Fog Forecast Performance — Harbor Island, TX

Port of Corpus Christi
December 20–21, 2025

Executive Summary

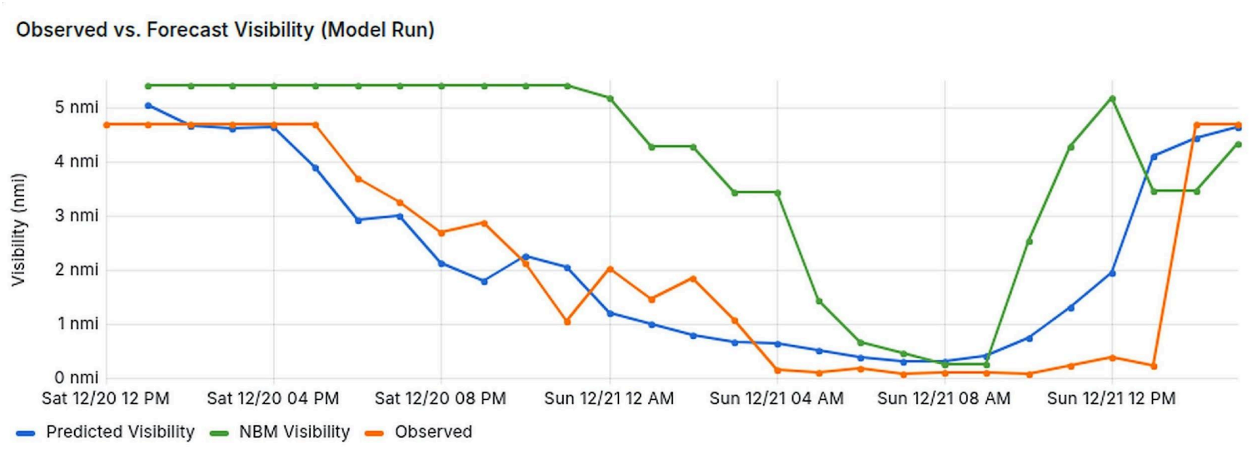
This case study evaluates SkyWind Solutions' fog forecast performance against the National Blend of Models (NBM), a National Weather Service forecast product, during a fog event at Harbor Island, TX on December 20–21, 2025.

SkyWind Solutions captured the onset, persistence, and dissipation more closely, reducing estimated average visibility forecast error by roughly 70% versus NBM during the event.

Key Findings

Measure	National Blend of Models (NBM)	SkyWind Solutions
Fog onset	Lagged observed onset by roughly 7 hours	Captured the visibility decline closer to the observed 5 PM onset
Fog dissipation	Cleared the event too quickly on Dec. 21	Maintained low visibility forecast through midday on 12/21, consistent with observations
Confidence signal	Single deterministic forecast — no distinction between patchy and persistent fog	Showed patchy fog before midnight, then persistent dense fog, with the strongest signal from roughly 6–9 AM

SkyWind vs. NBM Forecast

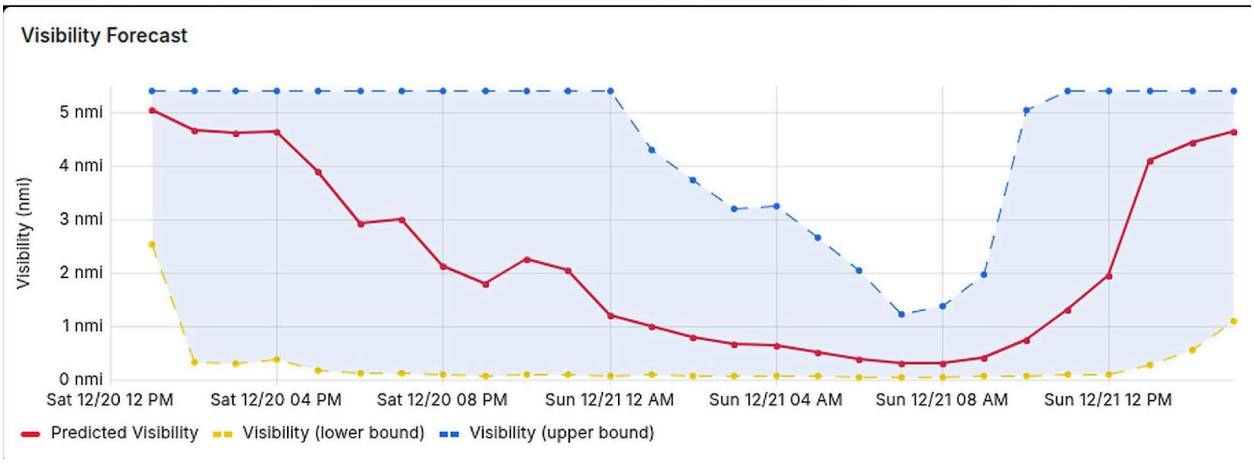


Observed visibility: SkyWind Solutions Harbor Island, TX visibility station

The orange line shows observed visibility from the SkyWind Solutions Harbor Island, TX station over the period 12/20 12 PM to 12/21 3 PM. The green line is the National Blend of Models (NBM), produced by the National Weather Service (NWS) and specifically developed and maintained by the Meteorological Development Laboratory (MDL). It is a collaborative project within NOAA's National Centers for Environmental Prediction (NCEP) that blends various models to create a consistent, accurate, and calibrated weather forecast dataset.

Notably, NBM was slow to initiate fog and did not begin dropping visibility until around 12 AM on 12/21 — roughly seven hours after observed onset. It also dissipated the fog too quickly on the afternoon of 12/21. SkyWind's forecast, shown in blue, tracked the formation and reduction of the fog with far greater accuracy.

Patchy Fog vs. Dense Fog Signal



SkyWind's fog forecasting product includes a confidence interval shown by the shaded region between the blue and yellow dashed lines. The red line is the visibility forecast. Throughout the evening of 12/20 into midnight, the forecast was dropping but the confidence interval remained wide — indicating patchy fog with waves of reduced visibility and possible clear periods in between. Beginning at 12 AM on 12/21, the upper bound of the confidence interval began to drop, signaling a shift to consistent, dense fog. The densest period was forecast between 6 and 9 AM on 12/21.

Conclusion

SkyWind Solutions provided a more accurate forecast of the Harbor Island fog event, capturing fog onset, persistence, dissipation, and the transition from patchy to dense fog more effectively than NBM.