

# **Perturbations of the El Niño Southern Oscillation Resulting from the Land-Use Induced Land-Cover Changes in the IPSL Climate Model**

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We perform three climate simulations using the IPSL coupled atmosphere-ocean-vegetation climate model (IPSLCM4) to investigate *the links* between the surface climate changes resulting from Anthropogenic Land Cover Change (ALCC) and the characteristics of the simulated El Niño Southern Oscillation. We address past (from pre-industrial to present-day) as well as future (from present-day to the end of the 21<sup>st</sup> century) climate changes. Past land-use changes mainly resulted in mid latitude deforestation in the northern hemisphere while tropical regions are now being deforested and will continue to be deforested according to scenarios of the IMAGE model. Our simulations show that, although the frequency of the ENSO events does not seem to be affected by ALCC, the characteristics of the simulated El Niño (or La Niña) are different when tropical regions are being deforested. The seasonal extent of each event is expanded, with an earlier warming of the equatorial east Pacific and a later recovery to normal (climatological) conditions. Moreover the warming of the Indian ocean, that accompanies with some delay the El Niño event in our model, is not only larger in magnitude, but is also more in phase with the sea-surface temperature anomalies in the East Pacific.