Geophysical Research Abstracts
Vol. 16, EGU2014-4747, 2014
EGU General Assembly 2014

Influence of land-atmosphere feedbacks on climate extreme indices in a multi-model experiment under present and future conditions (GLACE-CMIP5)

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Extreme events can be directly influenced by land surface-atmosphere interactions. It is important to investigate how extreme events might change in the future and the role these interactions play in amplifying extremes. The data from the GLACE-CMIP5 experiments (Seneviratne et al., 2013) provide a unique opportunity to examine the influence of soil moisture on extremes in transient climate simulations from a range of climate models.

The extreme indices we use are defined by the Expert Team on Climate Change Detection and Indices (ETCCDI) and contain a range of indices based on daily minimum and maximum temperature as well as daily precipitation. The ETCCDI indices are available from observational datasets, reanalysis and as well as CMIP5 runs. Hence, these indices are widely used and can be compared to other sources.

In this paper, we analyze the effects of land surface feedbacks on the extremes and their trends in the different global climate models.

Seneviratne, S. I., et al. (2013). Impact of soil moisture-climate feedbacks on CMIP5 projections: First results from the GLACE-CMIP5 experiment. GRL, 40(19), 5212–5217. doi:10.1002/grl.50956