



Modeling Investigation of the Recently Intensified North American Winter-Spring Storm Activities

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Recent studies have suggested a poleward shift of storm tracks in the warming climate. However, this shift demonstrates an inconsistency across geographic sectors (e.g., Zhang et al. 2004). An increase in intensity and frequency of winter-spring storm activities has been manifested over a broad area of the North American continent, in particular in the east coast. To understand these changes in storm activities over the North America, we examined a number of potential forcing factors. One of them is the elevated sea surface temperature (SST) associated with El Niño. Direct and indirect effects of tropical Pacific SST anomalies on atmospheric circulation patterns have been extensively investigated. However, the effects on North American winter-spring storms have not been fully understood. In this study, we conducted a series of control and sensitivity experiments by using the NCAR Community Atmosphere Model 3.1.p2 (CAM) to examine impacts of tropical Pacific SST anomalies on the North America storm activity. We found a significant increase in total number of storms over the North America when the tropical Pacific SST anomalies turn to position. Changes in the storm intensity and lifetime have been also examined in the model simulations.