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Impact of extreme events on the carbon fluxes of arable land in Europe

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Extreme weather events have a big impact on the environment. For the future the IPCC report predicts an increase of the number of extreme events like heavy rain, hail events, storms, drought periods or temperature extremes. Until now there is little understanding of the impact of the climate variability to the carbon cycle. The Carbo-Extreme project has the aim to investigate the impact of extreme weather events on carbon fluxes for Europe. As part of this project the work presented here shows simulation results of carbon fluxes of arable land for Europe. The objective of the work is to highlight the impact of drought and temperature effects. Therefore, the terrestrial biochemical model DailyDayCent simulates carbon fluxes for the period 1971–2050 in there spatial distribution. The climate data 1971-2010 are observed based projection, whereas the climate data 2010-2050 model data of REMO for the IPCC scenario A1B. The soil data are derived by pedo-transfer functions based on the FAO soil map of Europe. The land use data are the GLC2000 and MODIS VCF land cover data and assumed to be constant over the entire considered period. The results show changes and variations of net primary production and net ecosystem exchange for the periods 2021-2050 to 1971-2000 as well as the extreme year 2003. Extreme emissions will be also discussed and related to the climate data.