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Climate sensitivity to extreme temperature changes

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In recent decades, a high frequency of extreme high temperature has occurred in many regions worldwide with serious impacts on society and the economy. As the temperature increases, the sensitivity of extreme high temperatures to changing thresholds in the northern mid-latitudes exhibits a different performance response. The results of this study show that extreme high temperature in the increasing phase is more sensitive to changes in the threshold in both observations and simulations (the largest difference in the speed of temperature increase occurs at 3.5 days and 25 days/decade), primarily in North America and Central Asia. This finding highlight that the old definition of being in the increasing temperature phase in modern climate history is problematic today. At the same time, when the old base period is selected, the frequency of extreme high temperatures will become a common event (close to 98% in a year) by 2100. Using 1961-1990 as the base period is not suitable for calculating extreme temperatures in the future from the perspective of adapting to climate change. The increasing temperature threshold means there will be more frequent hot days, indicates that agriculture and species will be negatively affected, more wildfires will occur, resulting in increased risks to humanity.