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Transferability assessment of regional climate models: Extremes

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Transferability intercomparisons are providing a new approach for advancing the science of modeling the water cycle and energy budget on regional to global scales by using multiple limited-area models to simulate multiple domains. Under this approach, individual regional climate models perform simulations with all modeling choices held constant over a specific period on several prescribed domains representing different climatic regions. Transferability intercomparisons expose the limits of our current regional modeling capacity by examining model accuracy on a wide range of climate conditions and realizations, with special attention to challenging climate-system processes like the hydrologic cycle and extremes.

Current transferability analyses are intended to complement the range of activity occurring under the emerging GEWEX Coordinated Energy and water-cycle Observations Project (CEOP), such as the Inter-Continental Transferability Study (ICTS) and the Worldwide Integrated Study of Extremes (WISE) . In this presentation, we extend earlier testing of the hypothesis that regional models show performance on domain of origin that is similar to their performance in other regions. Previous study suggested a slight “home-domain” advantage. We focus on regions covered by the GEWEX Continental-Scale Experiment that provide a wealth of hydrologic-cycle observations for both climatic means and extremes. The analysis uses output from several regional models (RSM, RegCM3, CLM, RCA-3, and GEM-LAM) to assess their ability to capture climate variability and extreme events in precipitation and temperature. Further analysis attempts to link the extremes with governing circulation.