



Regional variability of climate change hot-spots in East Asia

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The Regional Climate Change Index (RCCI) is employed to investigate hot-spots under 21st century global warming over East Asia. The RCCI is calculated on 1-degree resolution grid from the ensemble of CMIP3 simulations for the B1, A1B and A2 IPCC emission scenarios. The RCCI over East Asia exhibits marked sub-regional variability. Five sub-regional hot-spots are identified over the area of investigation: three in the northern regions (Northeast China, Mongolia and Northwest China), one in eastern China and one over the Tibetan Plateau. Contributions from different factors to the RCCI are discussed for the sub-regions. Analysis of the temporal evolution of the hot-spots throughout the 21st century shows different speeds of response time to global warming for the different sub-regions. Hot-spots firstly emerge in Northwest China and Mongolia. The Northeast China hot-spot becomes evident by the mid of the 21st century and it is the most prominent by the end of the century. While hot-spots are generally evident in all the 5 sub-regions for the A1B and A2 scenarios, only the Tibetan Plateau and Northwest China hot-spots emerge in the B1 scenario, which has the lowest GHG concentrations. Our analysis indicates that sub-regional hot-spots show a rather complex spatial and temporal dependency on the GHG concentration and on the different factors contributing to the RCCI.