



Evaluating NARCCAP model performance in capturing frequencies of severe storm environments

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Because of the fine-scale nature of many severe weather phenomena, it is difficult to assess potential changes in severe weather under a changing climate. One approach is to analyze such storm activity indirectly via large-scale indicators of environments conducive to severe weather. Here, high-resolution climate models from the North American Regional Climate Change Assessment Program (NARCCAP) are evaluated for the present climate state using techniques from spatial weather forecast verification. While climate models are not intended to predict variables on a day-by-day basis, like weather models, they should be expected to mimic distributional properties of these processes. For extreme values in particular, they need to do better than simply inferring the mean. In this study, it is found that the relatively high-resolution NARCCAP climate model runs capture areas and spatial patterns of the highest frequency severe storm environments reasonably well, but all of them under predict the spatial extent of these high-frequency areas, although most models have reasonably good spatial placement of these areas. Some of the models generally perform better than others, but some models capture the highest frequency areas better than they do more moderate frequency regions.