MMM SEMINAR SERIES

A Comparison of the Downstream Predictability Associated with ET and Baroclinic Cyclones

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Individual case studies have shown that extratropical transition (ET) is associated with a decrease in the skill of subsequent downstream numerical weather prediction model forecasts. The degraded performance is often associated with the uncertainty that could originate in how the outflow from the TC impinges on the midlatitude waveguide, leading to the generation of a Rossby wave packet. Moreover, recent studies have suggested that the intensification of midlatitude cyclones can produce a similar downstream response; therefore, it is also possible that these storms could also be associated with decreased downstream predictability. The goal of this study is to evaluate whether ET and midlatitude cyclones are associated with a systematic decrease in downstream predictability.

The impact of ET and midlatitude cyclones on downstream predictability in the Atlantic and Western North Pacific (WNP) basins is evaluated using composites of cases within the GFS Ensemble Reforecast Version 2, which includes daily 11-member ensemble initialized at 0000 UTC from 1985-2014. Here, the relative predictability is measured by the ensemble standard deviation of the 500 hPa height against the evolving climatology of 500 hPa height standard deviation, which is a function of location, time of year, and lead time. On average, forecasts initialized prior to the onset of ET are characterized by reduced downstream predictability; however, forecasts initialized at or after the onset of ET exhibit similar predictability to climatology. The reduction in ensemble standard deviation relative to climatology is greater in the WNP compared to the Atlantic. By contrast, midlatitude cyclones in the winter (Nov.-March) exhibit a smaller reduction in predictability compared to ET and the downstream extent is not as great. The reasons for these results and their dynamical implications will also be discussed.

This seminar will not be recorded.

Thursday, 28 January 2016, 3:30 PM
Refreshments 3:15 PM
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