Geophysical Research Abstracts
Vol. 19, EGU2017-2042, 2017
EGU General Assembly 2017

The role of realistic soil moisture for the simulation of surface energy fluxes and precipitation

Wilhelm May
Lund University, Centre for Environmental and Climate Research, Lund, Sweden (wilhelm.may@cec.lu.se)

ERA-Interim/Land is a global land surface reanalysis data set over the period 1979-2010, where the evolution of soil moisture, soil temperature and snowpack are described (Balsamo et al. 2015). It is the result of a single simulation with the latest version of the ECMWF land surface model driven by the meteorological forcing from ERA-Interim and precipitation adjustments based on monthly mean values from GPCP v2.1.

In this study the role of a more realistic prescription of precipitation for the description of soil moisture is assessed by comparing ERA-Interim/Land with the soil moisture from Era-Interim. For this, respective local climatologies as well as the climatological annual cycles for selected regions (i.e., Amazonia, West Africa or India) are compared. Furthermore, we assess the relevance of more realistic soil moisture for the simulation of surface heat fluxes and precipitation in the IFS model version used for the re-analyses by comparing 24-hour forecasts of these meteorological variables initiated from ERA-Interim/Land and ERA-Interim, respectively. Again, this is done for the respective local climatologies and the climatological annual cycles for selected regions. Finally, the soil moisture as well as the surface energy fluxes and precipitation as simulated in the latest climate version of ECMWF's IFS model (i.e., EC-Earth v3) are analysed and compared to the soil moisture from ERA-Interim/Land and ERA-Interim and to the forecasts initiated from these two re-analyses. This allows for an assessment of the quality of the simulation of soil moisture, the surface energy fluxes and precipitation by EC-Earth as compared to the case that the meteorological forcing is constrained by observations in the two re-analyses.

Reference: Balsamo G, and 12 co-authors (2015) ERA-Interim/Land: a global land surface reanalysis data set. Hydrol Earth Syst Sci 19: 389-407