



Effects of single and recurrent drought on soil CO₂ production and transport in mountain grassland

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Climate models predict an increase in the frequency and intensity of extreme summer droughts, which can affect soil CO₂ emissions, production and transport. Alterations of CO₂ fluxes caused by extreme summer droughts can have an impact on the global carbon cycle and its feedbacks to the climate system. While consequences of extreme summer droughts on soil CO₂ emissions are becoming increasingly understood, responses of the underlying processes remain uncertain. Based on a 10 year dataset of soil CO₂ concentration profiles we analyze soil CO₂ production and transport under single and recurrent drought in mountain grassland in the Austrian Alps. We test the hypotheses that, compared to single drought, recurrent summer drought will lead to a stronger reduction in soil CO₂ production in deeper soil layers and a reduced CO₂ pulse after rewetting.