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A modeling study with a dynamical global vegetation model and last millennium GCM experiments to understand change of atmospheric CO_2 level and terrestrial carbon storage during the last millennium

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Reconstruction of paleo-environment from 850AD to pre-industrial (1850AD) indicates warmest temperature in the Medieval Warm Period (MWP: ca. 1000AD to 1200AD) and coldest temperature in the Little Ice Age (LIA: ca. 1600AD to 1800AD). On the other hand, reconstruction of atmospheric CO_2 level shows the highest value around the MWP and lowest value around the LIA. Paleoclimate modeling community is trying to reproduce and understand the climate and CO_2 change during this "last millennium" by using general circulation models (GCMs) and earth system models (ESMs). However, there is still discrepancy among models. In the present study, we use a dynamical global vegetation model "Land Processes and eXchange (LPX)" forced by last millennium GCM/ESM results as input, in order to investigate which aspect of millennial climate change influences terrestrial carbon storage and thus atmospheric CO_2 level during the last millennium.