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The change of Net Ecosystem Production under Climate Change: a modelling study to identify the sink and source of carbon regions at pan-European domain within AFTER project.

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Identifying sink or source of CO_2 in the terrestrial biosphere has become an important meaning in the last decades. Net Ecosystem Production (NEP) is one of the most used parameters for the understanding and visualization of change in a sink or source of CO_2 under consideration climate change, and transient CO_2 in modelling and in-situ studies. In this study, NEP was obtained by running the Community Land Model's (CLM version 4.5) for 25x25 km high spatial resolution between 1971 to 2100. It was focused on analyzing the NEP for two periods (i.e. 1971-2000 as past period and 2071-2100 as the future period). Within the study, the model was integrated with used bias corrected six climate parameter and transient CO_2 up to 2100. Validation of the model results showed a quite good correlation (ca. 77%) with observed NEP data. NEP will have an increase up to ca. 118% on an average, at pan-European scale in 2100. Although carbon accumulation in terrestrial biosphere will increase in most of the areas of the pan-European region, the accumulation will decrease in eastern Europe. These results particularly highlight the spatial and temporal distribution of NEP, and also a significant increase of NEP in the terrestrial biosphere under climate change and transient CO_2 at pan-Europe scale.