

UPDATE OF REGIONAL WEATHER AND SMOKE HAZE FOR AUGUST 2014

1. Review of Regional Weather Conditions in July 2014

1.1 Southwest Monsoon conditions continued to prevail in July 2014 with low level winds over the region blowing mostly from the southeast or southwest. Rain bands from tropical cyclones during the first half of the month led to extensive rain clouds over most parts of the ASEAN region. However, the northward migration of the monsoon rain belt accompanied with an intensification of typhoon activities in the Western Pacific Ocean and South China Sea during the second half of the month brought dry weather conditions over the southern ASEAN region.

1.2 The western Pacific Ocean and northern South China Sea experienced 4 tropical cyclones in July 2014, namely Typhoon "Neoguri", Typhoon "Rammasun", Typhoon "Matmo" and Severe Tropical Storm "Nakri". On 10 July 2014, Typhoon "Rammasun" developed to the southeast of the Mariana islands, tracked westwards and made landfall over Luzon island, the Philippines. "Rammasun" intensified as it entered into the South China Sea before making landfall over Hainan Island and moving across northern Vietnam on 18 and 19 July 2014 respectively. Typhoon "Rammasun" resulted in widespread damage, killing at least 200 people and injuring hundreds more.

1.3 During the month, many parts of the Mekong Sub-region received more than 125% of normal rainfall due to the presence of the monsoon rain belt in the northern hemisphere. In contrast, most parts of the southern ASEAN region received less than 100% of normal rainfall with the exception of central Sumatra and western Java where more than 125% of normal rainfall was received. The regional rainfall pattern for July 2014 is shown in Figure 1A.

Percentage of Normal Rainfall for July 2014

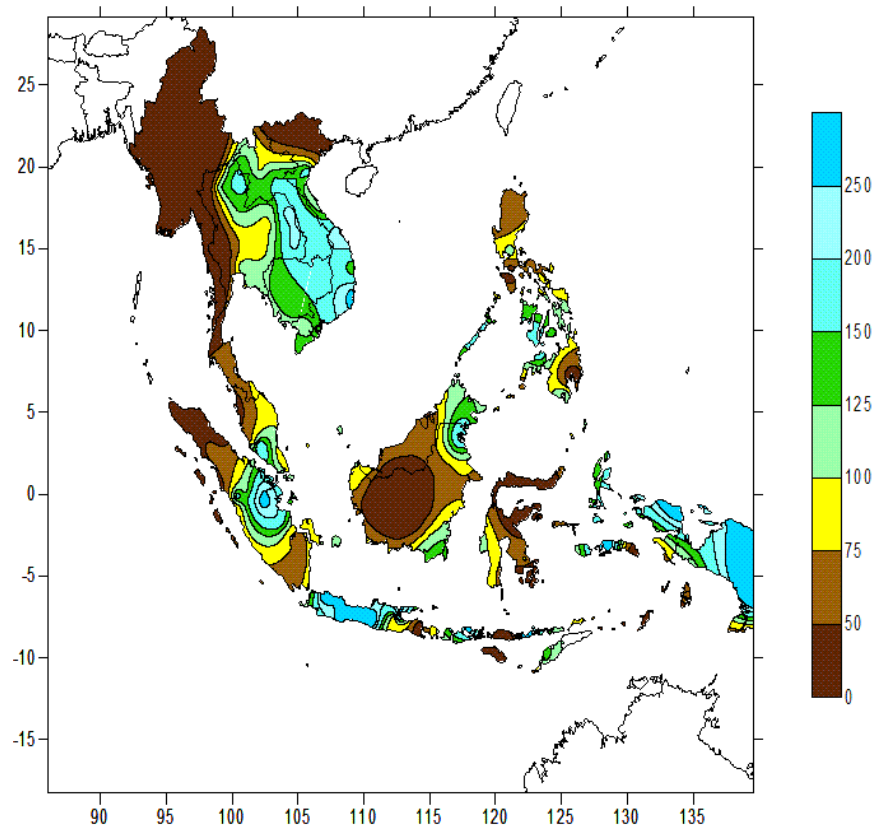


Fig. 1A: Percentage of Normal Rainfall for July 2014

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

2.1 The prevailing rainy season continued to help keep hotspot activities subdued in the northern ASEAN region. Few to scattered sporadic hotspots were detected mostly in Myanmar and Vietnam during brief periods of drier weather.

2.2 Wet weather conditions during the first half of the month helped to subdue hotspot activities in the southern ASEAN region. However, a period of drier weather conditions led to an increase in hotspot activities mainly over Borneo and the northern half of Sumatra during the second half of the month. Scattered hotspots with localized smoke plumes were detected over the northern half of Sumatra between 18 and 29 July 2014. During this period, some areas along the western coast of Peninsular Malaysia reported unhealthy levels of Air Pollutant Index (API) between 100 and 200. Port Klang had the highest API of 139 on 21 July 2014. Similarly, scattered hotspots with moderate smoke haze were also detected mainly in western Borneo. The smoke haze led to a drastic drop in air quality mainly in Sarawak with unhealthy readings recorded at Sibul, Samarahan and Sri Aman on 28 July 2014. The return of shower activities towards the end of the month helped to ease the smoke haze situation in the region. Satellite images depicting some of the hotspot activities over the ASEAN region in July 2014 are shown in Figs. 2A to 2E.

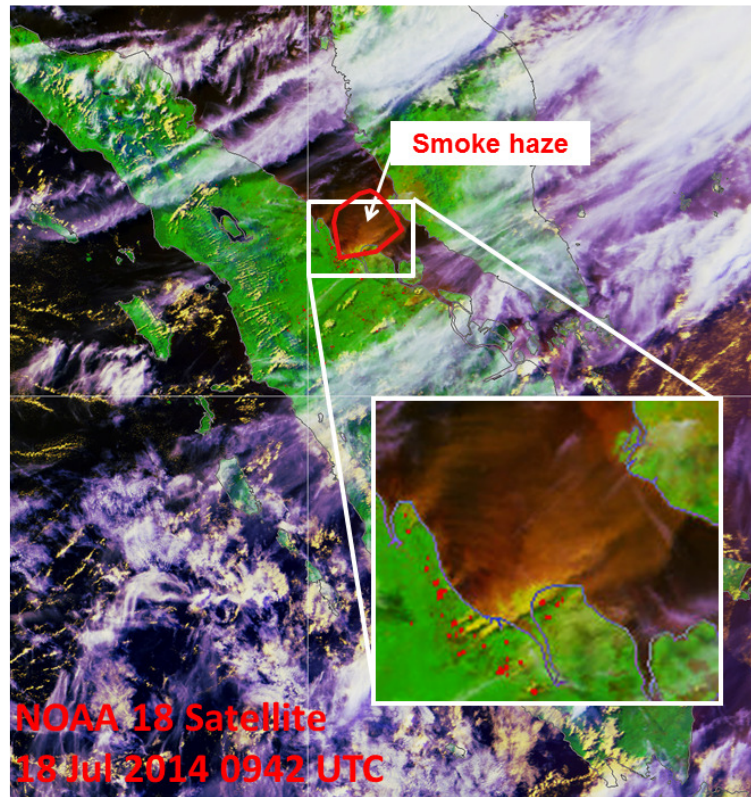


Fig. 2A: NOAA-18 satellite picture on 18 July 2014 showing slight to moderate haze from some of the hotspots in central Sumatra.

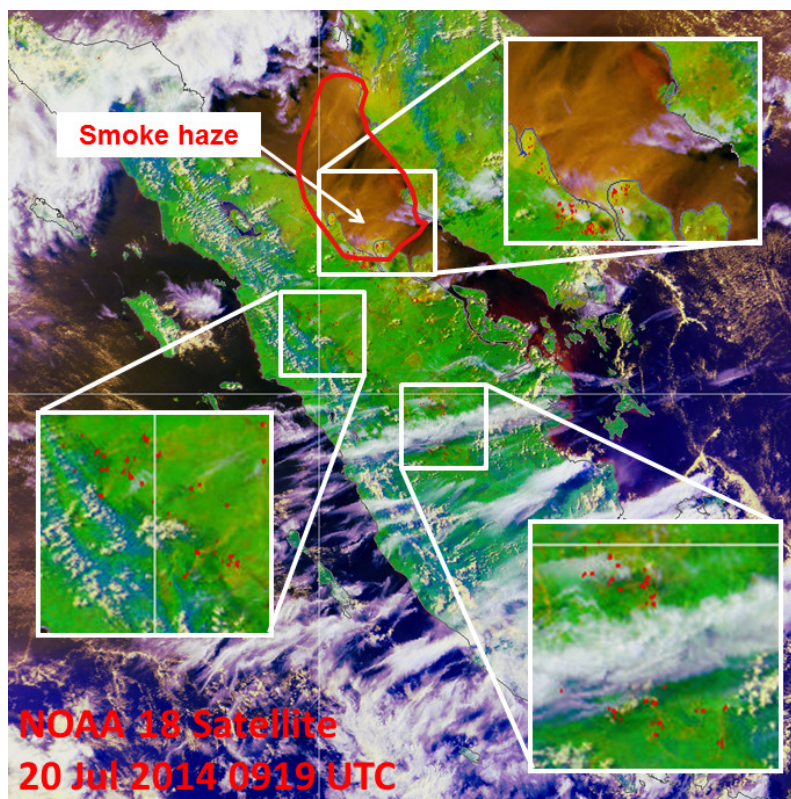


Fig. 2B: NOAA-18 satellite picture on 20 July 2014 showing smoke haze from Riau affecting parts of the Strait of Malacca and western Peninsular Malaysia

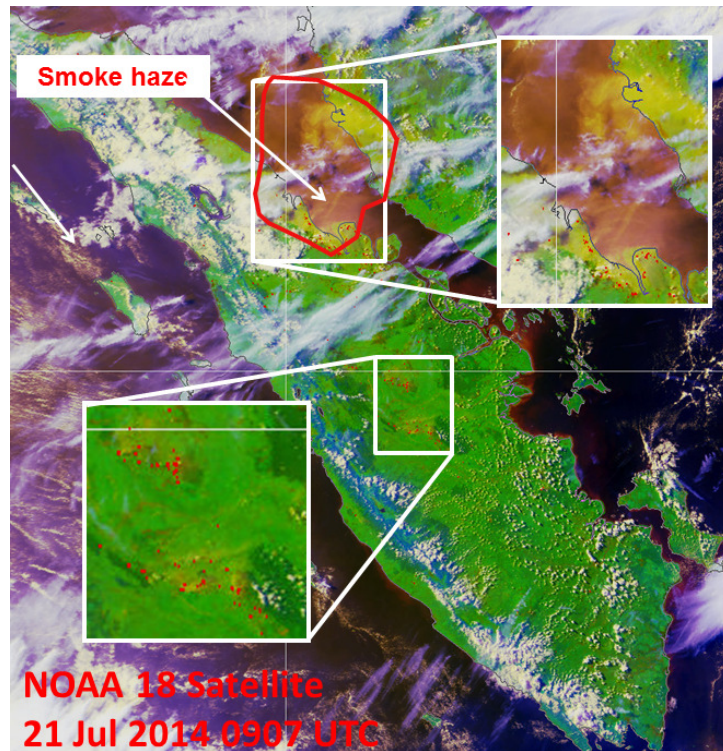


Fig. 2C: NOAA-18 satellite picture on 21 July 2014 showing moderate smoke haze over Riau spreading across the Strait of Malacca to affect the west coastal states of Peninsular Malaysia

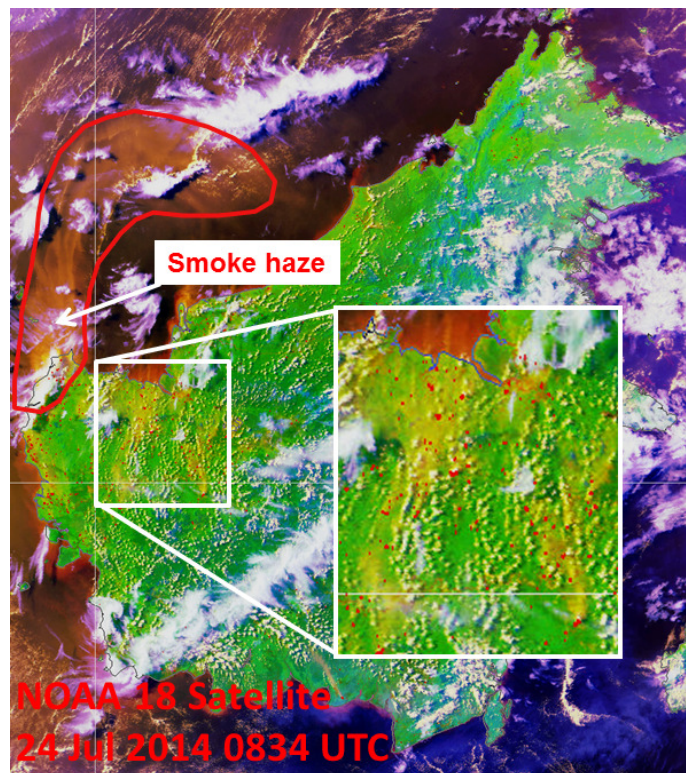


Fig. 2D: NOAA-18 satellite picture on 24 July 2014 showing scattered hotspots with localised smoke haze over western Kalimantan

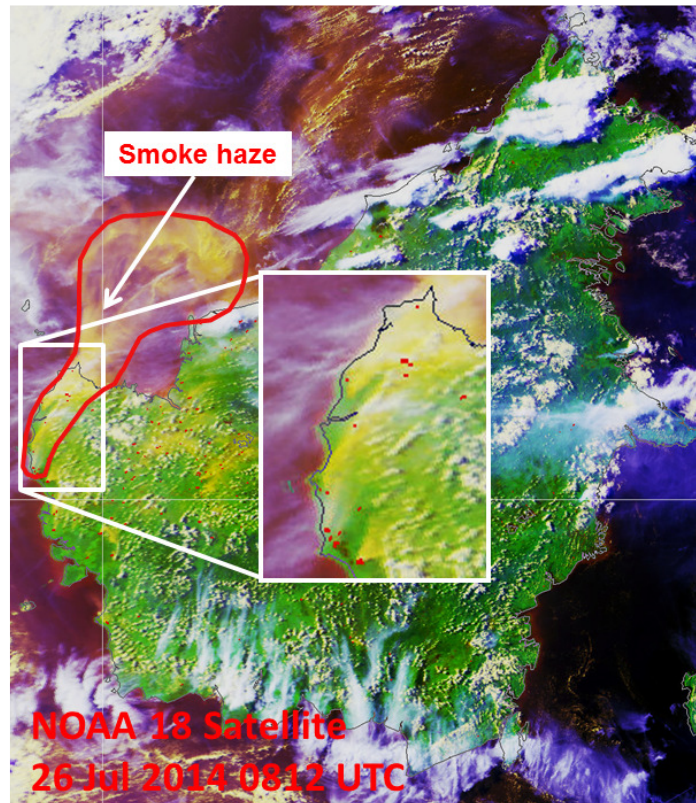


Fig. 2E: NOAA-18 satellite picture on 26 July 2014 showing moderate smoke haze emanating from hotspots in West Kalimantan.

2.3 The hotspot charts for July 2014 for

- a) Cambodia, Myanmar, Thailand, Lao PDR and Vietnam;
- b) Sumatra, Borneo and Peninsular Malaysia; and
- c) Java, Sulawesi and the Philippines

are shown in Figs. 2F to 2H respectively.

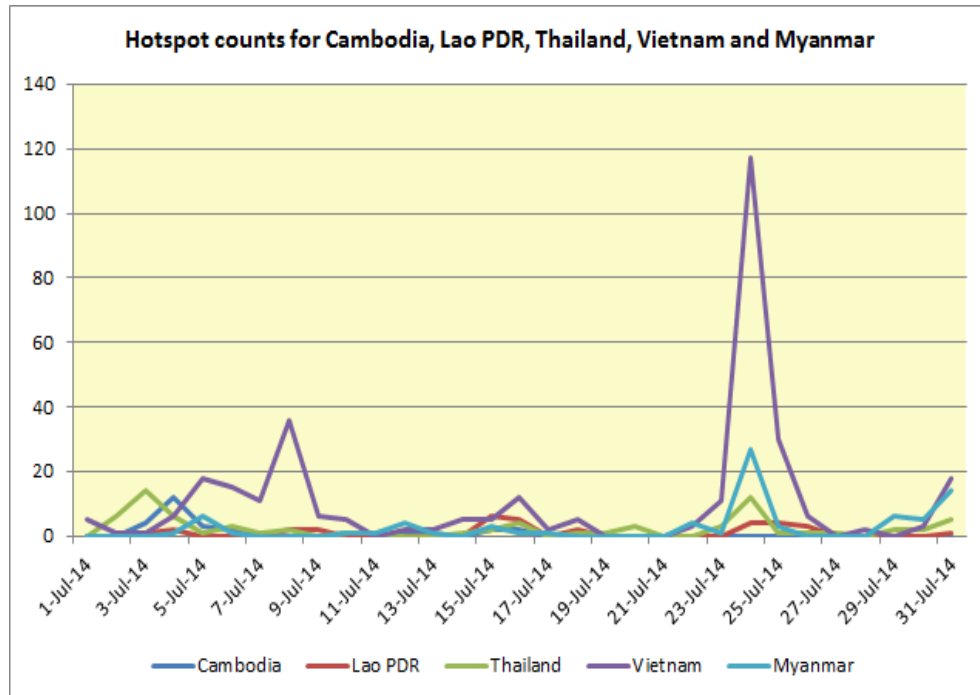


Fig. 2F: Hotspot Counts in Cambodia, Lao PDR, Thailand, Vietnam, Myanmar for July 2014

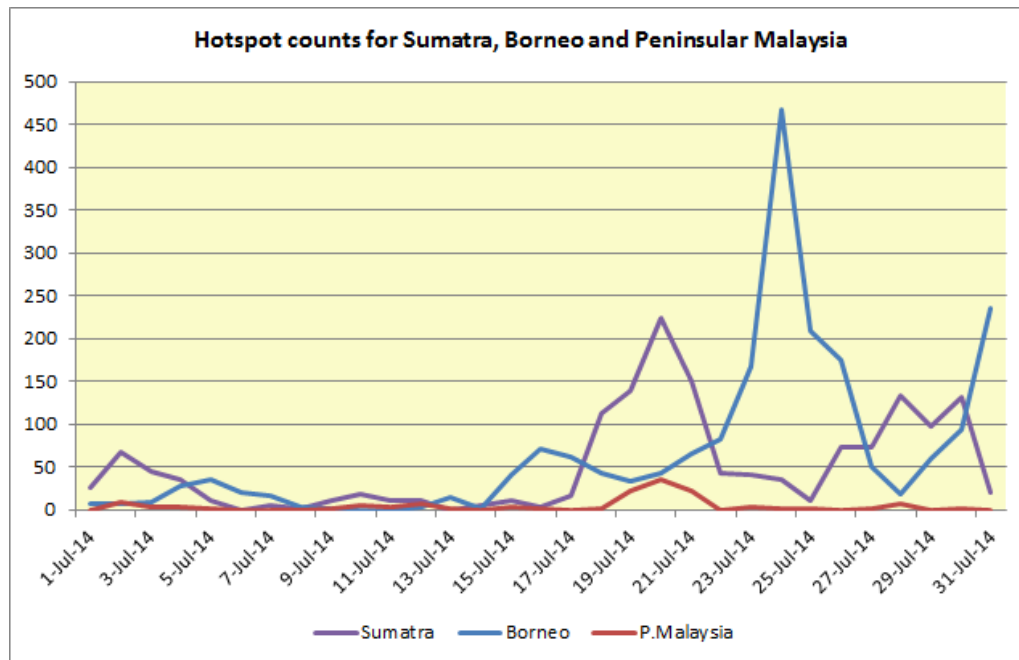


Fig 2G: Hotspot Counts in Sumatra, Borneo and Peninsular Malaysia for July 2014

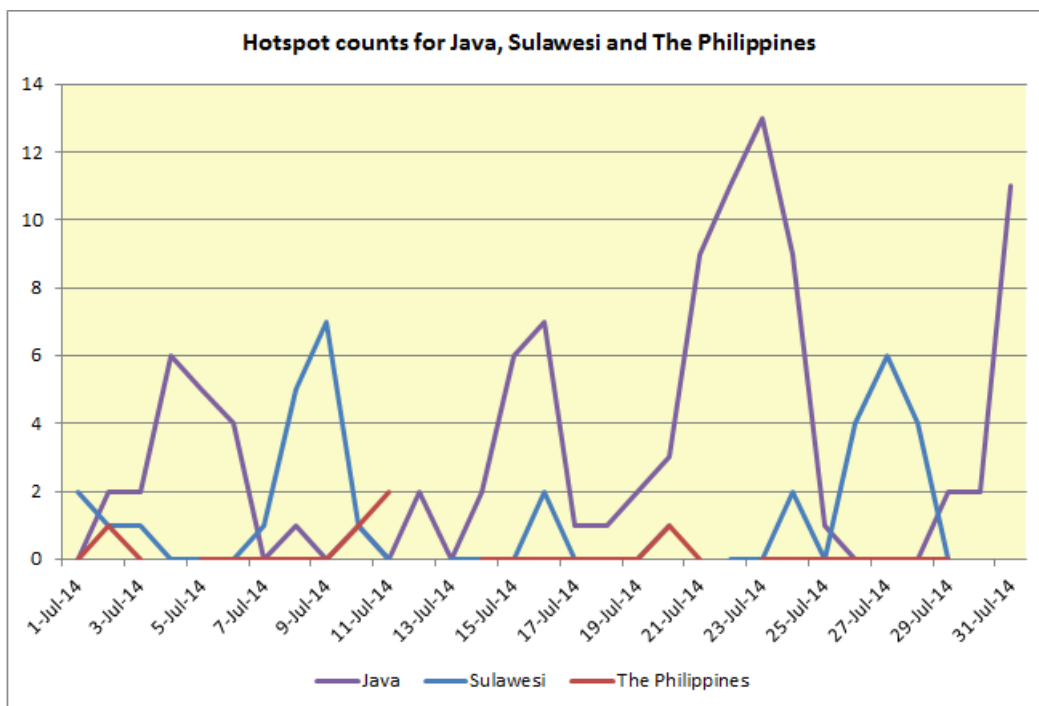


Fig. 2H: Hotspot Counts in Java, Sulawesi, Philippines for July 2014

3. Status of El Niño/La Niña*

3.1 The tropical Pacific Ocean surface temperatures have continued to warm (Fig. 3A) but gradually eased in recent weeks (Fig. 3B), slowing down the development of El Niño conditions. However, with most global climate models forecasting the continued warming of the tropical Pacific Ocean in the coming months (Fig. 3C), a weak to moderate El Niño is still likely to develop in the last quarter of 2014 (Fig. 3D).

3.2 Despite the observed warming over the tropical Pacific Ocean over the last few months, a number of atmospheric indicators of the El Niño, such as wind flow and cloudiness, have remained largely neutral. A plausible explanation for the lack of atmospheric response is that the warming has occurred over almost the entire tropical Pacific Ocean, including the sea areas in our region. During a typical El Niño development, warming is observed mostly in the eastern and central parts of the tropical Pacific Ocean.

3.3 In the last few months the sea surface temperatures in our region have been warmer than normal, leading to increased convection and formation of rain clouds. This has contributed to the relatively wet weather conditions in Singapore and the surrounding region during the current Southwest Monsoon season.

3.4 With the forecast of a weak to moderate El Niño in the last quarter of the year, it should be noted that the El Niño is known to have relatively less impact on weather patterns in Singapore and the nearby region during the Northeast Monsoon

season (typically from late November to March). The risk of drier weather conditions due to the El Niño is thus expected to be lower towards the end of the year.

3.5 Typically the impact from El Niño for the Southeast Asia region is drier than average rainfall conditions, especially for the southern and eastern parts (Fig. 3E). More locally-specific impact differs from place to place and for different seasons. As the Southwest Monsoon season continues to prevail in the region, and with the possibility of a weak to moderate El Niño, the risks of occasional extended periods of drier and warmer conditions cannot yet be ruled out.

** For El Niño/La Niña updates, ASMC assesses information provided by the World Meteorological Organization (WMO) and various international climate centres, such as the Climate Prediction Center (CPC) US, the Bureau of Meteorology (BoM) Australia, as well information from the International Research Institute for Climate and Society (IRI) which contains model outputs from various other centres around the world. For more information on El Niño/La Niña, please refer to the [FAQs website](#).*

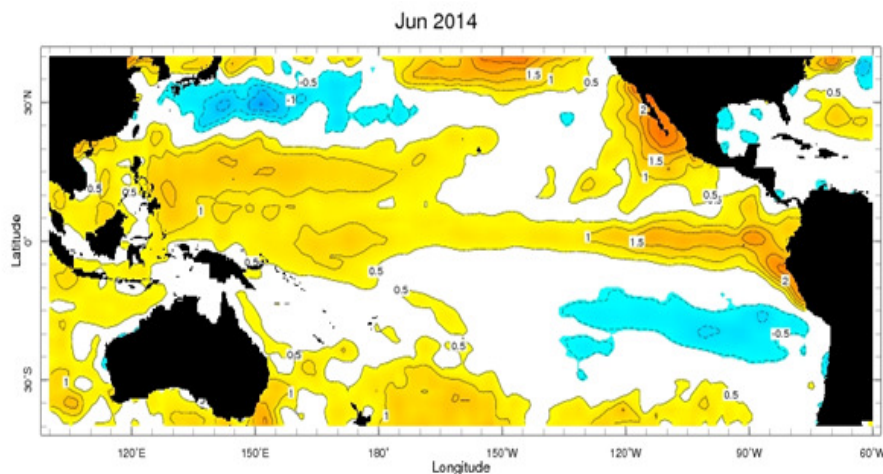


Fig. 3A: Surface warming has continued in June 2014 over the tropical Pacific Ocean, especially over the far eastern tropical basin (image credit: IRI Map Room). Yellow shades show regions of relative warming, while blue shades show regions of relative cooling. Complete data for July 2014 is not available at the time of update.

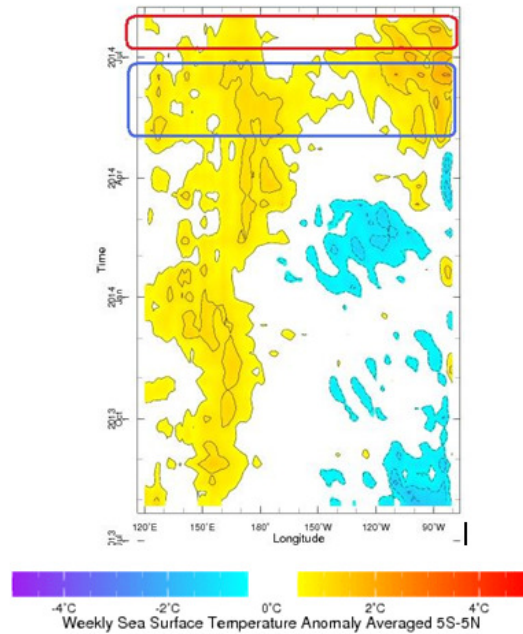


Fig. 3B: Time evolution of sea-surface temperature anomaly over the tropical Pacific Ocean (120E-90W, 5S-5N) from July 2013 (bottom) to July 2014 (top) (image credit: IRI Map Room). Notice the relatively cooler July 2014 (red box) compared to the preceding 2 months of May and June 2014 (blue box).

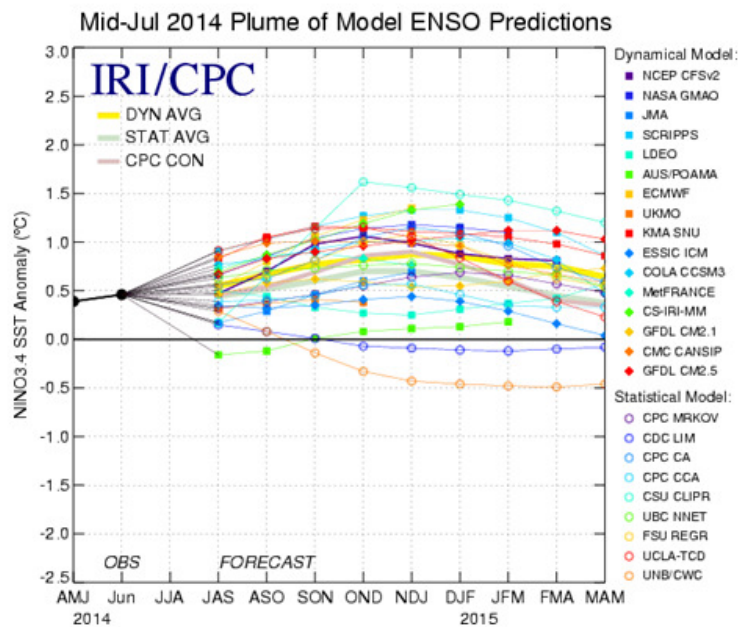


Fig. 3C: Forecasts of El Niño strength (in terms of the Niño3.4 index) for the remaining 3-month seasons of 2014 and 1st half of 2015. Temperature anomalies above 0.5°C indicate El Niño conditions, below -0.5°C indicate La Niña conditions, and in between indicate neutral conditions, i.e. neither El Niño nor La Niña. Model outlook and expert opinion suggest a weak to moderate El Niño strength to be likely if it occurs (image credit: IRI-CPC).

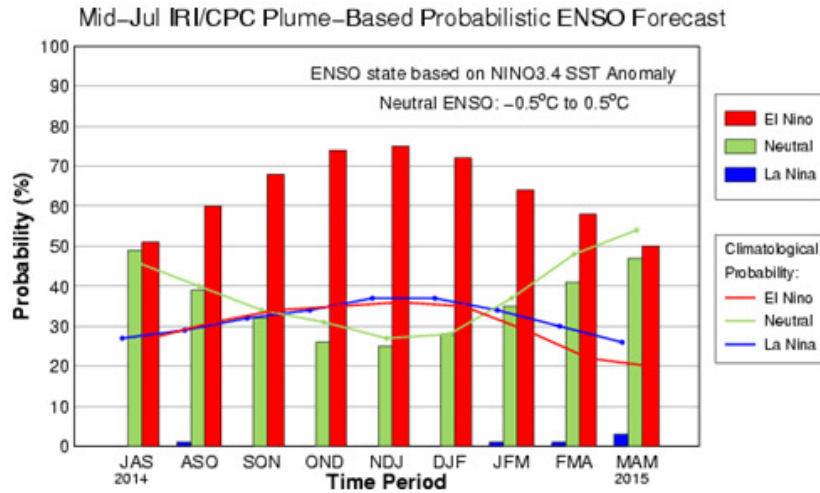


Fig. 3D: Probability of El Niño (red), La Niña (blue) and neutral conditions (green) in the remaining 3-month seasons of 2014 and 1st half of 2015. Beginning from the ASO (August-October) season, there is about 60% chance of El Niño developing based on the percentage of models showing El Niño conditions. Likelihood increases as we approach the end of 2014 (image credit: IRI-CPC).

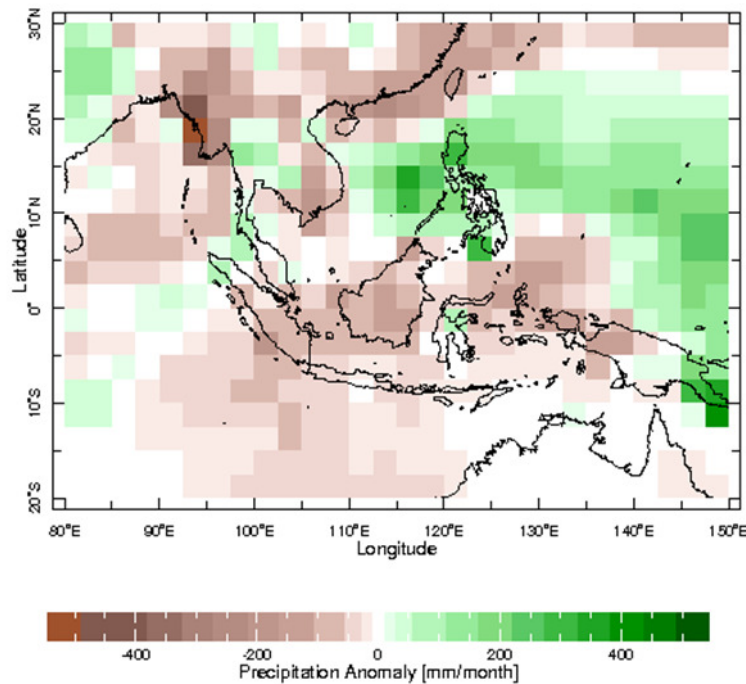


Fig. 3E: Rainfall anomaly composite for El Niño years (1965, 1972, 1982, 1987, 1991, 1993, 1994, 1997, 2002, 2004, 2006, and 2009) showing drier than average conditions (brown shades) mostly in the southern half of the region for the months June to September (IRI Data Library).

4. Outlook

4.1 The prevailing Southwest Monsoon conditions are likely to persist over the next two months of August and September 2014. During this period, the prevailing rainy season of the northern ASEAN region is expected to keep hotspot activities subdued until the onset of drier weather towards the end of the year.

4.2 Over the southern ASEAN region, the prevailing dry season is expected to prevail till early October 2014. During the traditional dry season, elevated hotspot activities with smoke haze can be expected in the fire-prone provinces of Sumatra and Borneo, particularly during extended periods of dry weather conditions. This could lead to occurrences of transboundary smoke haze in the region, and as such, vigilance should be stepped up for any escalation of hotspot activities in the fire-prone areas in the coming months.

4.3 For the next three months, rainfall is expected to be slightly below normal to normal for most parts of the ASEAN region. The rainfall outlook for the ASEAN region for August to October 2014 is shown in Figs. 4A – 4C.

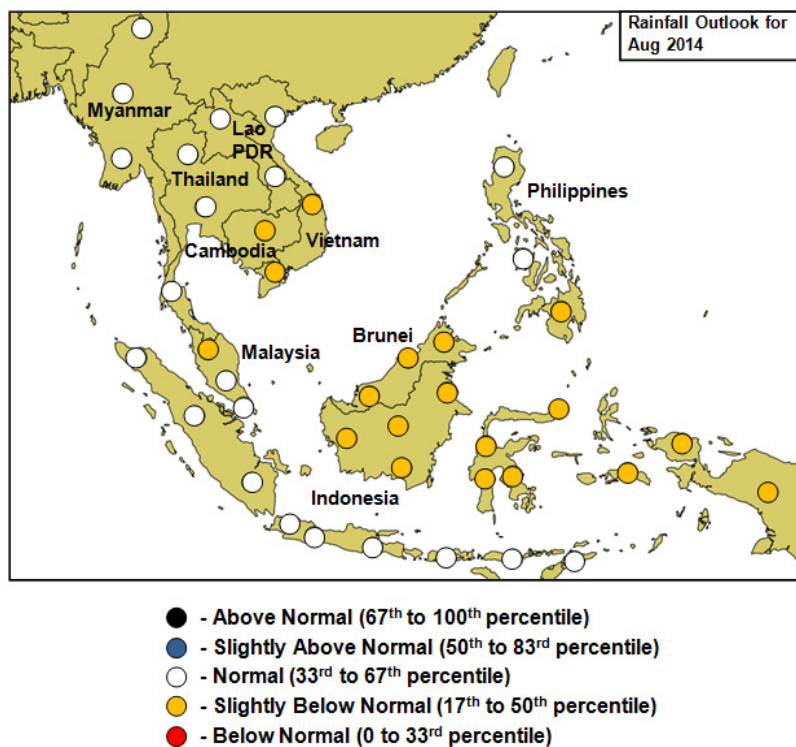


Fig. 4A: Rainfall Outlook for the ASEAN Region (Aug 2014)

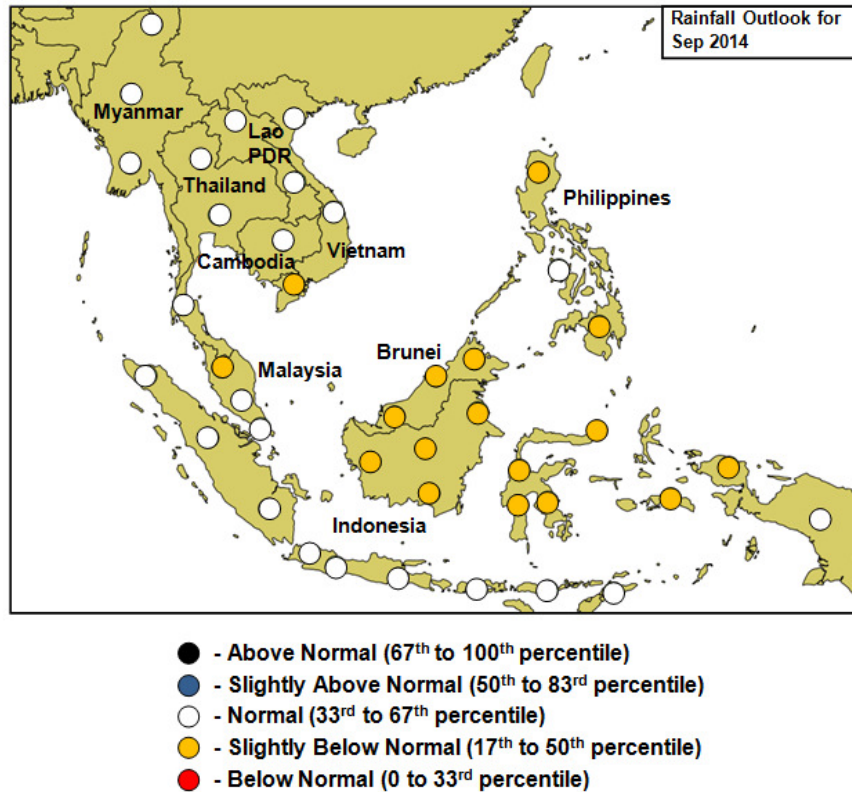


Fig. 4B: Rainfall Outlook for the ASEAN Region (Sep 2014)

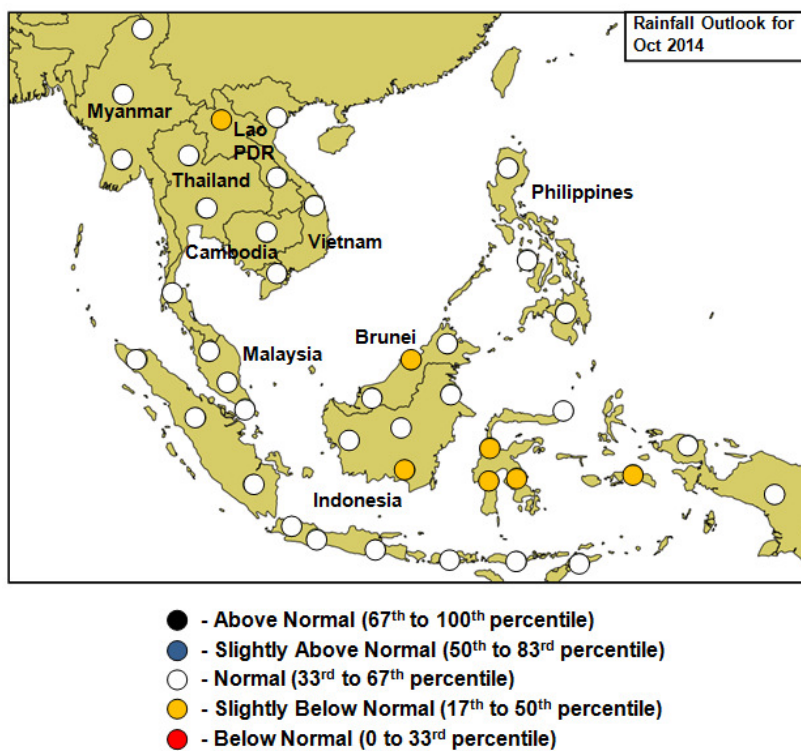


Fig. 4C: Rainfall Outlook for the ASEAN Region (Oct 2014)