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Effect of Land Use Changes on Climate in CMIP5 Projections

V. Brovkin (1), V. Arora (2), E. Kato (3), L. Boysen (1), and V. Gayler (1)

(1) Max Planck Institute for Meteorology, Hamburg, Germany, (2) Canadian Centre for Climate Modelling and Analysis, Victoria, Canada, (3) Research Institute for Global Change, JAMSTEC, Japan

Anthropogenic land cover changes affect climate through changes in physical characteristics of the land surface (albedo, LAI, soil moisture) as well as changes in atmospheric greenhouse gas concentrations. In the core simulations of Coupled Model Intercomparison Project Phase 5 (CMIP5), Earth System models are driven through the 21st century by a set of RCP scenarios that include land use changes. A set of RCP scenarios envelopes different scenarios of future land use changes, including increase in croplands used for climate mitigation as well as reforestation. To isolate an effect of land use changes on climate in CMIP5 projections, we performed additional LUCID-CMIP5 simulations without land use changes. A difference between simulations with- and without land use changes provides insights on effects of land cover changes on climate on regional and global scales. A comparative analysis of land use effects on climate and land carbon cycle in several Earth System models will be presented.