



## **The influence of land surface conditions on the abrupt hydrological transitions of Southeast Asian Monsoon**

**K. Dairaku (1)**

(1) National Research Institute for Earth Science and Disaster Prevention  
(dairaku@bosai.go.jp)

The variability of the monsoon climate strongly influences human lifestyles, economics, agriculture, and natural ecosystems throughout Asia and Australia. In order to control water resources in the face of droughts and floods, which frequently pose serious threats to human life and natural ecosystems, accurate seasonal forecasting of changes in monsoon rainfall is of utmost importance. The first transitions into the Asian Summer Monsoon (ASM) occur between late April and early May over inland Indochina, before any transitions occur along the coast. This study used a regional climate model to elucidate the influence of orography and ground wetness on subcontinental-scale hydrological processes. The model reproduced many elements of the onset of the Southeast Asia Monsoon (SEAM) associated with land surface conditions, including the early and abrupt onset observed when mountain effects and relatively dry soil conditions were combined in the model simulations. The nonlinear effects of mountains and ground wetness, combined with realistic increases in precipitation, can modify the hydrological cycle through changes in the surface energy budget. A positive feedback between soil moisture and precipitation increases the moisture source for further precipitation in the first transition period.