

MMM SEMINAR DISTINGUISHED SPEAKER SERIES

The Extratropical Transition of Tropical Cyclones in a Changing Climate

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Tropical cyclones that undergo transformation into strong extratropical cyclones are capable of massive societal impacts. How will these “extratropical transition” (ET) events change in frequency, location, intensity, and impact in a changing climate? While the question of how climate change will affect tropical cyclones has been studied extensively, much less work has been conducted to date on how climate change could affect ET. In this talk, I will present results from two different approaches to this problem, drawing on the recent work of graduate students Allison Michaelis, Chunyong Jung, and Ana Torres-Vazquez. First, I will present a “pseudo-global warming” case study in order to assess environmental influences on a single event, Hurricane Irene (2011). For this event, we identified greater ET intensity and an extended ET duration in a warmer climate relative to present-day conditions. In order to generalize these findings and to avoid limitations in the PGW approach, I will also share results of a set of high-resolution “tropical-cyclone allowing” global model simulations. Results of both approaches consistently reveal the potential for greater ET intensity and impacts in a warmer climate. Specifically, the global model results demonstrate changes in the geographical location of ET events, and illustrate that the changes are highly basin-dependent. In a warmer climate, tropical cyclones retain their tropical characteristics to higher latitudes, as they are able to maintain a warm core structure as they begin the ET process. The western North Atlantic showed the greatest geographical ET change in our global model simulations, with increases in ET in the northern portion of the Atlantic basin. The high-resolution global simulations provide a potentially useful data source for the study of other phenomena.

Thursday, 14 March 2019, 3:30pm

Refreshments 3:15pm

NCAR-Foothills Laboratory, 3450 Mitchell Lane
FL2-1022, Large Auditorium



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