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Comparison of mega-heatwaves in preindustrial and present-day simulations over Europe

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Heatwaves are likely to occur more frequent, longer, and stronger due to the rise in CO₂ concentrations. It is related to the change in the mean of a climate distribution, as well as through the change in variance. Mega-heatwaves, in particular, have a crucial impact on human health. Many studies are trying to understand the mechanisms of mega-heatwaves and also their characteristics included amplitude, duration, frequency. In spite of these efforts, researches are limited because of the small number of mega-heatwaves. In order to overcome these limitations, Earth system model should be needed. This study aims to figure out the comprehensive characteristics of mega-heatwaves using Community Earth System Model (CESM). First, the possibility of the occurrence of mega-heatwaves in preindustrial period in Europe was analyzed. Second, the relation between decadal climate variabilities and mega-heatwaves was investigated. In addition, changes in characteristics of mega-heatwaves were compared between preindustrial and present-day simulations.