

Variability and Trends of Withdraw for the Summer Monsoon over Vietnam

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In this paper, the 850 hPa winds of CFSR (Climate Forecast System Reanalysis) and OLR (Outgoing Longwave Radiation) during the period from 1982-2010 were used for analyzing the withdraw dates of summer monsoon over Vietnam. The criteria of withdraw for the Vietnam summer monsoon is defined by the simple index, the Vietnam summer monsoon index (VSMI) (N. D. Mau et al, 2016) or the mean 850-hPa zonal winds over the southern parts of Vietnam (5°-17°N and 100° - 110°E), when the first pentad of the easterly 850 hPa winds in the two consecutive pentads. The results showed that the climatological withdraw date of Vietnam summer monsoon is approximately pentad 65 to 66. The withdraw pentads were increasing during 1981-2010; which means that withdraw dates were trending towards later. The variability of the withdraw pentads was quite large; the latest pentad was 70 in 2009 and the earliest pentad was 61 in 1981 and 1984. The variability of the withdraw summer monsoon was closely related to El Niño-Southern Oscillation (ENSO) activities; with later dates in El Niño phases and earlier dates in La Niña phases (Fig. 1). The results also showed that the changes in 850 hPa winds and OLR was slow with the southwardly movement of the Western Pacific Subtropical High during the withdraw of the summer monsoon. The most prominent feature of the circulation during withdraw of the summer monsoon is the gradual retreat of western winds to the west and the expansion of the Western Pacific Subtropical High pressure to the west (Fig. 2).

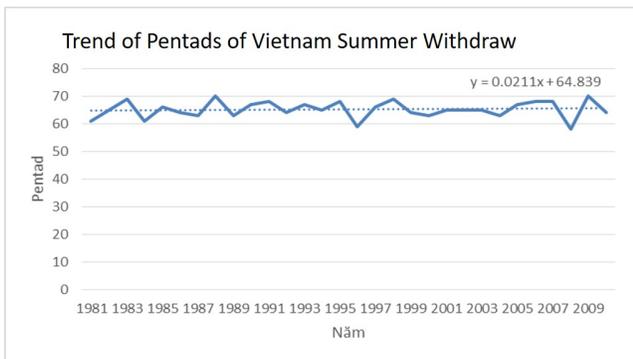


Figure 1. Trends of the withdraw pentads of Vietnam summer monsoon during 1981-2010.

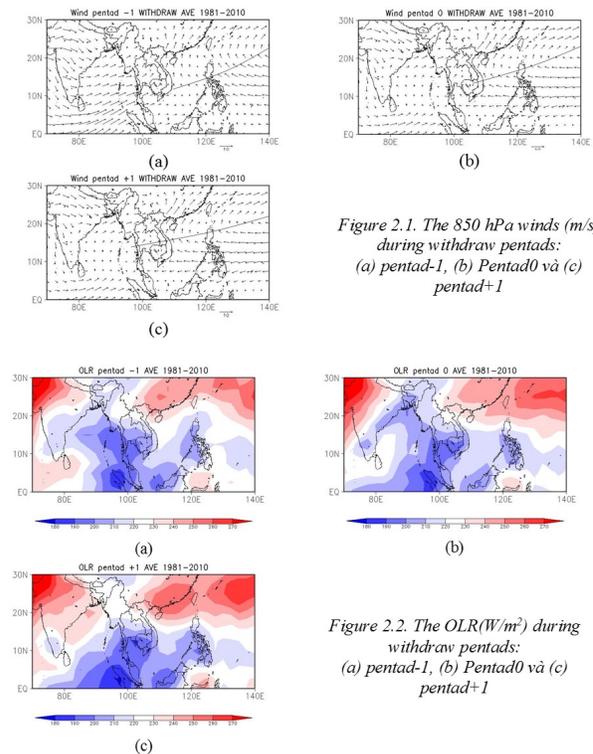


Figure 2.1. The 850 hPa winds (m/s) during withdraw pentads: (a) pentad-1, (b) Pentad0 và (c) pentad+1

Figure 2.2. The OLR(W/m²) during withdraw pentads: (a) pentad-1, (b) Pentad0 và (c) pentad+1

Figure 2. Changes in 850 hPa winds (Fig 2.1) and OLR (Fig. 2.2) during withdraw pentads of Vietnam summer monsoon.