UPDATE OF REGIONAL WEATHER AND SMOKE HAZE (Second Fortnight of October 2018)

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

1.1 Inter-Monsoon conditions prevailed in the second fortnight of October 2018. The monsoon rainband along the equatorial ASEAN region continued to bring rainy weather to the southern ASEAN region. The passage of super typhoon Yutu across northern Philippines brought heavy rainfall to the Philippines and parts of the northern ASEAN region. Central parts of Sumatra and Kalimantan, and Luzon Island received above normal rainfall.

1.2 Parts of the Mekong sub-region experienced dry weather, in particular in areas such as northern Myanmar, southern parts of Lao PDR and Viet Nam, Cambodia and western Thailand, received below normal rainfall. Due to the occasional incursion of dry air from the southern hemisphere, areas around the Java Sea, including southern parts of Sumatra and Kalimantan and eastern Java, also received below normal rainfall.

1.3 The daily average rainfall and the percentage of average rainfall for the second fortnight of October 2018 are shown in Figure 1 and Figure 2 respectively.

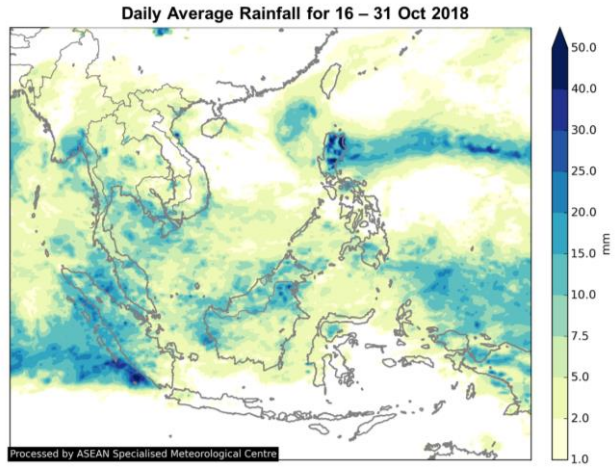

Figure 1 Daily average rainfall for the ASEAN region in the second fortnight of October 2018. (Source: JAXA Global Satellite Mapping of Precipitation)

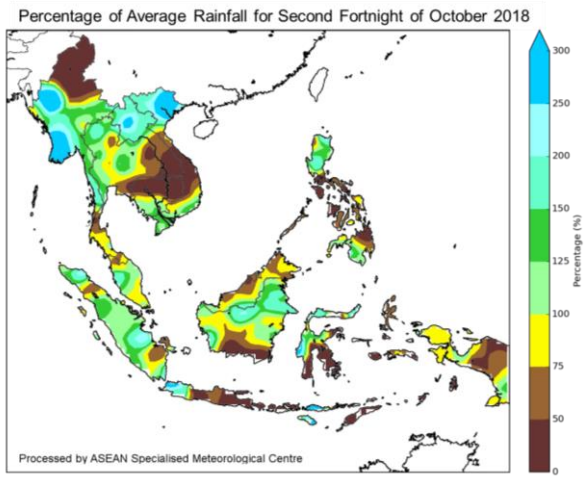

Figure 2 Percentage of average Rainfall for 16 – 31 October 2018. The rainfall data may be less representative for areas with a less dense rainfall network. (Source: IRI NOAA/NCEP CPC Unified Precipitation Analyses)

1.4 On 21 October 2018, a tropical depression to the east of Guam strengthened into tropical storm Yutu, which subsequently tracked westwards and intensified into a super typhoon by 24 October 2018. After making landfall on the island of Luzon, the Philippines on 30 October 2018, Yutu traversed across the island, bringing torrential rainfall to northern Philippines. It later tracked north-westward into the South China Sea and weakened into a tropical depression. The track of Super Typhoon Yutu from 21 October 2018 to 2 November 2018 is shown in Figure 3.

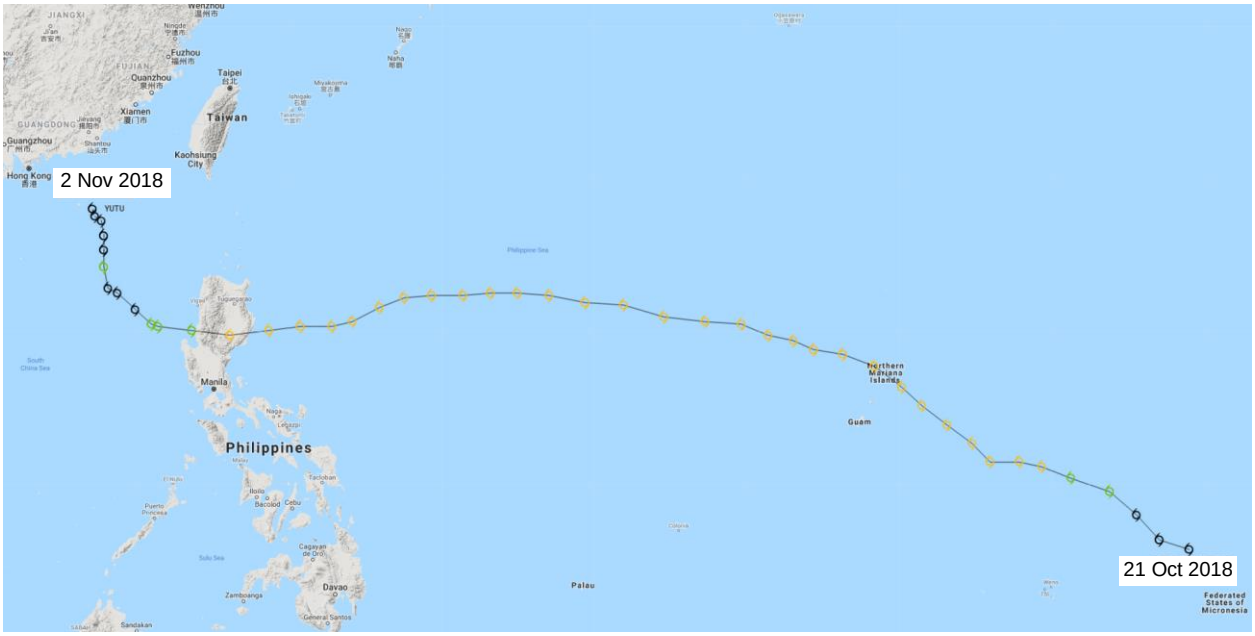

Figure 3 Track for Super Typhoon Yutu (21 Oct – 2 Nov 2018)

1.5 The persistent high pressure system over north Asia resulted in anomalous north-easterly winds over the northern ASEAN region and South China Sea. To the south, anomalously strong south-easterly winds were observed over the Java sea area. Elsewhere in the region, winds were close to normal conditions.

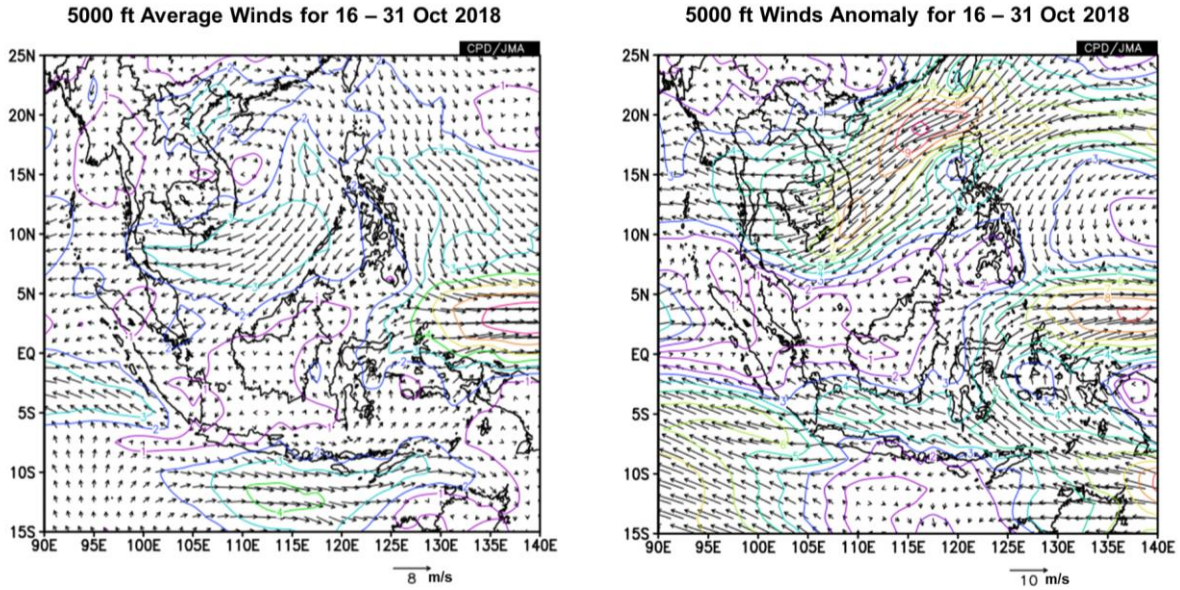

Figure 4 5000 ft average winds (left) and anomalies (right) for 16 - 31 Oct 2018. (Source: JMA)

1.6 There were signs of El Niño conditions developing, including the warming of sea surface temperature over the tropical Pacific Ocean, warmer than average sea sub-surface temperatures and weakening of trade winds. In addition, the sea surface temperature difference between the western and eastern Indian Ocean continued to indicate a positive Indian Ocean Dipole (IOD) event.

1.7 The Madden Julian Oscillation (MJO)[1] weakened in Phase 3[2] during the third week of October 2018. MJO Phase 3 typically brings wetter weather over the western half of the ASEAN region and drier weather over the Philippines and the surrounding vicinity. This was broadly consistent with the regional rainfall patterns observed.

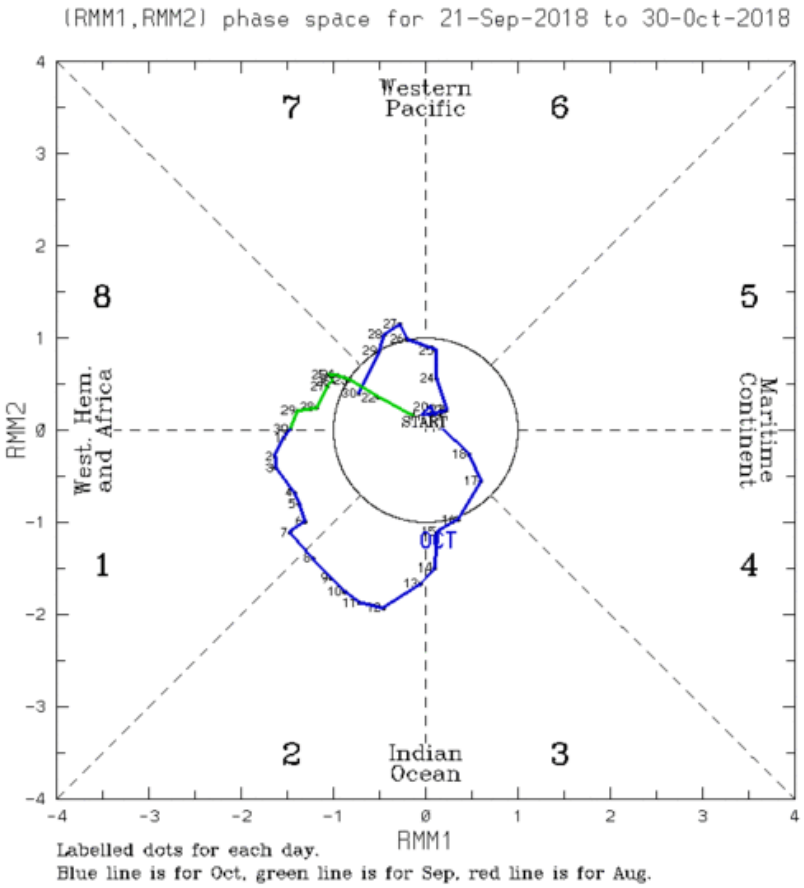

Figure 5 The MJO phase diagram for September-October 2018 (blue for October). The diagram illustrates the movement of the MJO through different phases, which correspond to different locations along the equator. The distance of the index from the centre of the diagram is correlated with the strength of 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 There were no significant hotspot activities observed in the region in the second half of October 2018. While rainy weather due to the monsoon rainband helped to keep hotspot activities in the southern ASEAN region generally subdued, there were some isolated hotspots with localized smoke plumes observed in Sumatra and Kalimantan. In the northern ASEAN region, isolated hotspot activities began to emerge towards the end of the fortnight due to the dry conditions prevailing over the region.

2.2 Figures 6 show satellite image over the ASEAN region in the second fortnight of October 2018.

[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.

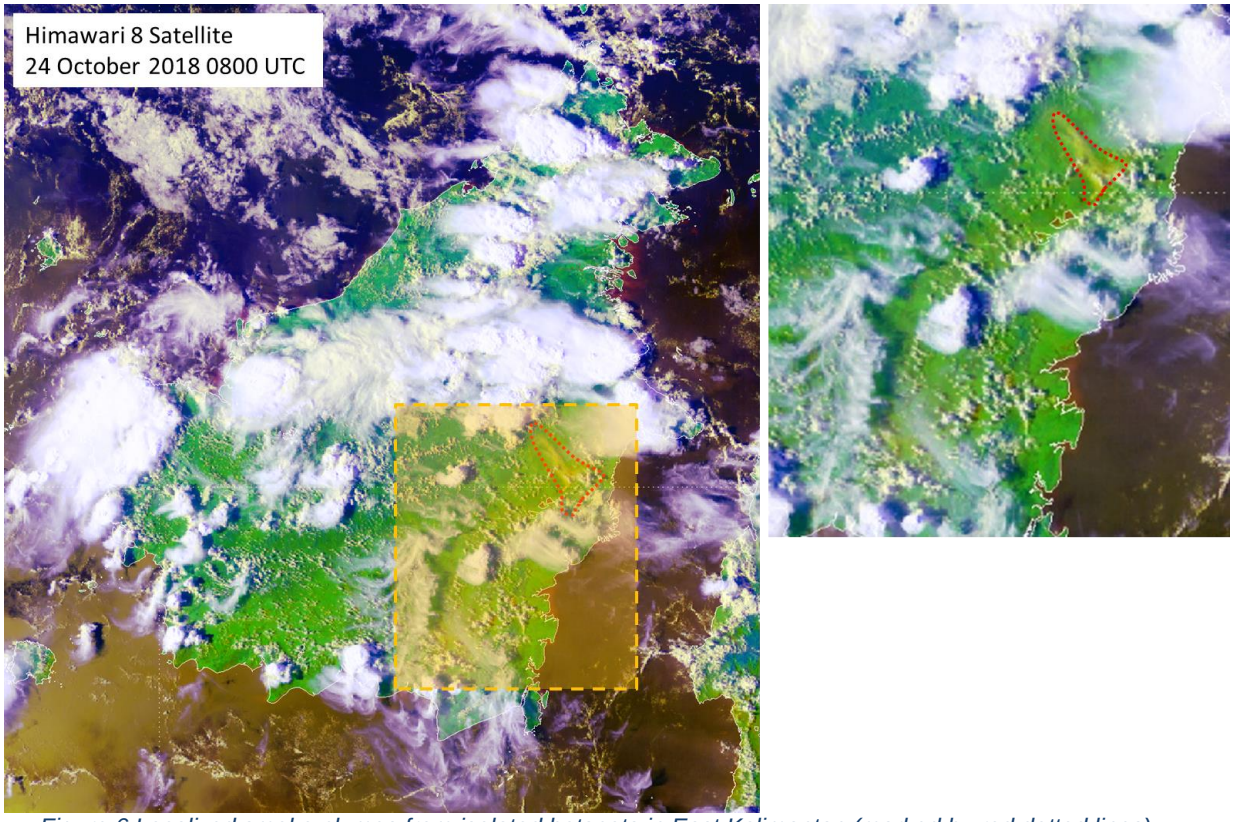

Figure 6 Localized smoke plumes from isolated hotspots in East Kalimantan (marked by red dotted lines)