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Future fires in the Coupled Model Intercomparison Project (CMIP) phase 6

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Fires are an important component in Earth system models (ESMs), they impact vegetation carbon storage, vegetation distribution, atmospheric composition and cloud formation. The representation of fires in ESMs contributing to CMIP phase 5 was still very simplified. Several Earth system models updated their representation of fires in the meantime. Using the latest simulations of CMIP6 we investigate how fire regimes change in the future for different scenarios and how land use, climate and atmospheric CO₂ concentration contribute to the fire regimes changes. We quantify changes in fire danger, burned area and carbon emissions on an annual and seasonal basis. Factorial model simulations allow to quantify the influence of land use, climate and atmospheric CO₂ on fire regimes.

We complement the information on fire regime change supplied by ESMs that include a fire module with a statistical modelling approach for burned area. This will use information from simulated changes in climate, vegetation and socioeconomic changes (population density and land use) provided for a set of different future scenarios. This allows the integration of information provided by global satellite products on burned area with the process-based simulations of climate and vegetation changes and information from socioeconomic scenarios.