

Interannual Rainfall Variability over the Indonesian Maritime Continent and its Relation to the Asian Winter Monsoon

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Interannual rainfall variability over the Indonesian maritime continent is well related to the Indian Ocean Dipole (IOD) and El Niño-Southern Oscillation (ENSO) events ^[1]. Droughts conditions during the dry season (May–October) in northwestern Jawa occur in conjunction with simultaneous development of positive IOD and El Niño events, whereas wet conditions tend to appear in negative IOD rather than single La Niña events. On the other hand, interannual rainfall variation in the rainy season (November–April) is not closely related to ENSO/IOD, but rainfall tends to be abundant in neutral (non-ENSO/IOD) years. Correlation and composite analysis suggested that the rainy season rainfall would be influenced by the Asian winter monsoon strength and/or variability.

In this study, we aim to investigate effects of Asian winter monsoon, especially for the cross-equatorial northerly surges (CENS) events over South China Sea and Jawa Sea, to interannual rainfall variability in the rainy season over northwestern Jawa. The CENS event was defined as the area-averaged northerly wind exceeding 5 m/s over South China Sea and Jawa Sea (105°E–115°E, 5°S–EQ) based on the QuikSCAT sea surface wind data ^[2]. During the analysis period (December 1999–March 2008), 53 CENS events were defined. We used surface daily rainfall data to investigate the rainfall variability and its relation to the CENS events. The occurrence frequency of CENS events was about 20%, whereas the contribution of CENS rainfall amount to the total rainfall amount in the rainy season was about 30–40%. The CENS events and rainfall peaks were well-corresponded including the Jakarta flood events in January 2002 and February 2007. Interannual variations of CENS events rainfall were well-corresponded to the interannual variations of the rainy season rainfall (correlation coefficient is 0.82). Obtained results suggested that CENS rainfall is one of the important factors to determine rainy season rainfall. It will be also suggested the CENS events would influence the rainfall variability in the rainy season over the southern part of the maritime continent, especially for the northern coastal region of the islands.

References:

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