

Impact of the land surface process change on the East Asian summer monsoon

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Abstract

A land surface model (LSM) has been included in Purdue Regional Model. The LSM is a new version which was developed by Dr Sun's Group. The purpose of this paper is to assess the model performance in 1998 summer monsoon and to study the effect of the land surface process change in continental scale and local scale on summer monsoon over East Asia. The result indicated that the model can have well the reproduction for the overall characteristics in the simulation of 1998 East Asian Summer Monsoon. There is a sensitivity test for 3 different land use datasets. The simulation of use the CNRM/METEO- France dataset and the AVHRR observed LAI is the best performance.

The sensitivity experiments of the land surface process in continental scale include different heating, land cover change and different soil moisture. The precipitation change in summer monsoon was dominated with the land sea temperature contrast. As the land surface temperature change to be warmer in the simulation of the land surface process change which the moisture transport of summer monsoon increase and the Pacific subtropical high weaken. The precipitation increase over the East Asian coast and the North of China, decrease in the Yangtze around. As the land surface temperature to be colder, the Pacific subtropical high strengthen, and the moisture transport decrease, induce the precipitation decrease over East Asia region. In the local scale test, the local land cover change over the Indochina and the South of China to influence the monsoon precipitation through the land sea temperature contrast and roughness length (frictional force) both change.