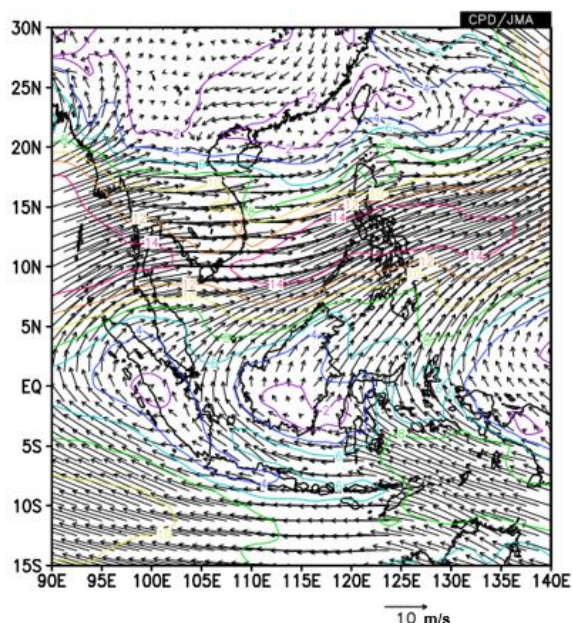


1. Review of Regional Weather Conditions for First Fortnight of August 2019

1.1 Southwest Monsoon conditions prevailed in the first half of August 2019. In the northern ASEAN region, the prevailing winds were blowing mostly from the southwest or west. During the fortnight, the westerly winds were anomalously strong and stronger-than-usual winds were also observed over the Philippines. The stronger winds could have been due to the presence of Tropical Storm Wipha over the South China Sea in early August 2019 and Typhoon Lekima over the western Pacific Ocean from 4 August till 12 August 2019. Wipha made landfall in northern Viet Nam on 3 August, bringing heavy rain and flash floods to the area. The rainband associated with the storms contributed to the well above-average rainfall recorded over northern Philippines and many parts of the Mekong sub-region.

1.2 In the southern ASEAN region, winds were blowing mainly from the southeast or southwest. The dry conditions observed since July 2019 persisted into the first half of August 2019. Well below-average rainfall was observed over many areas. The dry conditions could be attributed partly to the presence of the [Indian Ocean Dipole \(IOD\)](#) in the positive phase.

5000 ft Average Winds for First Fortnight of August 2019



5000 ft Wind Anomaly for First Fortnight of August 2019

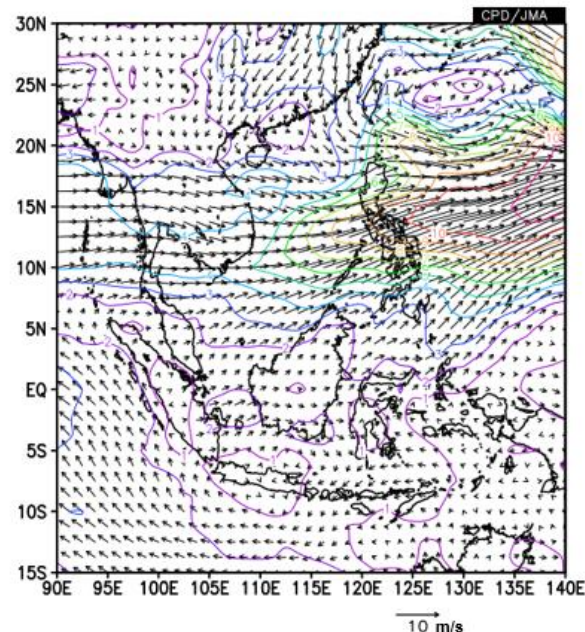


Figure 1: 5000 ft average winds (left) and anomalies (right) for 1 – 15 August 2019 (Source: JMA)

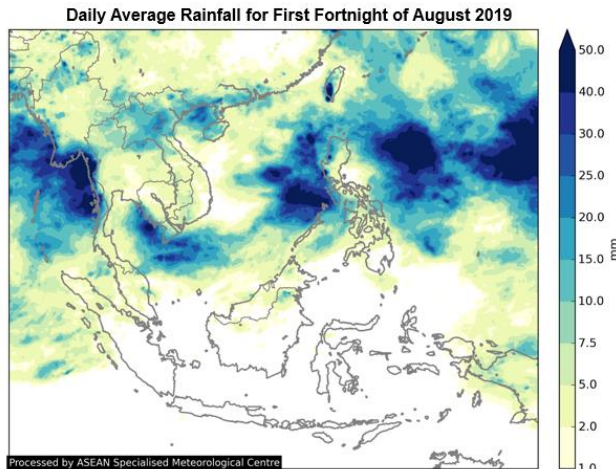


Figure 2: Daily average rainfall for the ASEAN region in the first fortnight of August 2019. (Source: JAXA Global Satellite Mapping of Precipitation)

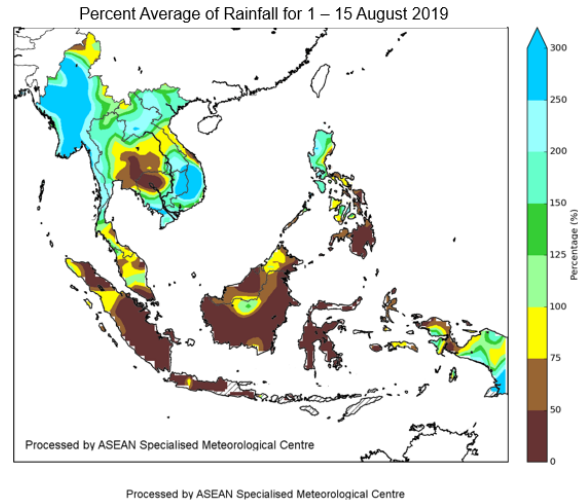


Figure 3: Percentage of average rainfall for 1 – 15 August 2019. The rainfall data may be less representative for areas with a less dense rainfall network. (Source: IRI NOAA/NCEP CPC Unified Precipitation Analyses)

1.3 There were signs of the Madden-Julian Oscillation (MJO) appearing briefly in Phases 3 and 4 (6th – 11th August), although MJO activity was insignificant by the end of the fortnight. The enhanced shower activities in the northern ASEAN region were consistent with the typical rainfall response from MJO in Phases 3 and 4 during this period.

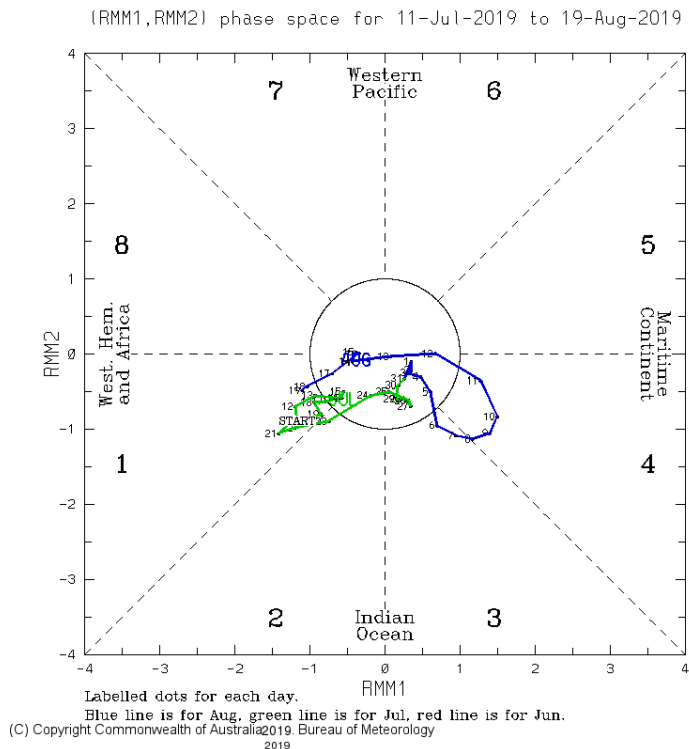


Figure 4: The MJO phase diagram (blue for August 2019). The diagram illustrates the movement of the MJO through different phases, which correspond to different locations along the equator. The distance of the index from the centre of the diagram is correlated with the strength of MJO. When the index falls within the circle, the MJO is considered weak or indiscernible. (Source: Bureau of Meteorology)

1.4 In the first fortnight of August 2019, the El Niño – Southern Oscillation (ENSO) remained neutral (i.e neither El Niño nor La Niña conditions).

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

2.1 Under the prevailing dry conditions, significant hotspot activities persisted in Sumatra and Kalimantan. Moderate to dense smoke haze continued to emanate from persistent hotspot clusters detected in Riau and Jambi. Isolated hotspots with smoke plumes were also observed in South Sumatra. The prevailing southerly and southeasterly winds transported some smoke haze toward the Straits of Malacca.

2.2 In Kalimantan, hotspot activities with smoke haze continued to be detected in Central, West and South Kalimantan. In particular, moderate to dense smoke haze was observed from the persistent hotspot clusters in West Kalimantan, and smoke haze emanating from these hotspots was blown by the prevailing southeasterly winds into Sarawak. Moderate to dense smoke haze was also observed near Palangkaraya in Central Kalimantan.

2.3 Isolated hotspots with smoke plumes were also detected in Sarawak. For a few days, smoke plumes from hotspots in Miri, Sarawak were blown eastwards toward Brunei.

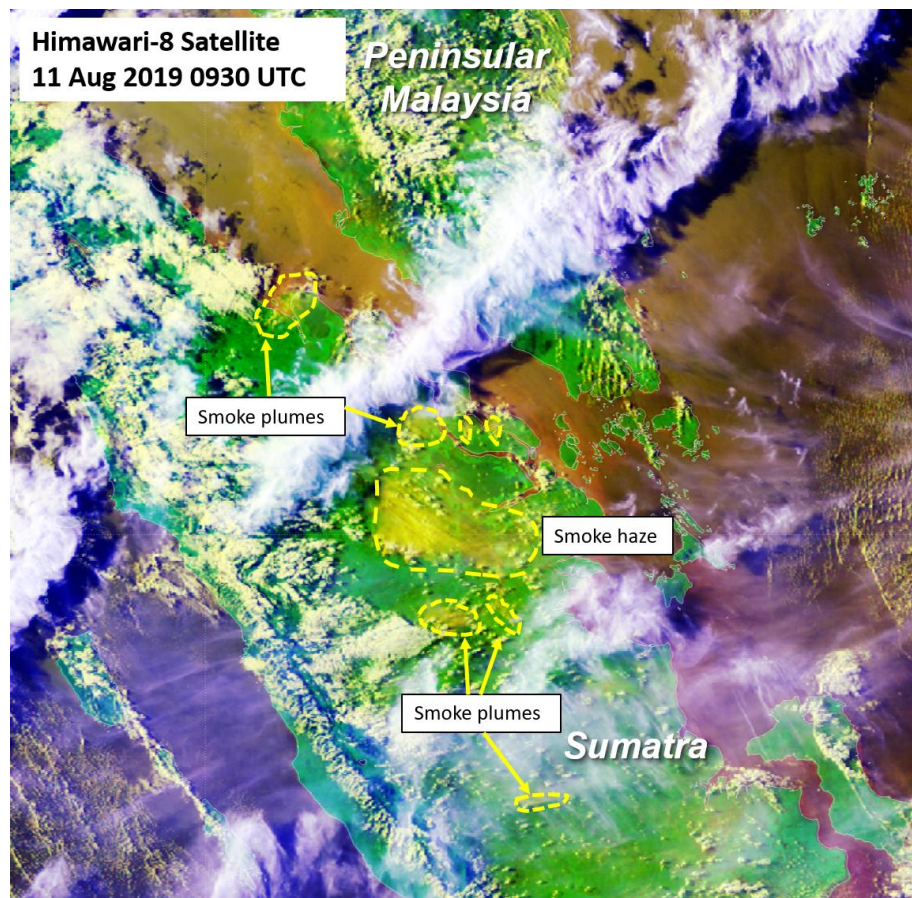


Figure 5: Himawari-8 satellite image showing moderate to dense smoke haze from hotspots detected in central and southern Sumatra.

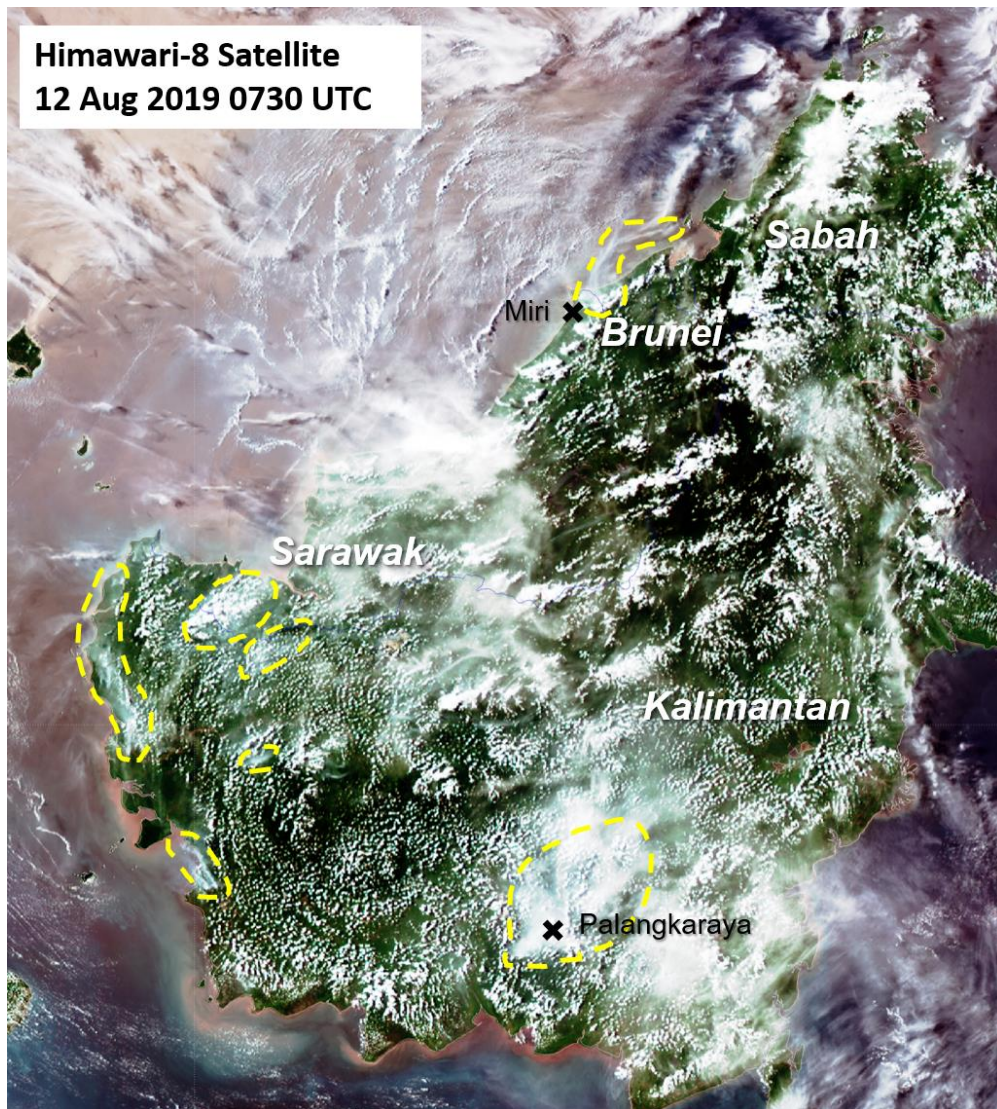


Figure 6: Himawari-8 satellite image showing moderate to dense smoke haze from persistent hotspots near Palangkaraya, Central Kalimantan. Smoke plumes were also observed in West and South Kalimantan. Smoke haze in West Kalimantan was blown into Sarawak by the prevailing winds. In Sarawak, smoke plumes from hotspots in Miri were blown eastwards toward Brunei.