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How Global Warming Changes the Difficulty of Synoptic Weather Forecasting

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Little is known on whether and how global warming may affect the atmosphere's predictability and thus our ability to produce accurate weather forecasts. Here, we combine a climate and an ensemble weather prediction model to show that, in a business-as-usual 21st century setting, global warming could significantly change the predictability of the atmosphere, defined here via the expected error of weather predictions. Predictability of synoptic weather situations could significantly increase, especially in the Northern Hemisphere. This can be explained by a decrease in the meridional temperature gradient, which seems to control the inter-annual variability of atmospheric predictability. Contrarily, summertime predictability of weekly rainfall sums might significantly decrease in most regions.