

## 1. Review of Regional Weather Conditions for First Fortnight of January 2019

1.1 Northeast Monsoon conditions prevailed over the ASEAN region. In the Mekong sub-region, dry weather persisted over most parts of the region, except for some isolated showers that fell over coastal Viet Nam on a few days due to the strengthening of northeasterly and easterly winds over the South China Sea. Rainy conditions were also experienced in southern Thailand and northern Peninsular Malaysia due to the passage of Typhoon Pabuk during the first week of the month. This resulted in above-average rainfall over southern Thailand and northern Peninsular Malaysia.

1.2 There were scattered shower activities over the southern ASEAN region, and most parts of the region received average to above-average rainfall. However, there were some areas where below-average rainfall was received, namely parts of Malaysia, northern Sumatra, and Java.

1.3 The rainfall distribution and the percent of average rainfall for the first fortnight of January 2019 are shown in Figure 1 and 2.

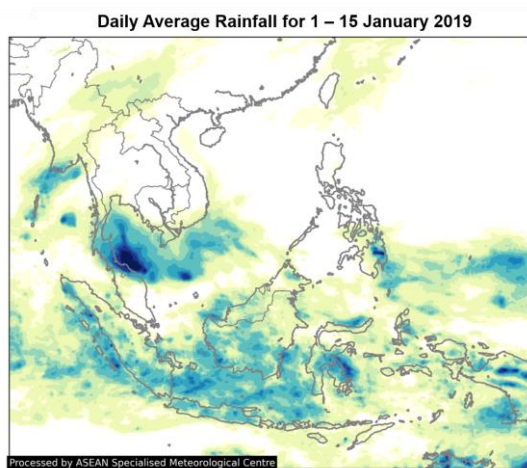


Figure 1: Daily average rainfall for the ASEAN region in the first fortnight of January 2019. (Source: JAXA Global Satellite Mapping of Precipitation)

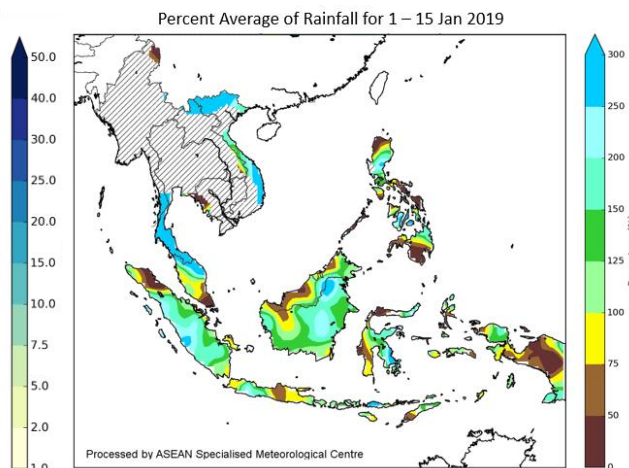


Figure 2: Percent of average rainfall for 1 – 15 January 2019. The rainfall data may be less representative for areas with a less dense rainfall network. Grey shades indicate climatology dry mask (average daily rainfall below 1 mm). (Source: IRI NOAA/NCEP CPC Unified Precipitation Analyses)

1.4 In the northern ASEAN region, moderate to strong easterly winds prevailed over the South China Sea area. There were also anomalously southwesterly winds under the influence of the Typhoon Pabuk. In the southern ASEAN region, anomalous westerly winds were recorded.

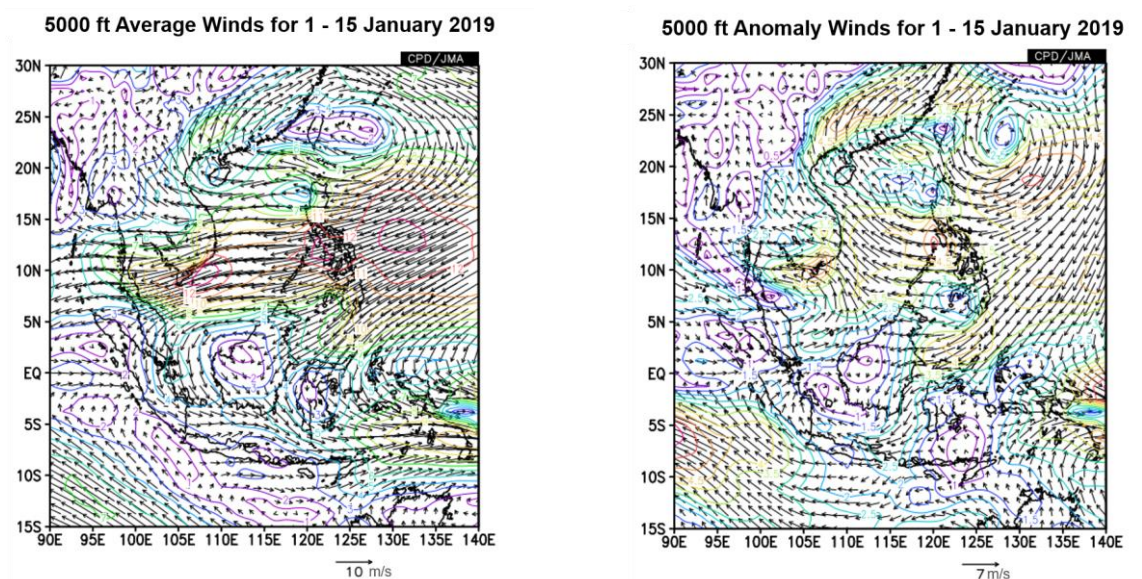


Figure 3: 5000 ft average winds (left) and winds anomaly (right) for 1 - 15 January 2019. (Source: JMA)

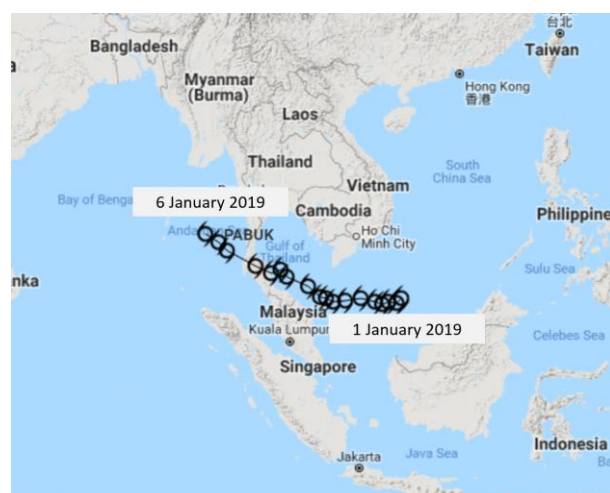


Figure 4: Track of Typhoon Pabuk between 1 and 6 January 2019.

1.5 The sea surface temperature (SST) over the tropical Pacific Ocean is warmer than average, but temperatures remained in weak El Nino conditions and have weakened further. Prevailing atmospheric response, viz the cloudiness and trade winds over the tropical Pacific Ocean have remained neutral.

1.6 During the fortnight, moderate to strong Madden Julian Oscillation (MJO)<sup>1</sup> signals propagated through Phase 6 - 8. The signal weakened towards the end of the second week of the fortnight. Although MJO signals in Phase 6 – 8 typically brought dry weather to the region, the MJO did not significantly influenced the weather in Southeast Asia during this period.

<sup>1</sup> 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.

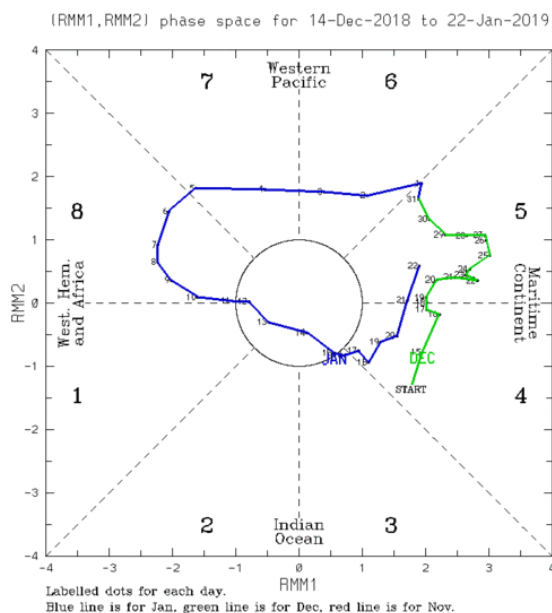


Figure 5: The MJO phase diagram for Jan 2019 (blue). The diagram illustrates the movement of the MJO through different phases, which correspond to different locations along the equator. The distance of the index from the centre of the diagram is correlated with the strength of MJO. When the index falls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

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

2.1 In the Mekong sub-region, prolonged dry weather led to an escalation of hotspot activities in Cambodia. A build-up of smoke haze was observed around persistent hotspot clusters in Cambodia and smoke haze was blown westward toward Thailand. In Thailand, isolated hotspots with localised smoke plumes were also observed. In the southern ASEAN region, hotspot activities were subdued under the prevailing wet conditions.

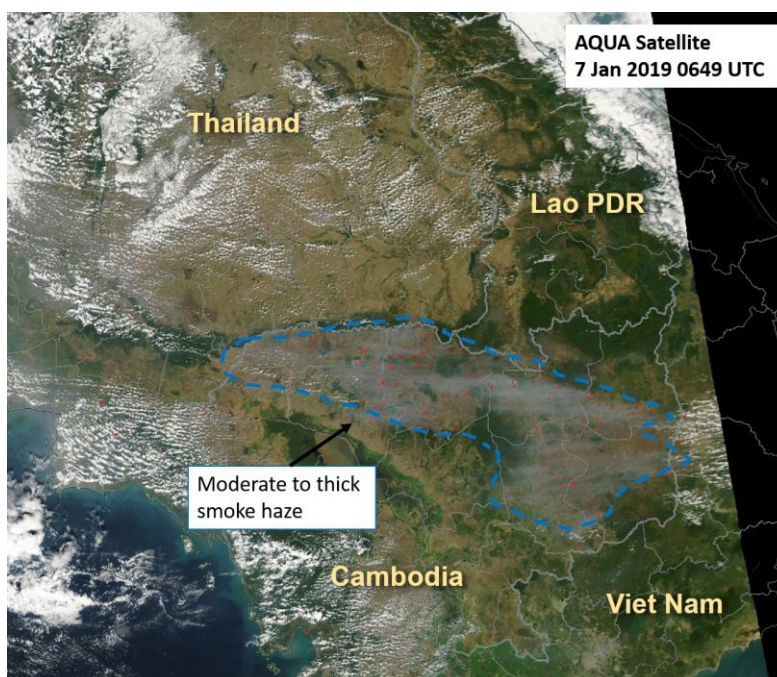
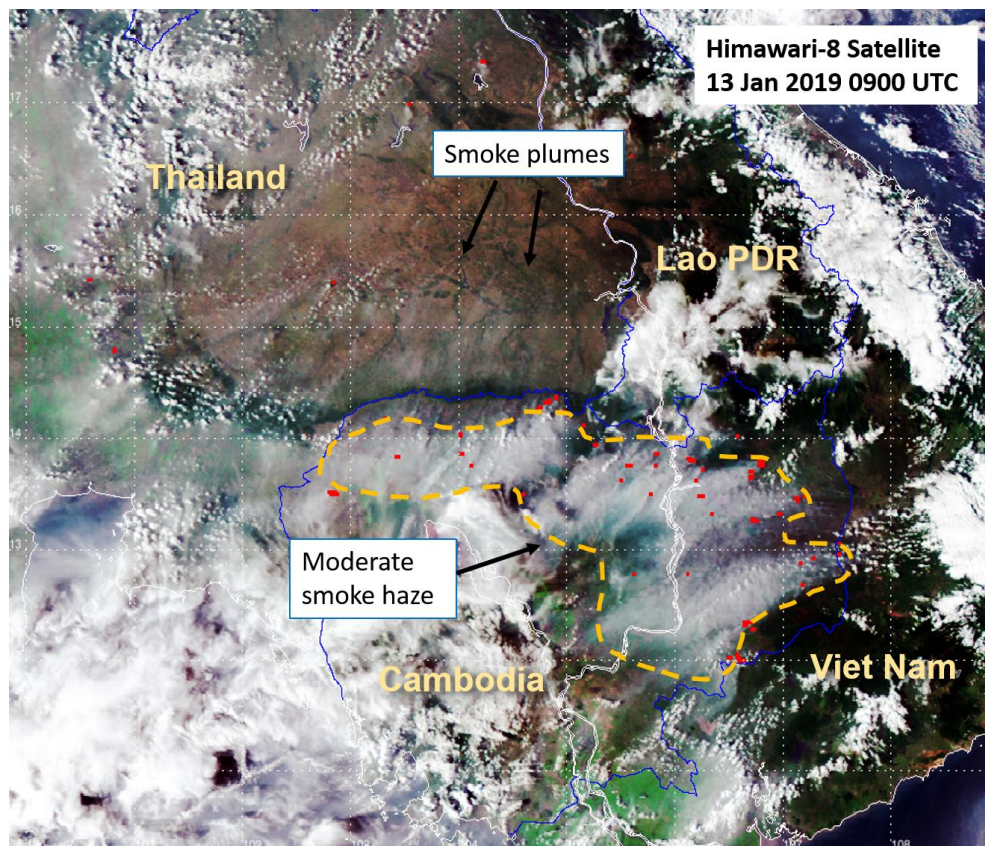


Figure 6: AQUA satellite image on 7 Jan 2019 shows moderate to dense smoke haze observed in Cambodia.





*Figure 7: Himawari-8 satellite image on 13 Jan 2019 shows moderate smoke haze observed in Cambodia. Localized smoke plumes were also observed in the vicinity of isolated hotspots in northeastern Thailand.*