Fechar Janela

Deforestation and Biomass Burning as Drivers of Regional Climate Change in Amazônia

Maria Assução Faus da Silva Dias, CPTEC/INPE and IAG/USP, assuncao@cptec.inpe.br
(Presenting)

Deforestation and biomass burning represent potential drivers of significant regional climate change in the Amazon Basin. The horizontal and temporal scales over which these drivers are affecting the atmosphere varies for the different part of the Amazon but a few common features arise from the research carried out in LBA. Deforestation is associated to a change in land cover, from forest to grassland or agriculture, or even a substitution by secondary growth forest. The change in land cover has direct impact on the energy input, through the change in surface albedo, and on the energy output through availability of soil moisture at root depth defining the partioning of sensible and latent heat fluxes. This is basically a boundary forcing for the atmospheric boundary layer and the effect on the atmosphere is a function of the scale where it is happening. One key result is an increase in surface temperature locally and impacts on cloudiness and rainfall depending on the scale of the deforested area. Biomass burning also has an impact on the surface forcing through a change in surface albedo, but the main impact is in the change of atmospheric composition, in particular with respect to number concentration of aerosol. The internal forcing represented by biomass burning alters the thermodynamic structure of the lower layers and the cloud microphysical structure with both effects combined changing the rainfall occurrence and amounts. The two effects, deforestation and biomass burning, combine in nature and the suggested effect is seen as a delay on the start of the rainy season, and a tendency to produce more thunderstorms in the end of the dry season.

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