Projected changes of growing season length across Northern Eurasia in the 1.5°C and 2°C warmer world

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Northern Eurasia, undergoing dramatic climatic and environmental changes, is a key part of the global socioeconomic systems. Projection data of growing season length (GSL) and daily mean temperature in 12 CMIP5 models under the RCP4.5 scenario were employed to investigate responses of ecology in Northern Eurasia to global warming. According to the projections from multi-model ensemble mean under the RCP4.5 scenario, the global mean temperature will increase to 1.5 ℃ and 2 ℃ above pre-industrial levels around 2029 and 2049 respectively. Changes of GSL in the 1.5℃ and 2℃ warmer time period are investigated as differences relative to the reference period (1986–2005) for RCP4.5. Results show that GSL have an evident increase across most of Eurasia under global warming of 1.5℃. However, GSL shows slight decline in several high latitude and altitude areas. Furthermore, in the 2℃ warmer world, GSL increases around the whole Eurasia relative to that in the 1.5℃ warmer world. The margin of increase is lower in northern Europe and East Asia compared to other areas in Eurasia. The changes of GSL under global warming of different thresholds may have far reaching consequences for the ecosystems and agriculture in Eurasia.

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