Geophysical Research Abstracts,
Vol. 10, EGU2008-A-08444, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-08444
EGU General Assembly 2008

Transferability of the Noah-WRF meso-scale model in semiarid environments for hydrological applications

B. DECHARME(1,2), C. OTTLE(1), S. SAUX-PICART(3), N. BOULAIN(4), B.CAPPELAERE(4), D. RAMIER(5), M. ZRIBI(3)

1) CNRS / IPSL / Laboratoire des Siences du Climat et de l'Environnement, Gif-sur-Yvette, France
(2) Centre National de Recherche Météorologique / Météo-France, Toulouse, France
(3) CNRS / IPSL/ Centre d'étude des Environnements Terrestre et Planétaires, Vélizy, France
(4) IRD / Maison des Sciences de l'Eau, Montpellier, Université Montpellier II, France
(5) IRD/Niamey, avenue de Maradi, BP11416, Niamey, Niger

Many studies on the West African Monsoon (WAM) have shown that land atmosphere feedbacks are particularly important over the Sahel. Nevertheless, these feedbacks partly depend on a large range of processes linked to the land surface hydrology and the vegetation heterogeneities. These findings induce the necessity to develop "realistic" land surface-atmosphere coupled models for a better understanding of the role of the land surface on the WAM dynamics and predictability. This study focuses on the transferability of the coupled Noah-WRF mesocale model over the Sahel for hydrological applications. Another focus is to investigate the influence of the land surface hydrology on the simulated WAM using the comparison between the previous version of the Noah land surface model and a new version where the surface hydrology has been improved. These two versions are evaluated against a dense rain gauge network, surfaces temperatures estimated from MSG/SEVIRI data, surface soil moisture mapping based on ASAR/ENVISAT C-band radar data, and in situ observations of surface atmospherics and land surface energy budget variables from the IRD Wankama catchments. Generally, the WAM is acceptably reproduced by the model even if a significant surface temperature hot bias is found, certainly due to the non representation of dusts and aerosols. An appreciable improvement of the model results is also found when the new hydrology is used. This fact seems to emphasise the relative importance of the

land surface hydrological processes on the WAM over the Sahel.