

## UPDATE OF REGIONAL WEATHER AND SMOKE HAZE November 2016

### 1. Review of Regional Weather Conditions in November 2016

1.1 Southwest Monsoon conditions prevailed on most days in October 2016 and the winds were blowing mostly from the west over most of the ASEAN region. In October 2016, there was a gradual increase of shower activities over the southern ASEAN region, and wetter than usual weather conditions were experienced in Java due to the warmer than usual sea surface temperatures over the eastern Indian Ocean. In contrast, the northern ASEAN region experienced less rainfall with dry weather conditions beginning to set in over parts of the region..

1.2 On 16 October, Typhoon Sarika made landfall and brought strong winds and heavy rains over central Luzon, the Philippines before tracking west-northwestward toward Hainan Island. This was followed by the passage of Super Typhoon Haima, which struck the northern tip of Luzon, the Philippines on 19 October 2016. Super Typhoon Haima moved to the northwest over the South China Sea and continued to steer toward southern China. The influence of both typhoons brought moderate to heavy rainfall parts of Indonesia, Peninsular Malaysia, Singapore, and Borneo Island as well.

1.3 Towards the end of October 2016, the region gradually transitioned from Southwest Monsoon conditions to Inter-Monsoon conditions. For October 2016, the Philippines and most parts of the Mekong sub-region received near-normal to above-normal rainfall. In the southern ASEAN region, near-normal rainfall prevailed over most parts of the near-equatorial region. Above-normal rainfall continued to prevail over Kalimantan, Java and the eastern parts of Indonesia Archipelago. The regional rainfall distribution for October 2016 is shown in Figure 1.

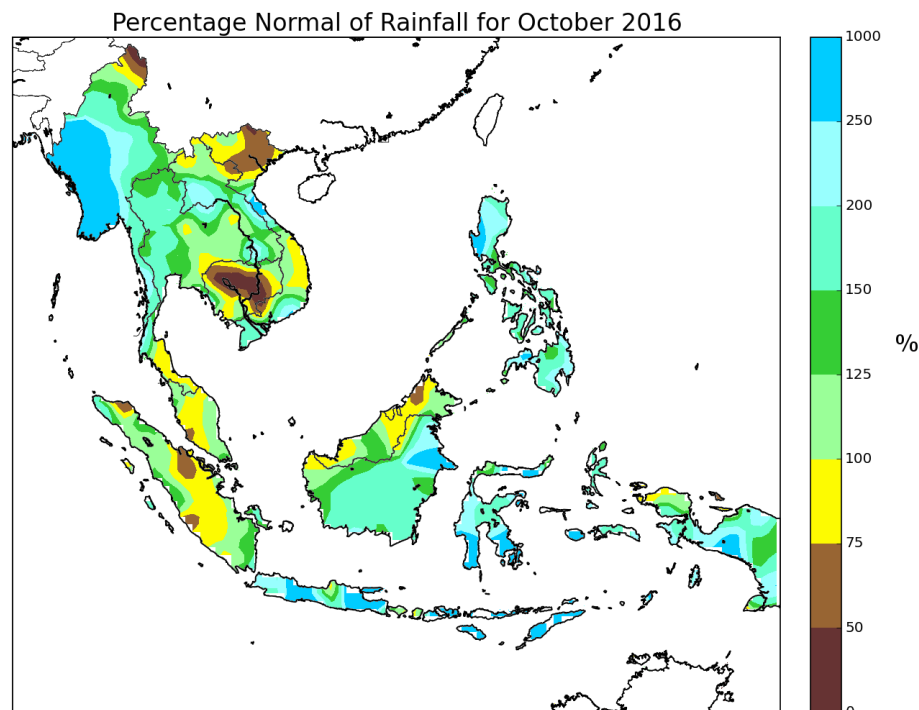


Figure 1: Percentage of Normal Rainfall for October 2016. The rainfall data may be less representative for areas with low density of rainfall network.

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

2.1 In October 2016, hotspot activities in both the northern and southern ASEAN region were largely subdued due to the prevailing wet weather conditions.

2.2 In early and mid-October 2016, there were brief periods of dry weather conditions over Sumatra and Kalimantan respectively. There was an increase in the number of hotspots, particularly in the western parts of central Sumatra and central Kalimantan. While smoke plumes were observed to emanate from some of the hotspots, the hotspot activities were localised and short-lived. The return of shower activities at the end of the brief dry periods helped to suppress the hotspot activities in Sumatra and Kalimantan. Satellite images depicting some of the hotspot activities over parts of the ASEAN region during October 2016 are shown in Figures 2A – 2E.

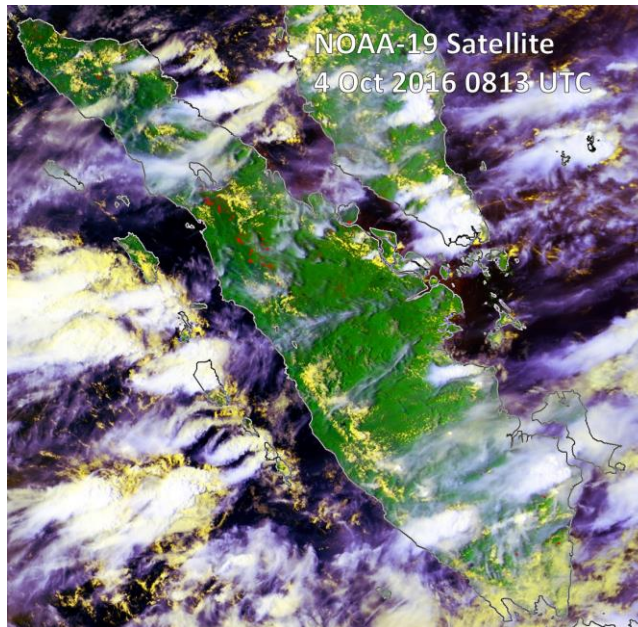


Figure 2A: NOAA-19 satellite image on 4 October shows isolated hotspot activities in western parts of central Sumatra.

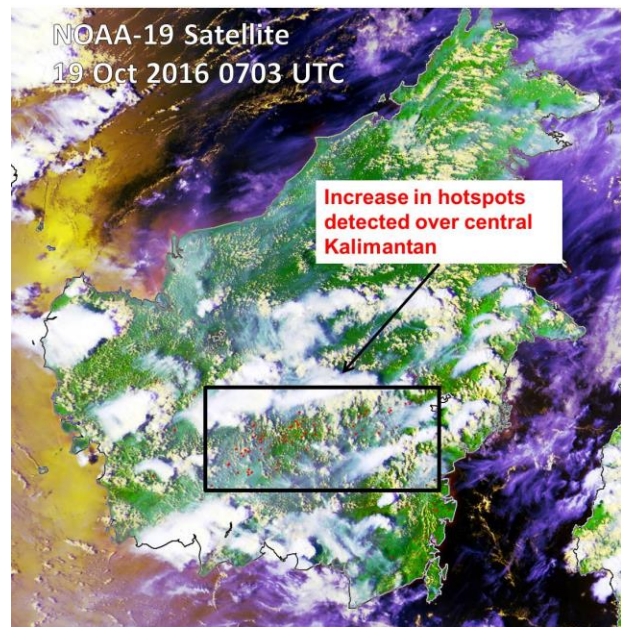


Figure 2B: NOAA-19 satellite image on 19 October 2016 shows an increase of hotspot activities in central Kalimantan following a brief period of dry weather conditions.



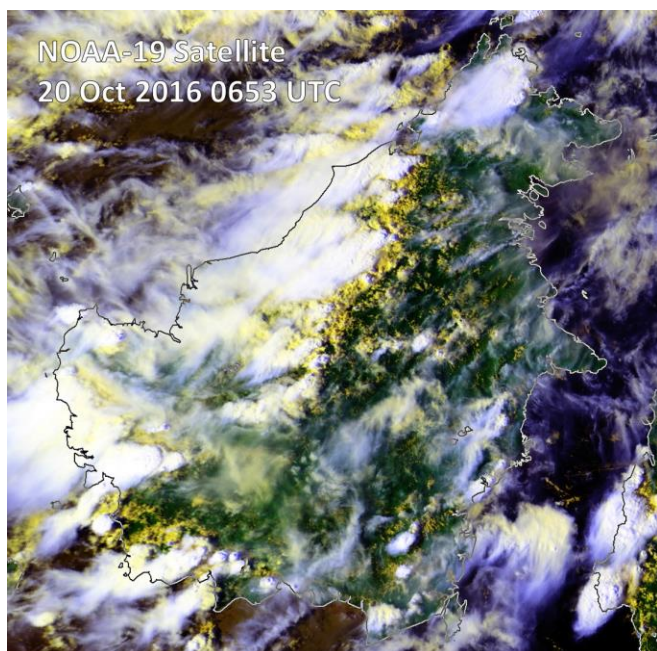


Figure 2C: NOAA-19 satellite image on 20 October 2016 shows returning shower activities over Kalimantan after a brief period of dry weather conditions.

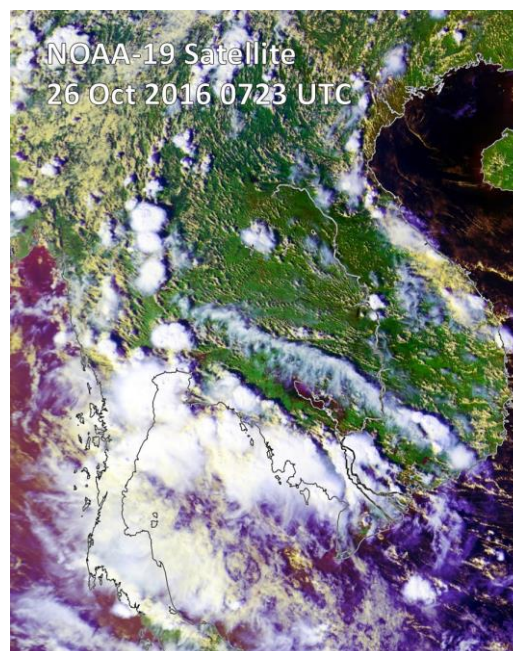


Figure 2D: NOAA-19 satellite image on 26 October 2016 shows isolated shower activities in parts of the Mekong sub-region.

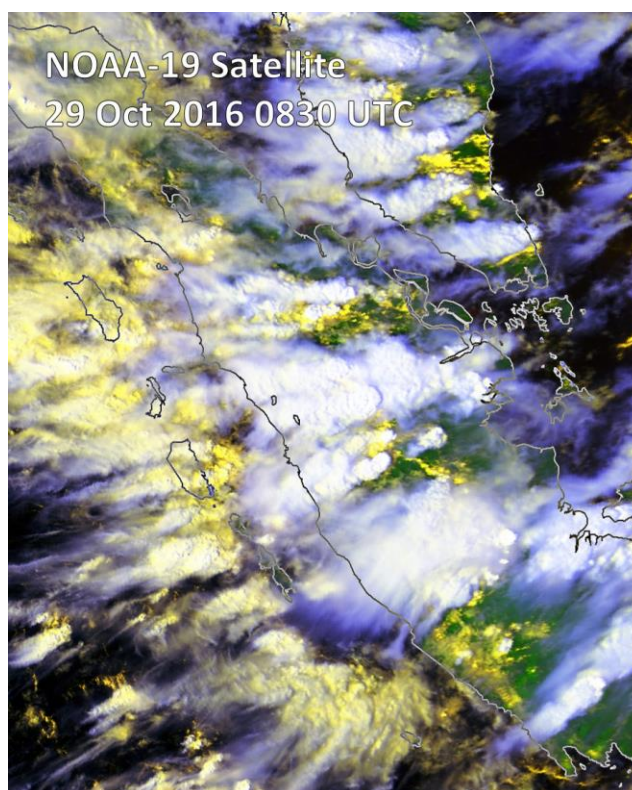


Figure 2E: NOAA-19 satellite image on 29 October 2016 shows widespread shower activities over Peninsular Malaysia and Sumatra.

- 2.3 The hotspot charts for October 2016 for
- a) Cambodia, Myanmar, Thailand, Lao PDR and Vietnam;
  - b) Sumatra, Borneo and Peninsular Malaysia;
- are shown in Figures 2F to 2G respectively.

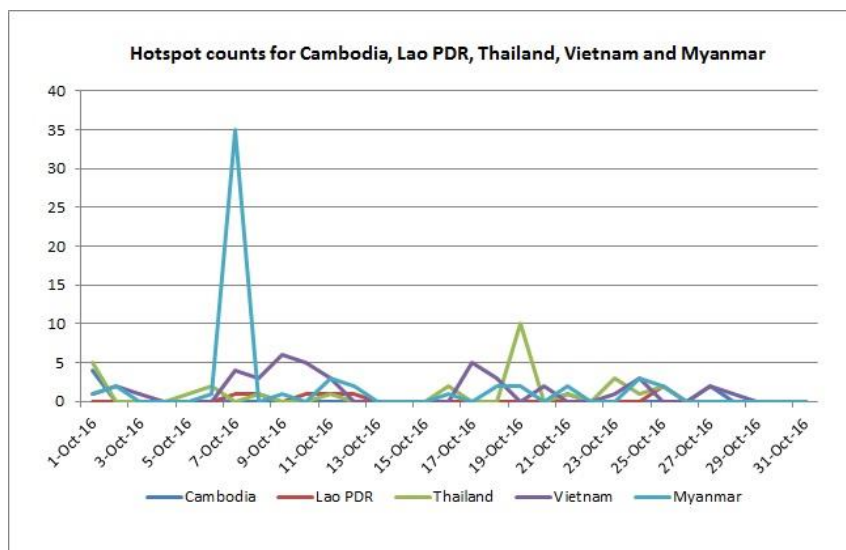


Figure 2F: Hotspot Counts in Cambodia, Lao PDR, Thailand, Vietnam, Myanmar for October 2016.

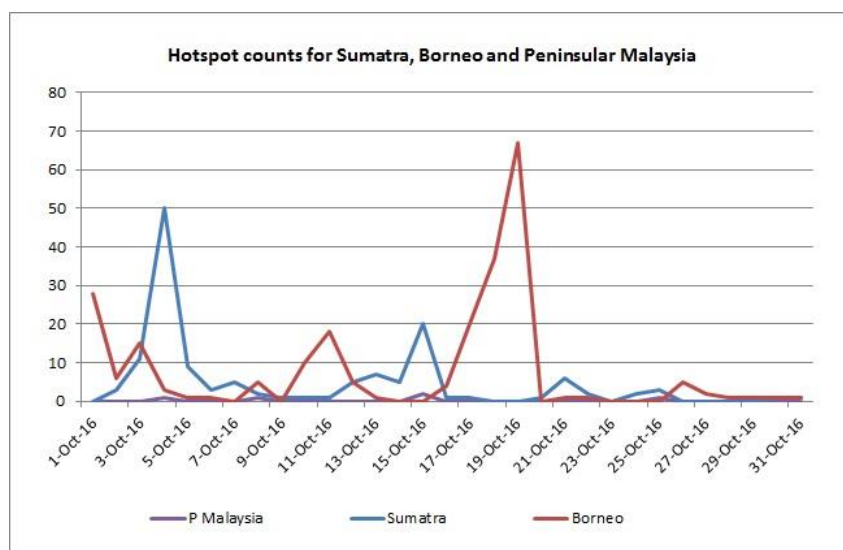


Fig 2G: Hotspot Counts in Sumatra, Borneo and Peninsular Malaysia for October 2016.

### 3. Status of El Niño/La Niña

3.1 In October 2016, the equatorial Pacific Ocean's sea-surface temperature (SST) anomaly over the Nino3.4 region was cooler than average, at borderline La Niña threshold values. Atmospheric variables, such as trade winds and cloudiness, over the equatorial Pacific were mostly at levels indicative of weak La Niña conditions.

3.2 Expert assessments of international climate models have maintained a 60% chance of weak or borderline La Niña developing in the November – January season.

3.3 The region is currently experiencing Inter-Monsoon conditions (Oct – Nov), and a transition into the Northeast Monsoon conditions (Dec – Mar) is expected in the latter part of November 2016. The impact of La Niña on the weather over the near-equatorial region is usually less pronounced during the Northeast Monsoon as compared to the Southwest Monsoon (Jun – Sep).

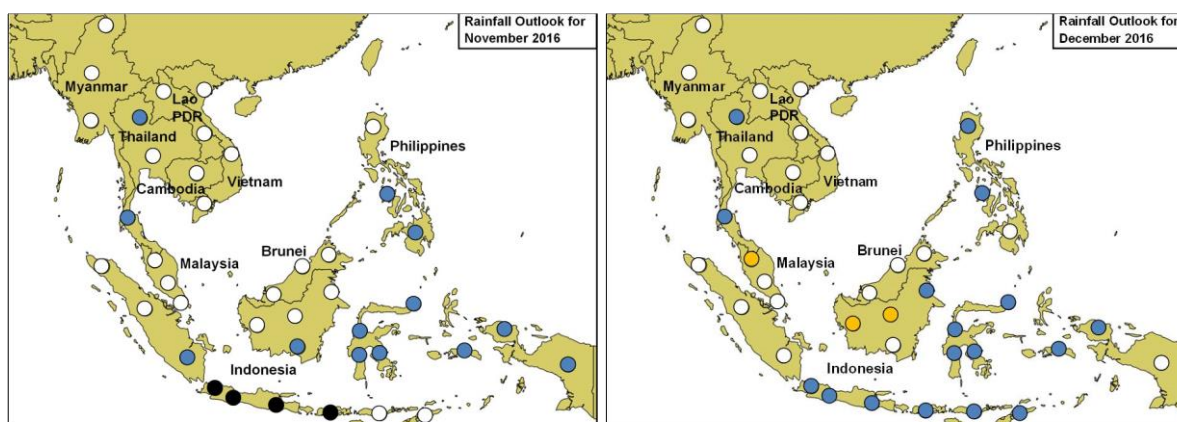
## 4. Outlook

4.1 Inter-Monsoon conditions typically characterised by light winds and shower activities interspersed with brief periods of dry weather conditions are expected to prevail over the ASEAN region for most parts of November 2016.

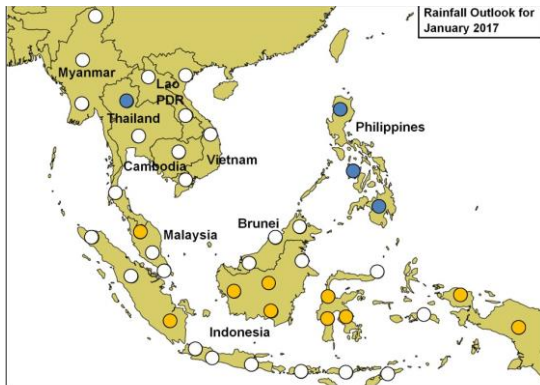
4.2 In late November 2016, a transition from Inter-Monsoon conditions to Northeast Monsoon conditions is expected. The northern ASEAN region would enter into their traditional dry season of the year, and hotspot activities are likely to increase as the dry season gradually becomes establish during the period. The southern ASEAN region on the other hand, would experience their traditional rainy season where an increase in shower activities can be expected over most parts of the near-equatorial region. The expected rainy weather is likely to further subdue the hotspot activities and keep the hotspot count low.

4.3 During the Northeast Monsoon season, the ASEAN region can experience several occurrences of monsoon surges due to cold air outbreaks from northern Asia. Monsoon surges that affect the southern ASEAN region typically bring prolonged moderate to heavy rainfall activities, where each episode could last from a few to several days.

4.4 For the upcoming November-December-January season, normal to slightly above-normal rainfall are expected for the Philippines and the northern ASEAN region. Slightly below-normal to normal rainfall are expected for Malaysia, Brunei, Singapore and parts of Kalimantan and Sumatra. Slightly above-normal to above-normal rainfall are forecast for Java and Sulawesi in November and December, while slightly below-normal to normal rainfall are expected in January. The regional rainfall outlooks for the next three months are shown in Figures 4A – 4C.







- - Above Normal (67<sup>th</sup> to 100<sup>th</sup> percentile)
- - Slightly Above Normal (50<sup>th</sup> to 83<sup>rd</sup> percentile)
- - Normal (33<sup>rd</sup> to 67<sup>th</sup> percentile)
- - Slightly Below Normal (17<sup>th</sup> to 50<sup>th</sup> percentile)
- - Below Normal (0 to 33<sup>rd</sup> percentile)

Figures 4A-4C: Rainfall Outlooks for the ASEAN Region – November 2016 (4A: top left), December 2016 (4B: top right), and January 2017 (4C: bottom left)

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