# Variability and Predictability of the Atlantic Warm Pool and Its Impacts on Extreme Events in North America

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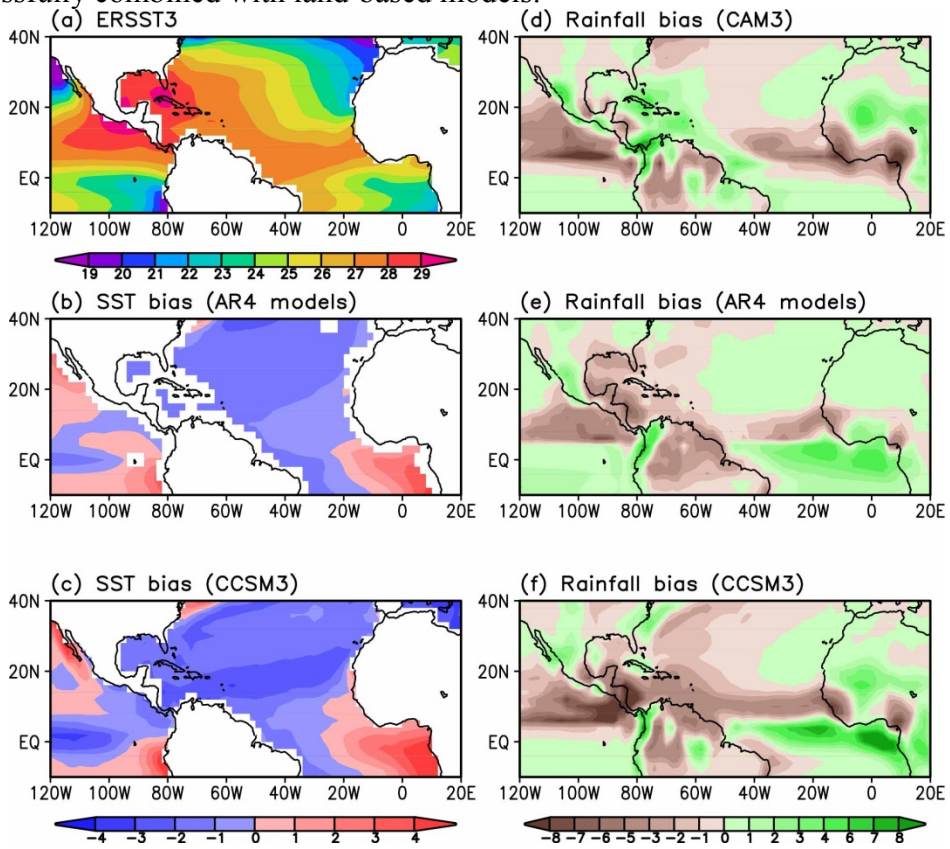
This work is done in collaboration with David Enfield (UM), Liping Zhang (Princeton) and Zhenya Song (The First Institute in China. Our previous research has pointed out the importance of the Atlantic Warm Pool (AWP) for summer climate and extreme events in the Western Hemisphere. Despite its importance, almost of all state-of-the-art uncoupled/coupled models exhibit serious biases (Figure) in the AWP region, which limit the seasonal prediction of AWP-related climate and extreme events. In the current project, we will continue our investigation of the AWP using fully coupled climate models. Two specific areas of proposed work are: (1) diagnosing the CMIP5 outputs to assess model biases near the AWP region and to understand their skill in simulating the mechanisms and climate impacts of AWP variability, and (2) performing coupled model experiments using CESM1 and analyzing the Climate Forecast System version 2 reforecasts to assess and improve predictability of the AWP and its impacts on climate and extreme events such as hurricanes, flood and drought in North America. It is hoped that over a longer time frame, this project will result in the regional implementation of data- and model-based outlooks for flood/drought in the United States, hurricanes and climate variability, when successfully combined with land-based models.




*The observed SST and long-term averaged model biases in the summer months of June-August (JJA). Shown are (a) the ERSST, (b) the model SST bias of the 22 IPCC-AR4 coupled model ensemble, (c) the model SST bias of CCSM3, (d) the model rainfall bias of the atmospheric GCM (CAM3), (e) the model rainfall bias of the 22 IPCC-AR4 coupled model ensemble, and (f) the model rainfall bias of CCSM3.*