

1. Review of Regional Weather Conditions for Second Fortnight of July 2018

1.1 Southwest Monsoon conditions continued to prevail in the second fortnight of July 2018. The monsoonal rain band brought rainy weather to many parts of the northern ASEAN region. In general, there was above normal rainfall, except for southern Thailand and southern Viet Nam, where rainfall was below normal. In contrast, dry weather prevailed over the southern ASEAN region. Rainfall was below normal in southern Sumatra, southern Kalimantan, Sabah and Java. Nonetheless, there was a gradual increase in shower activities towards the end of July.

1.2 The daily average rainfall and the percent of normal rainfall for the second fortnight of July 2018 are shown in Figure 1 and Figure 2

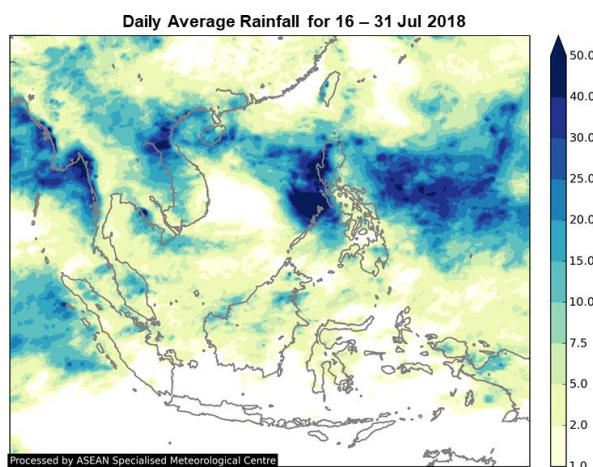


Figure 1 Daily average rainfall for the ASEAN region in the second fortnight of July 2018. (Source: JAXA Global Satellite Mapping of Precipitation)

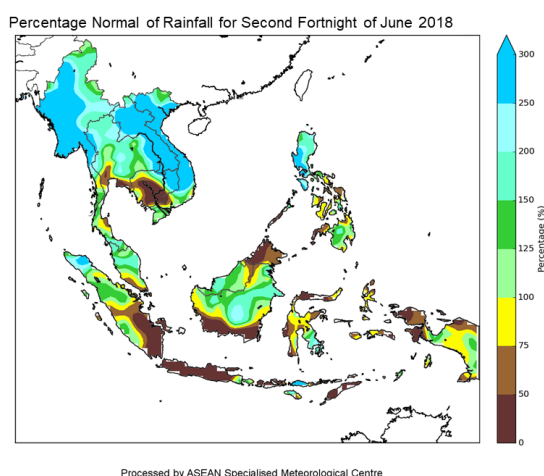


Figure 2 Percentage of Normal Rainfall for 16 – 31 July 2018. The rainfall data may be less representative for areas with a less dense rainfall network. (Source: IRI NOAA/NCEP CPC Unified Precipitation Analyses)

1.3 On 17 July 2018, Tropical Storm Son-Tinh developed over the South China Sea and tracked westwards before making landfall at northern Viet Nam on 19 July 2018. The tropical storm brought torrential rain to parts of Viet Nam and Lao PDR. The track of Tropical Storm Son-Tinh from 17 July 2018 to 19 July 2018 is shown in Figure 3.

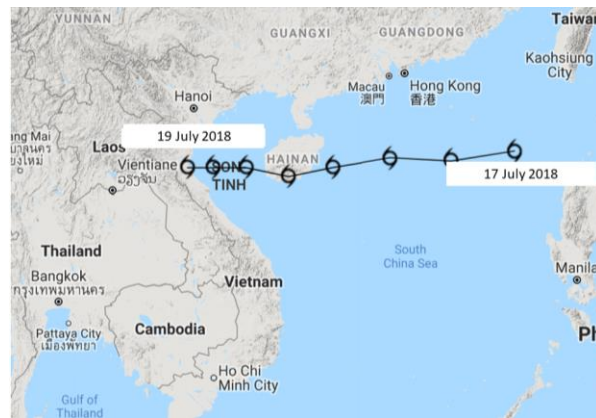


Figure 3 Track for Tropical Storm Son-Tinh (17 – 19 July 2018)

1.4 Broad scale anomalous westerly winds were observed over the northern ASEAN region, brought about by the development of tropical low pressure systems over the South China Sea. Meanwhile, the winds over the southern ASEAN region were predominantly from the southeast or southwest.

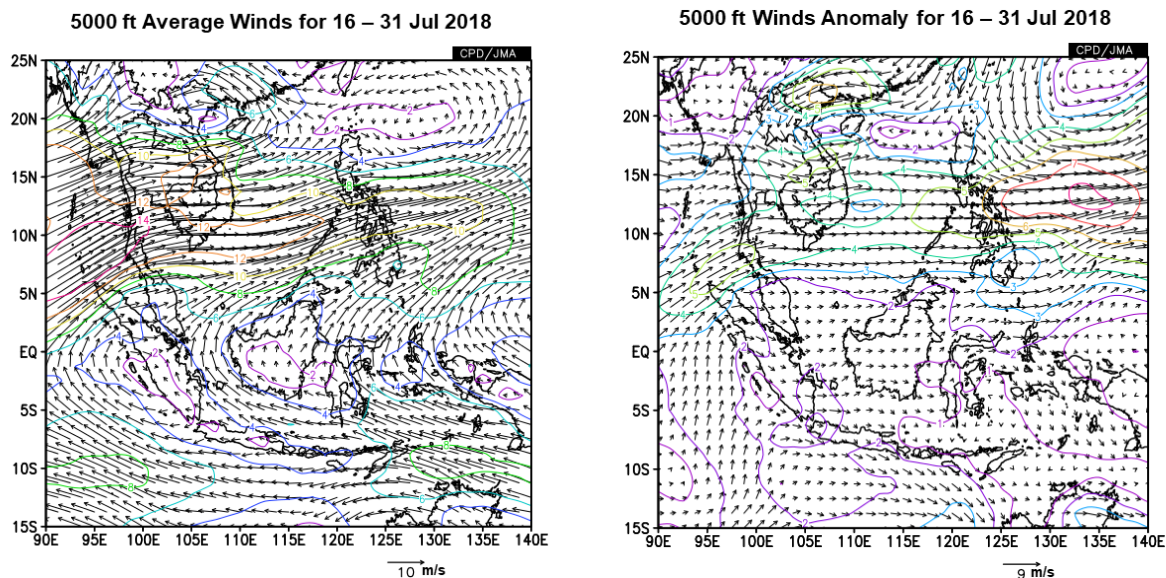


Figure 4 5000 ft average winds (left) and anomalies (right) for 16 - 31 July 2018. (Source: JMA)

1.5 Neutral conditions of the El Niño-Southern Oscillation (ENSO) persisted, and the sea surface temperature over the tropical Pacific Ocean decreased slightly but continued to remain higher than average. Other atmospheric indicators were also indicative of neutral conditions.

1.6 The Madden Julian Oscillation (MJO)¹ transitioned from Phase 5² to Phase 6 in the third week of July. The MJO subsequently weakened and became indiscernible by the end of July. MJO Phases 5 and 6 typically brought wetter weather over the Western Pacific Ocean and drier

¹ The MJO is characterised by an eastward propagation of clouds and rainfall over the tropics with an average cycle of 30 to 60 days. The MJO is more prominent between the Indian and western Pacific Ocean, and consists of two phases – an enhanced rainfall (convection) phase and a suppressed rainfall phase.

² Based on the Average Outgoing Longwave Radiation (OLR) information by the Bureau of Meteorology, Australia.

weather over the surrounding region of Java Sea. This was consistent with the regional rainfall patterns observed.

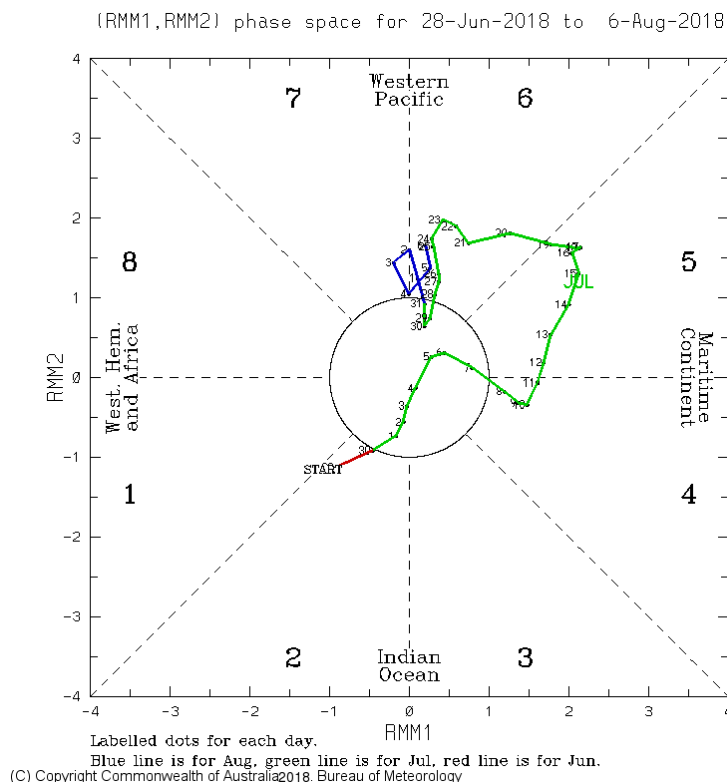


Figure 5 The MJO phase diagram for June-July-August 2018 (green for July). The diagram illustrates the movement of the MJO through different phases, which correspond to different locations along the equator. The distance of the index from the centre of the diagram is correlated with the strength of MJO. When the index falls within the circle, the MJO is considered weak or indiscernible. (Source: Bureau of Meteorology)

2. Review of Land/Forest Fires and Smoke Haze Situation

2.1 In the northern ASEAN region, no significant hotspot activities were observed.

2.2 In mid-July, drier weather in the southern ASEAN region contributed to an increase in hotspot activities, particularly in northern Riau and West Kalimantan. Smoke haze from hotspots in northern Riau was observed to spread northward across the Strait of Malacca towards Peninsular Malaysia. Several clusters of hotspots with smoke plumes were also observed in West Kalimantan and western Sarawak. These hotspots were short-lived and shower activities toward the end of July 2018 helped to subdue the hotspot activities there.

2.3 Figures 6 and 7 show satellite images over the ASEAN region in the second fortnight of July 2018.

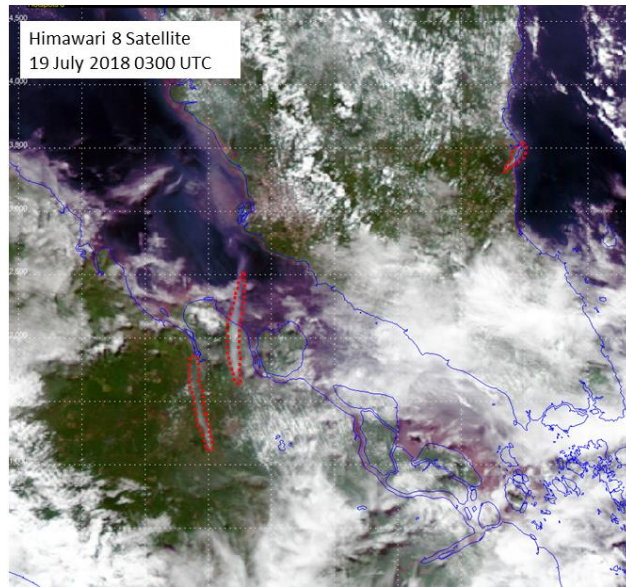


Figure 6 Smoke plumes from hotspot in northern Riau (marked by red dotted lines) that were blown across the Strait of Malacca .

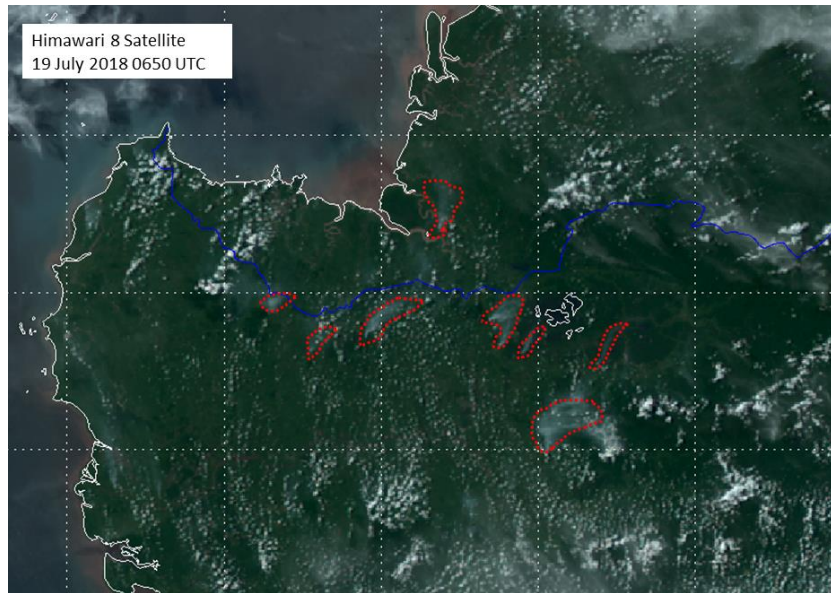


Figure 7 Smoke plumes (marked by red dotted lines) observed around hotspot clusters detected in Kalimantan and Sarawak