

Project: **887**

Project title: **Influence of tropical land-use transformations on local and regional climate in Sumatra/Indonesia**

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Report period: **2017-01-01 to 2017-12-31**

South-East Asia and Indonesia undergoes major and rapid land cover changes due to cash crop land increases. Land cover modifications result in alterations to surface fluxes such as moisture, heat, and momentum fluxes, and ultimately impact the boundary layer structure, cloud cover regime, and all other aspects of local and regional weather and climate occurring not only locally, but also in regimes remote from the original landscape conversion. The extent and magnitude of the anthropogenic conversion effect is still uncertain. In this project we examine the impact of abrupt land cover conversion from forested areas to grassland on South-East Asian climate during the period 1990-2010 and 2080-2100 using a regional climate model COSMO-CLM. Further, the impact of land cover change on extremes during ENSO events is analysed. The performed simulations over South-East Asia are analysed in terms of abrupt land cover conversions and impacts of land use changes for the present period using ERA-Interim data as forcing. The results of the modelling study are published in Tölle et al. 2017. Furthermore, sensitivity studies started regarding the land-atmosphere interactions. Future simulations with land cover changes are not performed, yet.

References

Tölle, M. H., S. Engler, H.-J. Panitz, 2017: *Impact of abrupt land cover changes by tropical deforestation on South-East Asian climate and agriculture*, Journal of Climate, 30, 2587-2600, DOI: 10.1175/JCLI-D-16-0131.1