



# **Tropical Cyclone Eta (AL292020)**

## **Wind and Storm Surge**

## **Final Event Briefing**

## **The Bahamas North West**

**19 November 2020**

## 1 SUMMARY

Tropical Cyclone Eta was the twenty-ninth and at the time the most powerful tropical cyclone of the 2020 Atlantic Hurricane Season. After landfall in Nicaragua as a devastating category 4 hurricane on 3 November, Eta quickly lost intensity, becoming downgraded to a tropical depression over Central America. On 4 and 5 November, it crossed Nicaragua and Honduras and on 6 November, it emerged over the northwestern Caribbean Sea. On 7 November Eta regained tropical storm strength, while heading towards Cuba. On 8 November it moved over Cuba and passed in the vicinity of The Bahamas North West<sup>1</sup>. Tropical-storm-force winds extended over The Bahamas North West. On 10 November, Nicaragua, the Cayman Islands and The Bahamas were the only CCRIF member countries where wind speeds, computed with the CCRIF SPHERA model, were greater than 39 mph (62.7 km/h) due to Hurricane Eta.

The Bahamas North West was the only area within The Bahamas that was affected by wind speeds greater than 39 mph (62.7 km/h). The final runs of the CCRIF loss model for wind and storm surge did not produce any government losses for The Bahamas North West<sup>2</sup>. Thus, for all three Tropical Cyclone policies (for The Bahamas North West, Central and South East), the government loss was zero. Therefore, no payouts under the policies for The Bahamas South East, The Bahamas Central and The Bahamas North West are due.

This event briefing is designed to review the modelled losses due to wind and storm surge due to Eta, calculated by CCRIF's models for The Bahamas, to be analyzed with respect its Tropical Cyclone policies. Other reports will be provided for Nicaragua and the Cayman Islands. A separate report on rainfall impacts on affected CCRIF member countries will be issued if applicable.

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<sup>1</sup> The Bahamas Department of Meteorology defines geographic zones within The Bahamas for giving hurricane and severe weather alerts: North West, Central and South East.

<sup>2</sup> The Government of Bahamas has three Tropical Cyclone policies: one for The Bahamas South East, one for The Bahamas Central and one for The Bahamas North West.

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## 2 INTRODUCTION

On 31 October 2020 at 2100UTC, the US National Hurricane Center (NHC) reported that a tropical depression formed over the central Caribbean Sea, approximately 214 mi (340 km) S of Haiti (15.0°N, 73.2°W). It originated from an intense tropical wave moving westward across the Caribbean Sea, which developed a low-level closed circulation. Six hours later, on 1 November at 0300UTC, the tropical depression was upgraded to a tropical storm and it was named Eta. The minimum central pressure was 1005 mb and the maximum sustained winds were estimated at 40 mph (65 km/h). The system moved towards the west with an estimated forward velocity of 15 mph (24 km/h).

The weak vertical wind shear, the moisture abundance and the high oceanic heat content (due to a sea surface warmer than 29°C) supported a steady and very rapid intensification of the tropical storm. On 2 November at 1800UTC, Eta became a major hurricane, with maximum sustained winds of 120 mph (195 km/h) and minimum pressure of 957 mb. At this time, the centre of Eta was at 14.7°N 82.0°W, at approximately 87 mi (140 km) from the closest coast of Nicaragua. The hurricane further decreased its forward velocity to 9 mph (15 km/h) and steered towards the west-southwest, due to a mid-level ridge over the south-central United States. In the next six hours, Eta continued to intensify and on 3 November at 0000UTC it reached the category 4 strength. The same day at 2100UTC, Eta made landfall in Nicaragua (at 13.8N 83.5W). Maximum sustained winds were estimated near 140 mph (220 km/h) with higher gusts.

After the landfall, Eta rapidly weakened due to the interaction with the inland areas and 12 hours later, on 4 November at 0900UTC, it was downgraded to tropical storm strength. On 5 November at 0000UTC, Eta weakened to become a tropical depression, while its centre (sited at that time at 14.1N 86.1W) left Nicaragua and moved to Honduras. The depression steered towards the northwest and later towards the north, crossing Honduras and returning to the Caribbean Sea on 6 November at 0000UTC. At this time, the centre of the system was over the southern Gulf of Honduras at 16.0°N, 87.8°W and it was heading towards the north-northwest at almost 8 mph (13 km/h). In the next 24 hours, Eta gradually steered towards the northeast, as it moved along the east side of a trough over the Gulf of Mexico, heading towards Cuba.

Despite the large availability of heat content from the warm sea surface, Eta did not re-strengthen rapidly due to the presence of a southwesterly vertical wind shear. It regained tropical storm strength on 7 November at 1500UTC, when its centre was located at 19.6°N, 81.8°W, approximately 45 mi (70 km) WNW from the Cayman Islands. In the following nine hours, the estimated maximum sustained winds increased to near 65 mph (100 km/h) with higher gusts and the minimum central pressure decreased to 991 mb. Eta's estimated intensity was unchanged when on 8 November at 0900UTC, it made landfall along the south-central coast of Cuba. After 6 hours, on 8 November at 1500UTC, the tropical storm emerged from the north-central coast of Cuba near 22.5°N, 79.2°W, approximately 130 mi (209 km) from the southern edge of Andros Island, The Bahamas North West (Figure 1). At this time, Eta was an extended tropical storm, with estimated maximum sustained winds of 65 mph (100 km/h) and tropical-storm-force winds affecting an area of 125 mi (205 km) outward from the centre (Figures 2 and 3a). Starting from this time, Andros Island (The Bahamas North West) started

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to experience tropical-storm-force winds due to Eta. The tropical storm was directed towards the north-northwest at 17 mph (28 km/h) and three hours later, it reached the minimum distance of approximately 100 mi (160 km) from the western coast of Andros Island (Figures 3b and 3c). Tropical-storm-force winds affected Andros Island up to 9 November at 0000UTC, when the tropical storm moved away from the waters in the vicinity of The Bahamas due to the deflection of Eta's track towards the north-west (Figure 3d). This direction change was caused by the interaction with an upper level trough located over the Gulf of Mexico, which also caused Eta to slow down and steer further westward, moving across the Florida Strait.

On 10 November, Eta was moving southwestwards over the southeastern Gulf of Mexico with unchanged strength. It was forecast to decelerate and to finally proceed towards the northeastern coast of the Gulf of Mexico.

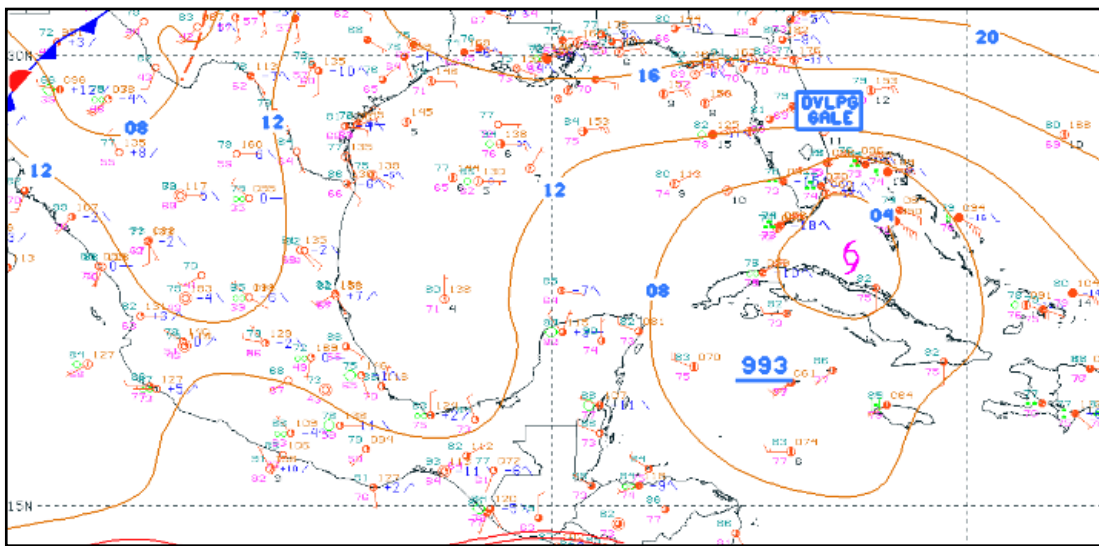


Figure 1 Surface analysis over the Caribbean area on 8 November at 1800. Tropical Storm Eta was located southwest of Nassau, The Bahamas. Source: US National Hurricane Center<sup>3</sup>

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<sup>3</sup> National Oceanic and Atmospheric Administration - FTP, National Hurricane Center, review date: 8 November 2020, available at: [https://www.nhc.noaa.gov/tafb/EPAC\\_18Z.gif](https://www.nhc.noaa.gov/tafb/EPAC_18Z.gif)

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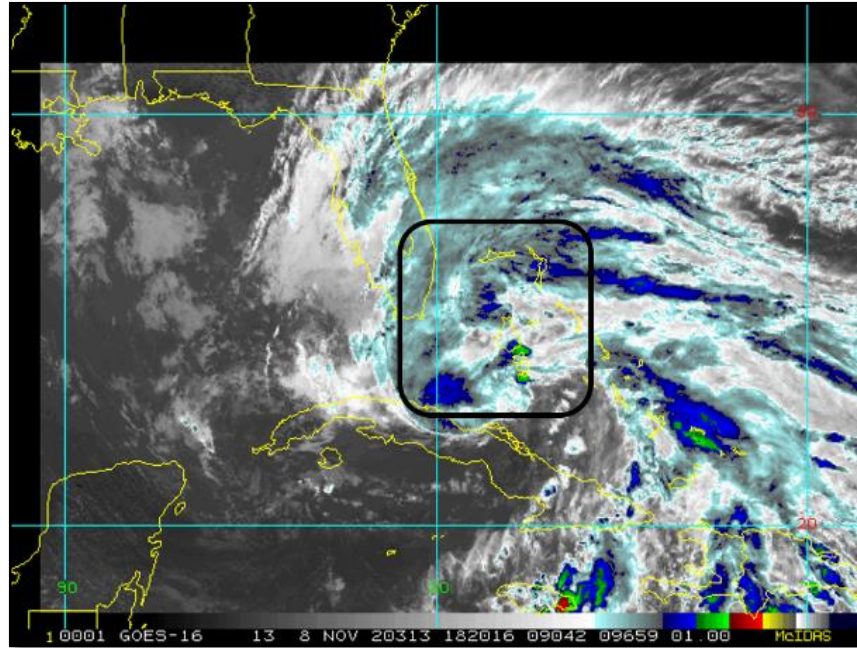
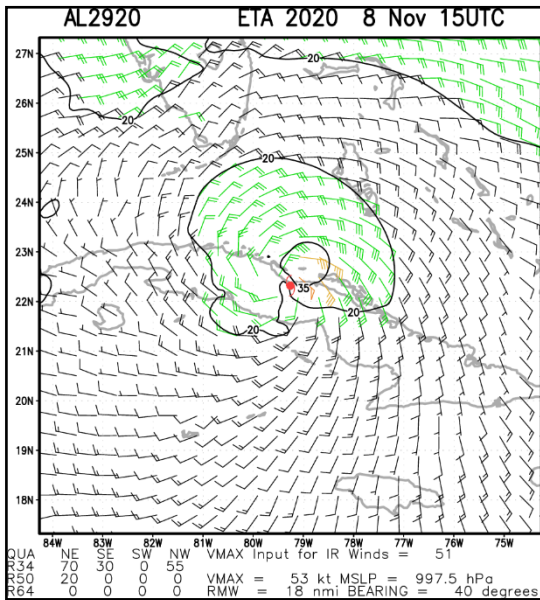
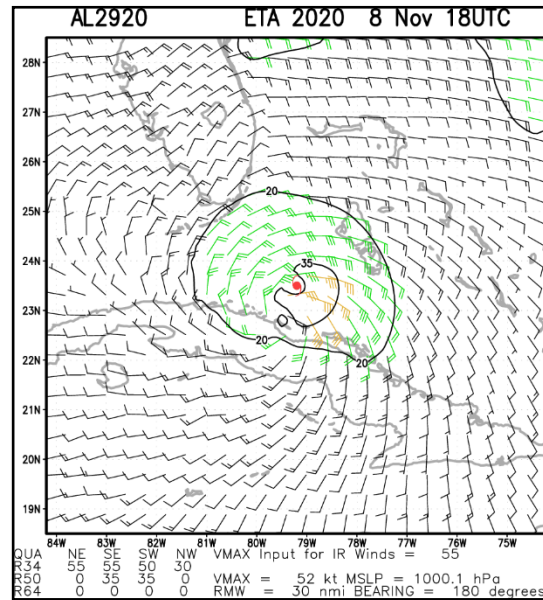


Figure 2 Satellite imagery on 8 November at 1820UTC from thermal infrared channel enhanced with colour. Blue/green colours represent high altitude clouds (top cloud temperature between  $-50^{\circ}\text{C}$  and  $-70^{\circ}\text{C}$ ), while the red/yellow colours represent very high altitude clouds (top cloud lower than  $-70^{\circ}\text{C}$ ). High altitude clouds indicate strong convection associated with intense precipitation. The Bahamas North West is indicated by the black square. Source: NOAA, National Environmental Satellite, Data and Information Service<sup>4</sup>.



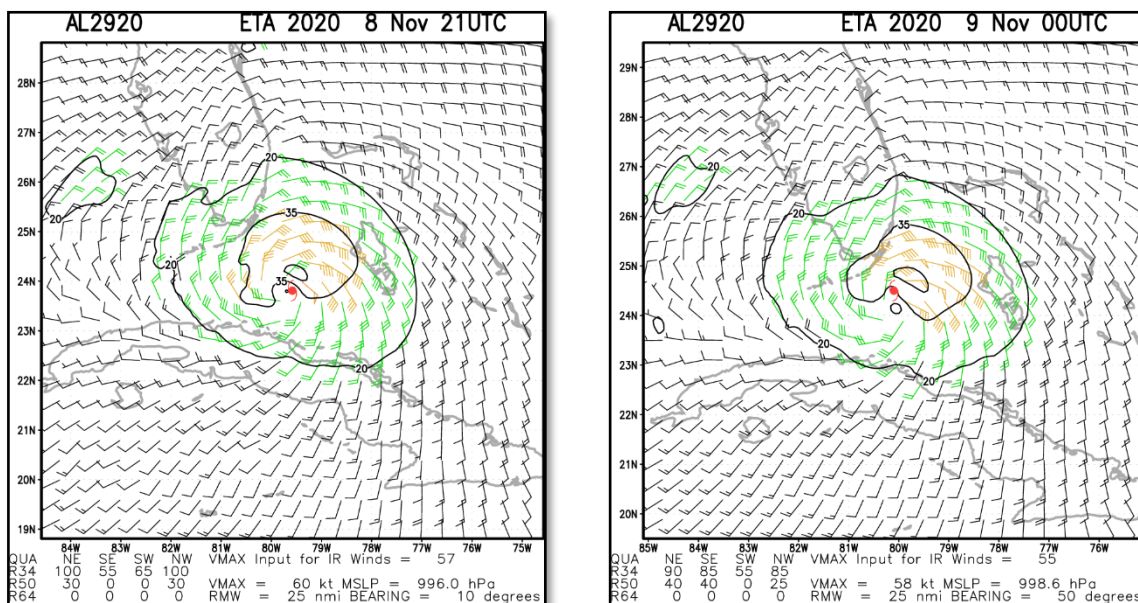
a) 8 November at 1500UTC



b) 8 November at 1800UTC

<sup>4</sup> RAMSDIS Online Archive, NOAA Satellite and Information Service, available at: [https://rammb-data.cira.colostate.edu/tc\\_realtime/storm.asp?storm\\_identifier=al292020](https://rammb-data.cira.colostate.edu/tc_realtime/storm.asp?storm_identifier=al292020)





c) 8 November at 2100UTC

d) 9 November at 0000UTC

Figure 3 Multiplatform satellite based tropical cyclone surface wind analysis estimated at different times as indicated in the labels. 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>5</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 12.4 mph (20 km/h) and 62.1 mph (100 km/h) were estimated across The Bahamas North West. 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 Eta in The Bahamas North West. Due to the physical conditions of Tropical Cyclone Eta across The Bahamas North West, the storm surge was insignificant, did not contribute to the damage, and is therefore not shown on a hazard map.

<sup>5</sup> RAMSDIS Online Archive, NOAA Satellite and Information Service, available at: [https://rammb-data.cira.colostate.edu/tc\\_realtime/storm.asp?storm\\_identifier=al292020](https://rammb-data.cira.colostate.edu/tc_realtime/storm.asp?storm_identifier=al292020)

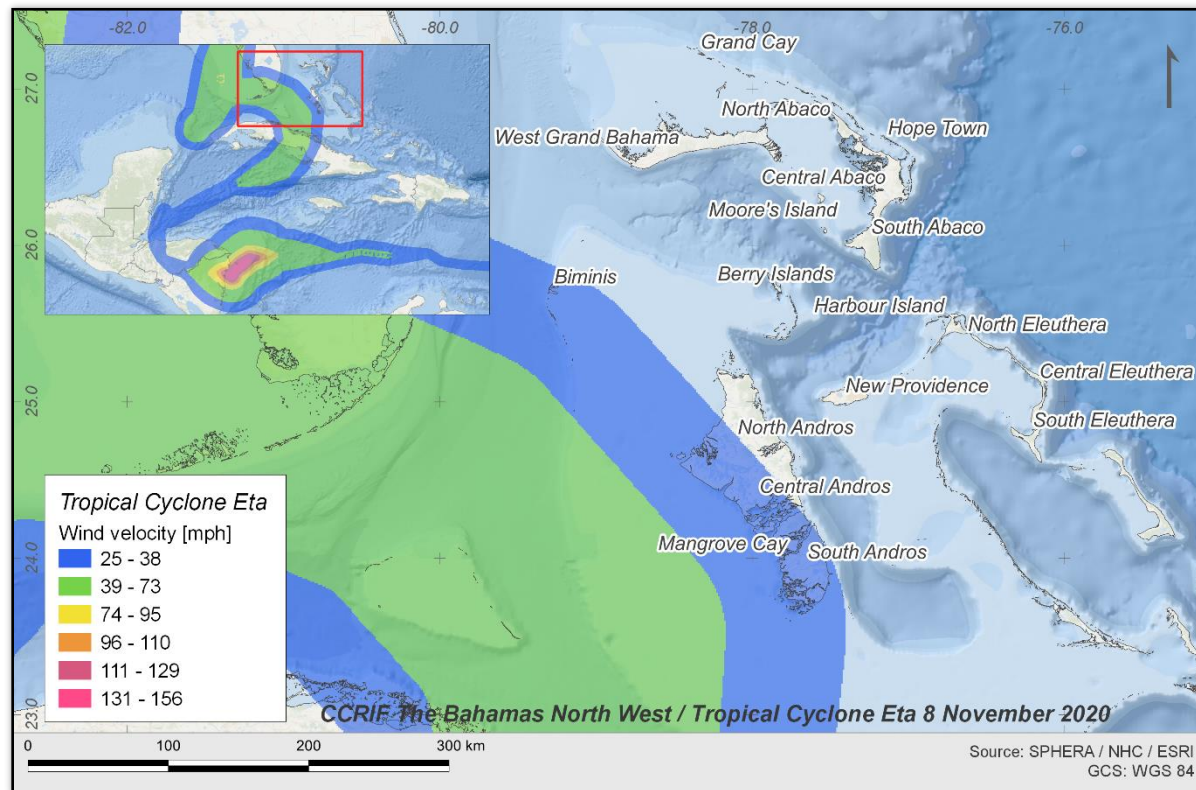


Figure 4 Map showing the wind field associated with Tropical Cyclone Eta in The Bahamas North West.  
Source: NHC & CCRIF/SPHERA

## 4 IMPACTS

Ten days after the passage of Tropical Cyclone Eta and according to a government statement<sup>6</sup>, flooding roads in some areas, high winds, gusty conditions, sea swells and some fallen trees were reported. Due to sea surges the Glass Window Bridge, in Eleuthera, was closed. There were no reports of losses caused by the passage of Tropical Storm Eta.

Prior to the arrival of Tropical Storm Eta, The Bahamas' authorities took precautionary measures such as partially activating the National Emergency Operations Centre (NEOC) and putting into effect a Tropical Storm Warning in the northwestern region of The Bahamas. As additional prevention measures the authorities opened some emergency shelters and air traffic was temporarily suspended.

<sup>6</sup> Bahamas Information Services, National Emergency Management Agency, 'Bahamas fared well during TS Eta' (As if 9 November 2020), review date: 10 November 2020, available at: [Government of The Bahamas – News and Press Release](#)

## 5 CCRIF LOSS MODEL

The Bahamas North West was the only area within The Bahamas that was affected by wind speeds greater than 39 mph (62.7 km/h). The final runs of the CCRIF loss model for wind and storm surge did not produce any government losses for The Bahamas North West<sup>7</sup>. Thus, for all three Tropical Cyclone policies (for The Bahamas North West, Central and South East), the government loss was zero. Therefore, no payouts under the policies for The Bahamas South East, The Bahamas Central and The Bahamas North West are due.

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

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