

## 1. Review of Regional Weather Conditions for Second Fortnight of June 2018

1.1 The southwest monsoon conditions prevailed in the second fortnight of June 2018. Shower activities were observed over many parts of the region.

1.2 During this period, there were isolated showers over parts of the northern ASEAN region but wetter weather was observed over coastal areas of Myanmar. In southern Myanmar, heavy rains reportedly triggered floods and landslides during the beginning of the second fortnight. Based on climatology, the wet conditions over coastal Myanmar is typical during this period of the season. Most parts of the Mekong sub-region experienced below-normal to near-normal rainfall, while northern and coastal areas of Myanmar, eastern Cambodia and southern Vietnam received above-normal rainfall.

1.3 In the southern ASEAN region, large scale convergence of winds caused by a circulation west of Borneo brought widespread shower activities over the region. Most areas experienced wetter than usual conditions, except for central Sumatra, central Kalimantan and Java where below-normal rainfall were received.

1.4 The rainfall distribution and the percentage of normal rainfall for the second fortnight of June 2018 are shown in Figure 1 and 2.

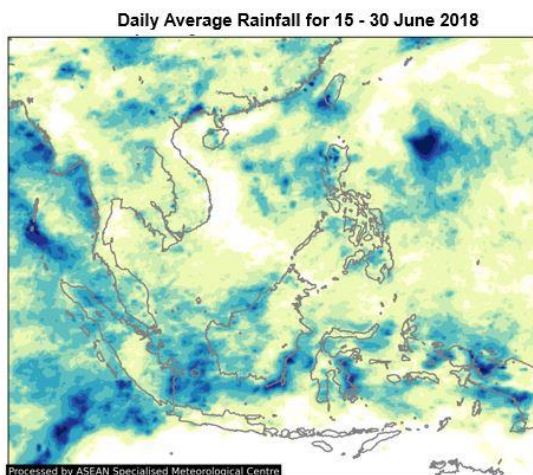


Figure 1: Daily average rainfall for the ASEAN region in the second fortnight of June 2018. (Source: JAXA Global Satellite Mapping of Precipitation)

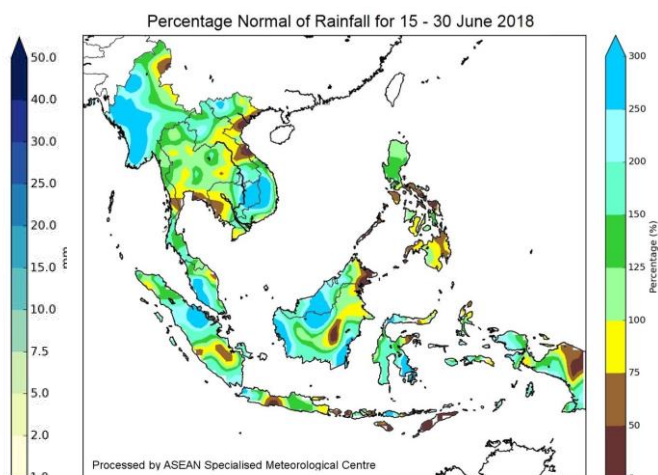


Figure 2: Percentage of Normal Rainfall for 15 – 30 June 2018. The rainfall data may be less representative for areas with a less dense rainfall network. (Source: IRI NOAA/NCEP CPC Unified Precipitation Analyses)

1.5 During the second fortnight of June 2018, weather in the region was influenced by Tropical Storm “Gaemi” and Typhoon “Prapiroon” as well. Rainbands associated with “Gaemi” brought widespread showers over parts of the northern ASEAN region, and persistent wet weather over Sumatra, Peninsular Malaysia and Singapore in the southern ASEAN region. Toward the end of June 2018, rain bands from “Prapiroon” also brought widespread showers over most parts of the ASEAN region.

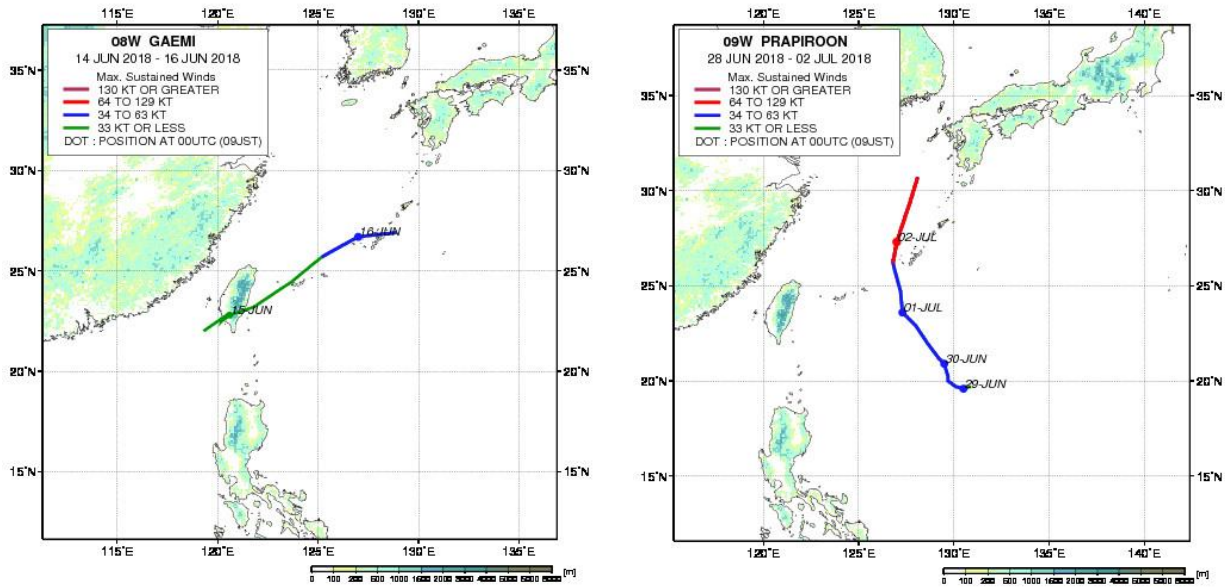


Figure 3 Historical storm track for Tropical Storm Gaemi and Typhoon Prapiroon. (Source: JAXA)

1.6 Prevailing winds over the northern ASEAN region and the South China Sea were weaker than usual and blew predominantly from the southwest or west. Over the southern ASEAN region, easterly to southeasterly winds prevailed. Figure 4 shows the average and anomalous winds at 5000 feet.

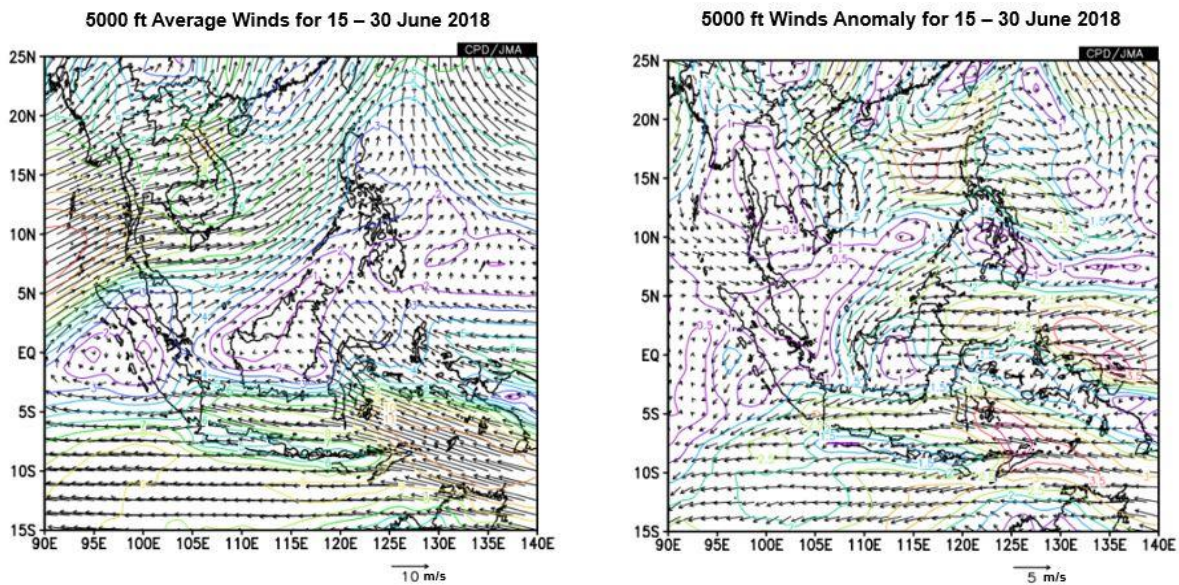


Figure 4: 5000 ft average winds (left) and anomaly (right) for 15 - 30 June 2018. (Source: JMA)

1.7 The El Niño-Southern Oscillation (ENSO) remained in the neutral state (neither El Niño nor La Niña). The atmospheric and oceanic indicators of ENSO such as sea surface temperature and trade winds were also indicative of neutral conditions, although the sea surface temperatures in the eastern Pacific Ocean have been observed to be warming slowly.

1.8 The Madden Julian Oscillation (MJO)<sup>1</sup> progressed from Phase 1 to Phase 2 before the signal weakened toward the end of the month. Typically, the MJO in Phases 1 and 2<sup>2</sup> brings less rainfall over the coastal Myanmar region and the South China Sea, and the MJO in Phase 2 would bring slightly enhanced rainfall around Sumatra and Borneo. In the second fortnight of June 2018, an increase in rainfall was observed along the belt between the Equator and 5°S.

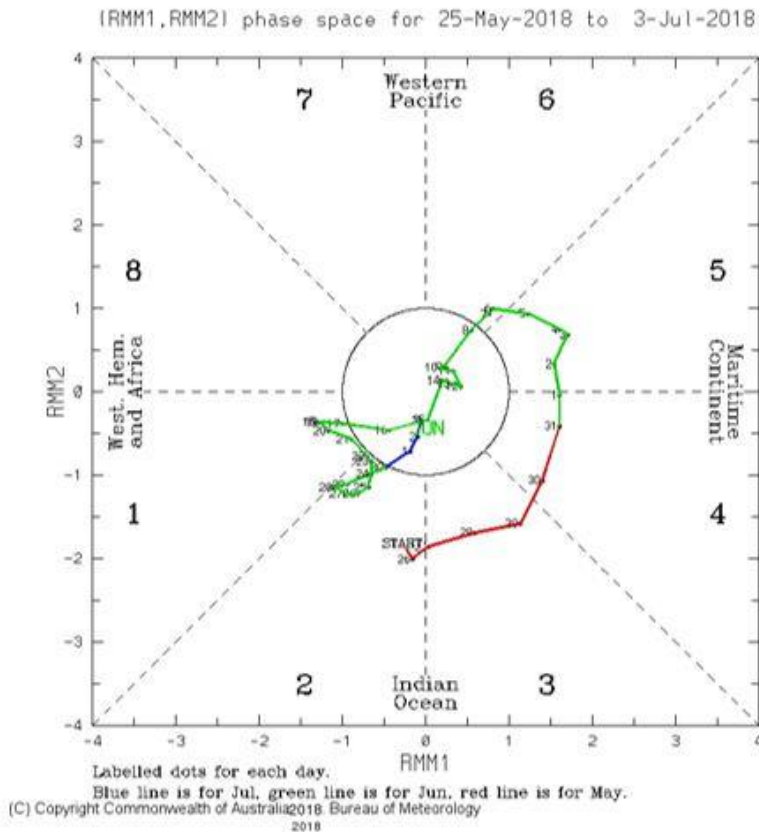


Figure 5: The MJO phase diagram for June 2018 (green). The diagram illustrates the movement of the MJO through different phases, which correspond to different locations along the equator. The distance of the index from the centre of the diagram is correlated with the strength of MJO. When the index falls 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 During the review period, there were isolated hotspots detected in the ASEAN region, but the overall hotspot activities were generally subdued due to the wet weather.

2.2 During the brief periods of drier weather, there were a few hotspots with thin smoke plumes observed on one or two days in central Sumatra. However, the smoke plumes were localised and short-lived.

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

<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.

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

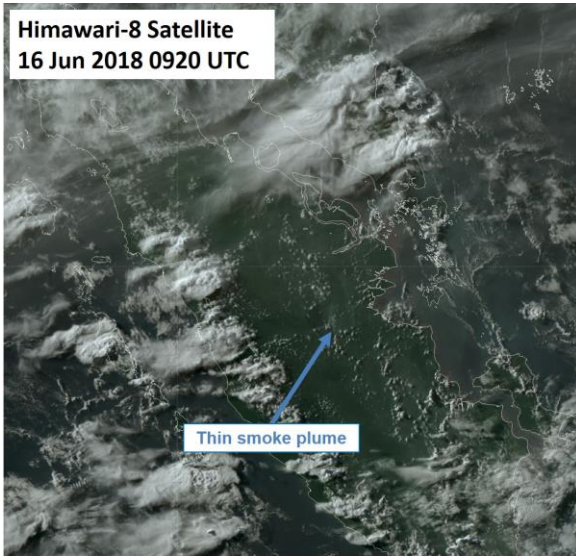


Figure 6: Himawari-8 satellite image on 16 Jun 2018 shows a thin smoke plume over central Sumatra.

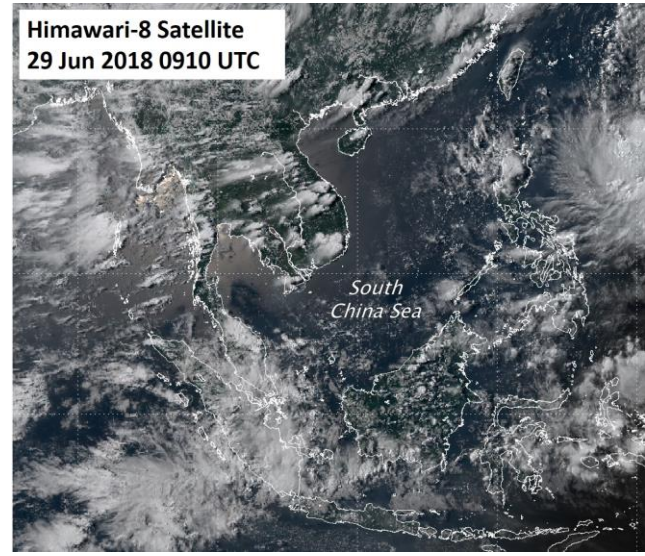


Figure 7: Himawari-8 satellite image on 29 Jun 2018 shows wet weather prevailed over most parts of the region.