



Simulated Evapotranspiration over South America by Different RegCM4.3 Parameterizations

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This study evaluates the simulated evapotranspiration by Regional Climate Model version 4.3 (RegCM4.3) over South America (SA). Seven different RegCM4.3 configurations are compared: control simulation (S_CTRL) used the Biosphere-Atmosphere Transfer Scheme (BATS), Holtslag for planetary boundary layer (PBL) and Mixed1 (Grell scheme over the continent and MIT scheme over the ocean) for cumulus convection; S_MIT changed Mixed1 by MIT convective scheme; and S_Tiedtke changed Mixed1 by Tiedtke scheme; S_PBL and S_PBL_MIT used University of Washington PBL (UW-PBL) instead Holtslag PBL; S_CLM and S_CLM_MIT changed BATS by Common Land Model (CLM). These experiments were carried out from January 1989 to January 2000 in a domain recommended by CORDEX to SA. S_Tiedtke underestimates the evapotranspiration in almost SA producing a precipitation dry bias over the continent. Simulations using MIT convective scheme overestimate the evapotranspiration resulting in positive bias in the precipitation mainly over the central part of Brazil during the wet season. Another interesting result is that changing the PBL scheme from Holtslag to UW-PBL, the precipitation bias remains dry for the experiment with Mixed1 scheme (S_PBL) and wet for that with MIT scheme (S_PBL_MIT). Therefore, the convective scheme has a higher control over the precipitation than PBL scheme. When CLM is coupled to the RegCM4.3 it contributes for a general decrease in the evapotranspiration. Thus, (a) a more intense dry bias occurs in the experiment S_CLM (Mixed1 with CLM) compared with S_CTRL (Mixed1 with BATS) and (b) there is a reduction of the wet bias decrease in the experiment S_CLM_MIT (MIT with CLM) in relation to the S_MIT (MIT with BATS). The combination of CLM and MIT schemes produces the more realistic precipitation rate over Amazon and of the air temperature over all continental SA.