intense precipitation. Source: NOAA, National Environmental Satellite, Data and Information Service<sup>2</sup>.

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<sup>2</sup> RAMSDIS Online Archive, NOAA Satellite and Information Service, review date: 3 September 2020, available at: [http://rammb.cira.colostate.edu/ramsdisk/online/archive.asp?data\\_folder=tropical/tropical\\_ge\\_14km\\_wv&width=640&height=480](http://rammb.cira.colostate.edu/ramsdisk/online/archive.asp?data_folder=tropical/tropical_ge_14km_wv&width=640&height=480)

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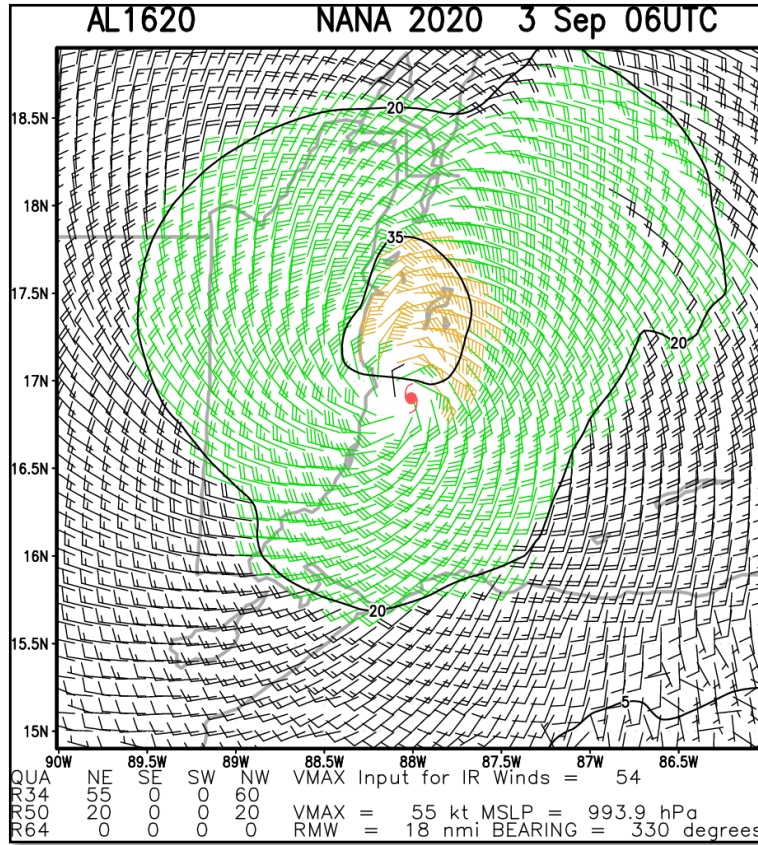


Figure 3 Multiplatform satellite based tropical cyclone surface wind analysis estimated on 3 September at 0600UTC. Contouring indicates wind intensity at 20 kn (23 mph, 37 km/h) and at 35 kn (40 mph, 65 km/h). Source: NOAA, National Environmental Satellite, Data and Information Service<sup>3</sup>.

### 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, wind speeds between 28 mph (45 km/h) and 72 mph (116 km/h) were estimated across Belize. 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 Nana in Belize. Due to the physical conditions of Tropical Cyclone Nana, storm surge was insignificant, did not contribute to the damage, and is therefore not shown on a hazard map.

<sup>3</sup> RAMSDIS Online Archive, NOAA Satellite and Information Service, review date: 3 September 2020, available at: [https://rammb-data.cira.colostate.edu/tc\\_realtime/storm.asp?storm\\_identifier=al162020](https://rammb-data.cira.colostate.edu/tc_realtime/storm.asp?storm_identifier=al162020)

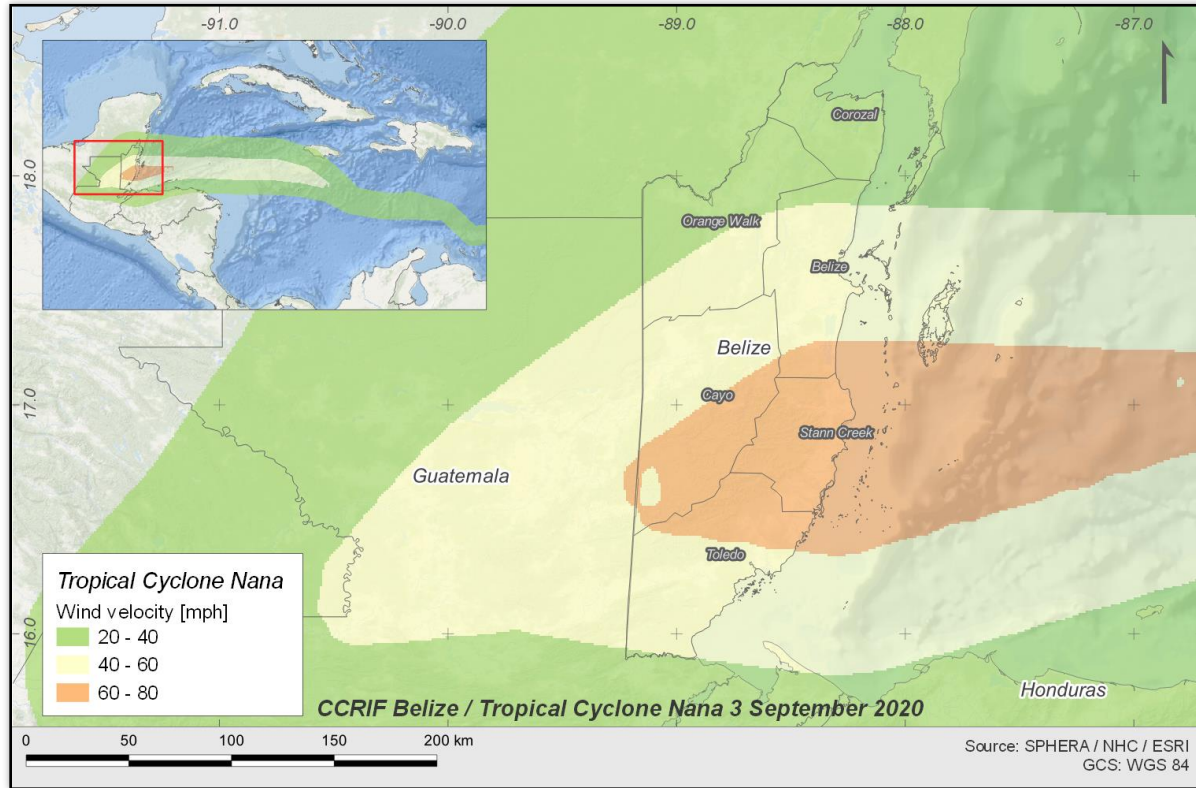


Figure 4 Map showing the wind field associated with Tropical Cyclone Nana in Belize.  
Source: NHC & CCRIF/SPHERA

## 4 IMPACTS

Eight days after the passage of Hurricane Nana and according to the preliminary assessments provided by Belize's National Emergency Management Organization (NEMO) and the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), the damage in Belize was minimal,<sup>4</sup> with no injuries or casualties reported. The District most affected by Hurricane Nana was Stann Creek where buildings, infrastructure and crops were damaged.

NEMO and other sources<sup>5 6</sup> indicated that at least 4,085 citizens occupied shelters and there was some flooding and fallen power poles and trees.

Prior to the arrival of Hurricane Nana, Belize's authorities took precautionary measures such as activating a Hurricane Warning and opening official emergency shelters.

<sup>4</sup> United Nations Office for the Coordination of Humanitarian Affairs (OCHA), Sub-Regional Flash Update No. 01 (As of 5:00PM EST, 3 September 2020), review date: 5 September 2020, available at: [Hurricane Nana – Sub-Regional Flash Update No. 01](#)

<sup>5</sup> United Nations International Children's Emergency Fund (UNICEF), Hurricane NANA Humanitarian Situation Report No. 1 (Reporting Period: 2 - 3 September 2020), review date: 5 September 2020, available in: [BELIZE - Hurricane NANA Humanitarian Situation Report No. 1](#)

<sup>6</sup> CAMBIO 22, review date: 5 September 2020, available in: <https://cambio22.mx/>

Figure 5 shows some of the wind damage caused by Hurricane Nana in Belize.



Figure 5 Some of the wind damage caused by Hurricane Nana in Belize – September, 2020.  
Source: *Belize Electricity Limited* and *News 5 Live*

## 5 CCRIF LOSS MODEL

For Belize, 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 Belize’s Tropical Cyclone policy was activated because a disaster alert declaration for Belize from ReliefWeb related to Hurricane Nana was issued and the modelled losses were above 10 per cent of the minimum payment for the policy. The final analysis shows that a payment of US\$35,000 is due to the Government of Belize under the ADC feature.

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

For additional information, please contact CCRIF SPC at: [pr@ccrif.org](mailto:pr@ccrif.org)