



Uncertainty in the response of transpiration to CO₂ and implications for climate change

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While terrestrial precipitation is a societally highly relevant climate variable, there is little consensus among climate models about its projected 21st century changes. The main source of precipitable water over land is plant transpiration. Plants control transpiration by opening and closing their stomata. The sensitivity of this process to increasing CO₂ concentrations is uncertain. To assess the impact of this uncertainty on future climate, we perform experiments with an intermediate complexity Earth System Climate Model (UVic ESCM) for a range of model-imposed transpiration-sensitivities to CO₂. Changing the sensitivity of transpiration to CO₂ causes simulated terrestrial precipitation to change by -10 % to +27 % by 2100 under a high emission scenario. This study emphasises the importance of an improved assessment of the dynamics of environmental impact on vegetation to better predict future changes of the terrestrial hydrological and carbon cycle.