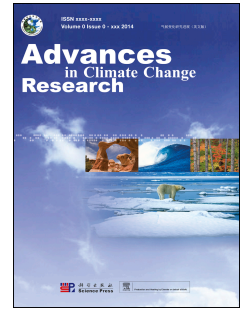


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Impacts of climate change on agricultural water resources and adaptation on the North China Plain

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Abstract

Climate change is having a considerable impact on the availability of water resources for agricultural production on the North China Plain (NCP), where the shortage of water is currently disturbing the stability and sustainability of agricultural production with respect to the drying tendency since the 1950s. However, although potential evapotranspiration (ET) has shown a decreasing trend under climate change, actual ET has slightly increased with an acceleration in hydrological cycling. Global climate model (GCM) ensemble projections predict that by the 2050s, the increased crop water demand and intensified ET resulting from global warming will reduce water resources surplus (Precipitation – ET) about 4%–24% and increase significantly the irrigation water demand in crop growth periods. This study assesses possible mitigation and adaptation measures for enabling agricultural sustainability. It is revealed that reducing the sowing area of winter wheat (3.0%–15.9%) in water-limited basins, together with improvement in crop water-use efficiency would effectively mitigate water shortages and intensify the resilience of agricultural systems to climate change.

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