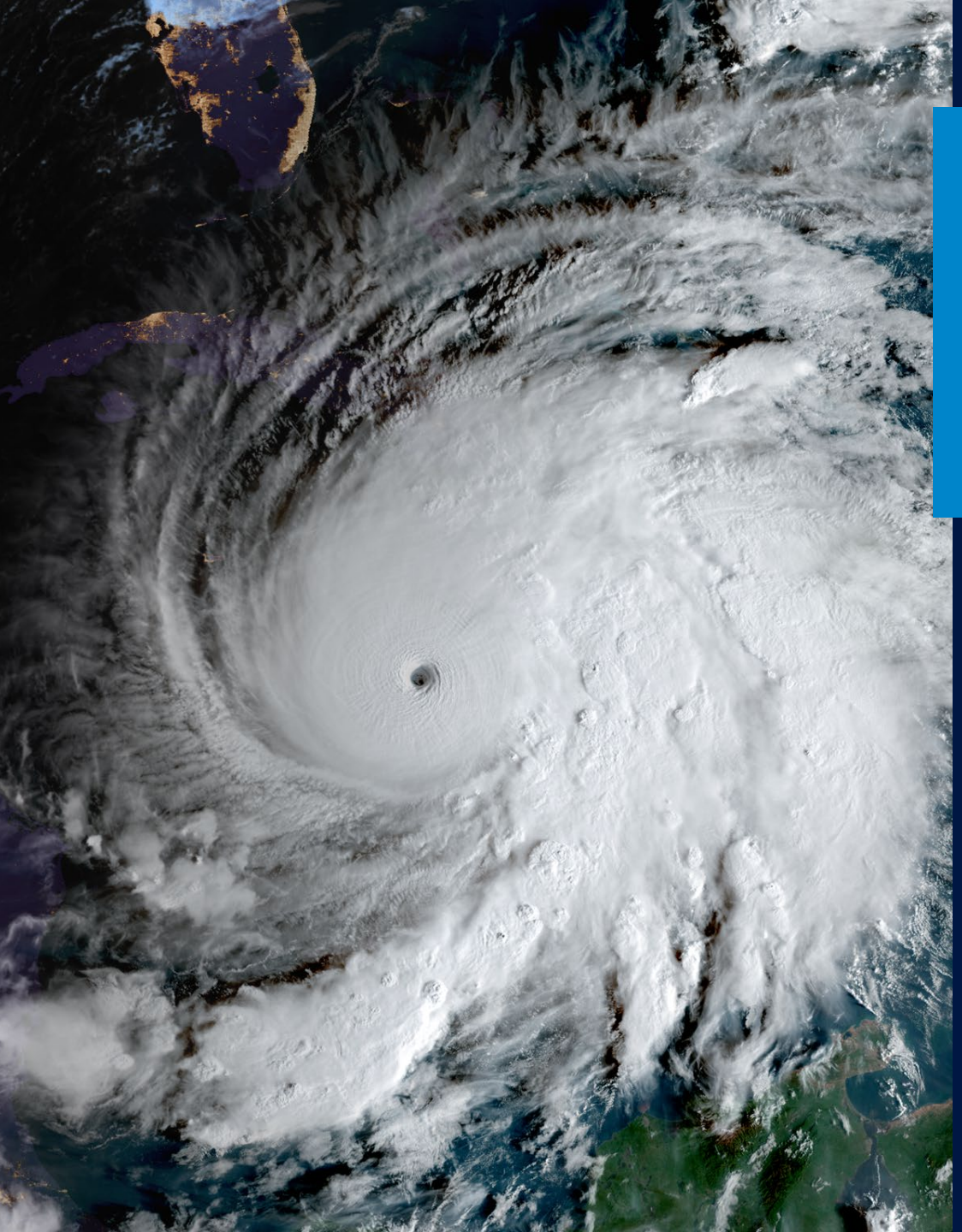
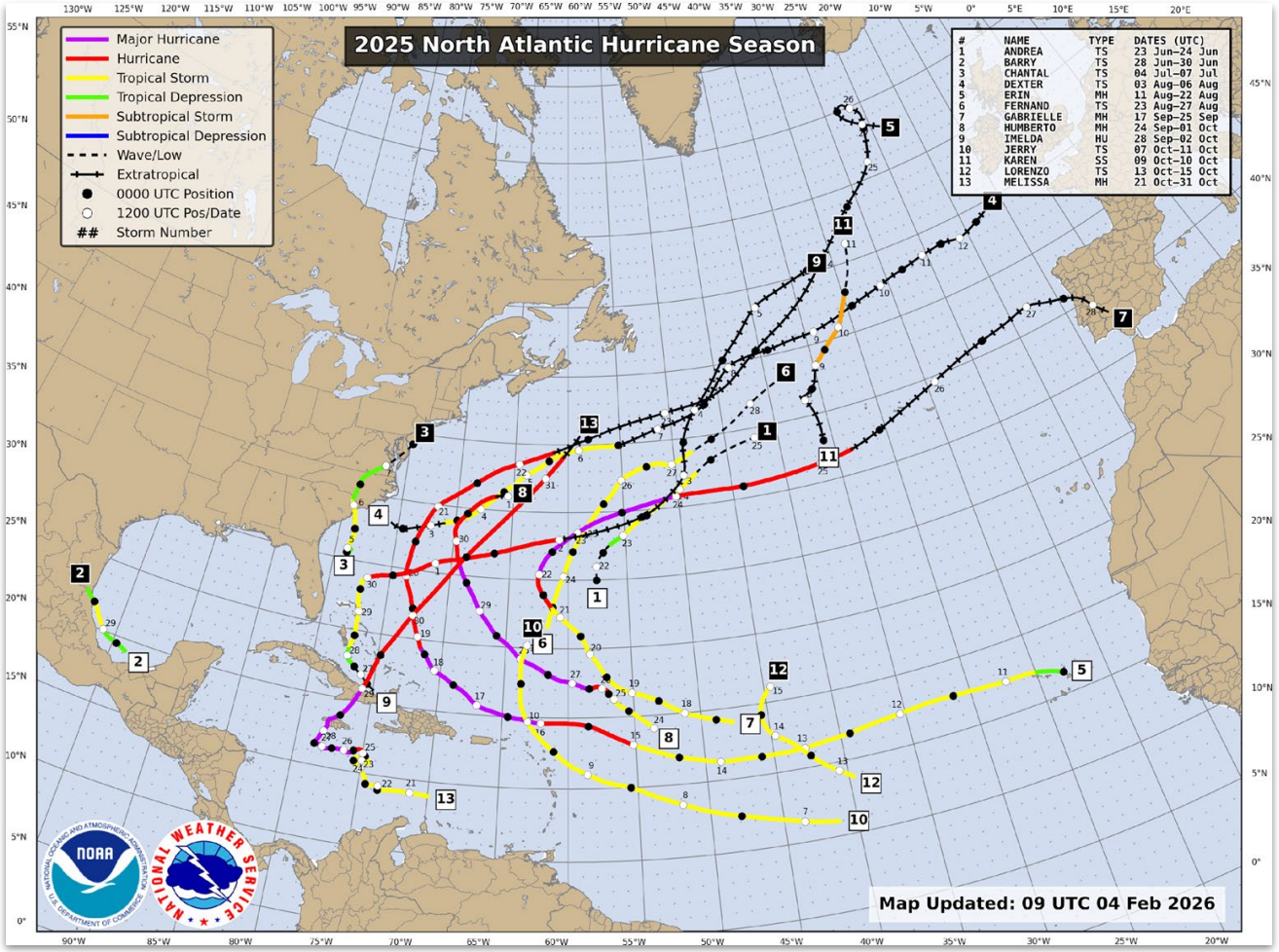


2025 Hurricane Season Summary & Challenges

Brad Reinhart
Senior Hurricane Specialist
National Hurricane Center

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service

2025 Atlantic Season Summary

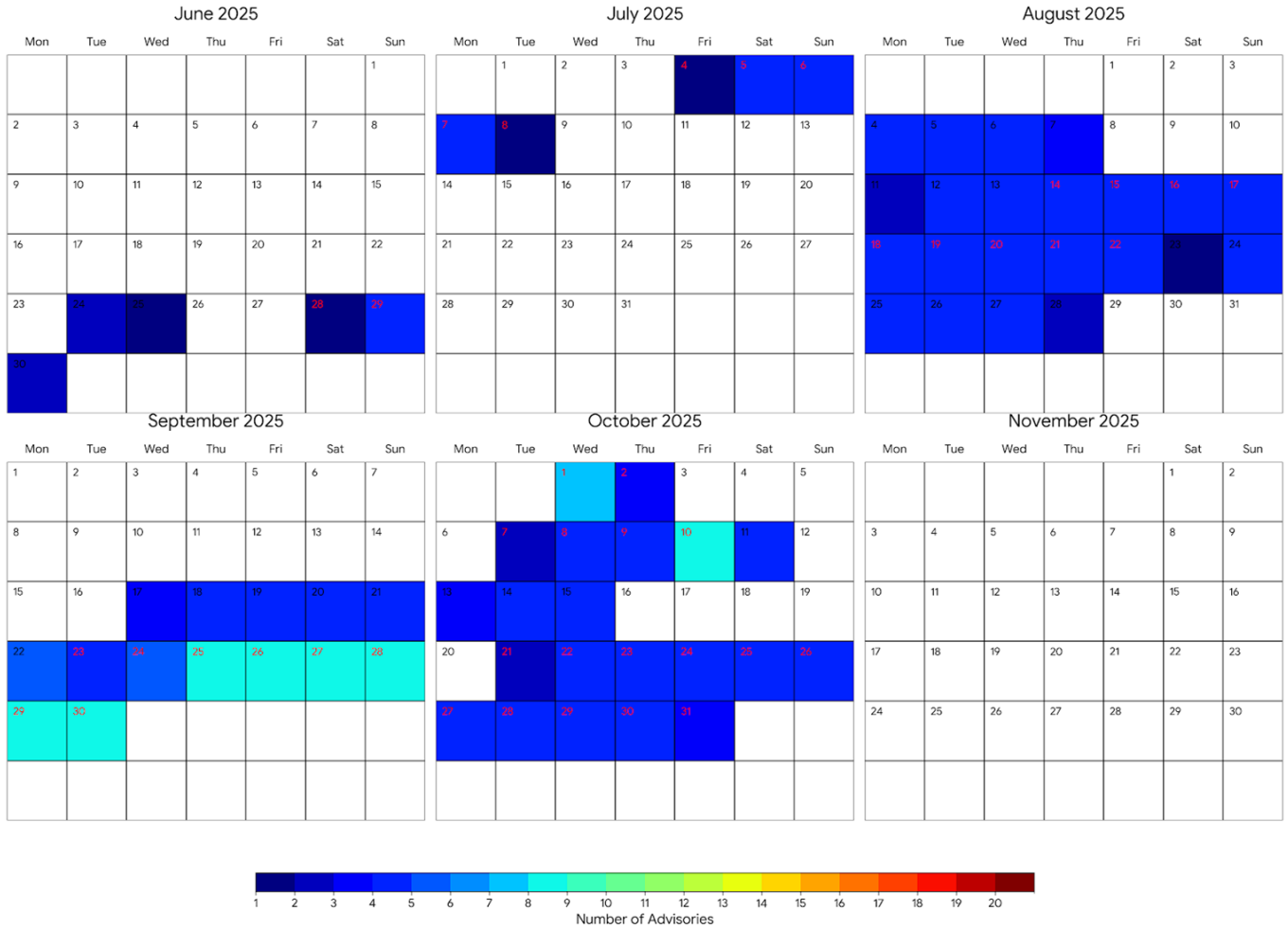


Named Storms	Hurricanes	Major Hurricanes
13 (-1)	5 (-2)	4 (+1)

- ACE: 130.8 (above normal)
- 123 direct fatalities
- Three category 5 hurricanes (most since 2005)

2025 Atlantic Season Summary

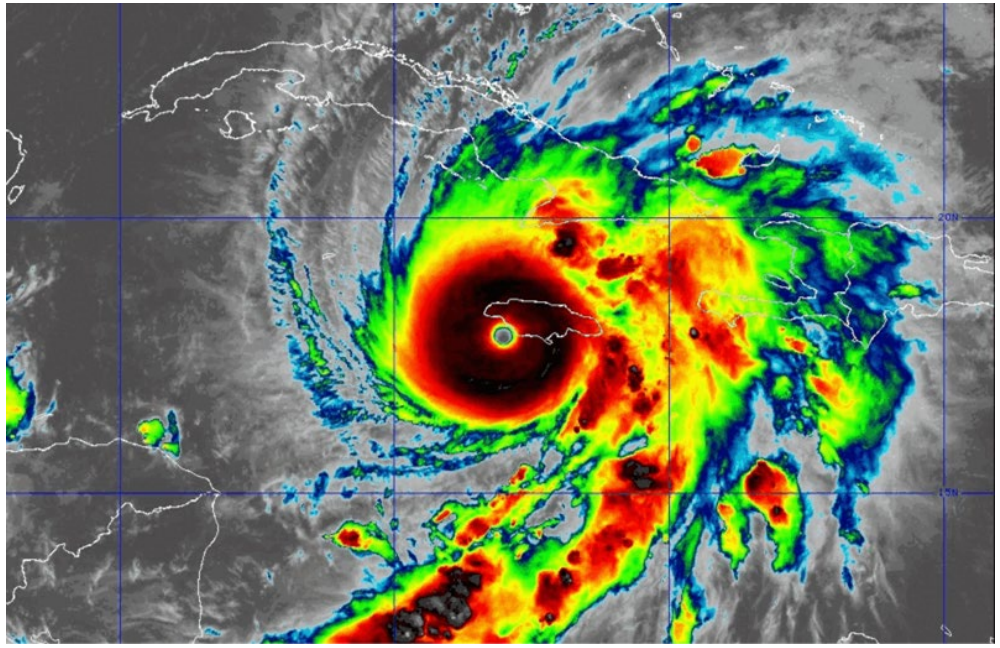
2025 Atlantic Full Advisories Issued Per Day



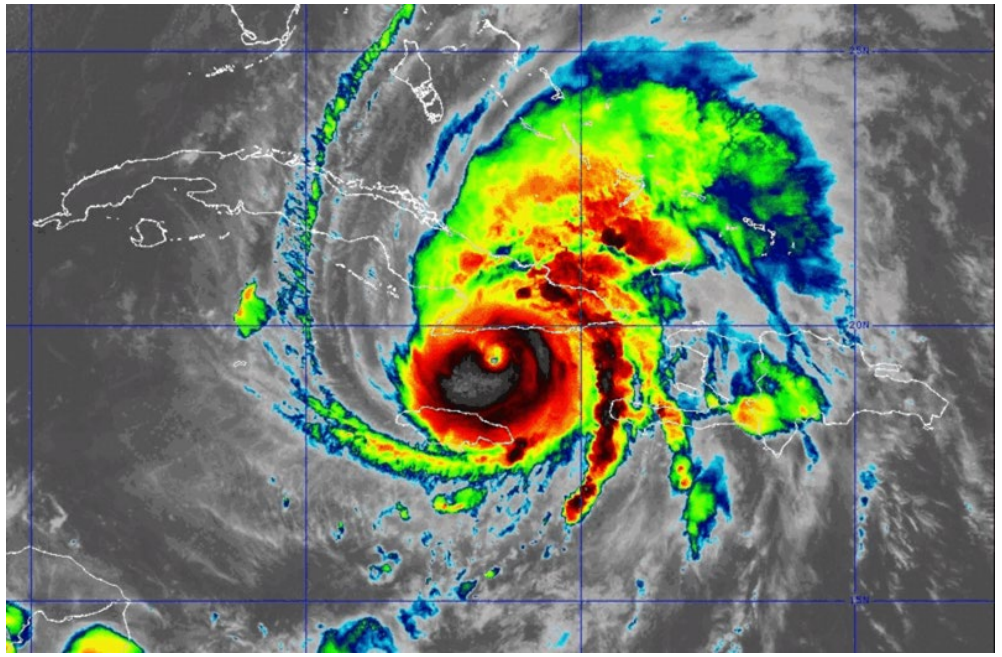
- Slow start to the season with several quiet periods, including around the climatological peak
- Steady activity during the latter half of September and through October
- No U.S. hurricane landfalls (first time since 2015)

Credit: Lisa Bucci (NHC)

2025 Atlantic Hurricane Landfalls



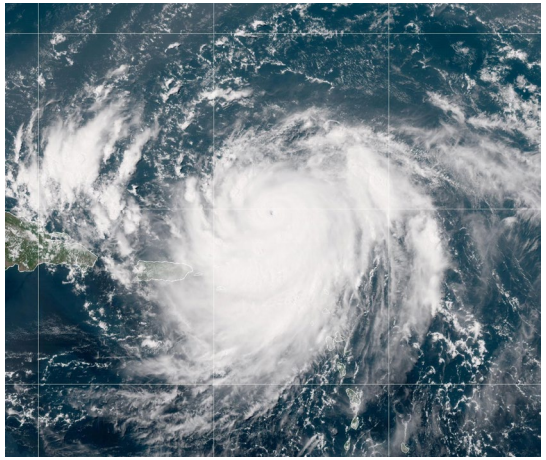
Cat. 5 Melissa | New Hope, Jamaica
October 28, 2025



Cat. 3 Melissa | Chivirico, Cuba
October 29, 2025

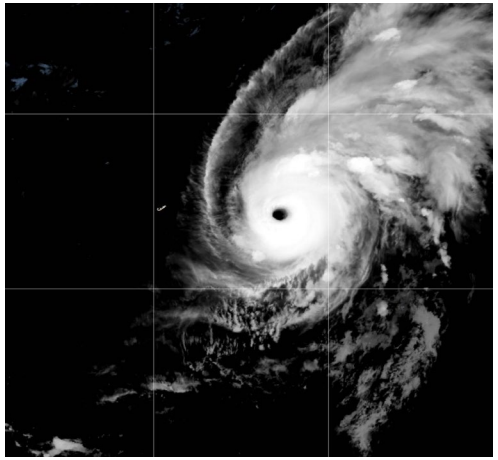
Atlantic Rapid Intensification

Category 5



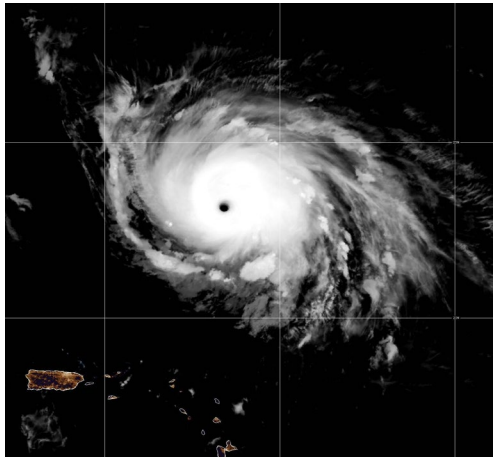
Erin
75 kt in 24 h

13 fatalities due to flooding and high surf



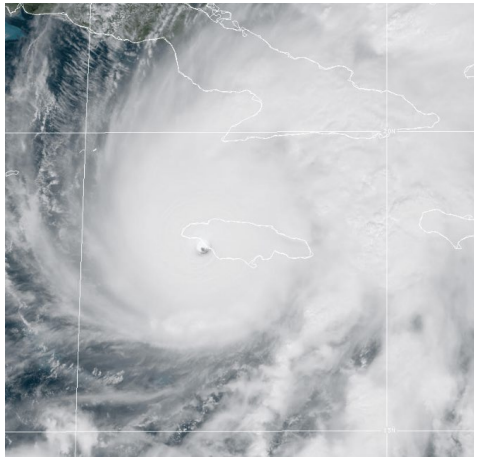
Gabrielle
50 kt in 24 h

Category 5



Humberto
55 kt in 24 h

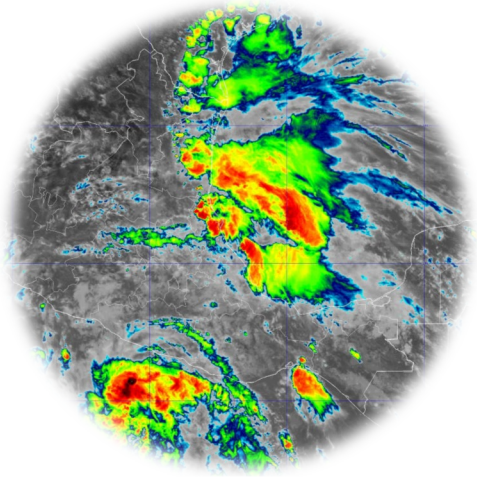
Category 5



Melissa
55 kt in 24 h
105 kt in 72 h

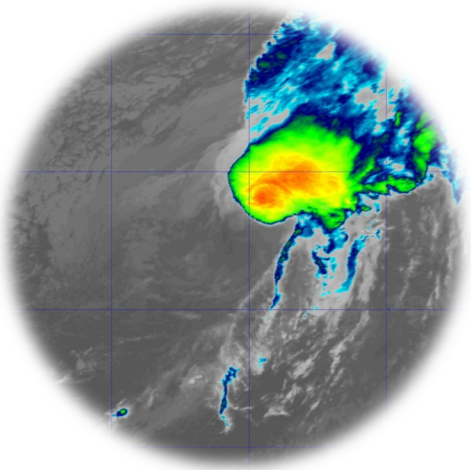
93 fatalities across the Caribbean

2025 Atlantic TC Land Impacts



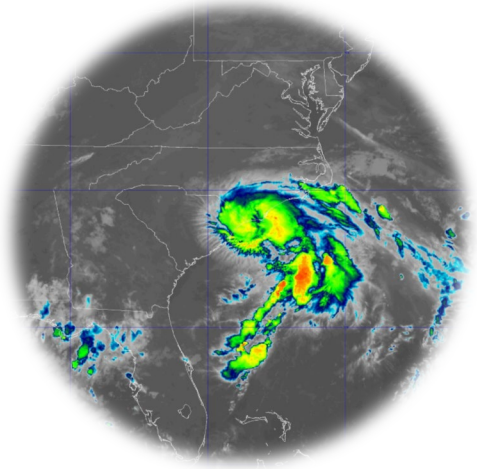
Barry
Mexico

8 direct deaths from flooding and rough surf in Mexico



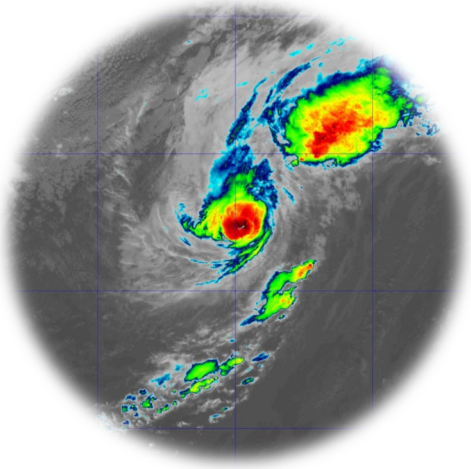
Post-tropical Gabrielle
Azores

Hurricane-force wind gusts in the Azores



Chantal
Carolinas

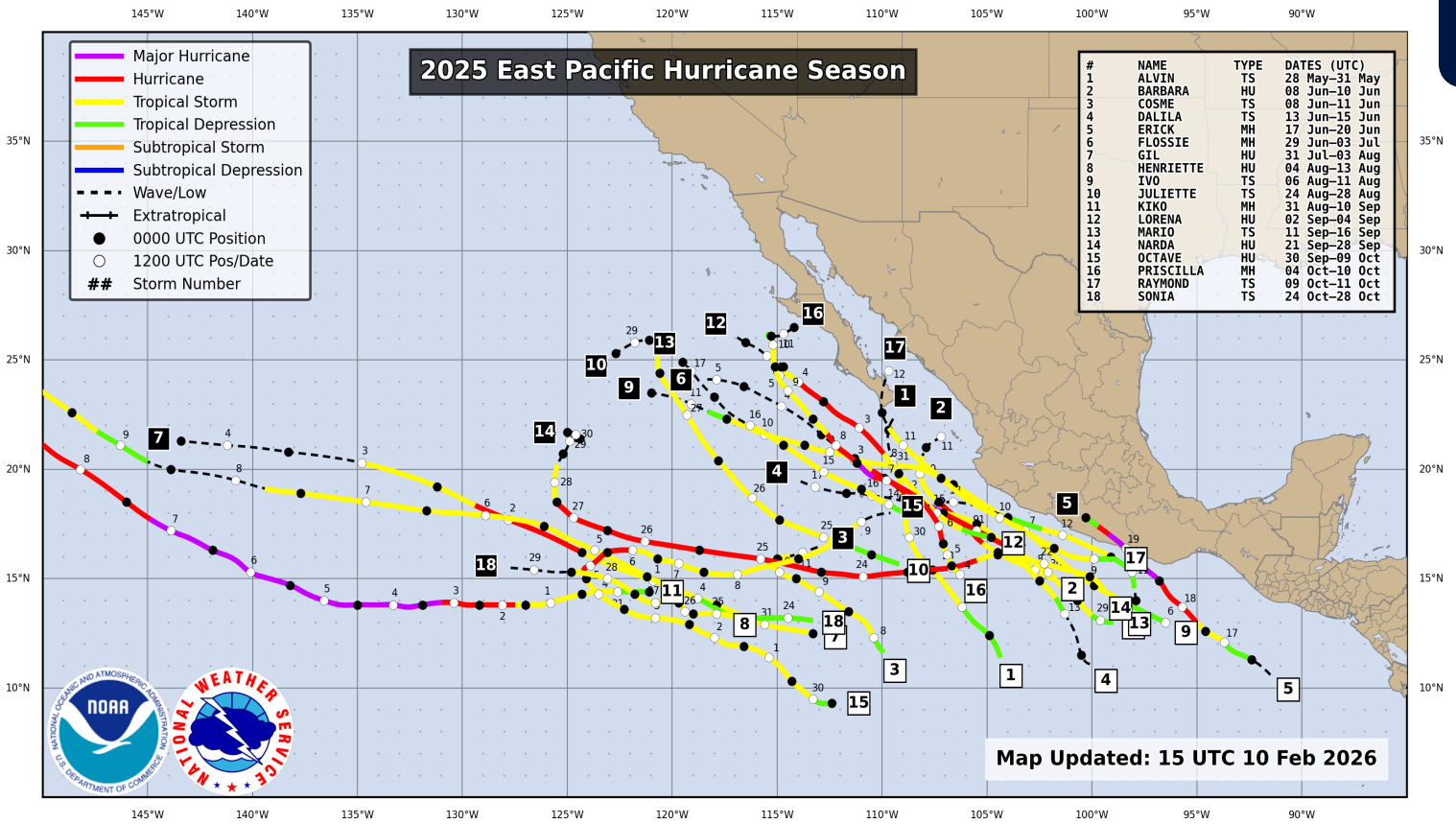
TS landfall in S. Carolina
6 fatalities in N. Carolina



Imelda
Bahamas & Bermuda

2 flooding fatalities in Cuba

2025 East Pacific Season Summary

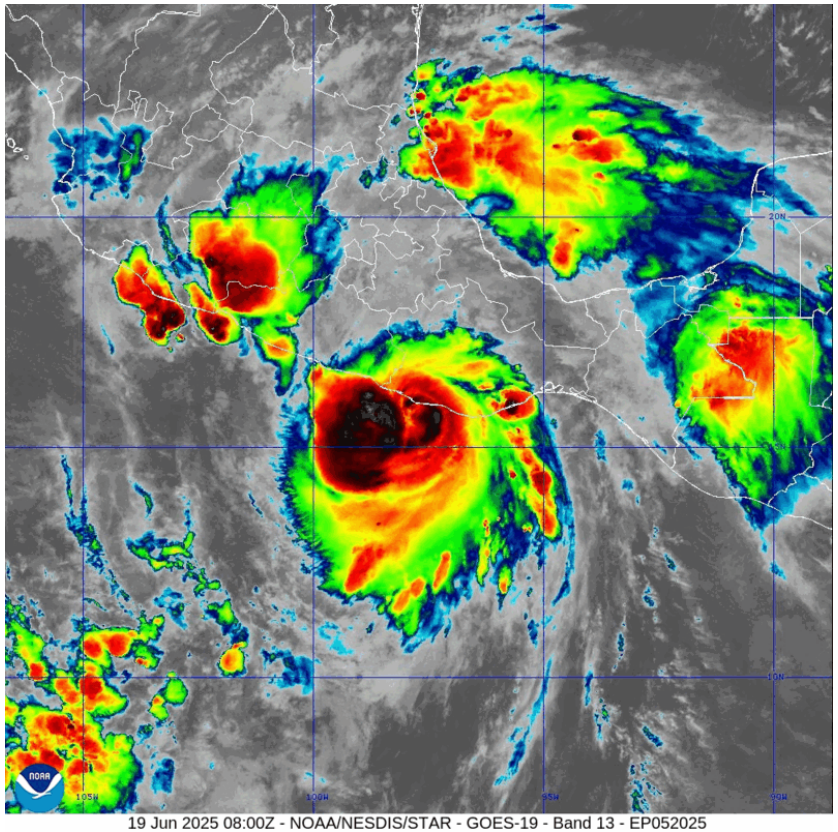


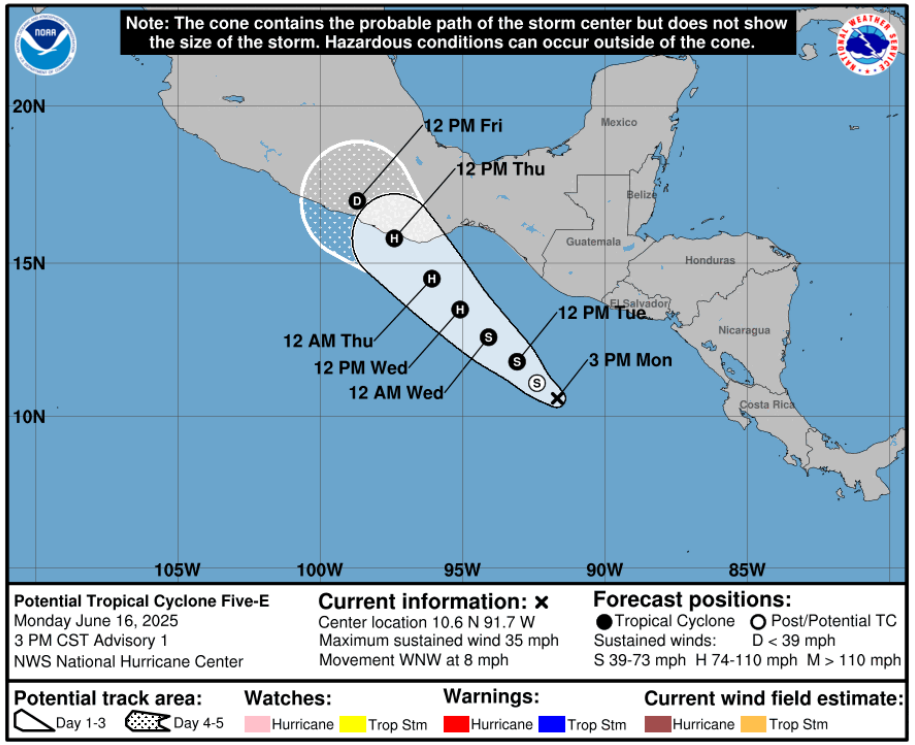
Named Storms	Hurricanes	Major Hurricanes
18	9	4
(+3)	(+1)	(0)

- ACE: 100.9 (below normal)
- 2 direct fatalities in Mexico

2025 East Pacific Hurricane Landfalls

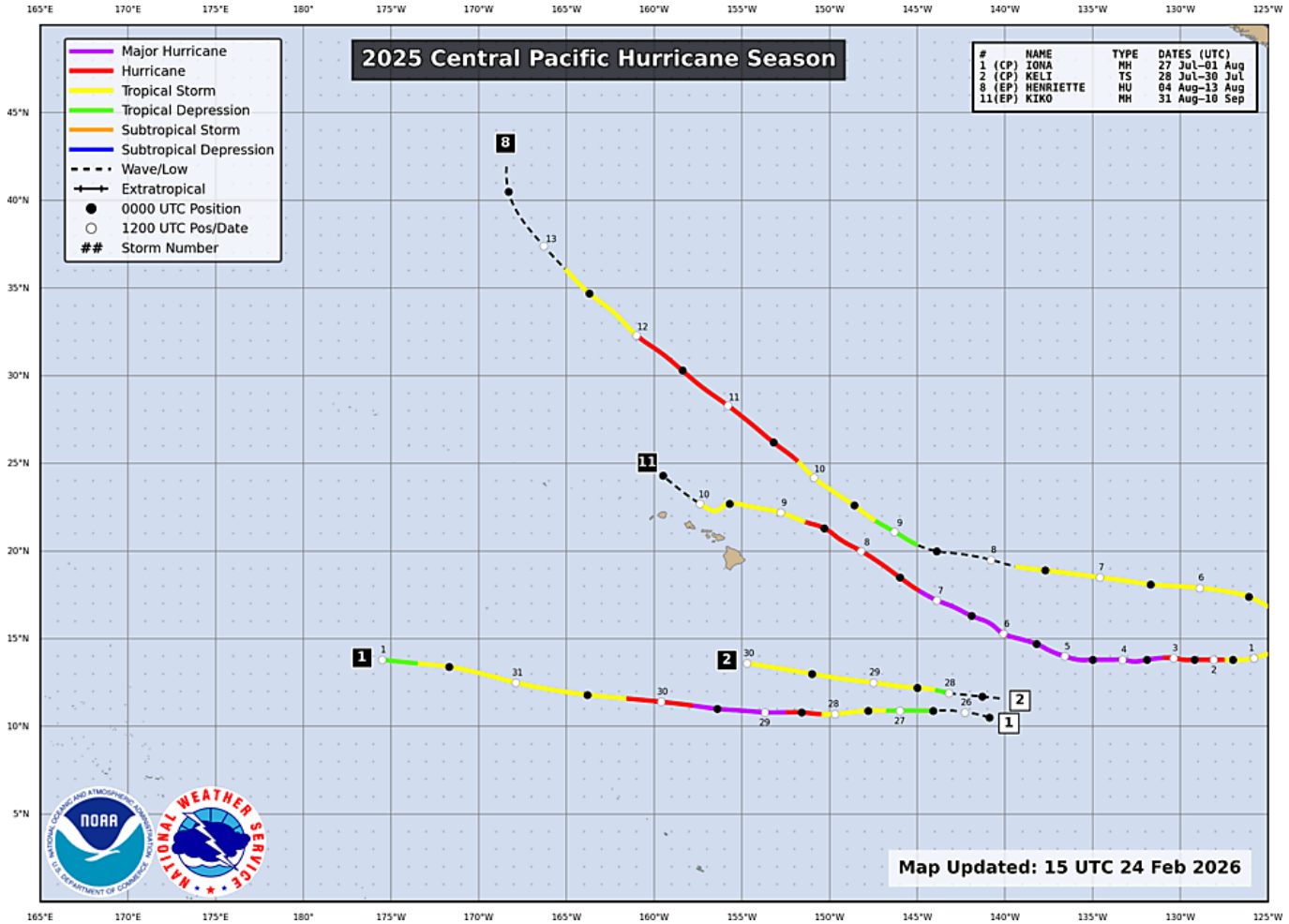
Cat. 3 Erick
Santiago Domingo Armenta, Mexico
June 19, 2025





- First time that NHC issued Potential Tropical Cyclone advisories up to 72 hours prior to land impacts
- 2 fatalities in Mexico (1 direct)

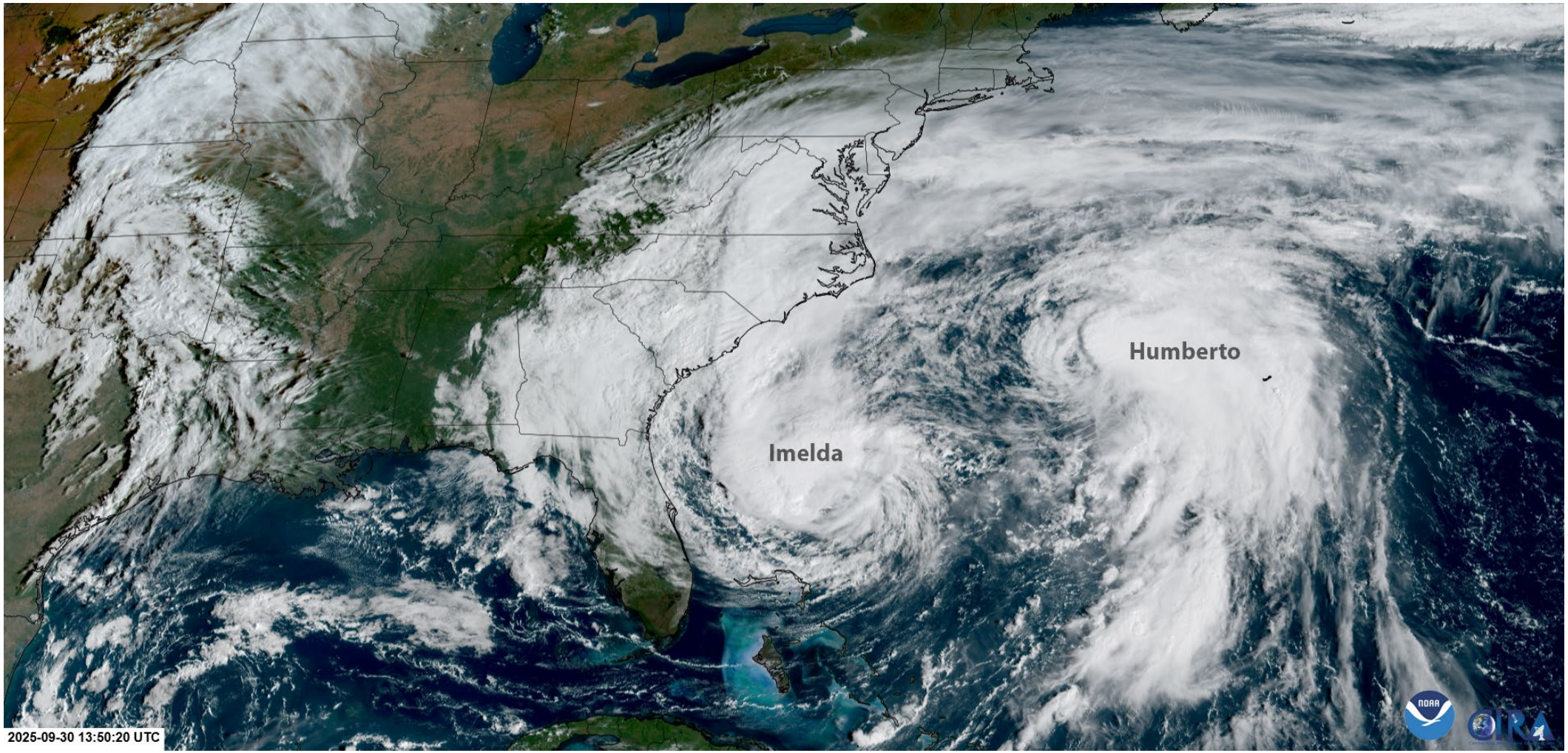
2025 Central Pacific Season Summary



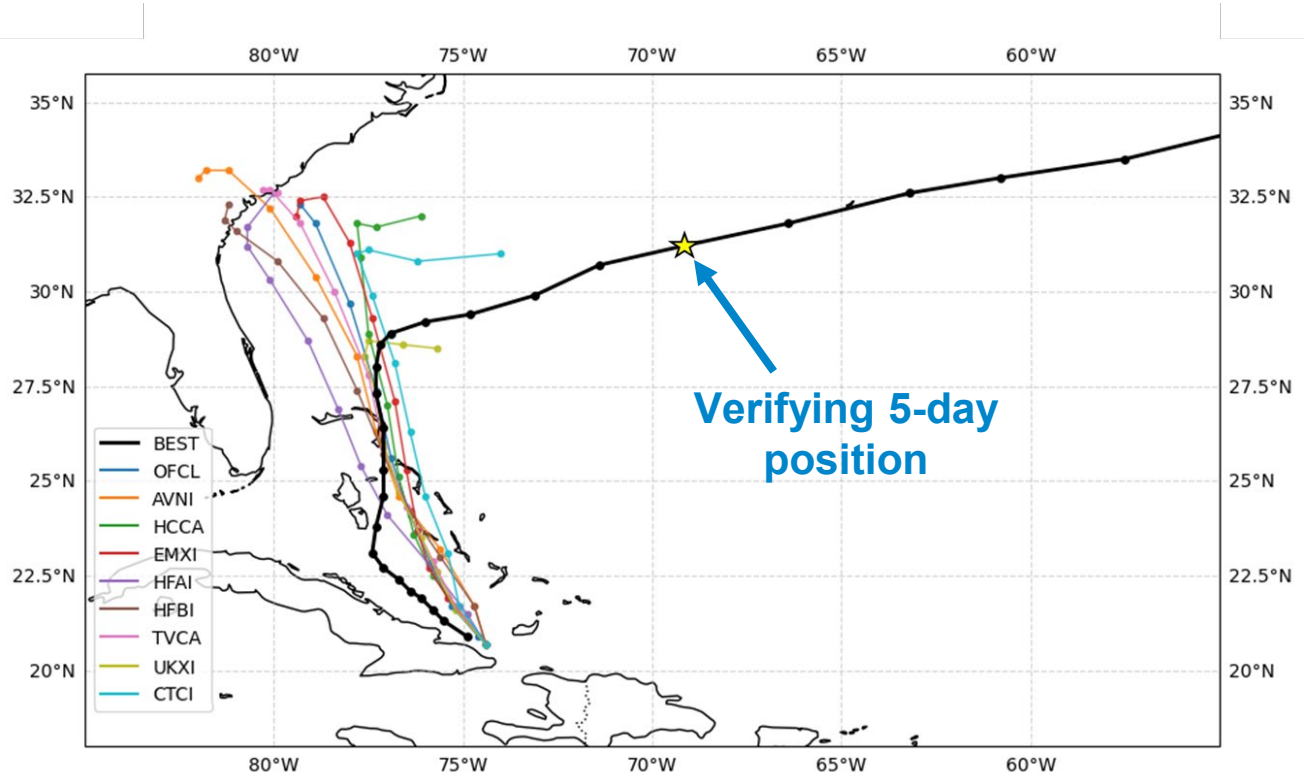
Named Storms	Hurricanes	Major Hurricanes
4	3	2

- 2 TCs formed in the Central Pacific basin
- 2 TCs crossed over from the EPAC → CPAC

Hurricanes Humberto & Imelda



Challenge: Imelda Track Forecast

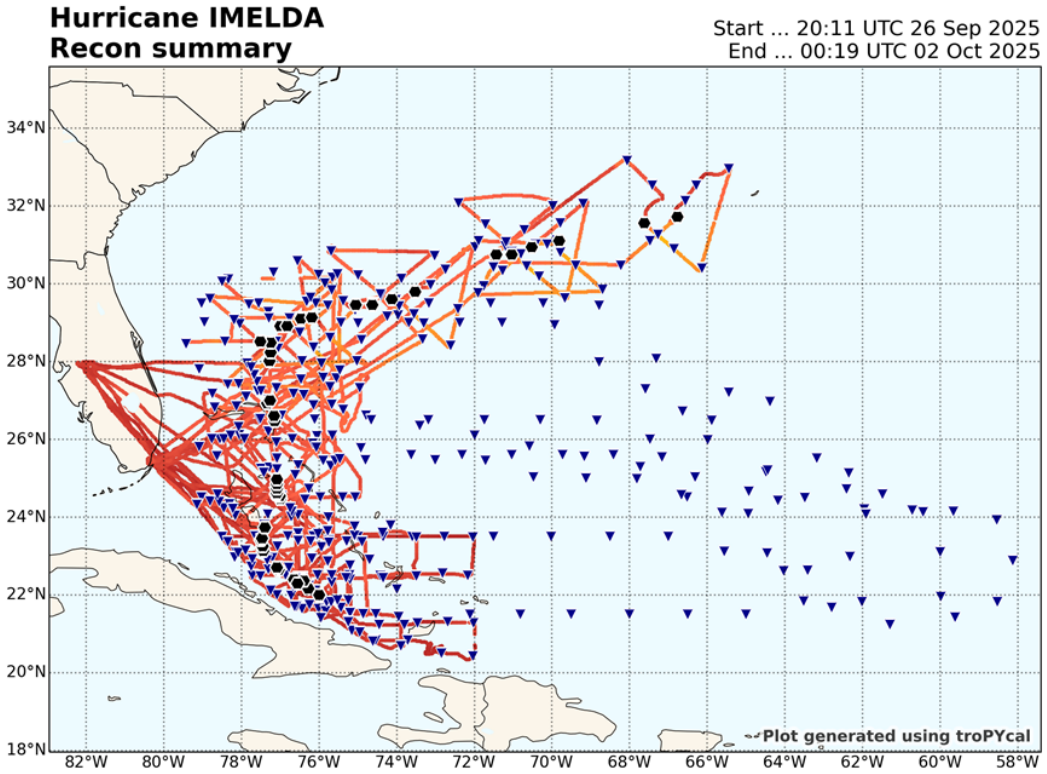


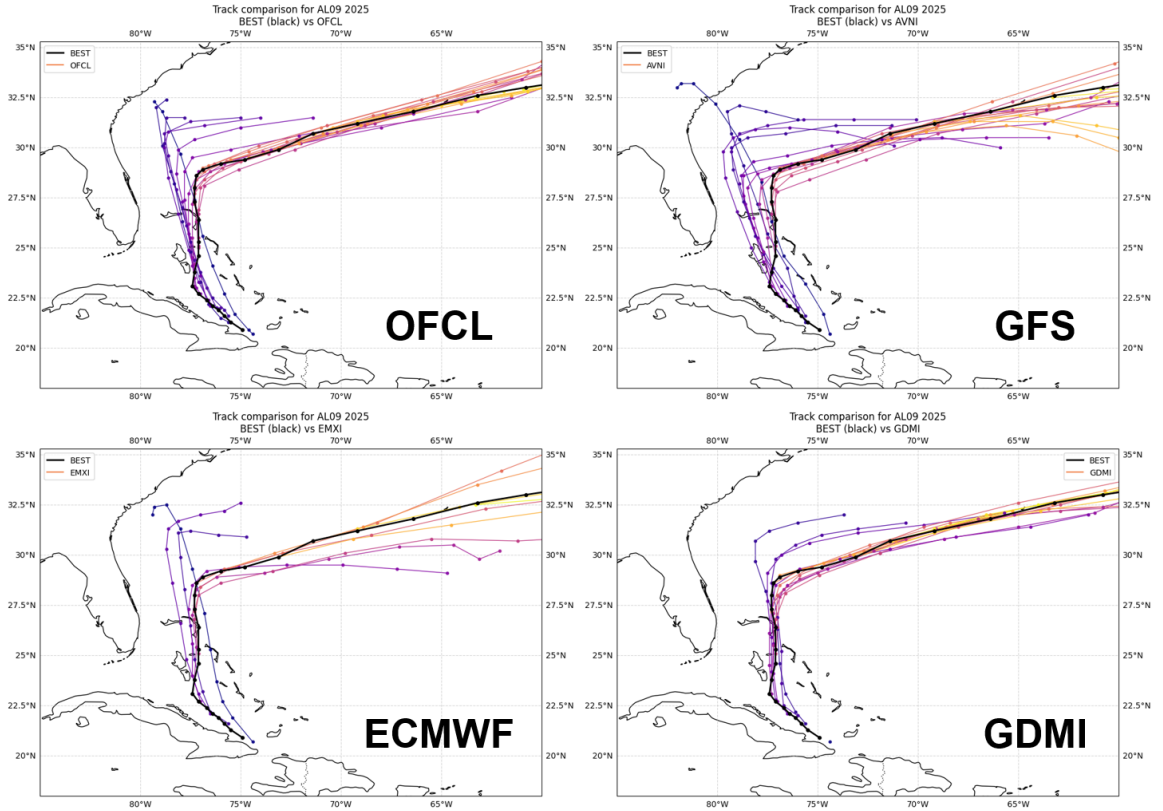
Potential Tropical Cyclone Nine
Advisory 1 | 2100 UTC 26 Sep 2025

- There was large uncertainty in early Imelda track forecasts due to a bifurcation of long-range track guidance solutions.
- The close proximity of Humberto and the potential for binary interaction complicated the forecast.
- Although NHC never explicitly predicted landfall, early forecasts showed a closer approach to the southeastern U.S. coast than what actually occurred.

Solution: Unique Recon Tasking

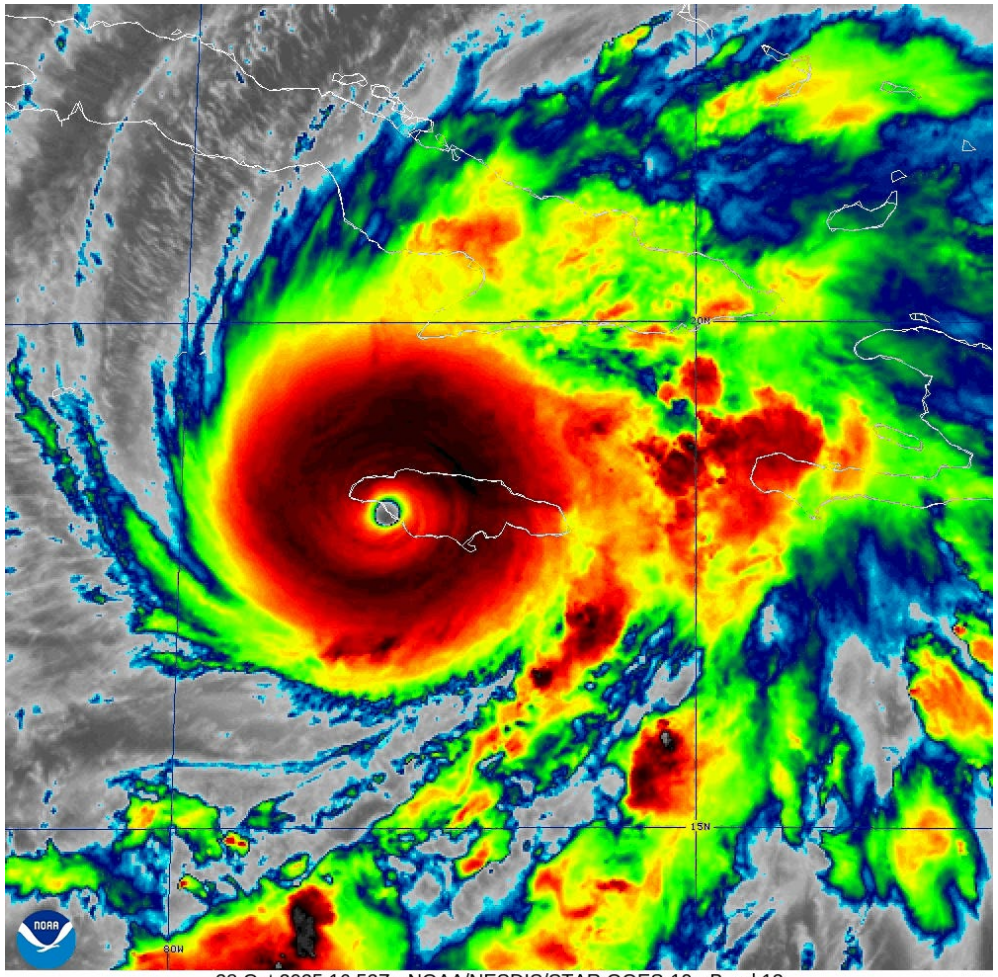
Several synoptic surveillance missions by the G-IV successfully performed circumnavigations of both 93L/Humberto and 94L/Imelda on the same flight.





This was the first time this strategy has been employed, and it helped get more observational data into the models.

Hurricane Melissa



28 Oct 2025 16:52Z - NOAA/NESDIS/STAR GOES-19 - Band 13

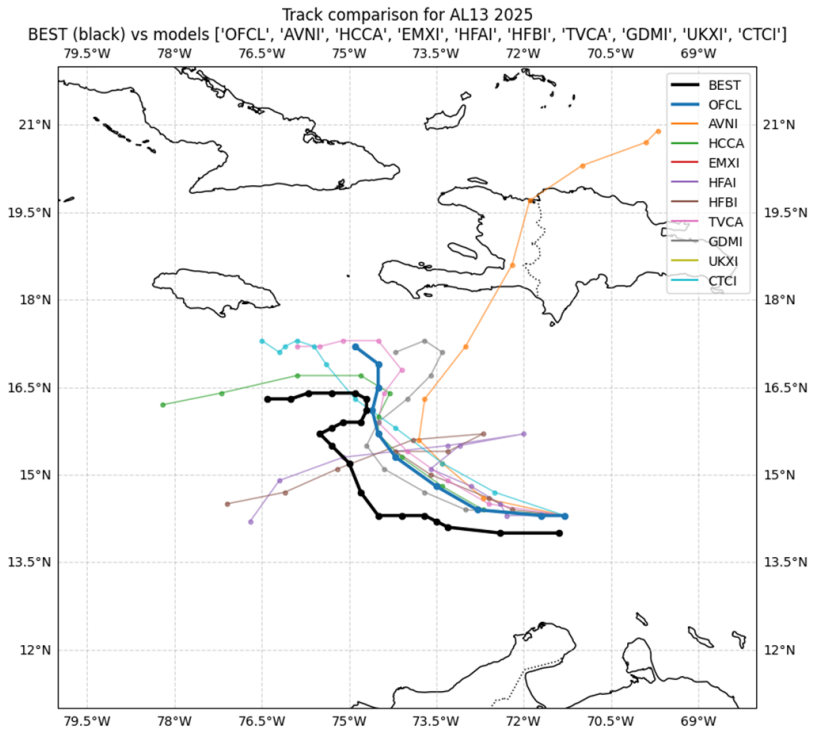
Hurricane Melissa Impacts*	
Jamaica	45 fatalities $8.8 billion (USD) in damage
Haiti	43 fatalities
Dominican Republic	4 fatalities
Cuba	1 fatality

**Preliminary data*

Atlantic Tropical Cyclone History

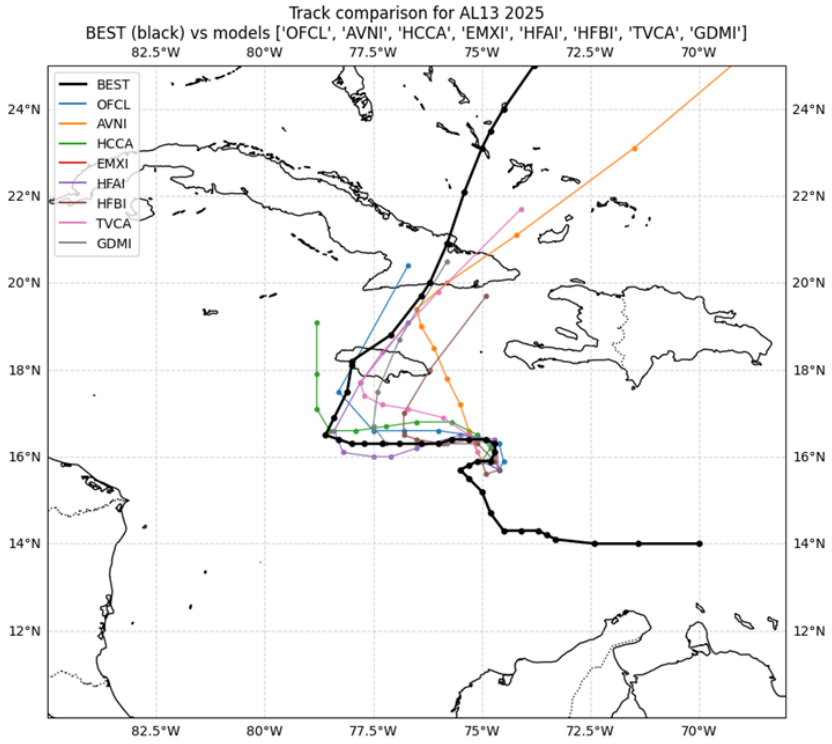
- One of the strongest hurricanes on record in the basin
- Tied for the strongest landfall intensity (160 kt)
- Tied for 3rd lowest minimum central pressure (892 mb)

Hurricane Melissa: Track Forecasts



Tropical Storm Melissa
Advisory 1 | 1500 UTC 21 Oct 2025

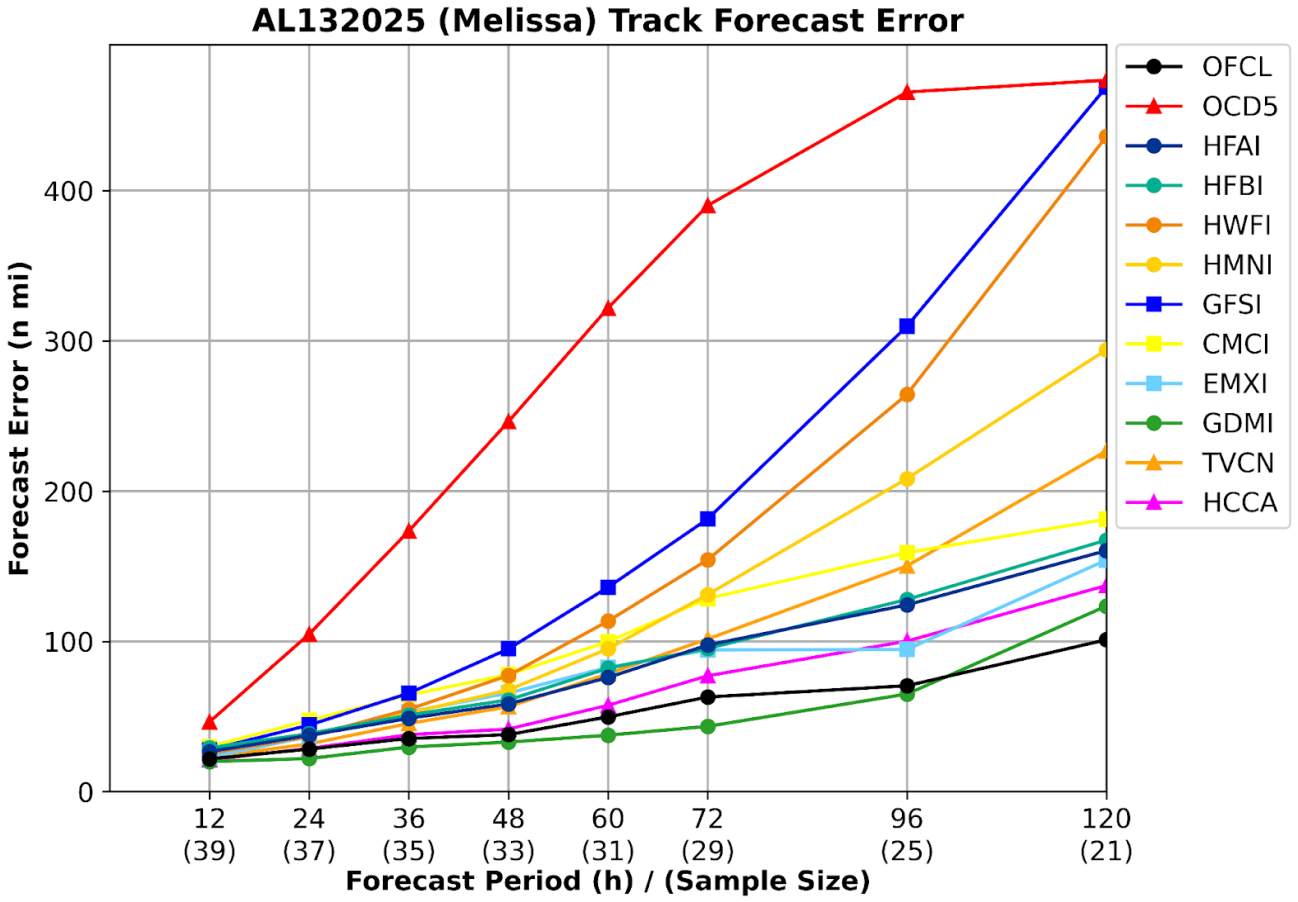
Large model spread, weak steering currents, and uncertainty regarding how quickly the storm would develop made for a very challenging track forecast.



Tropical Storm Melissa
Advisory 13 | 1500 UTC 24 Oct 2025

Four days before landfall, NHC predicted a major hurricane tracking over western Jamaica with a track error of only 11 n mi.

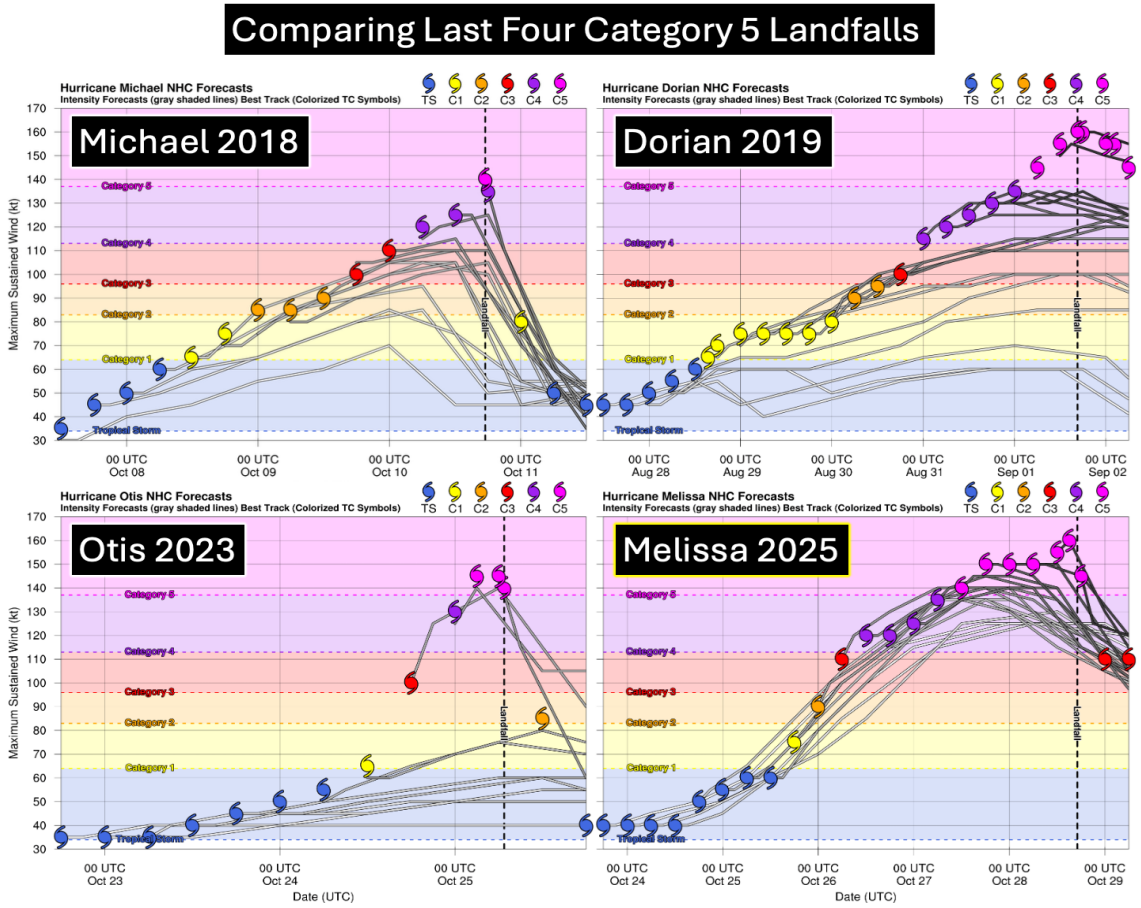
Hurricane Melissa: Track Forecasts



- NHC forecast (OFCL) outperformed nearly all available models.
- Average 5-day OFCL error was about 50% smaller than the 2020-24 average.
- Google DeepMind (GDMI) was the top performer, comparable to or slightly better than OFCL and beating all of the other individual models considerably.

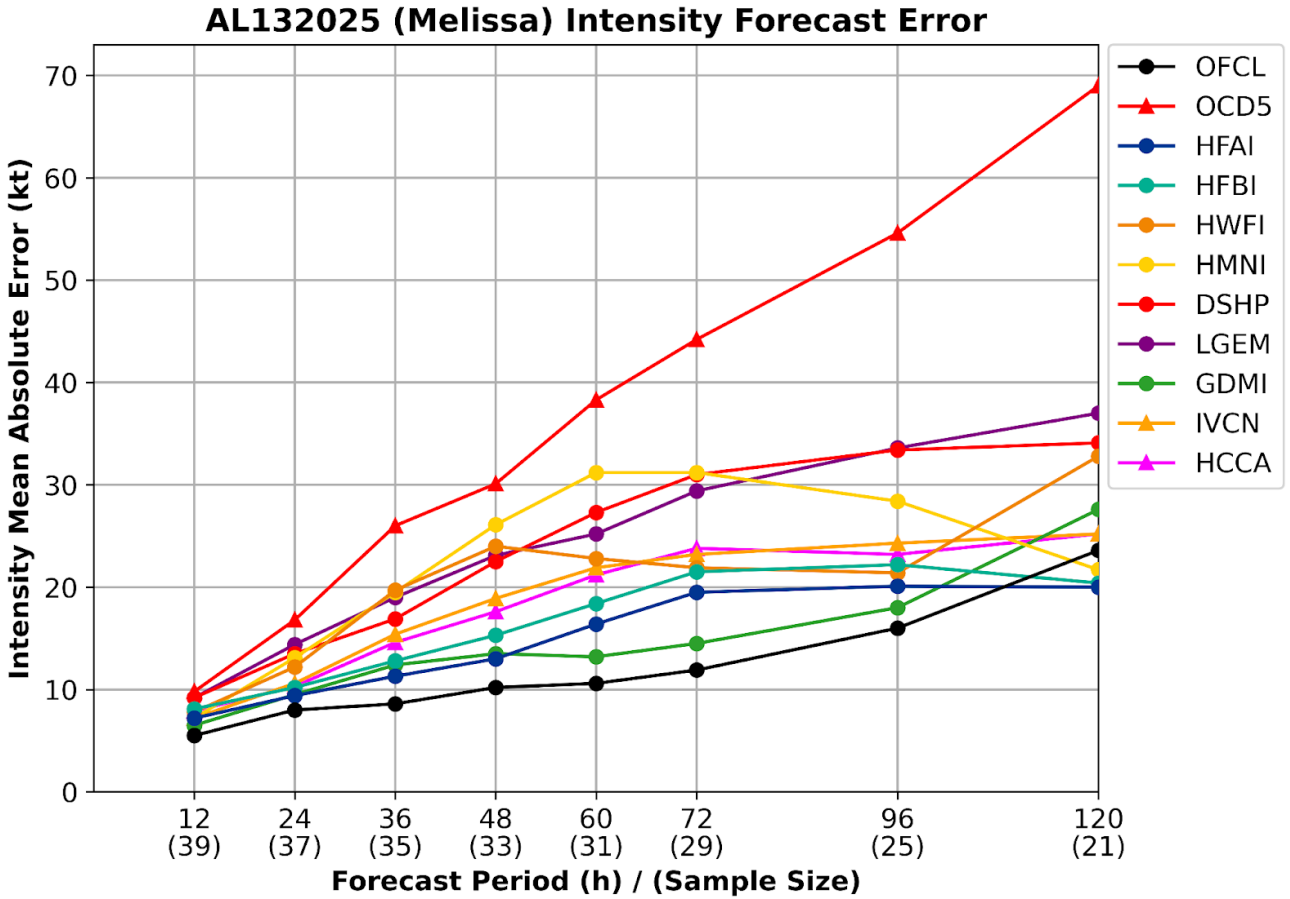
Hurricane Melissa: Intensity Forecasts

- Five days before landfall: NHC predicted Melissa to rapidly strengthen to a Cat. 4 hurricane (125 kt) over western Jamaica when it was just a 40-kt tropical storm.
- NHC provided nearly 3 days of advanced notice that Melissa would make landfall as a Cat. 5 hurricane in Jamaica.
- The Melissa forecasts stand out for their superior depiction of peak intensity at landfall when compared to other recent Cat. 5 storms.



Credit: Philippe Papin (NHC)

Hurricane Melissa: Intensity Forecasts



- The NHC forecasts (OFCL) had lower intensity errors than all of the intensity guidance through 96 h.
- NHC explicitly predicted rapid intensification (RI) with exceptionally long lead time.
- Melissa highlights the substantial progress that NHC has made in RI forecasting over the past decade.

Summary

2025 Hurricane Season

2025 season marked by contrasts

- Most category 5 hurricanes since 2005
- Quiet climatological peak of the season
- Melissa made a devastating Cat. 5 landfall
- No U.S. hurricane landfalls

Progress at forecasting extreme events

- 2025 was one of the most skillful years of intensity forecasting for NHC
- Melissa forecasts provided exceptional lead time for RI and the devastating Cat. 5 impacts to Jamaica