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## The Role of El Niño in Modulating the Effects of Deforestation in the Maritime Continent

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The deforestation rate in the Maritime Continent (MC) has been accelerating during the past several decades. Understanding the changes in local hydro-climatological cycles as deforestation takes place is essential because the MC is suffering from frequent and extreme droughts and fires, which often occur during the dry season and are more severe during El Niños. Therefore, this study explores how deforestation affects the hydrological cycle and precipitation in the MC during El Niños, focusing on the boreal autumn season and using the coupled atmosphere-land model simulations. It is found that the precipitation over the MC increases in the deforestation experiments, and the precipitation responses can be magnified during El Niño events. A strong subsidence anomaly associated with El Niño does not prevent enhanced convection associated with local deforestation. Instead, the subsidence reduces the cloud cover in the MC region during El Niño, which increases the incoming solar radiation and increases surface temperatures. Under a warmer environment induced by El Niño, the nonlinear biogeophysical feedbacks associated with deforestation also play a critical role in more substantial land surface warming. A warmer land surface induces a more unstable atmospheric environment associated with a tendency toward enhanced local convection and lateral moisture convergence. This study highlights how the different mean climate states may modulate the impact of local land-use changes on hydroclimatological cycles in the Maritime Continent, and sheds light on the state of our knowledge of interactions between the local land surface and remote large-scale atmospheric circulations.