Long-term trends of Asian summer monsoon and its seasonality During the recent several decades

Tetsuzo YASUNARI,
Yoshiyuki KAJIKAWA, Shuhei YOSHIDA and Hatsuki FUJINAMI

Hydrospheric Atmospheric Research Center, Nagoya University, 464-8601, Japan
Phone +81-52-789-xxx; Fax +81-52-789-3436
e-mail:

Abstract

long-term trends of the Asian summer monsoon rainfall and circulation field during the several decades (1979-2008) have been examined *by using the data of CMAP, APRODITE precipitation NCEP/NCAR reanalysis, HadiSST, and NOAA interpolated OLR*. A significant increasing trend of monsoonnal rainfall is found over the Arabian Sea, the Bay of Bengal and the South China Sea in May. In contrast, the decresing rainfall trend over these area is found in June. The increasing trend over the Southern China is also detected in June. These rainfall trends are accompanied by wind circulation field in the lower troposphere. The broad-scale monsoon onset date is shifted earlier in recent decades, which is consistent with the rainfall trends in May and June. Of interest is that the Asian monsoonal rainfall in July and August does not have clear significant trend. Thus, the Asian monsoon has significant trend only during the transient phase. It is suggested that these trends of the earlier monsoon onset date is closely related to the increasing trends of the SST warming over the tropical Pacific and Indian Ocean.

Further investigations are needed for (1) the possible mechanism to produce the seasonality in the long term variation and (2) addressing whether the remarkable SST increase is due to anthropogenic or natural forcings. We are also examining these features using a coupled ocean-atmosphere climate model.