

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

1.1 In the first fortnight of November 2019, northeasterly winds prevailed over many parts of the northern ASEAN region (Figure 1). Under the influence of Tropical Storms Matmo and Nakri (Figure 2), there were anomalously strong westerly winds to the east of Viet Nam and west of the Philippines. Over the equatorial region, winds were weak and variable in direction. In parts of the southern ASEAN region south of the equator, the prevailing winds blew mainly from the southeast.

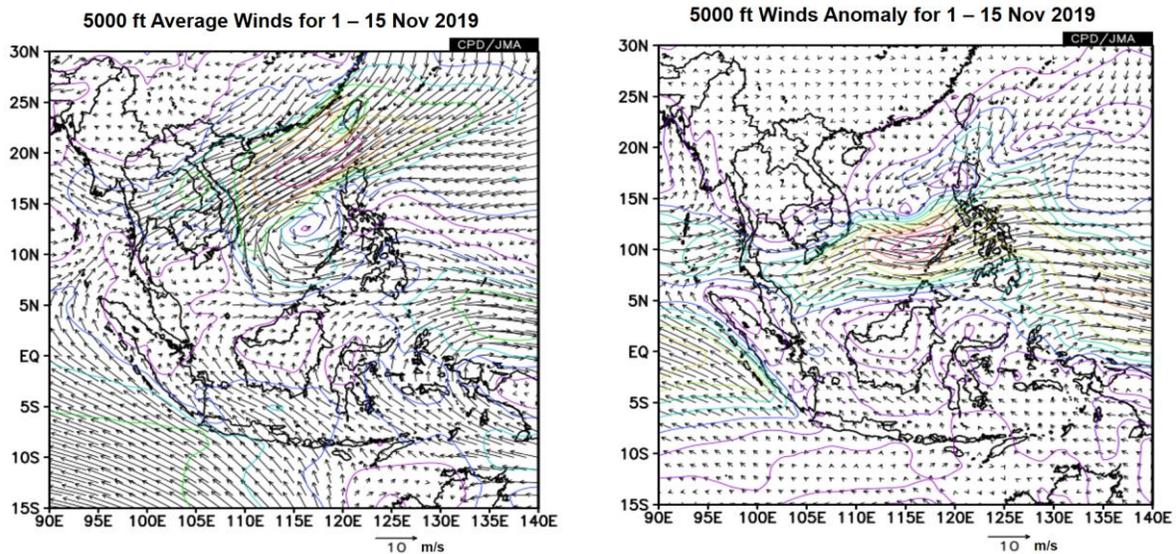


Figure 1: 5000 ft average winds (left) and winds anomaly (right) for 1 - 15 November 2019. (Source: JMA)

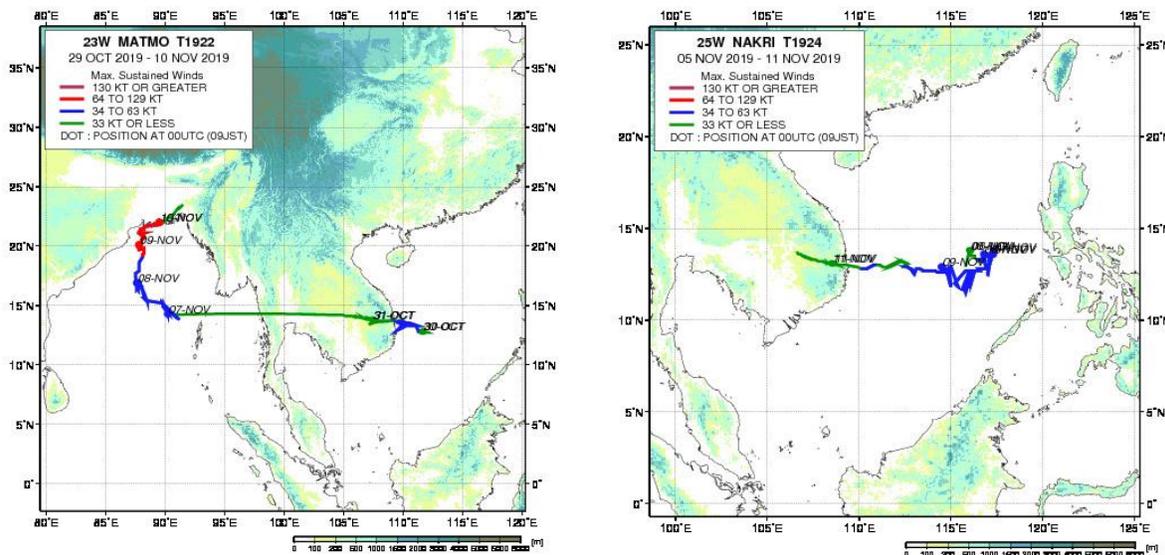


Figure 2: Historical track of Tropical Storm Matmo (left) and Tropical Storm Nakri (right). (Source: JAXA)

1.2 In the northern ASEAN region, the occurrence of the tropical storms resulted in above-average rainfall over the Philippines and Viet Nam, while drier conditions prevailed over many parts in the Mekong sub-region. In the southern ASEAN region, the monsoon rain band over the equatorial areas brought above-average rainfall over Sumatra, western Java, Malaysia, and most parts of Kalimantan. Figures 3 and 4 shows the daily average rainfall and the percentage of average rainfall respectively for the second fortnight of November 2019.

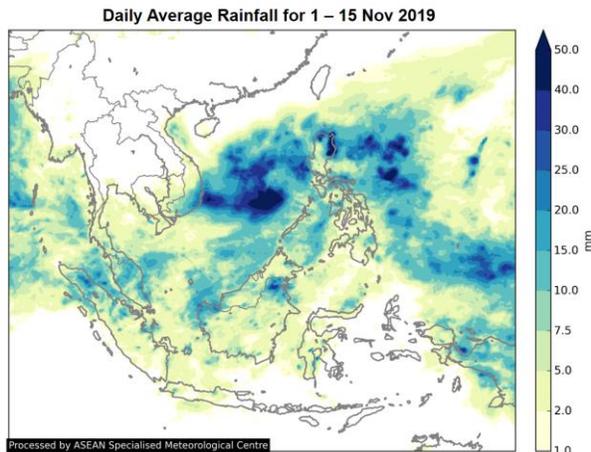


Figure 3: Daily average rainfall for the ASEAN region in the first fortnight of November 2019. (Source: JAXA Global Satellite Mapping of Precipitation)

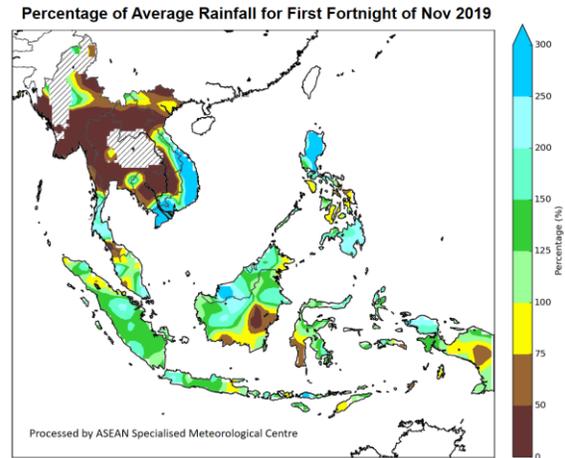


Figure 4: Percent of average rainfall for 1 – 15 November 2019. The rainfall data may be less representative for areas with a less dense rainfall network. (Source: IRI NOAA/NCEP CPC Unified Precipitation Analyses)

1.3 The Madden-Julian Oscillation (MJO) strengthened and propagated from Phase 5 to Phase 8 in the first fortnight of November 2019. However, its effect in moderating the rainfall over the southern ASEAN region was offset by the development of low-pressure systems over the South China Sea during the period.

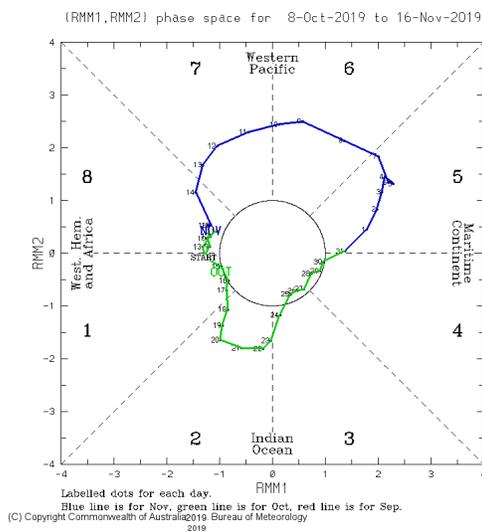


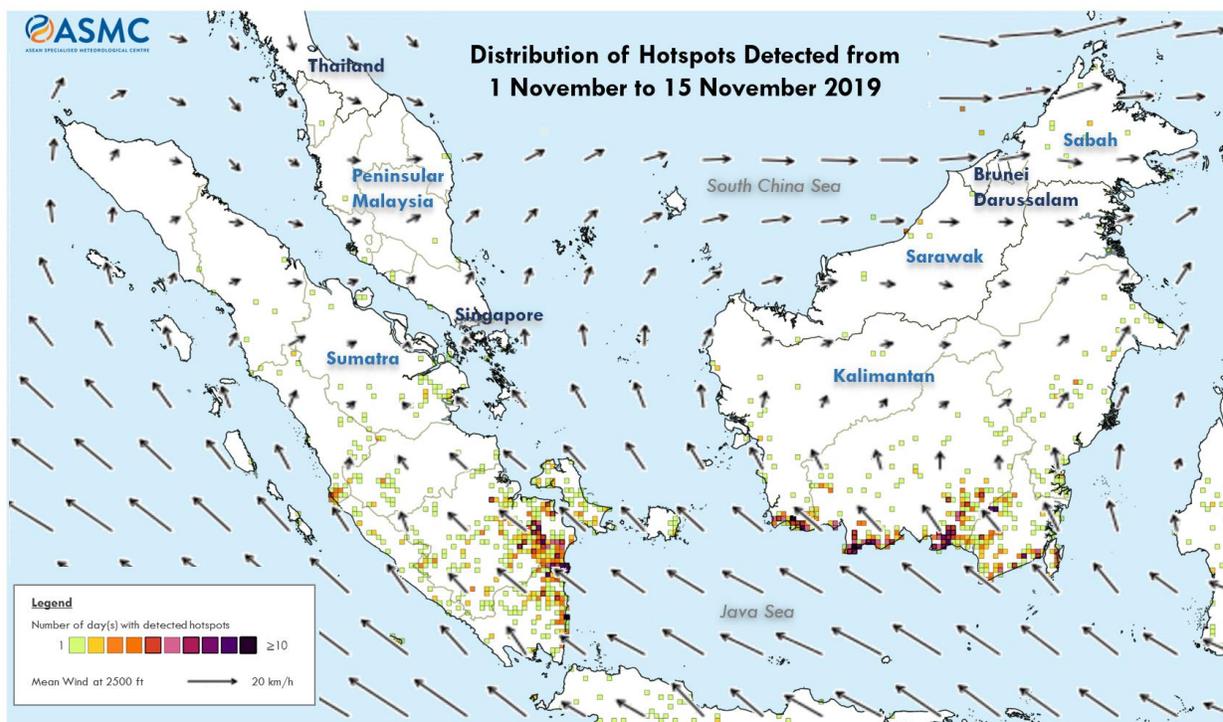
Figure 5: The MJO phase diagram for Nov 2019 (blue). The diagram illustrates the movement of the MJO through different phases, which correspond to different locations along the equator. The distance of the index from the centre of the diagram is correlated with the strength of MJO. When the index falls within the circle, the MJO is considered weak or indiscernible. (Source: Bureau of Meteorology)

1.4 The El Niño – Southern Oscillation (ENSO) remained in the neutral state in the first half of November 2019, and the sea-surface temperatures (SST) over the tropical Pacific Ocean continued to cool. Over the Indian Ocean, the positive phase of the Indian Ocean Dipole (IOD) persisted.

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

2.1 In the first fortnight of November 2019, hotspot activities in the northern ASEAN region remained subdued.

2.2 In the southern ASEAN region, there were persistent hotspot clusters and moderate to dense smoke haze mainly in the Sumatran provinces of South Sumatra and Lampung. There were also isolated hotspots with localised smoke plumes detected in southern Kalimantan and some parts of the Lesser Sunda Islands.



Note:

- Hotspots may not have been detected on some days due to cloudiness or partial satellite pass.
- Each coloured 10km x 10km grid represents the number of days in which hotspots were detected within that grid over the two-week period. A darker grid colour indicates more days with detected hotspots within that grid.

Figure 6: Distribution of hotspots detected based on NOAA-20 satellite surveillance and mean winds at 2500 ft in the first fortnight of November 2019 (Source of wind data: JMA)

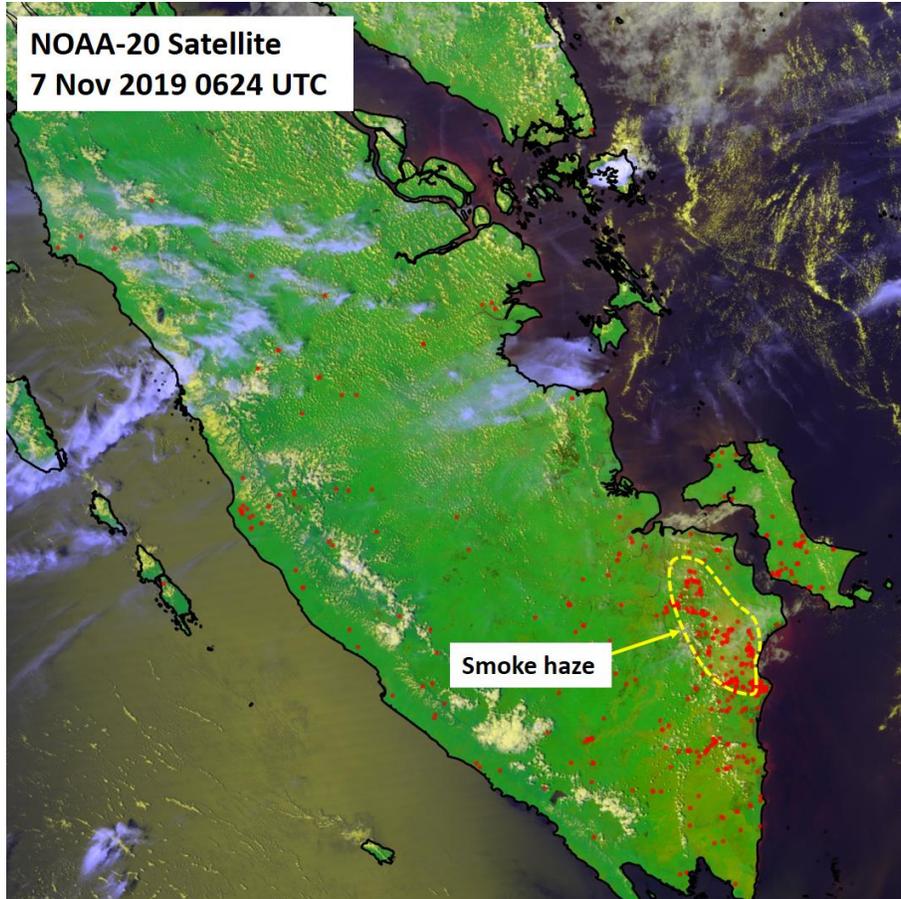


Figure 7: NOAA-20 satellite image on 7 November 2019 shows smoke haze from hotspot clusters in the southern parts of Sumatra.