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## Response of crop evapotranspiration on the elevated CO<sub>2</sub> in Northwest China

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The increase in atmospheric carbon dioxide (CO<sub>2</sub>) concentration is changing plant physiology, thus affecting terrestrial hydrological response. A nonlinear stomatal conductance response to carbon dioxide concentration ( $g_s - CO_2$ ) was incorporated in the VIC model for better representation of the evapotranspiration (ET) response to the elevated CO<sub>2</sub>. The annual ET of maize and wheat over the agricultural land in Northwest China was found to decrease by 0.54% and 0.21% during 1980–2010, respectively. Under doubled CO<sub>2</sub> concentration (660 ppm), the ET reduction of maize and wheat was 23.3 mm and 8.9 mm, which accounted for 4.3% and 1.8% of the corresponding annual ET. The annual ET reduction of maize, under the four future scenarios (RCP4.5\_2040s, RCP4.5\_2080s, RCP8.5\_2040s, and RCP8.5\_2080s), was about 1.1–6.4%, resulted from an ensemble mean of eight general circulation models. The effects of elevated CO<sub>2</sub> offset part of ET increase caused by the precipitation and temperature changes. This study has practical implications for precise irrigation. The ET response of maize should be paid more attention for its larger potential in saving irrigation water for the studied region. The elevated CO<sub>2</sub> concentration will be beneficial for saving irrigation water to a certain degree.