Geophysical Research Abstracts
Vol. 14, EGU2012-2494, 2012
EGU General Assembly 2012
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Occurrence of deep convective events over North America under a changing climate using Canadian RCM simulations.

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Severe thunderstorms have important societal and economical impacts and some studies have indicated that their intensity may increase during the XXI century, as a consequence of climate change, particularly over the USA. The objective of our study is to investigate this hypothesis using data produced by the Canadian Regional Climate Model (CRCM) version 4 at 45-km resolution over North America.
To discriminate severe environmental conditions, vertical wind shear and CAPE are used as well as the convective precipitation produced by the model. Simulations driven by reanalysis are used to study the 1960-2000 historic period, while simulations driven by different GCMs are used for the projected transient climate, covering 1960-2100.
Results show an increase of the severe environmental conditions in the 1960-2100 period over the entire North American territory, particularly due to an increase in CAPE despite a slight decrease in vertical wind shear. The number of severe events captured in each simulation is strongly dependant on the driving data while the rate of increase with time is mostly independent of the driving data. The different simulations show coherent results in most but not all regions of North America.