CEDIM Forensic Disaster Analysis (FDA) Group

Hurricane MELISSA
(Jamaica, Haiti & Cuba, October 2025)

Report Nr. 1
Information as of 03 November 2025

DOI: 10.5445/IR/1000186554

Authors: B. Mühr, C. Sperka, D. Böhnke, K. Gramlich, S. Mohr, M. Kunz

Overview

Event	Start	End	Duration
Hurricane MELISSA	**25/10/2025**	**31/10/2025**	**7 days**

Highlights:

Most affected countries	Jamaica, Cuba, Haiti
Cat 5 Hurricane	Sustained winds: 160 kt; Gusts: 190 kt
Intensity	Most intense tropical storm system in 2025 worldwide
Intensity	Most intense hurricane ever making landfall in Jamaica
Impacts	Torrential rain, extreme wind, storm surge. Death toll: >50

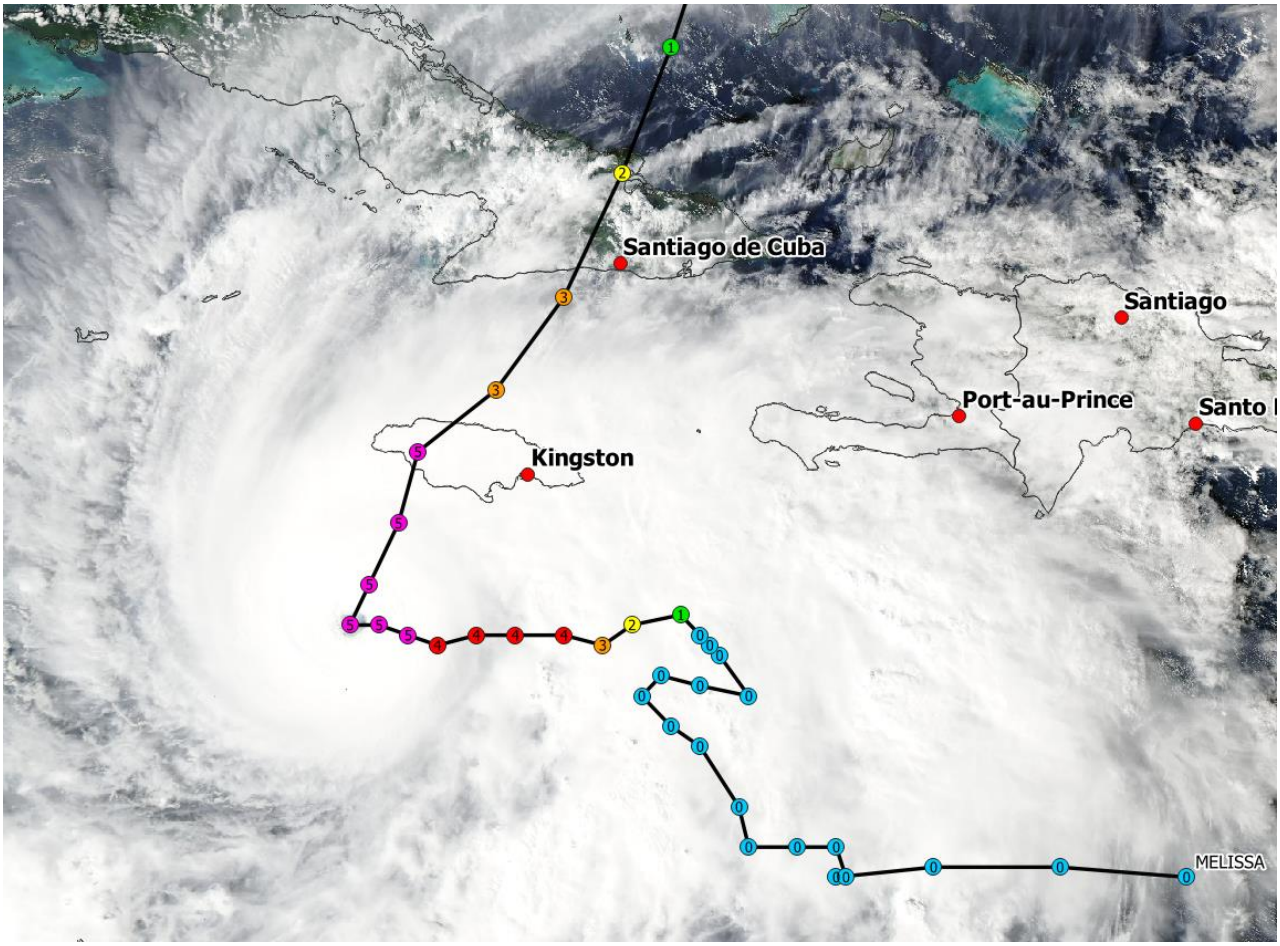

Fig. 1: Combination of satellite image (27 October 2025) and Melissa's path, indicating hurricane category (Source: https://worldview.earthdata.nasa.gov, https://www.nhc.noaa.gov).

1. Summary

At the end of October 2025, Melissa formed as the fifth tropical cyclone of the 2025 Atlantic season that reached hurricane strength. Like two of its predecessors, Erin and Humberto, Melissa developed into a Category 5 hurricane, the highest category. Average wind speeds of 160 kt and gusts of up to 190 kt made Melissa one of the strongest tropical cyclones that ever occurred in the Atlantic Basin. Melissa reached the south coast of Jamaica on 28 October 2025, at its peak intensity and crossed the island as a Category 5 hurricane heading north. Melissa became the strongest tropical cyclone ever to hit Jamaica. Tied with the Labor Day Hurricane (1935) and Dorian (2019), Melissa thus topped the list of the strongest hurricanes to make landfall since 1851.

Melissa was responsible for enormous amounts of rain, which caused devastating flooding, especially in Haiti, and claimed many lives. In Jamaica, the hurricane left a trail of destruction, with many buildings damaged. Most of the island was without power. As it continued northward, the hurricane gradually weakened, but as it passed over Cuba, Melissa was responsible for extensive damage again. Finally, Melissa moved across the Bahamas and passed Bermuda 250 km to the west before travelling into the vastness of the North Atlantic, where it lost its hurricane status on 31 October 2025. As an extratropical storm, Melissa headed towards European waters.

2. Meteorological Information

2.1. Development and storm track of Melissa

Like many Atlantic tropical storms that reach hurricane strength, Melissa was triggered by a westward-moving tropical wave. Tropical waves or easterly tropical waves are north-south-oriented pressure systems that move westward over the west coast of West Africa on the equatorial side of the subtropical high-pressure belt or ridge. As early as 17 October several massive thunderstorm complexes formed far out in the tropical Atlantic Ocean, about 2,000 kilometers east of Trinidad and Tobago. The area with constantly regenerating thunderstorm complexes moved further west, crossing the southern Islands of the Lesser Antilles on 19 October and reached the Caribbean. However, it took until 21 October for the thunderstorms to become significantly organized. The system was upgraded into a tropical storm at 15 UTC and named Melissa. Melissa continued to move through the Caribbean until 25 October initially showing little sign of further intensification. Its propagation speed was low, and at times the tropical storm even took a course that led it back eastward for a few hours. Under exceptionally favorable conditions with low vertical and horizontal wind shear and high surface water temperatures, Melissa intensified explosively: Within 24 hours, the average wind speed increased from 60 kt on 25 October, 12 UTC, to 120 kt by the following day. Melissa crossed the threshold to a Category 1 hurricane on 25 October at around 15 UTC, with its center still located about 200 km southeast of Jamaica. Continuing slowly westward, the hurricane reached highest category 5 on 27 October at around 09 UTC, with average winds of 140 kt and a central pressure of 917 hPa. At this point, Melissa veered northward and covered the last 180 km to the southern coast of Jamaica, slowly increasing its propagation speed.

The hurricane reached its peak intensity with sustained winds of 160 kt and gusts of up to 190 kt on 28 October at around 17 UTC while coming ashore in southwestern Jamaica near the town of New Hope in Westmoreland Parish. As a Category 5 hurricane, Melissa crossed Jamaica within about 5 hours, moving north to northeast. It took 36 hours until 29 October 00 UTC, before Melissa weakened into a Category 4 hurricane.

Seven hours later, on 29 October at 07:10 UTC, Melissa made the next landfall as a Category 3 hurricane (105 kt, 952 hPa) near Chivirico, 65 km west of Santiago de Cuba in the far southeast of Cuba. Melissa continued to weaken as it travelled across the Bahamas, where it made two further landfalls during the night of 30 October (Table 1). Finally, as a Category 2 hurricane (85 kt), Melissa passed Bermuda at around 03 UTC on 31 October 2025 with its center 200 km to the west.

Figure 2 shows Melissa's track from 17 October to 31 October 2025, in 6-hour increments, as analyzed by the National Hurricane Center. The colored circles indicate the intensity of the cyclone, with blue representing a tropical storm, green a Category 1 hurricane, yellow a Category 2, orange a Category 3, red a Category 4, and purple a Category 5 hurricane. The red numbers mark the position of the storm center at 0 UTC on the specified

day in October 2025. From 22 October, 00 UTC, to 28 October, 18 UTC — shortly after landfall — Melissa covered a distance of just 1,150 km in 162 hours. In the meantime, the tropical storm or hurricane even became almost stationary. An average propagation speed of only 7 km/h (4 kt) over a period of almost a week is extremely slow.

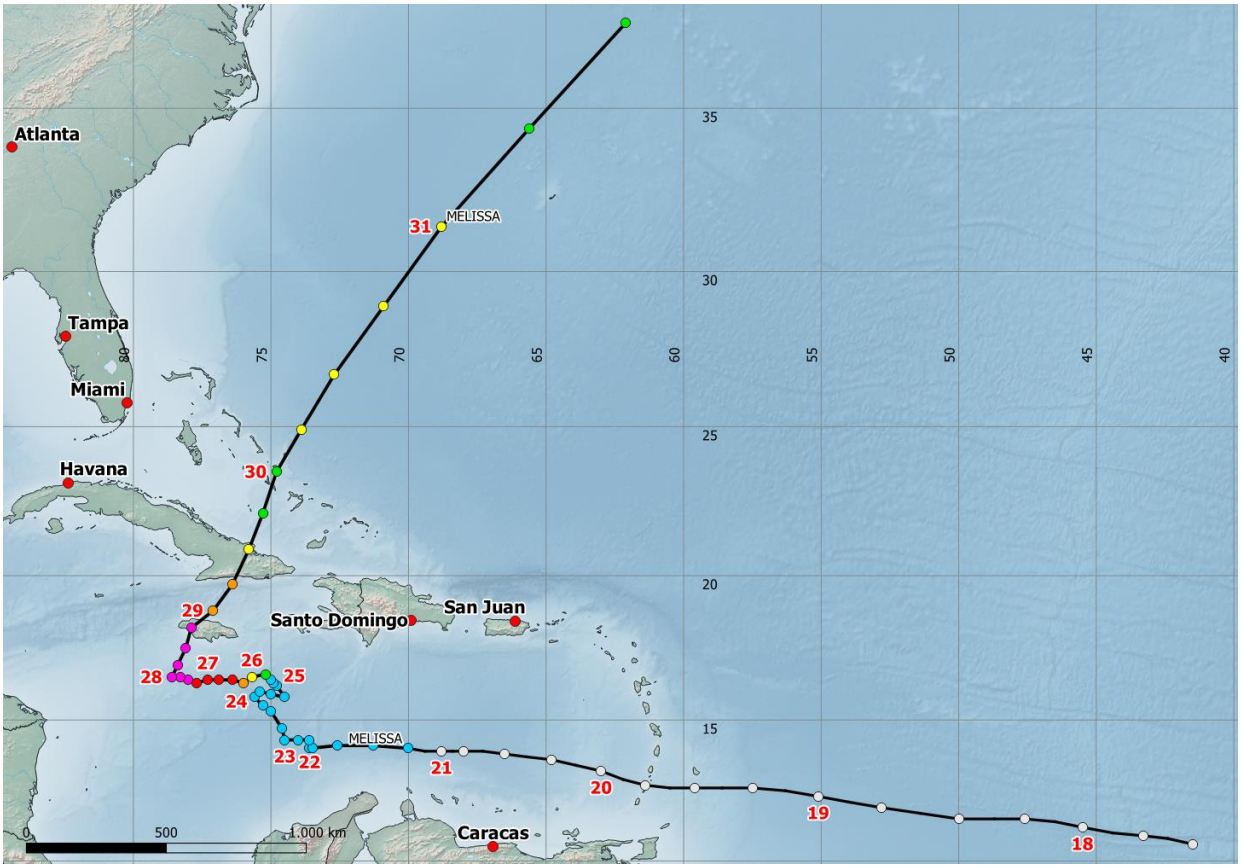

Fig. 2: Track of Hurricane Melissa (17-31 October 2025). Melissa became a named storm (blue dots), reached Cat 1 (green), Cat 2 (yellow), Cat 3 (orange), Cat 4 (red) and finally Cat 5 (purple). Numbers in red indicate the day of the eye's position at 00 UTC, time step 6 hours (Track data: https://www.nhc.noaa.gov).

Table 1: Melissa's 4 landfalls (times are estimated).

Landfall	Time	Hurricane Category	Location
10/28/2025	17:00 UTC	5 - 160 kt	Jamaika: New Hope, Westmoreland Parish, between Savanna-la-Mar und Black River
10/29/2025	07:10 UTC	3 - 105 kt	Kuba: Chivirico, Provinz Santiago de Cuba
10/29/2025	22:00 UTC	1 - 80 kt	Bahamas: Long Island
10/30/2025	02:00 UTC	1 - 80 kt	Bahamas: San Salvador Island

2.2. Sea Surface Temperature

High sea surface temperatures are an essential prerequisite for the formation of tropical storms and cyclones. A hurricane derives most of its energy from latent heat, which is released during the condensation of water vapor. Minimum surface temperatures of 26.5 or 27.0 °C are often quoted to be necessary. Figure 3 shows the distribution of sea surface temperatures as analyzed on 21 October 2025, four days before Melissa reached hurricane status. The entire area from the Lesser Antilles to the Gulf of Mexico had surface temperatures of more than 27 °C, and even the 30-degree isotherm encompasses most of the Caribbean. Temperatures around 30 °C were also measured in the Bahamas and in the adjacent Atlantic Ocean to the east.

Figure 4 illustrates the deviation of sea surface temperatures on 21 October 2025, from the long-term average. The developing tropical storm system encountered surface waters with above-average temperatures on 21 October and during the following days. Throughout almost the entire Caribbean, water temperatures were 1 to 2 K above their long-term averages. Only the easternmost part of the Caribbean was slightly cooler than usual; however, the thunderstorm complexes that had already passed through this area may have caused the cooling.

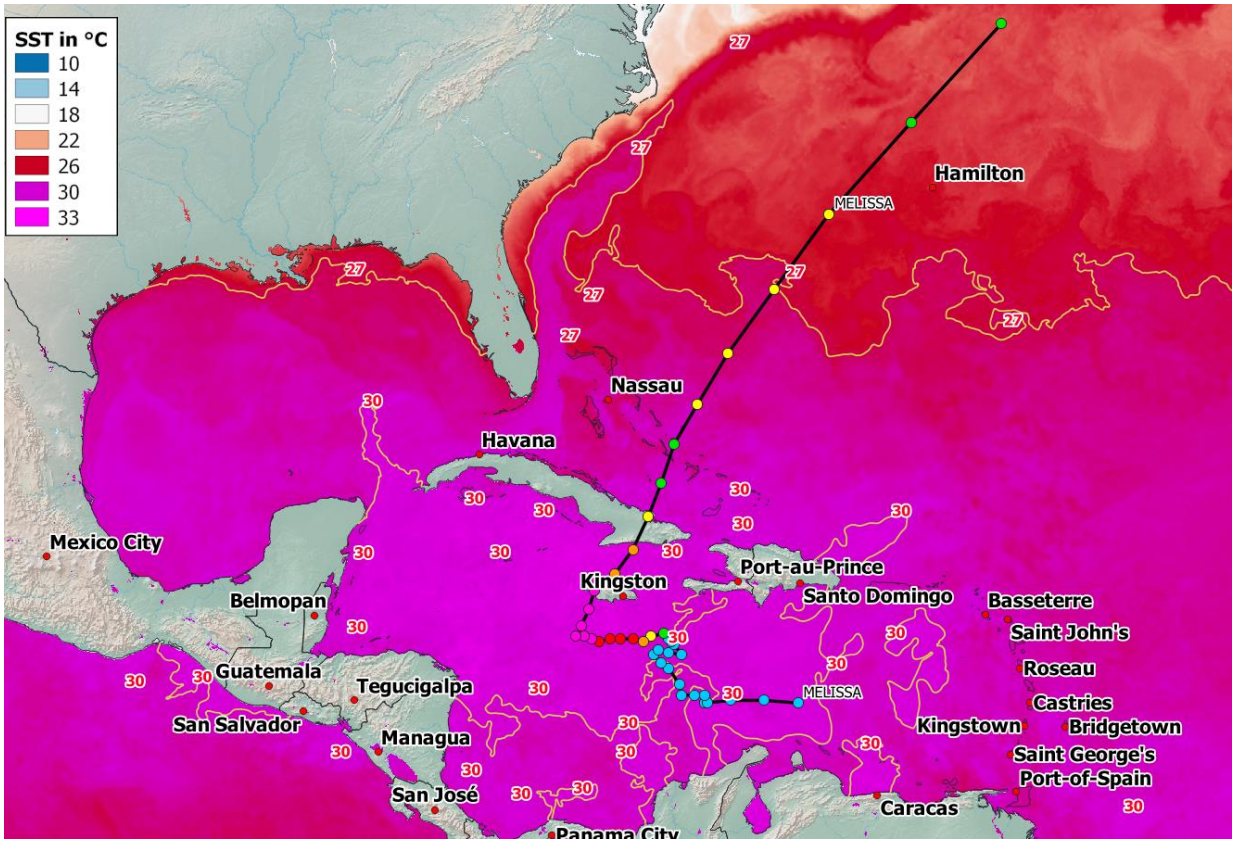

Fig. 3: Analyzed Sea Surface Temperature (SST) in °C on 21 October 2025 with the track overlay of Melissa (SST data: https://podaac.jpl.nasa.gov).

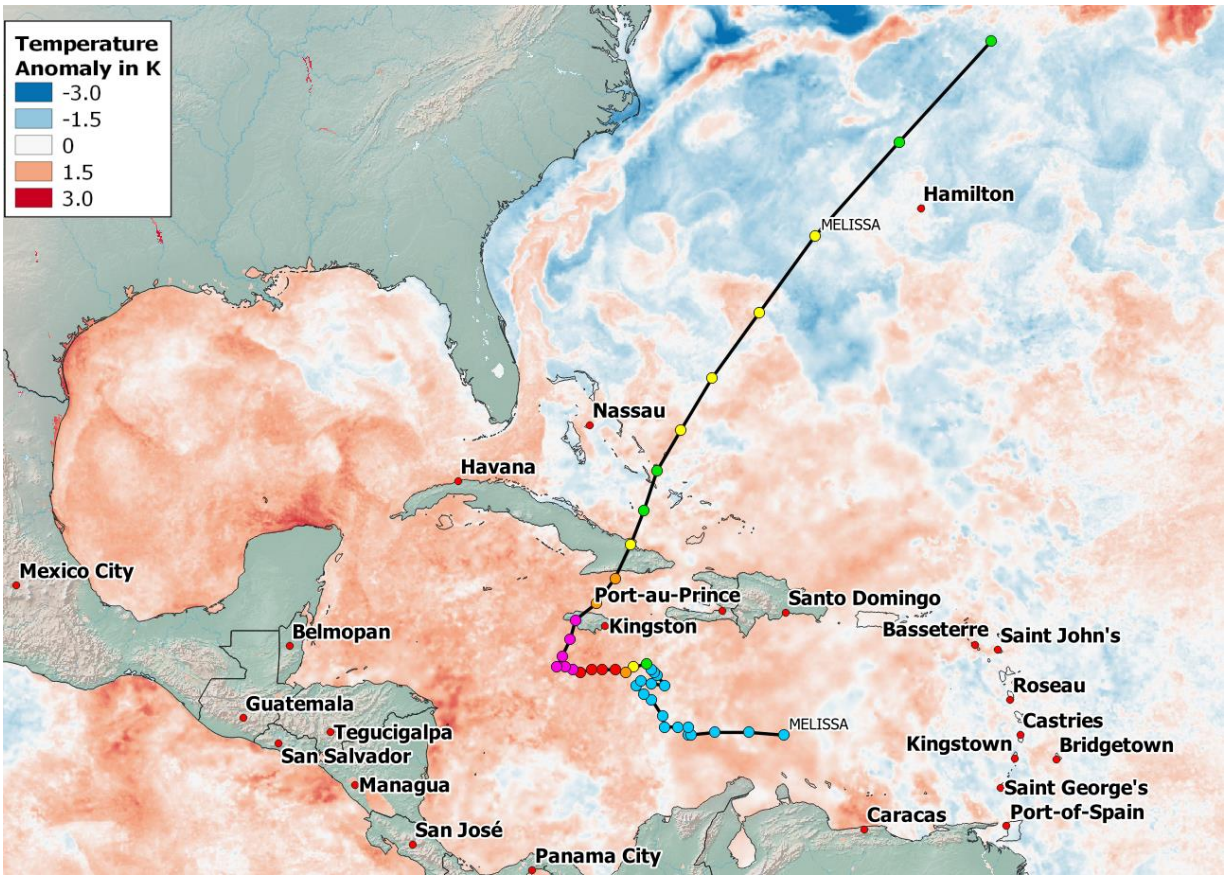

Fig. 4: Analyzed Sea Surface Temperature Anomalies (SST) from long term mean in K on 21 October 2025 with the track overlay of Melissa (SST data: https://podaac.jpl.nasa.gov).

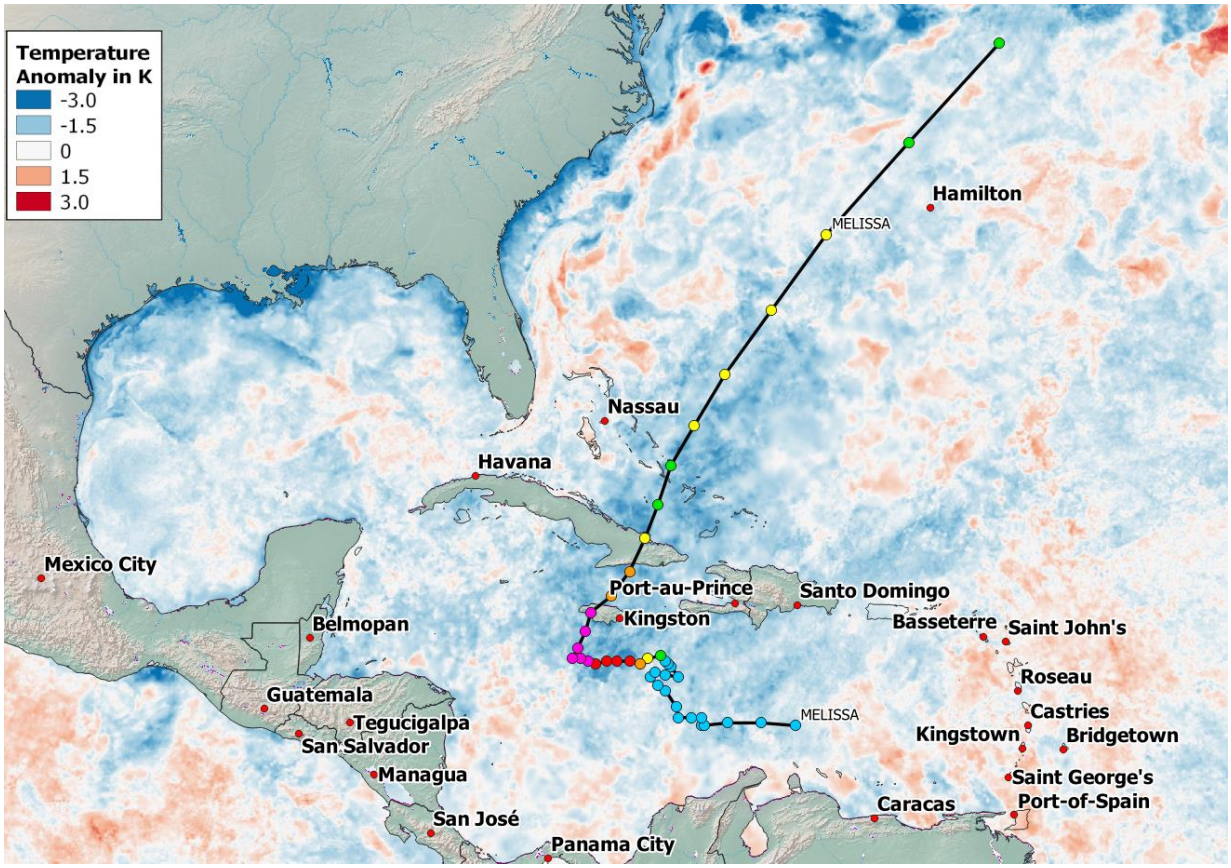

Fig. 5: Difference of the Sea Surface Temperature (SST) between 21 and 31 October 2025 in K, before and after Melissa (SST data: https://podaac.jpl.nasa.gov).

Figure 5 shows the change in sea surface temperature between 21 October (before Melissa) and 31 October 2025 (after Melissa). The map is dominated by blue tones; part of the cooling is due to the seasonal 10-day cooling effect at the end of October. However, the area in which Melissa caused a cooling of 2 to 3 K with intense mixing of the sea surface and precipitation stands out clearly.

2.3. Precipitation

Tropical storms and tropical cyclones naturally always incorporate extremely humid air masses into their circulation. The amount of precipitation that occurs with a passing hurricane can be enormous. Unsurprisingly, tropical cyclones are responsible for the highest rainfall intensities within 12 or 24 hours worldwide. The speed of movement, the duration of the rain, and the topographical features are of significant importance in this context.

Melissa spent most of its time in the central Caribbean. And even though Melissa was still far from reaching its peak intensity, not even hurricane status, the heaviest rainfall occurred here. Figure 6 shows the total rainfall for the period from 18 October to 31 October 2025. In the area south and southwest of Hispaniola, more than 1000 mm was analyzed in places, with peaks of more than 1250 mm. Parts of the Dominican Republic and southern Haiti received more than 500 mm, and most of Jamaica received between 500 and 750 mm. As Melissa moved faster and faster, rainfall amounts north of Jamaica decreased significantly, but rainfall amounts between 250 and 500 mm were still recorded along the storm's path (e.g., in eastern Cuba).

Rainfall activity and intensity can be accurately recorded in high spatial and temporal resolution using precipitation radar. Figure 7a shows the precipitation radar image from 28 October 2025, 15 UTC, shortly before Melissa made landfall on the south coast of Jamaica. The concentric precipitation band around the eye of Melissa is clearly visible, as are the spiral precipitation bands around the center. Far away from the center of the hurricane, massive rain areas already cover the southeastern parts of Cuba.

In Figure 7b, the center of Melissa is still clearly visible after making landfall over southeastern Cuba on 29 October 2025, at 10:30 UTC. However, the concentric and symmetrical precipitation structures near the center of Melissa are no longer present.

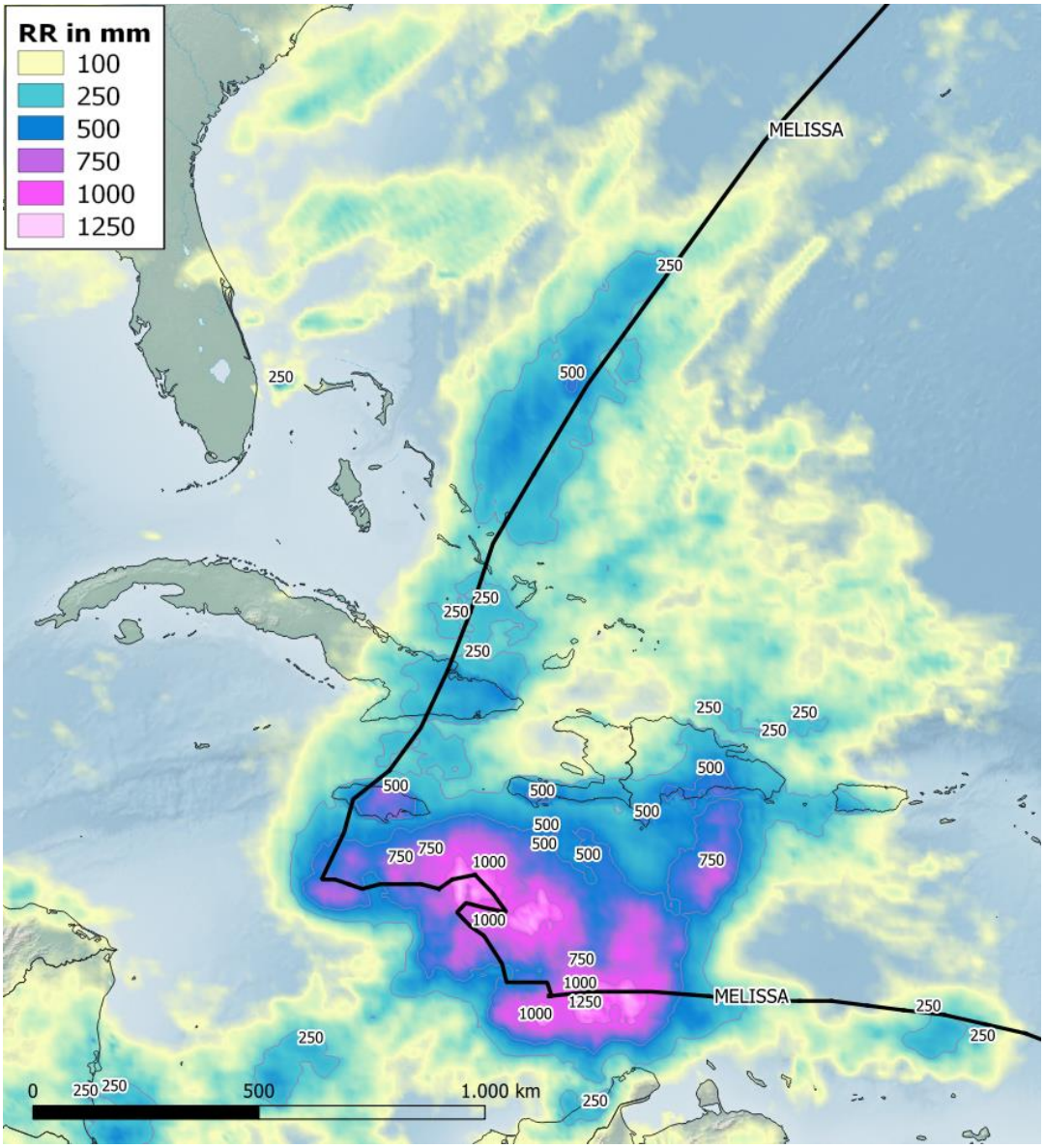

Fig. 6: Accumulated rain amount, 18-31 October 2025. Rain areas with less than 100 mm are not indicated (Precipitation data: https://giovanni.gsfc.nasa.gov/giovanni).

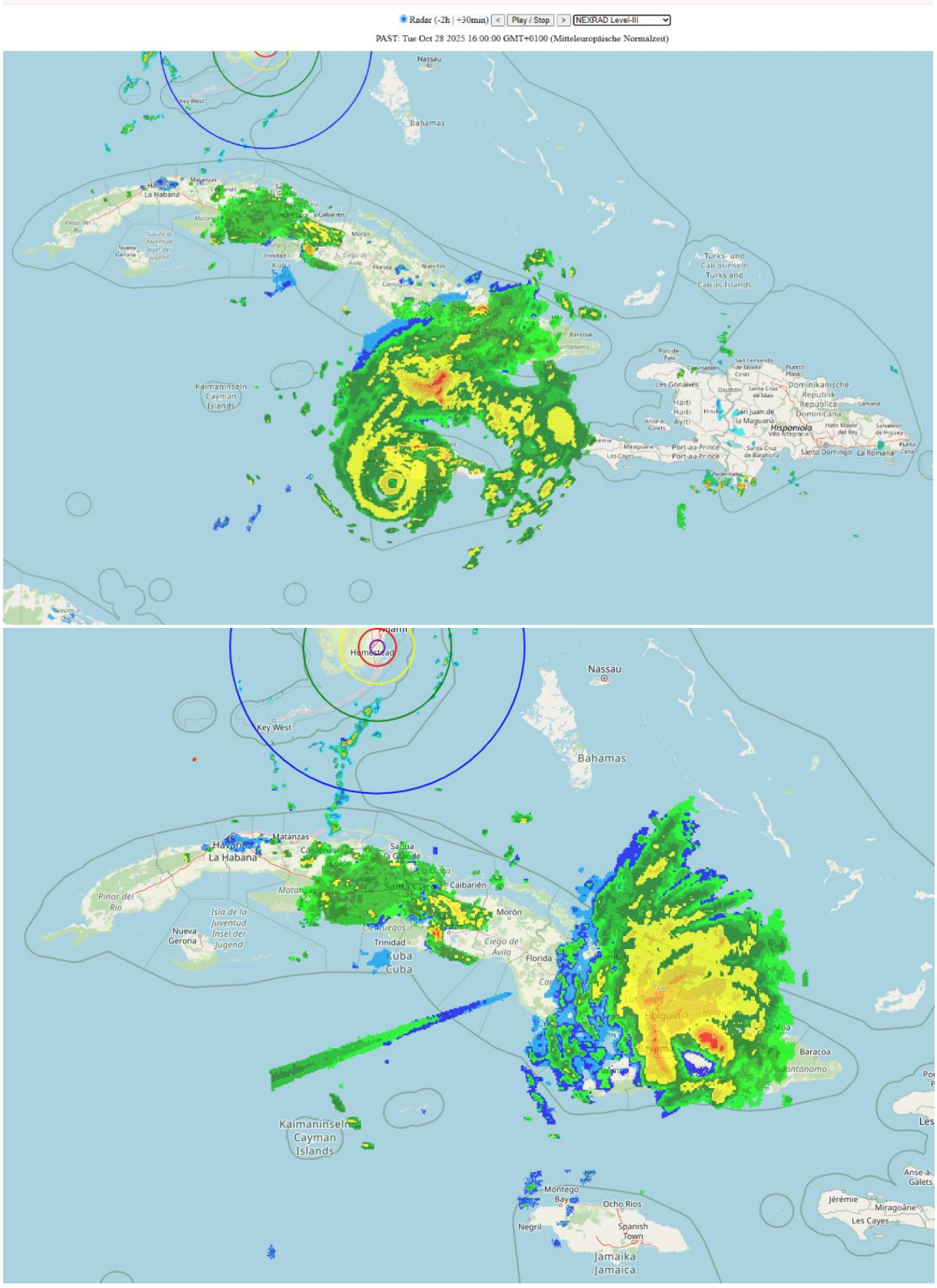

Fig. 7a and 7b: Weather Radar Map from 28 October 2025, 15 UTC (above) and from 29 October 2025, 10:30 UTC (below; Source: [https://www.rainviewer.com/weather-radar-map-live.html).](https://www.rainviewer.com/weather-radar-map-live.html)

2.4. Wind

Melissa reached Category 1 hurricane status on 15 October 2025, at around 15 UTC, with average wind speeds of at least 64 kt (1-minute sustained winds). Melissa lost its hurricane status six days later, on 31 October 2025, at around 18 UTC. At that time, the hurricane was located off the coast of New York. Melissa became part of the westerly wind zone as an extratropical storm and continued to have hurricane-force average wind speeds for quite some time. In total, Melissa traveled a distance of 3700 km along which the average wind speed was at least 64 kt. Melissa remained at the highest hurricane category 5 for 36 hours on 27 and 28 October 2025; during this time, however, Melissa moved only over a distance of slightly more than 300 km.

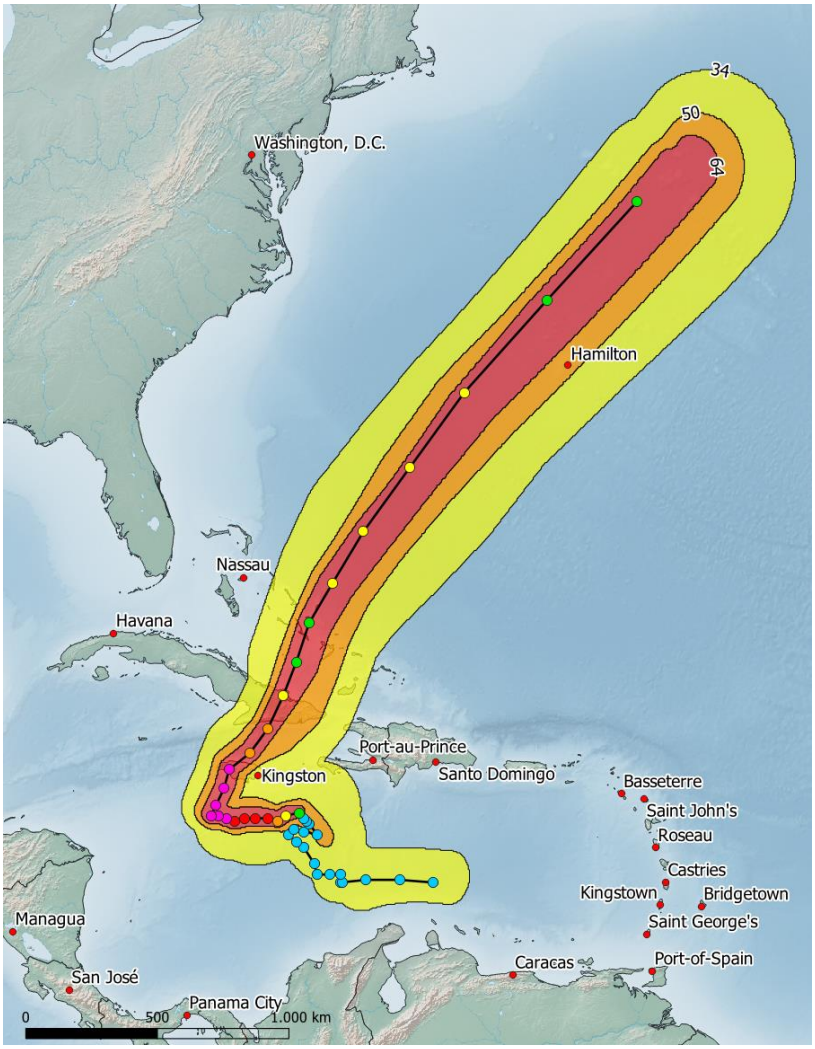

Fig. 8: Windswaths of Melissa during its path from 21 to 31 October 2025. 1-minute sustained winds exceed 34 kt (yellow area), 50 kt (orange area) and 64 kt (Cat 1, red area; Source: National Hurricane Center).

Figure 8 shows the path of Melissa as a tropical storm and as a Category 1 to 5 hurricane from 21 October to 31 October 2025, as well as the areas on either side of the path where the average wind speed was at least 34 kt (yellow), 50 kt (orange), or hurricane force 64 kt (red). The wind fields, especially those with hurricane force, cover comparatively narrow strips at the peak of the cyclone's development. The absolute highest wind speeds beyond 140 kt always remain confined to a small area around the center. When the cyclone begins to weaken, and especially when interaction with the westerly wind zone begins, the wind fields cover increasingly larger areas far outside the center, however, the absolute wind speeds decrease.

The Multiplatform Satellite Surface Wind Analysis in Figure 9 (left) shows the near-surface wind field around the center of Melissa on 28 October 2025, at 06 UTC, when the hurricane was near its peak intensity and classified as a Category 5 storm. The highest average wind speeds were reported at 160 kt. The wind arrows show the cyclonic (counterclockwise) flow around the eye of Melissa. The green color represents average wind speeds of 34 kt, the orange area shows average winds of at least 50 kt, and the red wind arrows indicate average wind speeds of more than 64 kt (hurricane force). The area with hurricane-force wind speeds (Cat 1) is concentrated in a fairly narrow area around the eye of Melissa, with a radius of 20 nm (around 40 km) in all quadrants. Analyses at neighboring times show radii of up to 30 nm (around 50 km).

By 29 October 2025, 12 UTC, Melissa had almost completely crossed Cuba and weakened to a Category 2 hurricane. Due to interaction and friction effects with the topographical structures, the wind field had no longer has the symmetrical appearance it had previously over the low-friction water surface. In addition, peak winds only reached speeds of 93 kt. However, the area with hurricane-force average winds expanded and moved away from the storm's center. Average wind speeds of at least 64 kt are occurred up to 65 nm (120 km) from the center. On 31 October 2025, at 18 UTC, hurricane-force average wind speeds could still be analyzed at a distance of 80 nm (150 km) (not shown).

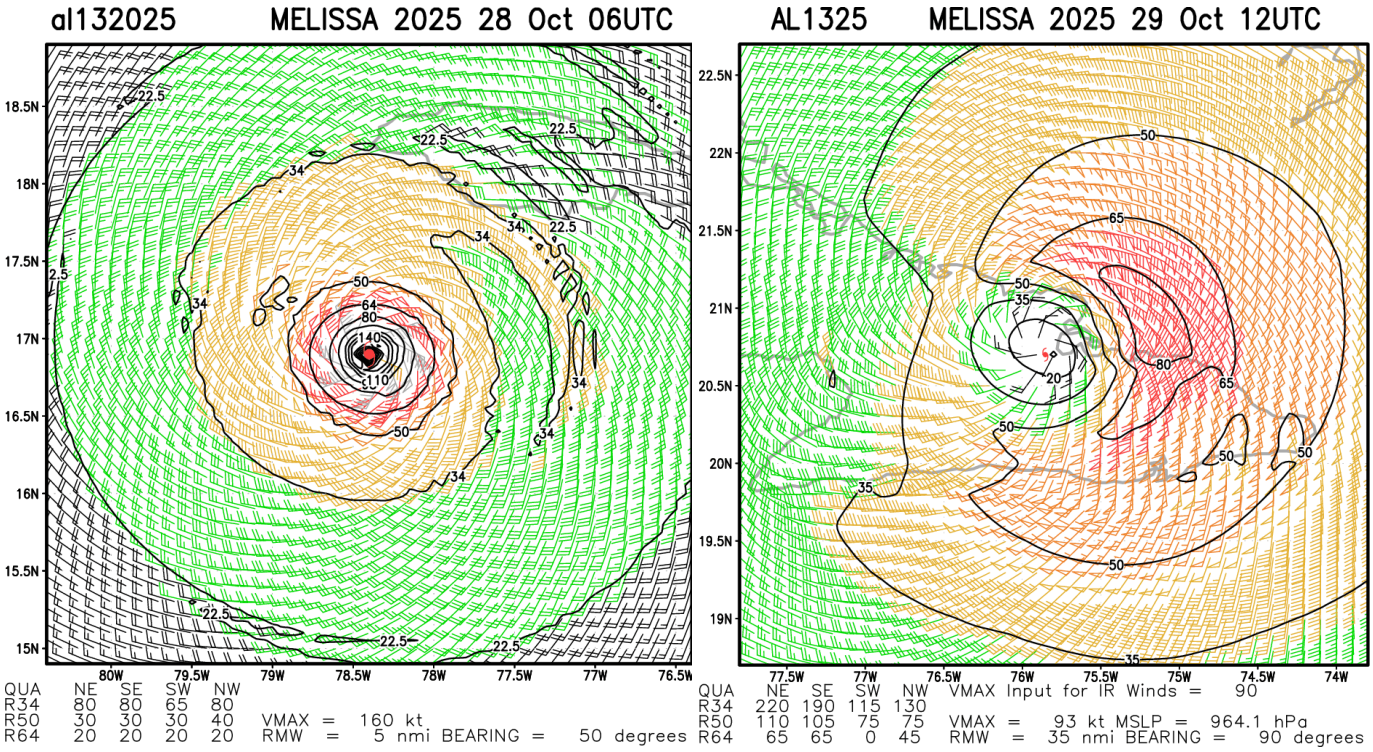

Fig. 9: Multiplatform satellite wind analysis around the center of Melissa indicating wind direction and wind speed. Average winds are >34 kt (green), >50 (orange) and >64 kt (red). Melissa was a Cat 5-hurricane at 28 October 2025, 06 UTC (left), and a Cat 2-hurricane at 29 October 2025, 12 UTC (right; Source: https://rammb-data.cira.colostate.edu/tc_realtime/storm.asp?storm_identifier=AL132025).

3. Track Guidance

Reliably predicting the path and intensity of tropical storms and hurricanes is always a major challenge. What path will a hurricane take, what maximum wind speeds can be expected, and how much precipitation must be taken into account? When and where will it make landfall? Especially at the beginning of a tropical storm's development, there is often a large uncertainty about the storm's further behavior. And whenever a tropical system moves very slowly or becomes quasi-stationary, forecasts of its path and intensity often show a wide range of possibilities.

Melissa was no exception and also eluded reliable forecasts regarding its further path and intensity for quite a long time. On 23 October 2025, at 12 UTC, the forecasts of the storm's path over the next 120 hours still showed considerable variability (Figure 10, top left). The forecast models used here expected Melissa moving further into the western Caribbean, with one model showing a shift north toward Hispaniola and a few others toward Jamaica and Cuba. In terms of the expected intensity, none of the models used here predicted a Category 5 hurricane by 29 October 2025, 12 UTC. In fact, by 27 October 2025, 09 UTC, Melissa had already matured into a Category 5 hurricane with average wind speeds of 140 kt.

On 28 October 2025, at 12 UTC, the forecast models were in broad agreement regarding Melissa's trajectory over the next five days. Most of the models predicted that Melissa would move across western Jamaica and eastern Cuba. However, even at this point, only one of the models used here predicted that Melissa would develop into a Category 5 hurricane.

Artificial intelligence models are now also being used in weather forecasting. One of the models, developed by Google DeepMind, showed astonishingly good forecast performance. It was trained using an extensive dataset of global weather observations and data from around 5,000 tropical cyclones over the last 45 years. On 21 October 2025, six days before Melissa actually developed into a hurricane of the highest category, the model predicted a 50-60% probability of a category 5 hurricane. In fact, the forecast performance of the previous 12 named storms of the 2025 Atlantic hurricane season was also convincing in terms of both intensity and trajectory.

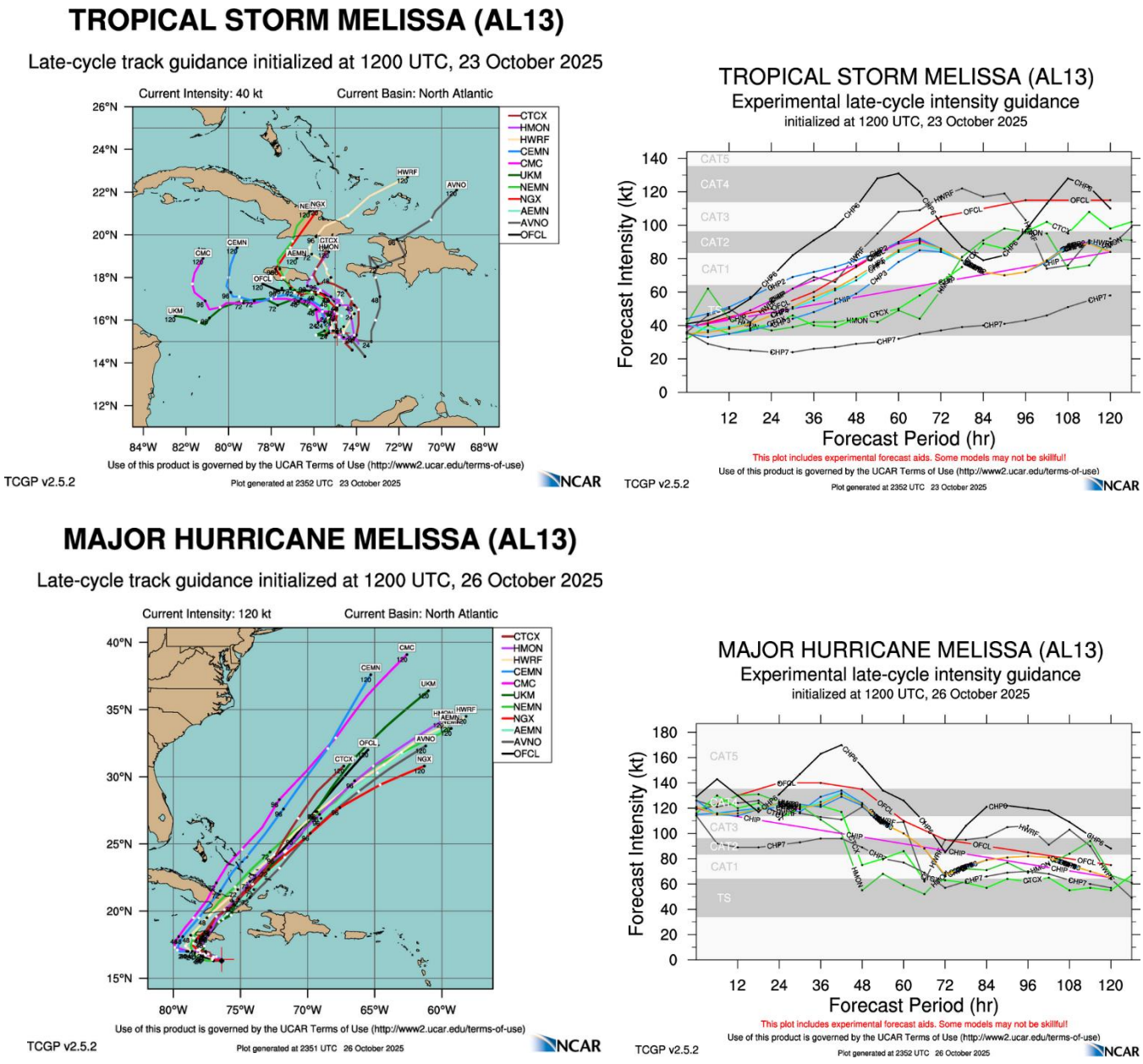

Fig. 10: Track forecast next 120 hours, initialized at 23 October 2025, 12 UTC (top left) and initialized at 26 October 2025, 12 UTC (bottom left) and intensity forecast next 120 hours, initialized at 23 October 2025, 12 UTC (top right) and initialized at 26 October 2025, 12 UTC (bottom right; Source: https://hurricanes.ral.ucar.edu/realtime/plots/northatlantic/2025/al132025).

4. Remarkable features and records

The 2025 Atlantic hurricane season (including Hurricane Melissa) was marked by several distinctive features and it also set several new records:

- Atlantic season 2025 so far: 13 named storms (avg. 1991-2020: 13.2), 5 hurricanes (avg. 6.4), 4 major hurricanes (avg. 3.0)
- Melissa was the strongest tropical storm so far in 2025 worldwide
- Melissa was the 5th Cat5-tropical system in 2025 worldwide. Average (1990-2024) for Cat 5-systems worldwide is 5.3 per year. Others were:
  - Typhoon Ragasa (21 September, Northwestern Pacific)
  - Erin (16 August, Atlantic)
  - Humberto (27 September, Atlantic)
  - Errol (16 April, Indian Ocean off northwestern Australia)
- Melissa was the 4th major (Cat 3+) hurricane in 2025 in the Atlantic Basin (Cat 4: Gabrielle, Cat5: Erin, Humberto)

- Melissa was the 3rd category 5-hurricane in 2025 in the Atlantic (previous were Erin and Humberto). Just one Atlantic season had at least 3 Cat 5-hurricanes: 2005 (Emily, Katrina, Rita, Wilma)
- Melissa was the 4th hurricane to reach Cat 4 (out of 5) in the Atlantic in 2025. This happened only 3 times before: 1932, 1999, 2020)
- All of the 4 major hurricanes in the Atlantic in 2025 experienced an explosive intensification: increase of sustained wind by 50 kt within 24 hours
- Melissa was the 3rd major hurricane since 22 September 2025. Tied with 1991 and 2024 with the most major hurricanes between 22 September and 27 October
- Melissa was the first named storm of the 2025 season in the Caribbean
- Melissa had the lowest central pressure such late in an Atlantic hurricane season: 892 hPa
- Melissa was the strongest hurricane in history to hit Jamaica
- Melissa kept Cat 5 for 36 hours, ranking 5th in the Atlantic
  - Irma: 65 hours, September 2017
  - Ivan: 36 hours, September 2004
  - Mitch: 42 hours, November 1998
  - David: 42 hours, September 1979
- Melissa was the 3rd strongest hurricane in history with respect to central pressure of 892 hPa
  - Labor Day hurricane (892 hPa, 1935).
  - Wilma (2005, 882 hPa)
  - Gilbert (1988, 888 hPa)
- Melissa was the 2nd strongest hurricane with respect to 1-min sustained winds (160 kt). Strongest was Allen (1988, 165 kt)
- Melissa was the strongest hurricane on record when making landfall

Table 2: Strongest hurricanes at landfall.

Rank	Name	Date	Location of Landfall	1-min sustained winds	Central Pressure
1	Melissa	10/28/2025	Jamaika (New Hope)	160 kt	892 hPa
	Labor Day Huricane	09/03/1935	Florida Keys	160 kt	892 hPa
	Dorian	09/01/2019	Bahamas (Abaco Island)	160 kt	910 hPa
4	Irma	09/06/2017	Barbuda, St. Martin, British Virgin Islands	155 kt	914-915 hPa
		09/09/2017	Northern Cuba	145 kt	924 hPa
5	Camille	08/18/1969	Mississippi	150 kt	900 hPa
	Dean	08/21/2007	Mexico (Yucatan)	150 kt	905 hPa
	David	08/31/1979	Dominican Republic	150 kt	926 hPa
	Anita	09/02/1977	Mexico (north of Tampico)	150 kt	926 hPa
	Janet	09/28/1955	Mexico (Yucatan)	150 kt	914 hPa
10	Maria	09/19/2017	Dominica	145 kt	922 hPa
	Cuba Hurricane	10/19/1924	Western Cuba	145 kt	910 hPa
	Andrew	08/23/1992	Bahamas (Eleuthera)	140 kt	923 hPa
		08/24/1992	Florida	145 kt	922 hPa

- Melissa's eye had a diameter of 19 km (27 October 2025; see Figure 11)
- Cloud top temperatures of thunderstorms within the eyewall were < -80 °C
- NOAA Hurricane Hunters released dropsondes while flying through the eyewall. Measurement was 219 kt (406 kph at 215 msl), possibly a new record. Previous Atlantic record was Hurricane Isabel in 2003: 207 kt (384 kph) at 1400 msl.

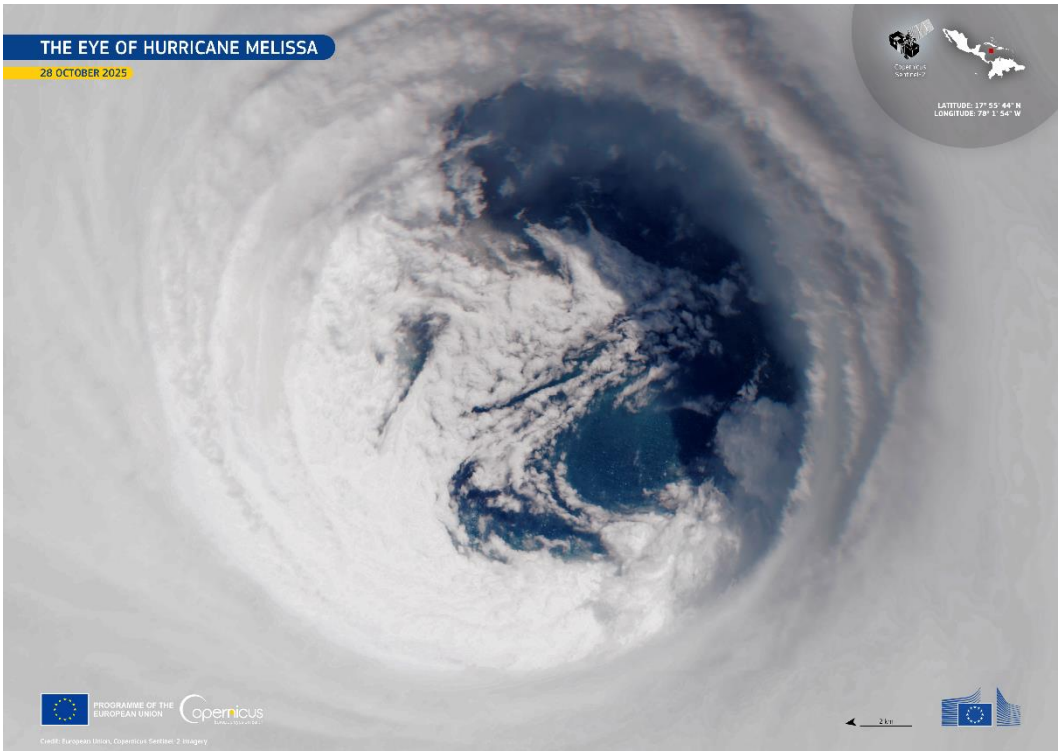

Fig. 11: Close-Up of Melissa's eye on 28 October 2025, 15:55 UTC, just before making landfall in Jamaica. Within the perfect circular-shaped eye, blue ocean is visible, surrounded by a massive eye-wall (Credit: European Union, Copernicus Sentinel-2 imagery).

5. History of Atlantic Hurricanes

Many hundreds of hurricanes occurred over the last 100+ years in the Atlantic Basin. Figure 11 shows an overview of all category 1 to 5-hurricanes that have been recorded by the International Best Track Archive for Climate Stewardship (IBTrACS). The color palette ranges from green (category 1) to yellow (category 2), orange (category 3), red (category 4), and purple (category 5). The path of Melissa (category 1 to category 5) is shown in black.

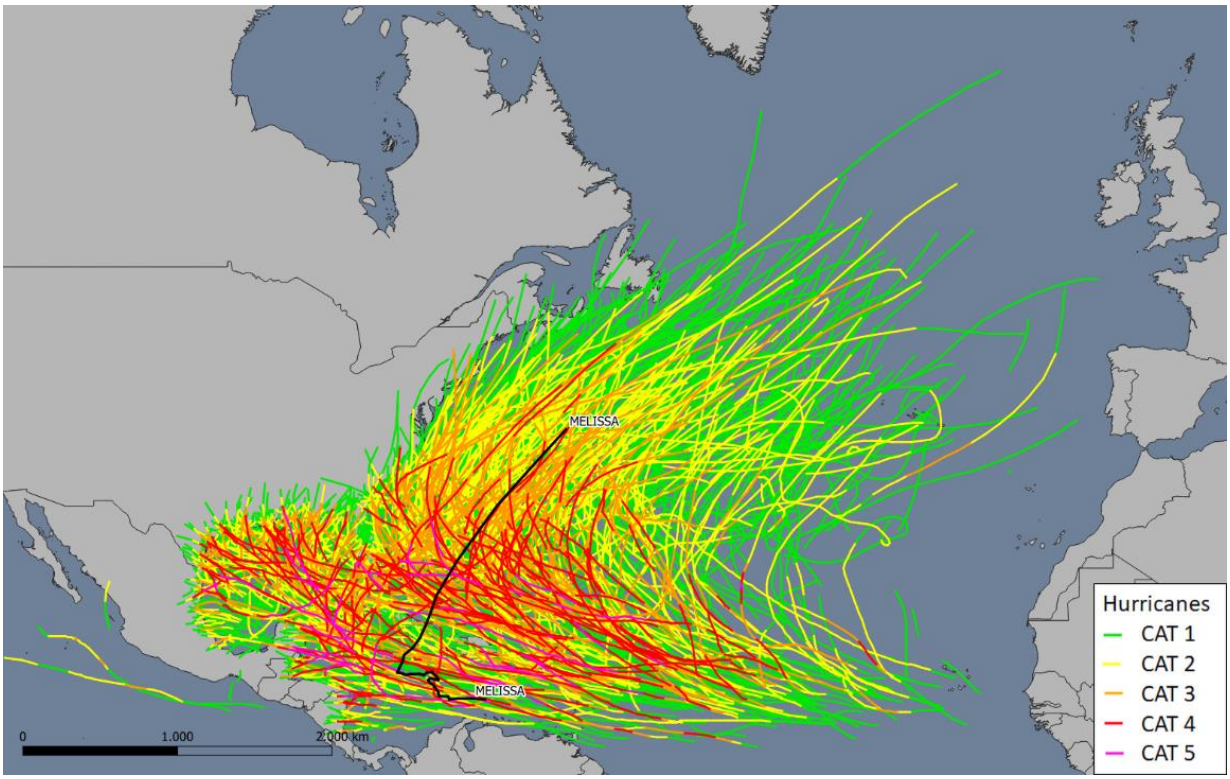

Fig. 12: Tracks of all Atlantic hurricanes since 1851. Colours indicate the category the hurricanes. Green: Cat 1, Yellow: Cat 2, Orange: Cat 3, Red: Cat 4, Purple: Cat 5 (Data: https://www.ncei.noaa.gov/products/international-best-track-archive).

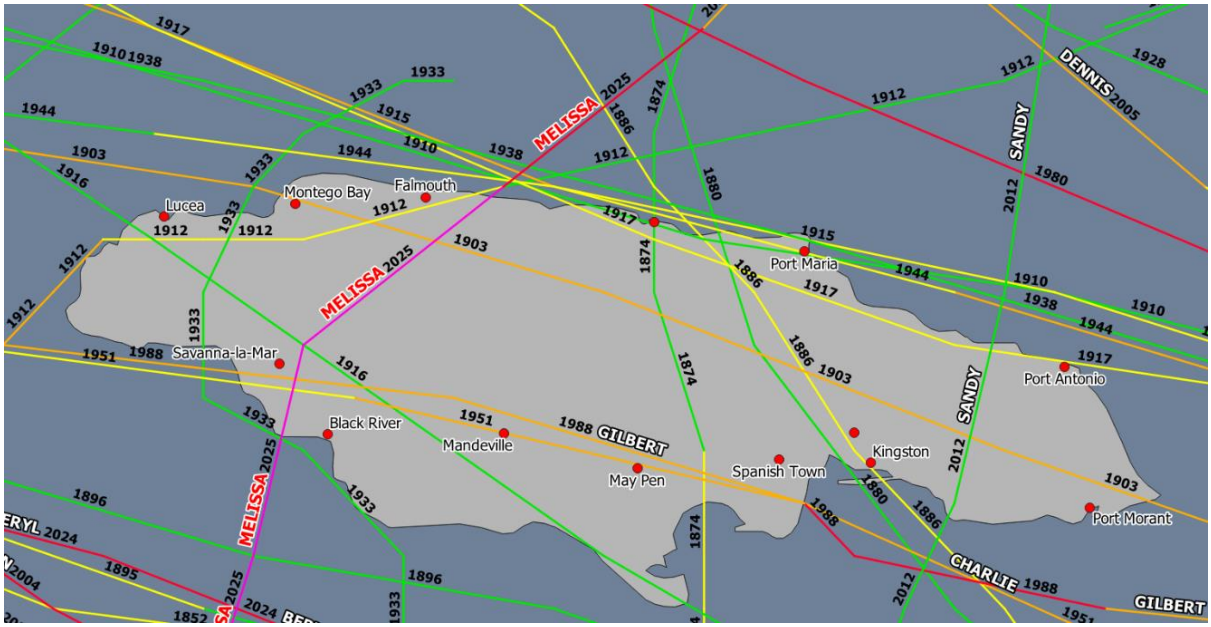

Fig. 13: Tracks of all hurricanes since 1851 over and around Jamaica. Colors indicate the category the hurricanes. Green: Cat 1, Yellow: Cat 2, Orange: Cat 3, Red: Cat 4, Purple: Cat 5 (Data: https://www.ncei.noaa.gov/products/international-best-track-archive).

Most hurricanes that grazed or crossed Jamaica, or passed close to the island moved from the east to the west. Only a few cyclones hit Jamaica from the south. Melissa did so. Figure 13 shows the paths of all hurricanes over and around Jamaica. Gilbert and Charlie followed almost identical paths, and in 1903, a Category 3 hurricane made landfall on the easternmost tip of Jamaica. A total of five major hurricanes have made landfall in Jamaica to date. Melissa was the sixth and the only Category 5 hurricane. For Cuba, Melissa was the 12th major hurricane to hit the island in the last 25 years.

Table 3: List of major hurricanes making landfall on Jamaica since 1851 (Information based on IBTrACS data).

Date	Name	Category
10/28/2025	Melissa	5
09/12/1988	Gilbert	4
08/18/1951	Charly	3
08/11/1903	Unnamed	3
08/20/1944	Unnamed	3
11/18/1912	Unnamed	3

6. Impact and damage

History

The last hurricane that caused severe damage in Cuba was Rafael. The category 3-hurricane with sustained winds of 100 kt and a central pressure of 956 hPa crossed the western part of Cuba and was responsible for damage amounting 1$ billion

In Jamaica, Melissa had a much stronger impact than the strongest hurricane before, which was Gilbert, a category 4-hurricane (115 kt) at the time of landfall. Gilbert came ashore at the easternmost tip of Jamaica and crossed the island from east to west. The damage amounted to US$1 billion, which is approximately US$2.7 billion in 2025 terms. In relation to GDP, this represented 27%.

Impact of Melissa in Jamaica

In anticipation of Hurricane Melissa, all airports were closed on Saturday, 25 October, a few days before the storm made landfall as the strongest hurricane on record to impact Jamaica. About 25,000 tourists were stranded in Jamaica during landfall.

Shortly after landfall, the country was declared a 'disaster area' by prime minister Andrew Holness on late Tuesday. The Hurricane severely compromised the infrastructure of the island, leaving about 77% of customers without electricity as of Wednesday morning. Most of Jamaica's roads were blocked, regular cell service disrupted in many parts of Jamaica and about 10% of water systems damaged. One day after landfall on 30 October, 134 roads remained blocked and only 11 roads were restored. More than 25,000 people were admitted to emergency shelters.

Hurricane Melissa mainly affected the western parts of Jamaica, with one of the hardest hit places being Black River, a small coastal town located approximately 15 km southeast of the landfall point. Black River was affected by a storm surge of up to 5 meters and strong winds destroyed up to 90% of roofs in the town, including the roof of the Black River hospital (see Figures 14 and 15). At least two people died in Black River and were later found floating in the water after the storm passed. Hurricane Melissa also caused extensive damage to vegetation, turning lush green areas into a brown, bleak landscape.

Fig. 14: Satellite image of the Black River Hospital before Hurricane Melissa (Source: https://www.google.de/maps).

Fig. 15: Satellite image of Black River after Hurricane Melissa made landfall, showing the same area as in Figure 14 on 29 October, 2025 (Source: Vantor's Open Data Program, https://xpress.maxar.com).

All three international airports reopened on 30 October for relief flights, but only Kingston's Norman Manley International Airport and Ocho Rios' Ian Fleming International Airport for commercial flights. Montego Bay's Sangster International Airport (MBJ) sustained roof and flood damage at seven gates, but is expected to reopen for limited commercial flights on 31 October. Cruise terminals in Montego Bay and Falmouth were flooded and damaged, but the ports of Ocho Rios, San Antonio and Port Royal started accepting vessels on Friday, 31 October. At least 28 people died in Jamaica as of 2 November 2025.

Overall, Jamaica was by far the hardest-hit country and initial damage estimates for the hurricane range between US$48 - $52 billion according to accuweather.

Numerous buildings were left partially or fully destroyed, especially in the western and southwestern parts of Jamaica. In Figure 16, those buildings that are possibly, partially or completely destroyed are marked with colored dots (Yellow: possibly damaged, orange: damaged, red: destroyed).

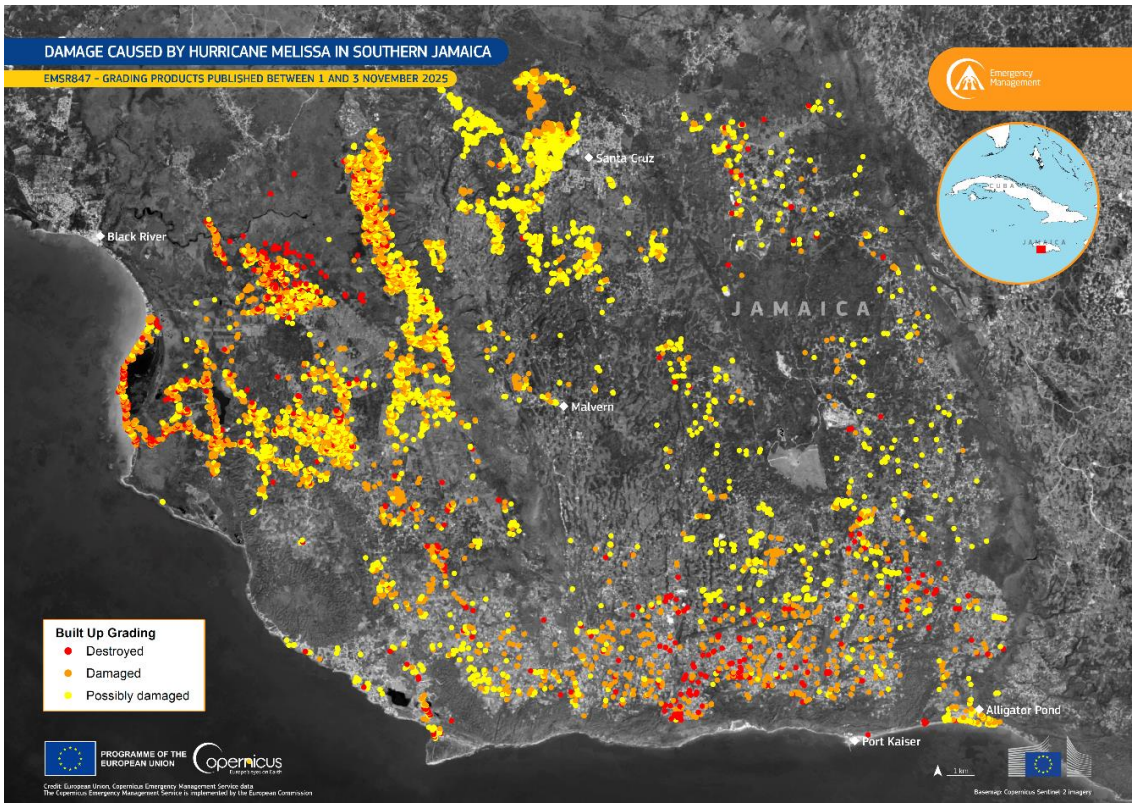

Fig. 16: Analysis of damaged or destroyed buildings in southwestern Jamaica (Big Woods, Bull Savanna, Arlington, Santa Cruz, and Top Hill areas). Yellow: possibly damaged, orange: damaged, red: destroyed (Credit: European Union, Copernicus Emergency Management Service).

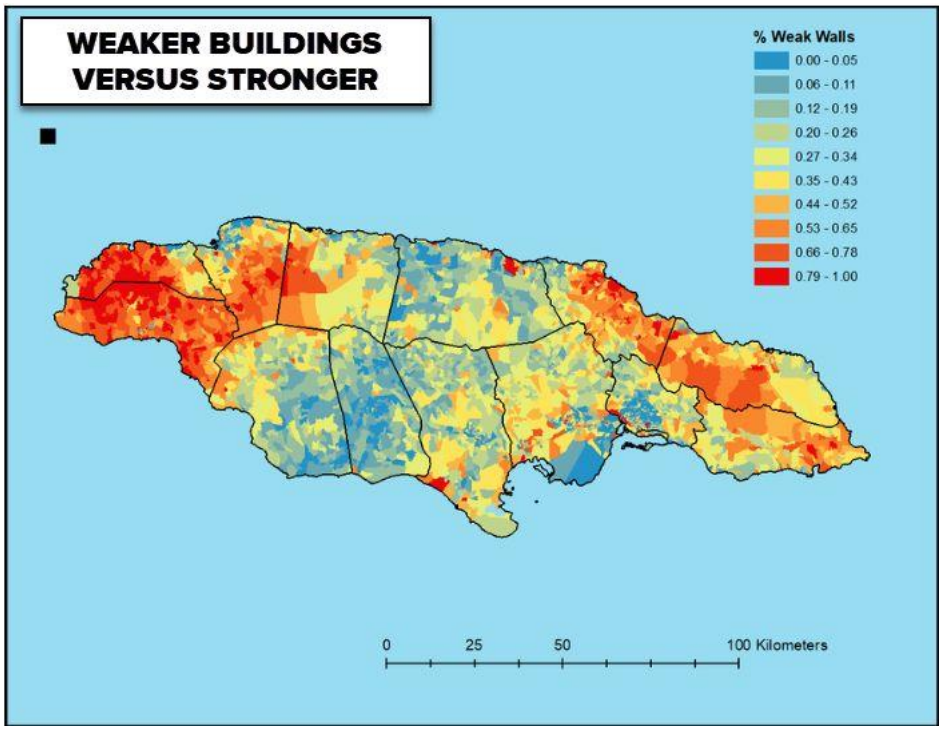

Fig. 17: Distribution of more resilient and less resilient buildings across Jamaica (Source: https://www.researchgate.net/publication/348943501_Poverty_and_hurricane_risk_exposure_in_Jamaica).

The weakest buildings (Figure 17) are located in the far west of Jamaica, and there are also numerous vulnerable buildings in the far northeast. Melissa hit the southwest of the island with its maximum intensity.

Haiti and Dominican Republic

Hurricane Melissa affected Haiti mainly with extensive rain, causing severe river flooding in Southern Haiti that killed at least 25 people. Several municipalities were flooded and cut off from communication, with roads blocked by landslides. Due to flooding, at least 450 homes and 10 slums were damaged. About 15,000 people remained in shelters. In total, the country reported at least 30 deaths and 20 more missing.

In the Dominican Republic, about 1.1 million people were left without water supply due to extensive damages to the water supply system after heavy rains of Hurricane Melissa. Landslides and flooding affected the road and bridge network, isolating more than two dozen communities. At least 200 homes were damaged, 4 people were reported dead and 1 missing.

Cuba

More than 735,000 people across eastern Cuba were evacuated ahead of the Hurricane. After the passage of the storm, 241 communities and around 140,000 people were cut off from communication in Southeastern Cuba and nearly 3.5 million people were without electricity. In Guantànamo, Holguìn and Santiago de Cuba, about 992,000 houses were damaged and almost 450,000 people lost access to safe water. The airports Santiago de Cuba and Holguin were temporarily closed on 28 and 29 October.

Bahamas

Nearly 1,500 people in vulnerable communities were evacuated before the storm. Some roofs were damaged, trees uprooted and utility poles downed, knocking out power. Widespread flooding was reported on the islands and also impacted the Deadman’s Cay airport, which was forced to close. Additionally, Exuma International Airport closed on 28 October at 10 pm local time, but reopened on 30 October.

Bermuda

Although hurricane Melissa was located about 112 nautical miles away from its closest approach to Bermuda, hurricane force wind gusts were measured by an elevated station at the National Museum of Bermuda. Tropical storm force winds caused fallen branches, foliage and downed powerlines. Around 19,000 households in Bermuda lost power due to Hurricane Melissa. Besides, the airport in Bermuda was closed at 6 pm on 30 October and reopened on 31 October.

7. Supplement

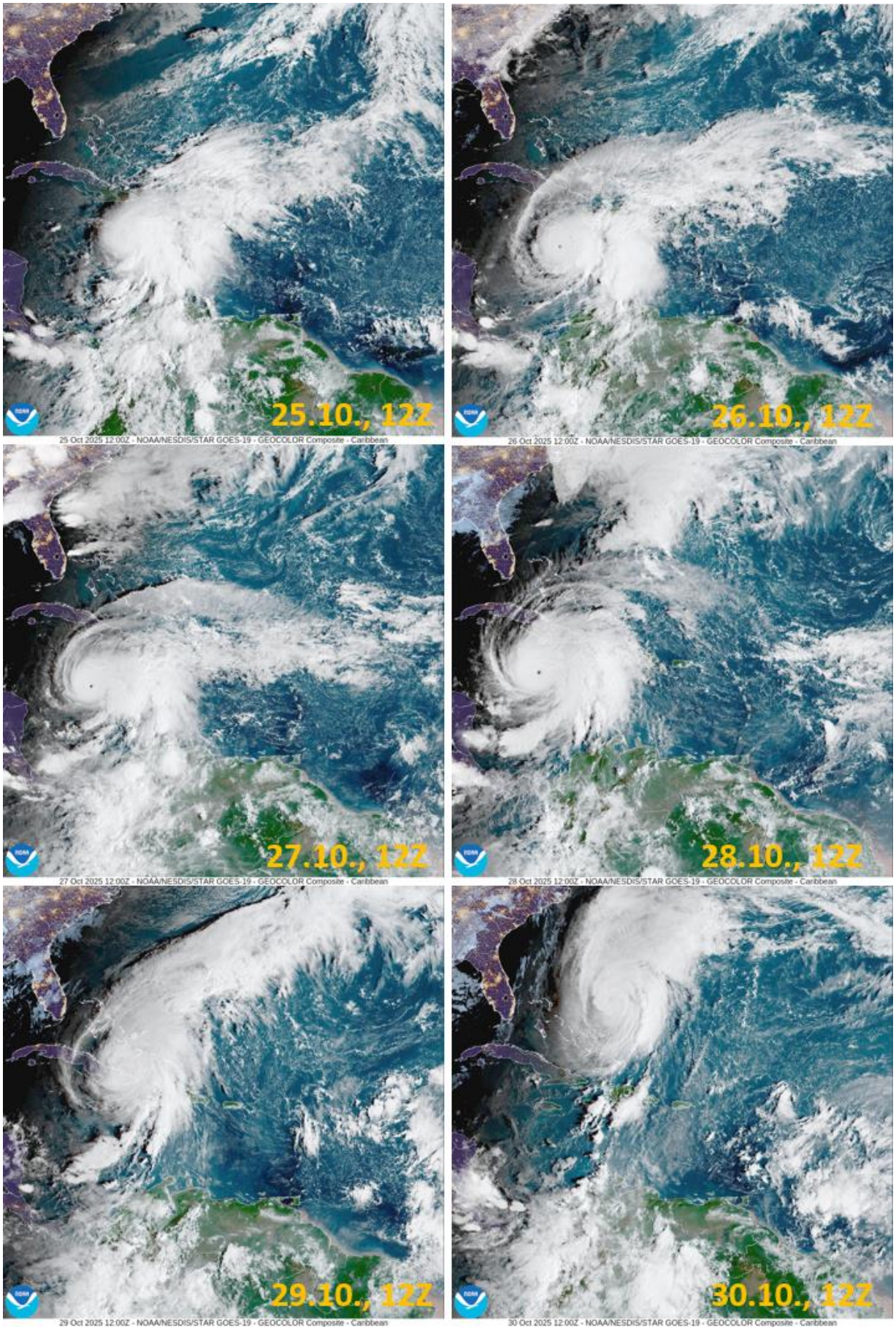

Figure 18: Satellite images, 25-31 October 2025, 12 UTC (Source: https://cdn.star.nesdis.noaa.gov).

8. Sources & References

https://www.cbsnews.com/news/hurricane-melissa-strongest-hurricanes-atlantic/

https://edition.cnn.com/weather/live-news/hurricane-melissa-jamaica-landfall-monday-climate

https://yaleclimateconnections.org/2025/10/catastrophic-hurricane-melissa-hits-jamaica-as-the-strongest-landfalling-atlantic-hurricane-on-record/

https://www.nhc.noaa.gov/data/tcr/AL052019_Dorian.pdf

https://www.researchgate.net/publication/348943501_Poverty_and_hurricane_risk_exposure_in_Jamaica

https://yaleclimateconnections.org/2025/10/jamaica-braces-for-cat-5-hurricane-melissa-earths-strongest-storm-of-2025/

https://weather.com/storms/hurricane/news/2025-10-31-hurricane-melissa-recap-category5-jamaica-cuba-hispaniola

https://bsky.app/profile/michaelrlowry.bsky.social/post/3m4chrlpgvn2g

https://cmr.earthdata.nasa.gov/

https://worldview.earthdata.nasa.gov/

https://sealevel.nasa.gov/missions/ghrsst

https://podaac.jpl.nasa.gov/

https://www.nature.com/articles/d41586-025-03539-x

https://mapping.emergency.copernicus.eu/news/tropical-storm-melissa-in-jamaica-emsr847/

https://www.copernicus.eu/en/media/image-day-gallery/sentinel-2-captures-vivid-view-hurricane-melissas-eye

https://giovanni.gsfc.nasa.gov/giovanni/

https://rammb-data.cira.colostate.edu/tc_realtime/storm.asp?storm_identifier=AL132025

https://rammb-data.cira.colostate.edu/tc_realtime/image_airctcwa.asp?product=airctcwa&storm_identifier=al132025&product_filename=2025al13_airctcwa_202510280600

https://www.wpc.ncep.noaa.gov/tropical/rain/web/storms/MELISSA.html

https://www.wpc.ncep.noaa.gov/tropical/rain/tcrainfall.html

https://gpm.nasa.gov/data/directory

https://hurricanes.ral.ucar.edu/realtime/plots/northatlantic/2025/al132025/

https://mapping.emergency.copernicus.eu/news/tropical-storm-melissa-in-jamaica-emsr847/

https://rapidmapping.emergency.copernicus.eu/EMSR847/reporting

https://www.ncei.noaa.gov/products/international-best-track-archive

https://coast.noaa.gov/hurricanes/#map=7.39/17.671/-77.17

https://x.com/philklotzbach

https://www.nbcnews.com/weather/storms/tropical-storm-melissa-hurricane-updates-rcna239732

https://jis.gov.jm/hurricane-melissa-makes-landfall-in-new-hope-westmoreland/

https://apnews.com/article/hurricane-melissa-jamaica-landfall-cuba-bahamas-8f71433722c9963554421d9258cd4d6b

https://www.nytimes.com/2025/10/28/world/americas/hurricane-melissa-jamaica.html)

https://www.cnn.com/weather/live-news/hurricane-melissa-cuba-bahamas-landfall-wednesday-climate-hnk?post-id=cmhbuyex10006356pf9c46m9u

https://edition.cnn.com/weather/live-news/hurricane-melissa-cuba-bahamas-landfall-wednesday-climate-hnk?post-id=cmhbo1ksp00053b6pjn51s2or

https://www.thetimes.com/us/news-today/article/hurricane-melissa-jamaica-storm-latest-news-jgb2vb2lk

https://nypost.com/2025/10/29/world-news/jamaica-still-has-no-idea-how-many-hurricane-melissa-victims-are-dead-missing-after-storm-of-the-century/

https://edition.cnn.com/2025/10/30/americas/jamaica-hurricane-melissa-black-river-latam-intl

https://www.bloomberg.com/news/articles/2025-10-29/hurricane-melissa-takes-aim-at-bahamas-after-battering-cuba

https://news.sky.com/story/hurricane-melissa-leaves-28-dead-after-tearing-through-jamaica-13462331

https://www.bbc.com/news/articles/c1e34p92q0vo

https://aviationweek.com/air-transport/airports-networks/jamaicas-airports-resume-limited-operations-following-hurricane

https://www.accuweather.com/en/hurricane/total-devastation-hurricane-melissa-leaves-trail-of-destruction-flooding-in-jamaica/1829663

https://reliefweb.int/report/cuba/emergency-appeal-cuba-hurricane-melissa-mdrcu013

https://havanatimes.org/news/very-preliminary-report-on-damage-in-cuba-from-melissa/

https://apnews.com/article/hurricane-melissa-jamaica-haiti-cuba-killed-flooding-96bada7a26013c3cf4048d8390cc08f6

https://www.diariolibre.com/planeta/clima/2025/10/24/melissa-deja-mas-de-un-millon-sin-agua-y-183-viviendas-afectadas/3288709

https://www.haitilibre.com/en/news-46068-haiti-flash-melissa-has-become-a-hurricane-2-departments-in-the-red-the-human-toll-is-rising-video.html
https://www.thenassauguardian.com/news/taking-stock-residents-relieved-after-escaping-worst-of-melissa/article_6c192270-6fa9-4f45-bdf1-b55ffa951e39.html
https://www.gov.bm/articles/hurricane-melissa-emo-update-3pm
https://bbc.bm/weeks-delay-halloween-activity-post-storm
https://www.msn.com/en-us/news/world/hurricane-melissa-aftermath-jamaica-cuba-haiti-facing-economic-losses-more-hardship/ar-AA1Pwqqr?ocid=BingNewsSerp
https://www.paxnews.com/news/travel-advisories/hurricane-melissa-closes-airports-eastern-cuba
https://www.travelpress.com/cuba-closes-airports-oct-28-and-oct-29-as-it-prepares-for-hurricane-melissa/
https://bm.usconsulate.gov/weather-alert-hurricane-melissa/

Kontakt

CEDIM Head Office

Dr. Susanna Mohr
E-mail: info@cedim.de

CEDIM Spokesman

Prof. Dr. Michael Kunz
E-mail: kunz@kit.edu

KIT Public Relations

Christian Könemann
E-Mail: christian.koenemann@kit.edu