Verification of decadal forecasts: Attribution of the extreme U.S. East Coast snowstorms of 2010

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This study examines the cause of the extreme snowstorm activity along the US east coast during the winter of 2009/10 with a focus on the role of sea surface temperature (SST) anomalies associated with a mature El Niño and a persistent negative North Atlantic Oscillation (NAO). The study employs the GEOS-5 atmospheric general circulation model (AGCM) run at high resolution (1/4° and 1/2°) and forced with specified observed or idealized SST. The simulations consist of 50-member ensembles of three-month long simulations (initialized December 1) aimed at assessing the roles of the Pacific and Atlantic SST anomalies. Comparisons are made with the winter of 1999/2000 - a period that is characterized by SST anomalies that are largely of opposite sign. The results show that the model is able to reproduce the main features of the observed changes including the enhanced storminess along the east coast. Experiments that attempt to isolate the role of the North Atlantic SST indicate that the anomalies over the United States are to a large extent driven by El Niño, while the impact of the North Atlantic SST is primarily to contribute to the cooler temperatures along the U.S. east coast.