



Precipitation teleconnections induced by land-cover change in tropical regions

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State-of-the-art socioeconomic scenarios of land-cover change in the Amazon basin for the years 2030 and 2050 are used together with the Regional Atmospheric Modeling System (RAMS) to simulate the hydrometeorological changes caused by deforestation in that region under diverse climatological conditions that include both El Niño and La Niña events. Surprisingly, the basin-averaged rainfall is not significantly affected by this drastic land-cover change except during El Niño events. However, the spatial distribution of rainfall is significantly affected by both the land-cover type and topography. While the massively deforested region experiences an important decrease of precipitation, the areas at the edge of that region and at elevated regions receive more rainfall. Propagating squall lines over the massively deforested region dissipate before reaching the western part of the basin, causing a significant decrease of rainfall that could result in a catastrophic collapse of the ecosystem in that region. Furthermore, three GCMs were used in a multi-model ensemble to study teleconnections triggered by deforestation in tropical regions. Significant precipitation disturbances are found even at high latitudes.