4a.5   A case study (Sandy 2012) with GSI/EnKF Hybrid data assimilation

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Cycled GSI Hybrid/EnKF DA experiments were conducted with WRF ARW model and forecasts in 3km horizontal grid spacing were carried out at each DA cycle for both the Hybrid and EnKF mean analyses.

Statistical performance was evaluated based on these forecast samples. Track and intensity were compared among the Hybrid, EnKF and GFS global forecasts, and it is found that both the Hybrid and EnkF forecasts share similar patterns and both are superior to the GFS forecast. Aggregated errors show that the Hybrid overall performs better than the EnKF mean forecasts. Both the Hybrid and EnKF forecasts are able to capture the evolution of the precipitation patterns and the surface wind structures during the storm life cycle, especially near landfall time, through qualitative comparisons with available observtions. The ETSs quantitatively demonstrate that the Hybrid obtains the highest score for the precipitation during landfall, and the GFS has the lowest scores.