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Evaluation of uncoupled soils models with field campaign soil moisture measurements available in Argentina.

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The soil moisture fields from the uncoupled soil models are an alternative data set for hydroclimatic studies, as well as for the initialization of numerical weather prediction models. The verification among observed soil moisture data and products derived from uncoupled models, would then be a key step to develop future comparisons between measured and modeled soil moisture values obtained from numerical weather prediction runs. Focusing on this goal, this work intends to demonstrate the ability of the GLDAS (Global Land Data Assimilation System) soil models in reproducing some soil moisture field campaign measurements and satellite data over different areas of Argentina. We also employ soil moisture data from the CPTEC (Centro de Pesquisas e Estudos de Tempo e Clima) soil model. From GLDAS we use the results of the uncoupled soil models CLM (Community Land Model), Mosaic, Noah and VIC (Variable Infiltration Capacity), which provides monthly and daily fields of soil variables at different depths. For satellite data we employ daily fields of soil moisture product derived from AMSR-E at 1 cm depth to analise the superficial layers of GLDAS. The field campaign soil moisture data available at selected locations of the province of Cordoba by CONAE (ComisiÛn Nacional de Actividades Espaciales) for different dates during the year 2009 and 2010, are used to evaluate the soil models results. The monthly average for March 2009 from the GLDAS models shows similar patterns in the West and South of the Argentina. The monthly average of satellite data from AMSR-E corroborates the explained above patterns in the superficial layer. All GLDAS models present a great uncertainty to the northeast of Argentina and over La Plata Basin. This behaviour is also shown by the CPTEC soil model. From the arguments above, one of the main conclusions of this work is that field campaign over regions of great uncertainty should be encouraged. The subsequently assimilation of this data into the coupled and uncoupled soil models should be the necessary further achievement to fulfill.