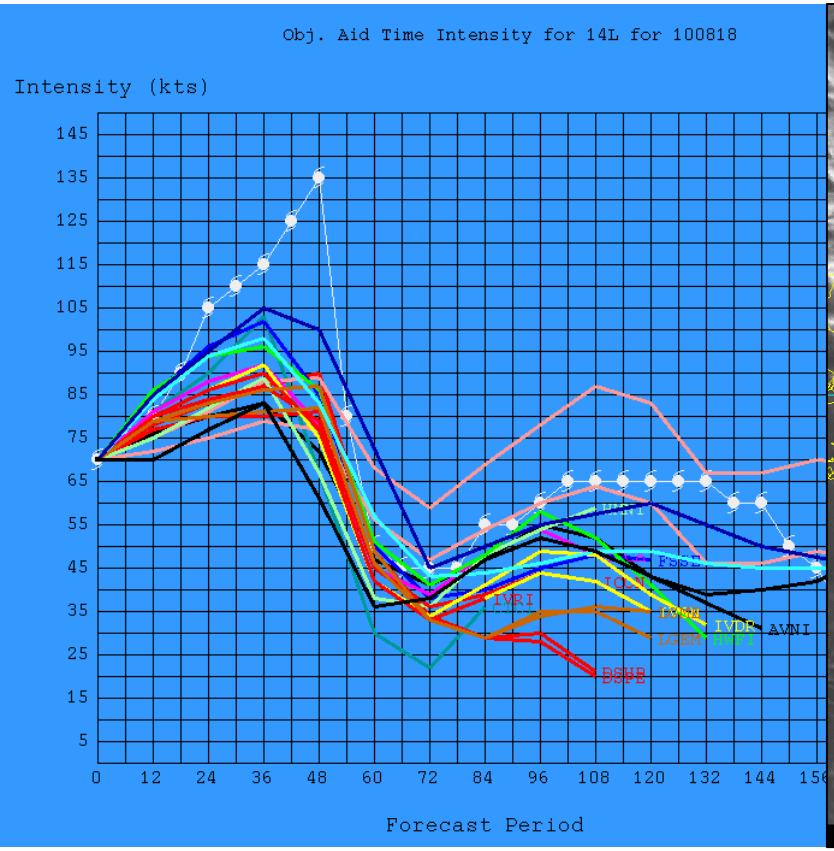
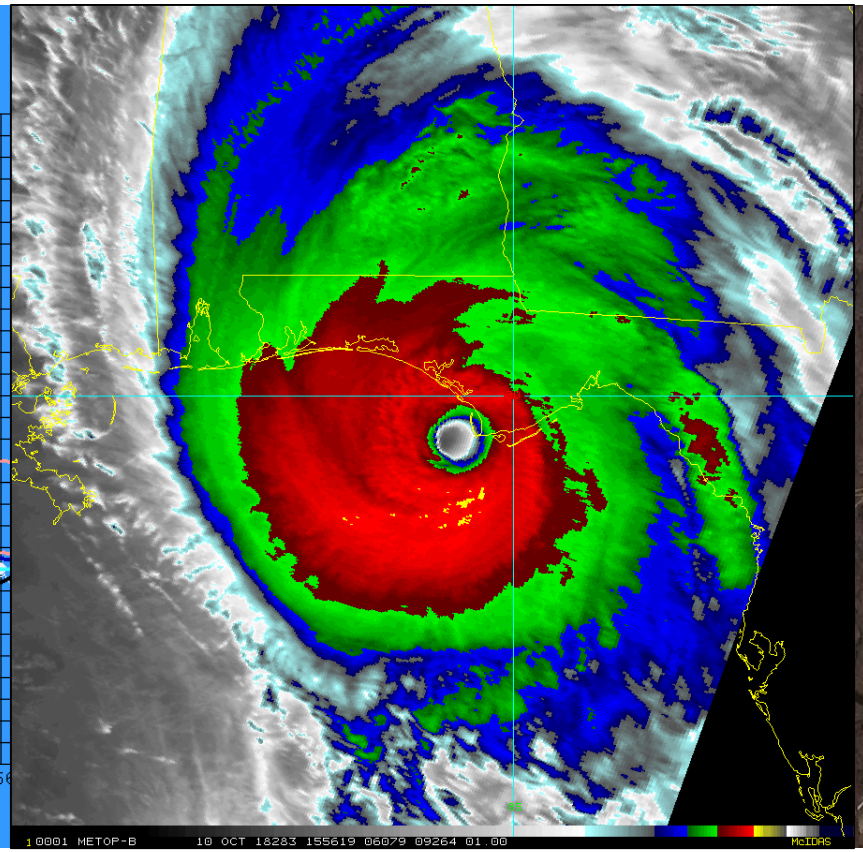
NHC Modeling Priorities for 2019





Michael J. Brennan, HSU Branch Chief

2018 HFIP Annual Review

6 November 2018

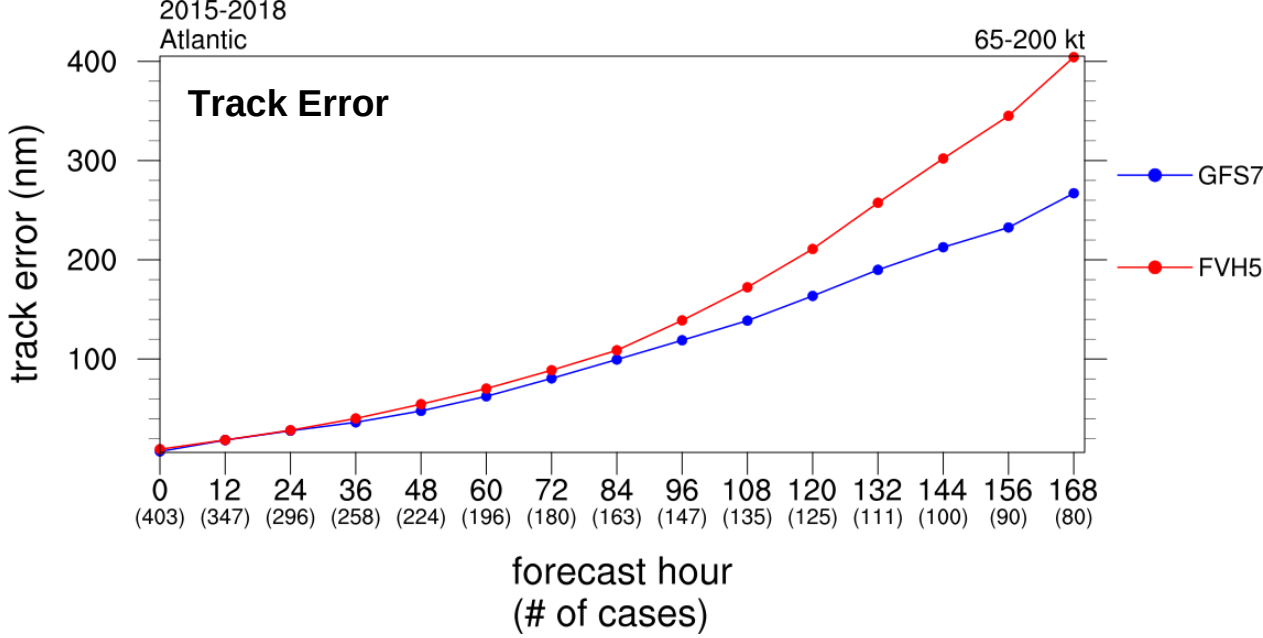
NHC Modeling Priorities for 2019

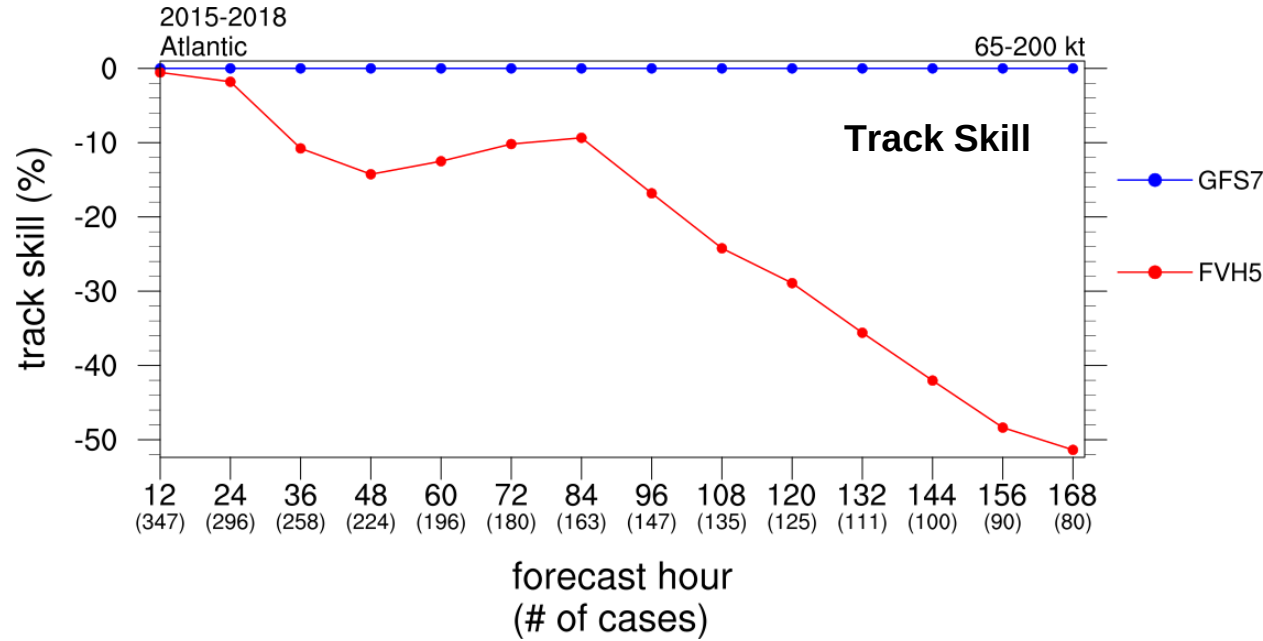
- Address degradation of long-range Atlantic track forecasts in FV3 relative to current GFS
  - Degradation reaches 20% at 168 h
  - Day 7 outliers with track error > 500 n mi doubled (20.7% of the time)
  - Atlantic hurricane track degraded 30% at 120 h, 50% at 168 h
  - Reduces the skill of the Atlantic multi-model track consensus (TVCN) by about 14% at day 7
- Improve POD of genesis in FV3
  - FAR reduced compared to GFS
- Understand how FV3 will affect SHIPS and LGEM, RII, etc.

2015-2018 Track Error/Skill Atlantic

Hurricanes (>= 65 kt)

- 30% degradation at 120 h, 50% degradation at 168 h
- Large cross-track bias (> 200 nm) from 120-168 h
- Positive bias in storm size relative to GFS
- Translation speed for stronger storms is too fast
  - Perhaps related to the progressive solution of FV3 that's been observed?
- Lack of vortex relocation?





Outliers: Atlantic

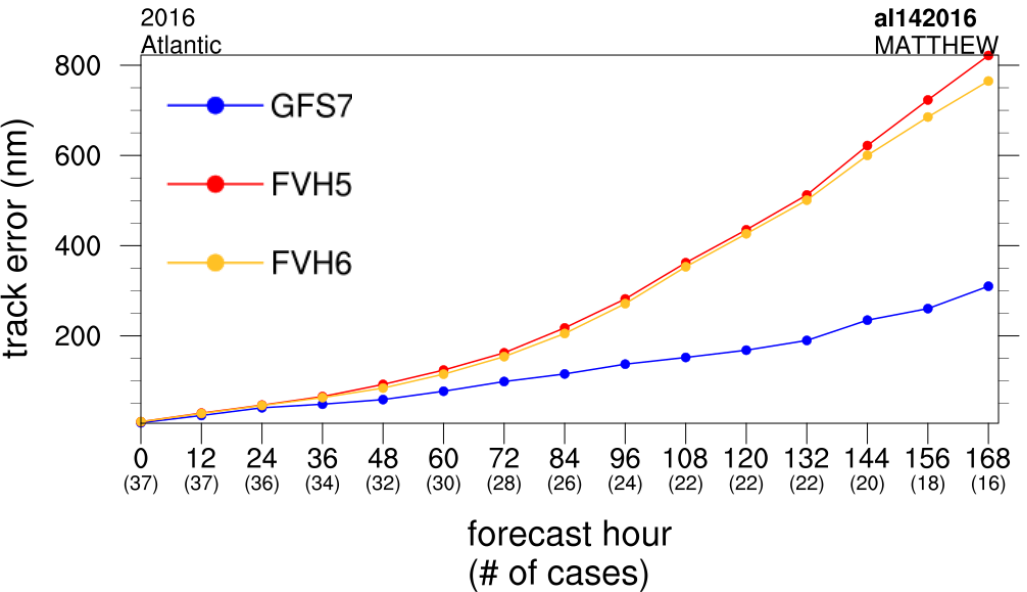
168 h Track Error > 500 nm

GFS – 16/169 **(9.5%)**

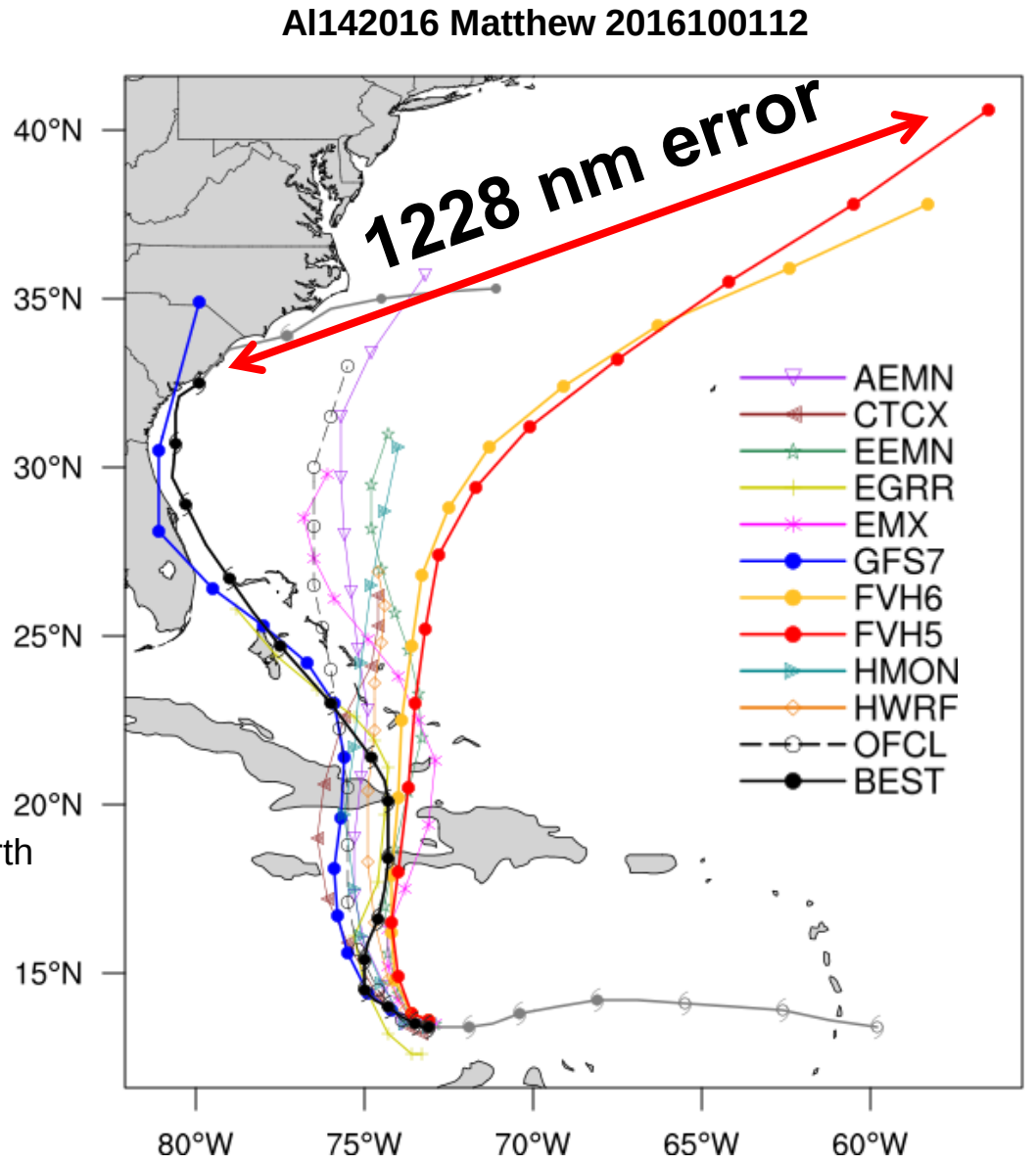
AL112015 Joaquin (2)
AL072016 Gaston (3)
AL122016 Karl (1)
AL142016 Matthew (2)
AL152016 Nicole (1)
AL112017 Irma (3)
AL122017 Jose (4)

FV3 – 35/169 **(20.7%)**

AL102015 Ida (2)
AL112015 Joaquin (4)
AL072016 Gaston (4)
AL122016 Karl (2)
AL142016 Matthew (15)*
AL152016 Nicole (2)
AL112017 Irma (1)
AL122017 Jose (2)
AL152017 Maria (3)



*FV3GFS consistently brought Matthew to the north too fast, causing it to miss the westward expansion of the ridge.



NHC Modeling Priorities for 2019

- Better calibrated intensity guidance for rapid changes
  - Details of RI and RW still frustratingly elusive when making deterministic forecasts
- Address SST dataset issues with SHIPS/LGEM
- Investigate very high RII probabilities in SHIPS model that were sometimes incorrect in the east Pacific in 2018
- Continue to improve HMON to make it more competitive with HWRF (already beating statistical models)

NHC Modeling Priorities for 2019

- Continue to work towards a less under-dispersive ensemble system with FV3
- Reduce low intensity bias in FV3 ensemble
- Work toward extending TC intensity guidance, dynamical and statistical, out to 7 days
- Improved data assimilation and utilization of all available observations
- Better tools for targeting of supplemental observations