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# Relation between large-scale circulation and European winter temperature: Does it hold under warmer climate?

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The idea of using large-scale information to predict local climate variability is widely exploited in climate change impact studies as an alternative to computationally expensive high-resolution regional models. This approach implies the hypothesis that the statistical relationship between large-scale climate states and local variables defined for the present-day climate remains valid in the altered climate.
In this paper, the concept of weather regimes is used to deduce a relationship between large-scale circulation and European winter temperature. The change in temperature simulated by a model forced with increased greenhouse gases is however not homogeneous among individual regimes. As a result, the statistical relation obtained for the present climate does not hold everywhere in the future, limiting its usefulness for predicting local temperature changes.