UPDATE OF REGIONAL WEATHER AND SMOKE HAZE FOR JANUARY 2015

1. Review of Regional Weather Conditions in December 2014

1.1 Moderate Northeast Monsoon season was established in the region in December 2014, bringing dry and cool weather to most parts of the Mekong Sub-region of Cambodia, Lao PDR, Myanmar, northern Thailand and Vietnam. In the southern ASEAN region, the prevailing rainy season affected most parts of the southern ASEAN region.

1.2 Super Typhoon 'Hagupit' which was the most intense tropical cyclone of the year, developed to the east of the Philippines in the last week of November 2014. It strengthened as it tracked westwards, making landfall over the provinces of Samar and Masbate in the Philippines on 6 and 7 December 2014 respectively. 'Hagupit' weakened rapidly after making landfall and dissipated rapidly over the South China Sea, southeast of Vietnam. On 29 December 2014, another Tropical Storm 'Jangmi' affected the Philippines, making landfall over Mindanao. 'Jangmi' tracked across the Philippines before dissipating over South China Sea. Both 'Hagupit' and 'Jangmi' affected up to a million people, and destroying hundreds of houses along their path.

1.3 During the second half of December 2014, the strengthening of north-easterly winds over the South China Sea, or a monsoon surge, affected the region on a few occasions. The monsoon surges brought wet and windy conditions to parts of the southern ASEAN region. Continuous heavy showers of rain fell over most parts of Peninsular Malaysia, and led to severe flooding in the eastern coastal States of Terengganu, Pahang, and Kelantan with around 250,000 people displaced from their homes. Several districts in Indonesia and southern Thailand were also affected by floods due to the several days of continuous rainfall.

1.4 In December 2014, many parts of the southern ASEAN region received more than 100% of normal rainfall with the exception of southern Sumatra and western Borneo where less than 100% of normal rainfall was received. In contrast, most parts of the northern ASEAN region such as Thailand, Myanmar and Cambodia received less than 50% normal rainfall. Many parts of the Philippines received more than 125% of normal rainfall due to the passage of Super Typhoon 'Hagupit' and Tropical Storm 'Jangmi'. The regional rainfall distribution for December 2014 is shown in Fig. 1A.

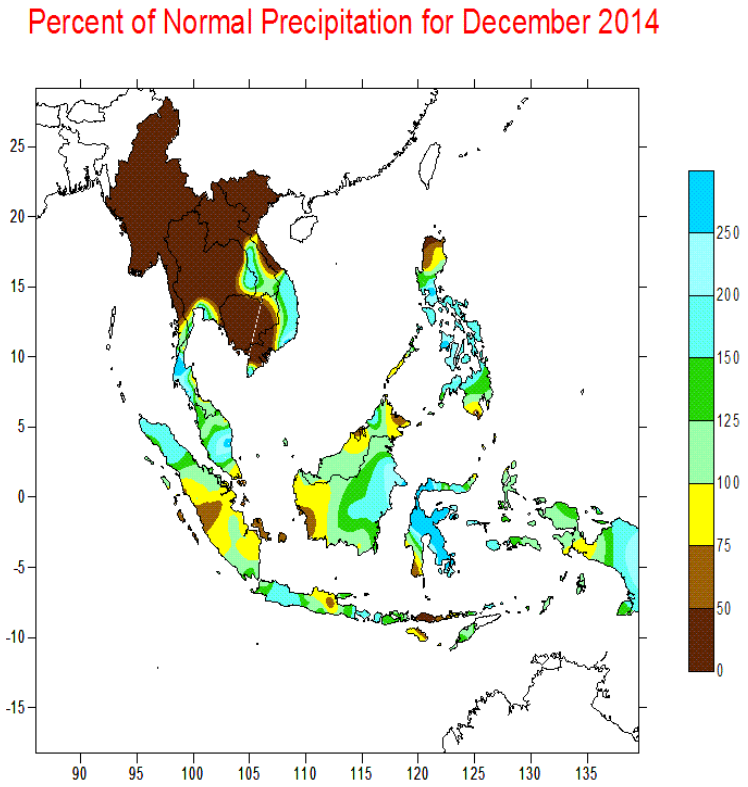

Fig. 1A: Percentage of Normal Rainfall for December 2014

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

2.1 Wet weather conditions in December 2014 continued to keep hotspot activities in the southern ASEAN region subdued. For the northern ASEAN region, the onset of the traditional dry season brought an increase in hotspot activities, mainly in Cambodia, Myanmar, Thailand and Vietnam. Satellite images depicting some of the hotspot activities in the ASEAN region in December 2014 are shown in Figs. 2A to 2E.

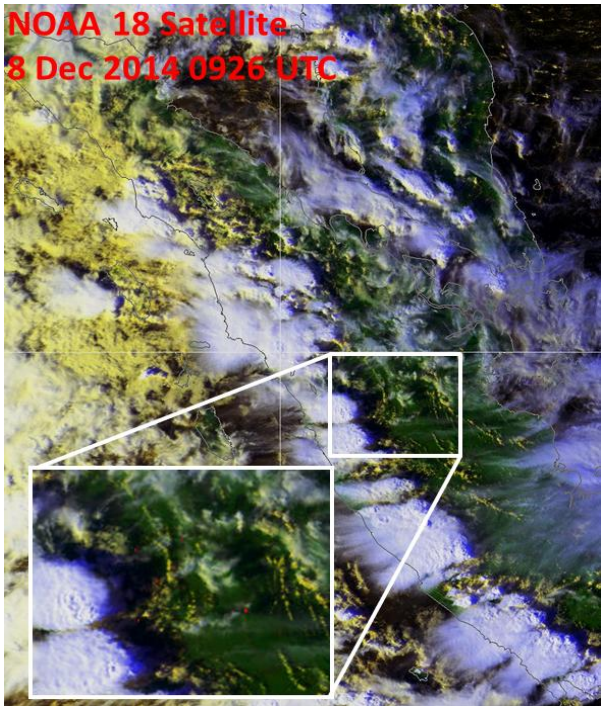

Fig. 2A: NOAA-18 satellite picture on 8 December 2014 shows subdued hotspot activities in Sumatra due to the prevailing wet weather

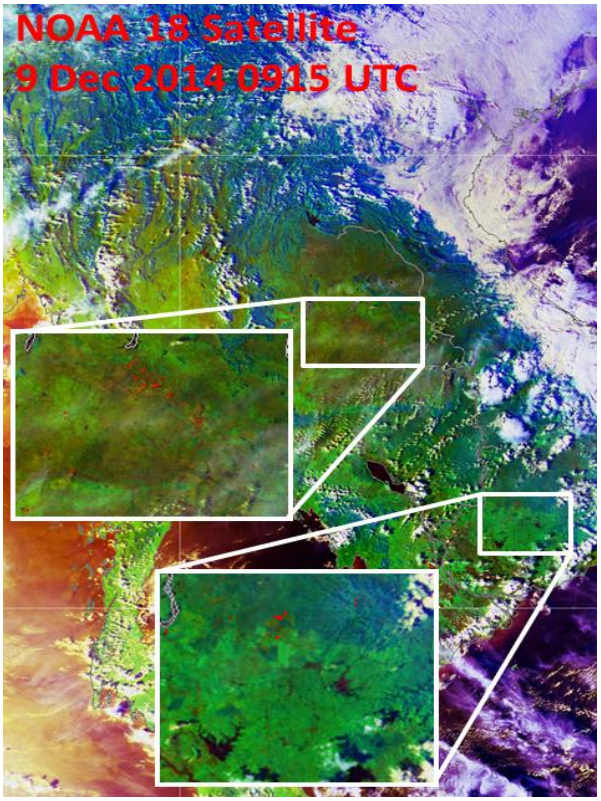

Fig. 2B: NOAA-18 satellite picture on 9 December 2014 showing the emergence of increased hotspot activities in northern ASEAN

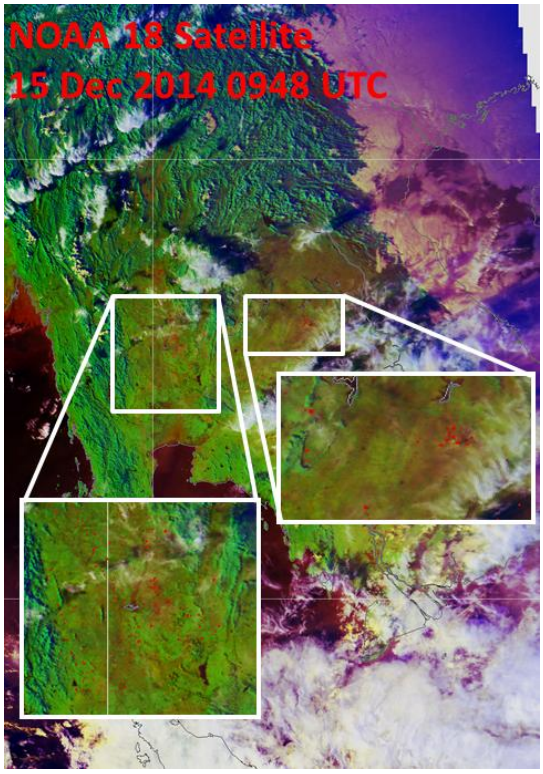

Fig. 2C: NOAA-18 satellite picture on 15 December 2014 showing an increase in hotspot activities in Thailand due to the drier weather conditions

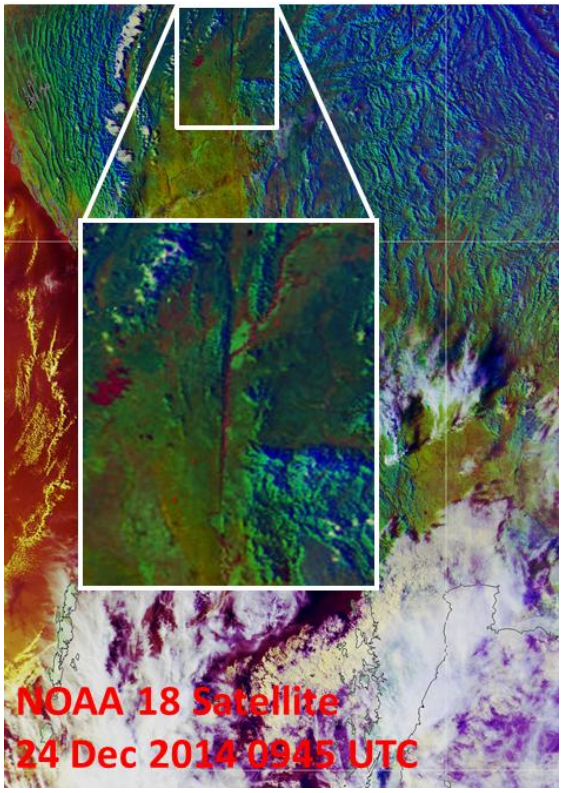

Fig. 2D: NOAA-18 satellite picture on 24 December 2014 showing the occurrence of isolated hotspot activities in Myanmar

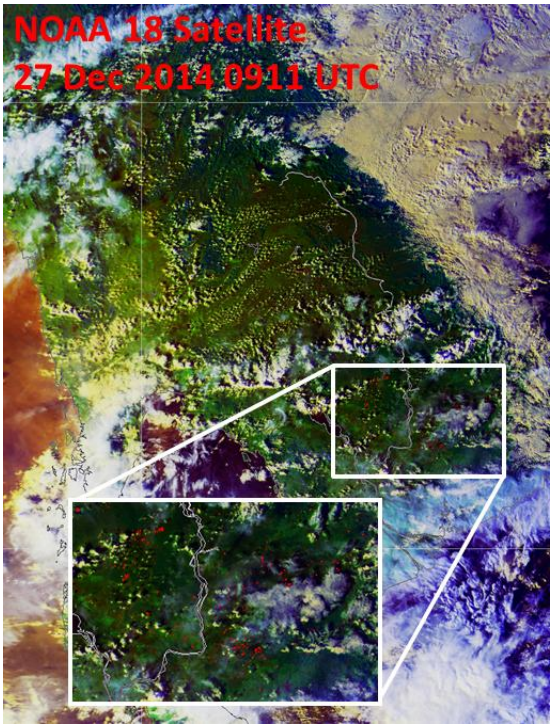

Fig. 2E: NOAA-18 satellite picture on 27 December 2014 shows an increase in hotspots in the Cambodia

2.2 The hotspot charts for December 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.

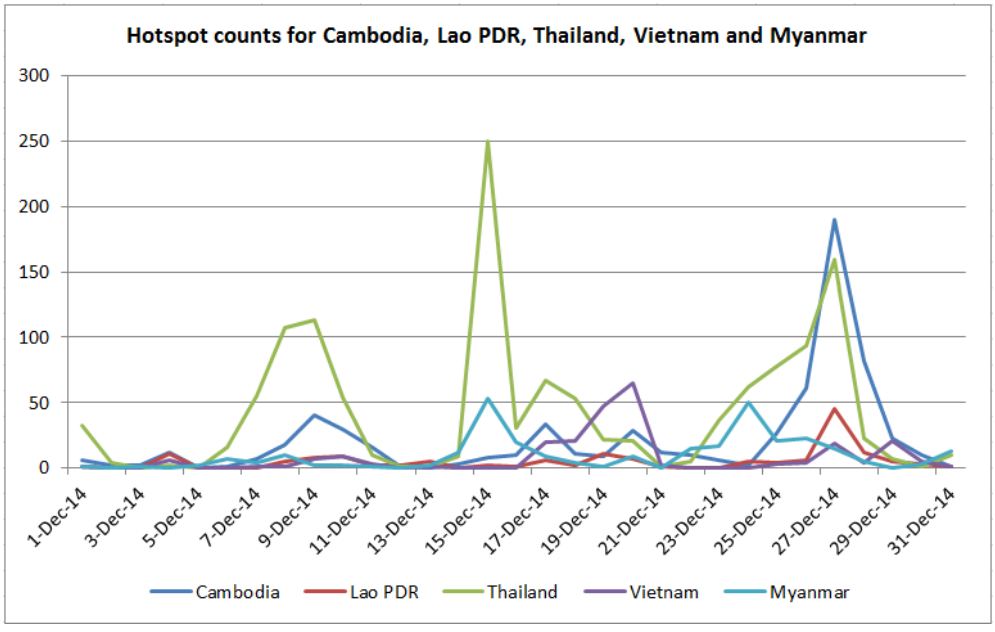

Fig. 2F: Hotspot Counts in Cambodia, Lao PDR, Thailand, Vietnam, Myanmar for December 2014

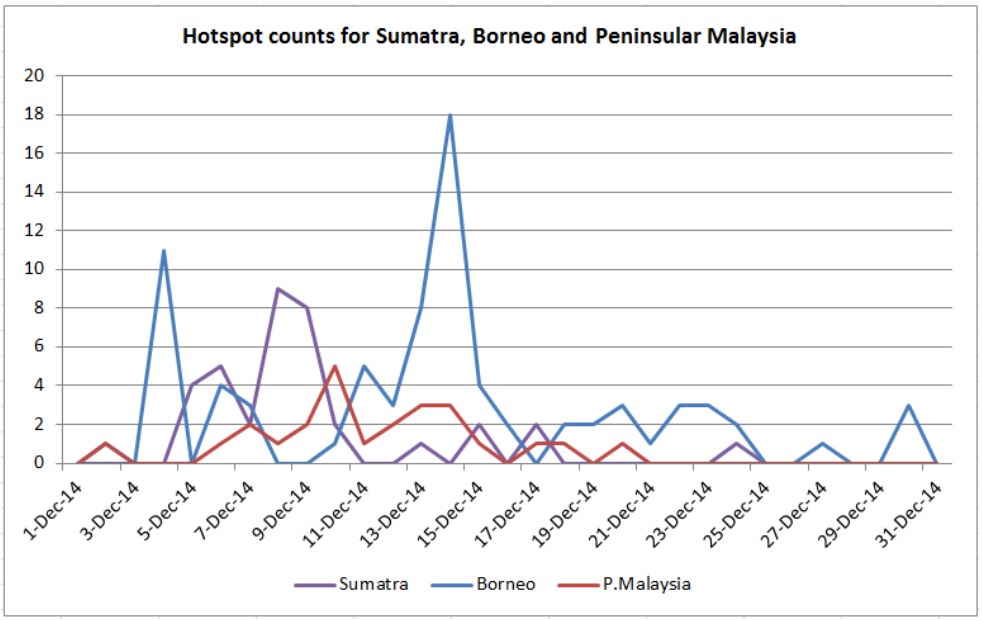

Fig 2G: Hotspot Counts in Sumatra, Borneo and Peninsular Malaysia for December 2014

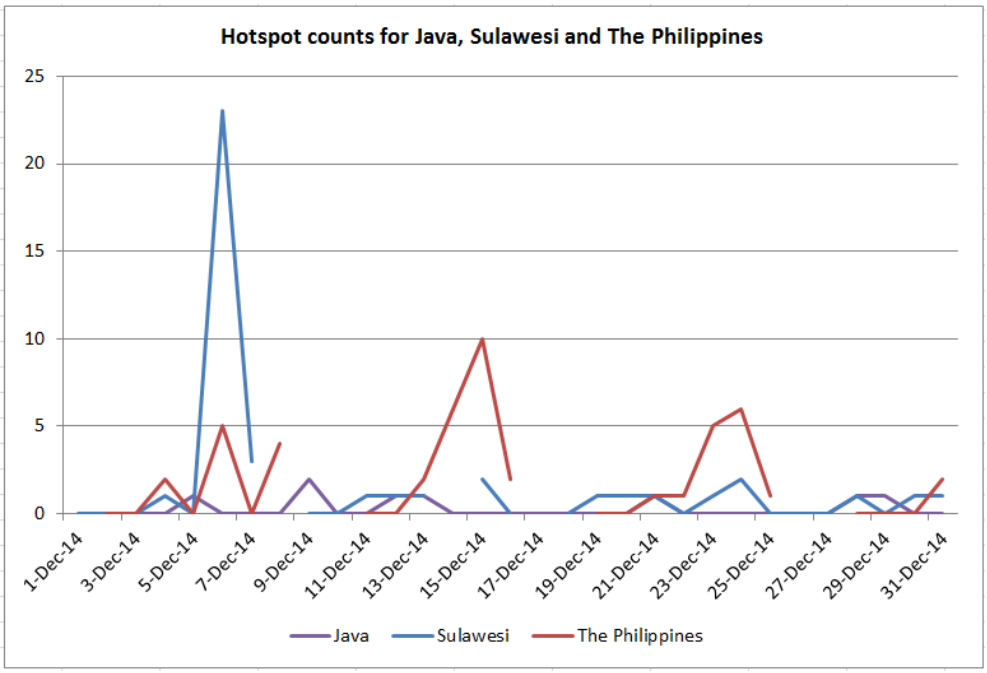

Fig. 2H: Hotspot Counts in Java, Sulawesi, Philippines for December 2014

3. Status of El Niño/La Niña*

3.1 The sea surface temperature (SST) over the tropical Pacific Ocean continues to be warmer than average in December 2014 (Fig. 3A) with the anomaly over the Niño3.4 region being slightly lesser than the preceding month (**Error! Reference source not found.**Fig. 3B). While the 3-month average Niño3.4 value remains within weak El Niño threshold, only some of the atmospheric indicators signal an El Niño pattern (e.g. upper level winds and the Southern Oscillation Index). Overall, the combined atmospheric and oceanic condition remains in neutral state.

3.2 Most models predict the SST anomalies over the tropical Pacific Ocean to remain at weak El Niño levels (Fig. 3C). If El Niño were to emerge, expert assessment favours a weak event (approximately 50-60% chance) during the next two months (Fig. 3D), with ENSO-neutral conditions favoured thereafter.

3.3 Typically the impact from El Niño for the Southeast Asia region is drier than average rainfall conditions, especially for the southern and eastern parts during June to October (Fig. 3E). More locally-specific impact differs from place to place and for different seasons.

3.4 As we are within the Northeast Monsoon season (Dec – Feb), where El Niño is not known to have much impact on the western part of the Maritime Continent (Fig. 3F), the possibility of a weak El Niño developing in the next one to two months do not pose significant risks of extended periods of drier and warmer conditions in this part of Southeast Asia.

** 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.*

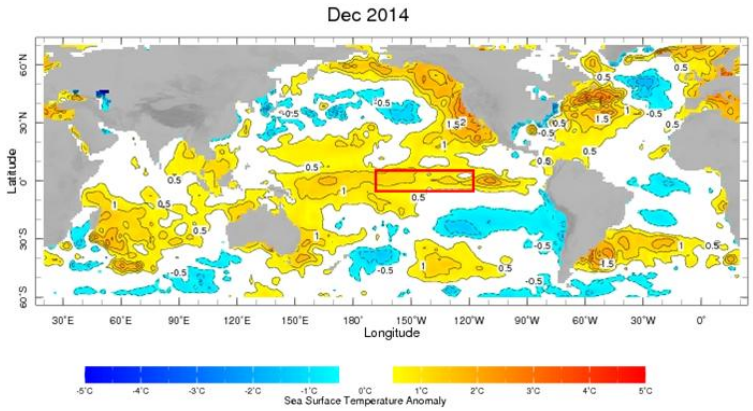

Fig. 3A: Warming of the tropical Pacific Ocean is sustained over the Niño3.4 region (red box, 120°W-170°W and 5°S-5°N) in December 2014 (image credit: IRI Map Room). Yellow shades show regions of relative warming, while blue shades show regions of relative cooling with respect to 1971-2000 climatology for that month

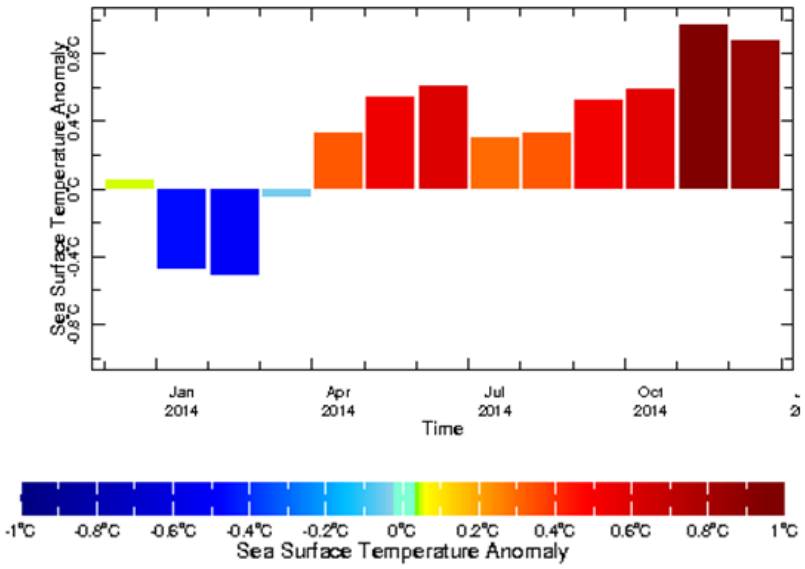

Fig. 3B: Monthly sea-surface temperature anomaly over the tropical Pacific Ocean over the Niño3.4 region (120°W-170°W and 5°S-5°N) from Dec 2013 (left) to Dec 2014 (right) (image credit: IRI Map Room). Sustained warming has been observed since Apr 2014 (red box). The 3-month average value has hit above 0.5, which is a threshold set to indicate El Niño condition, for two consecutive months

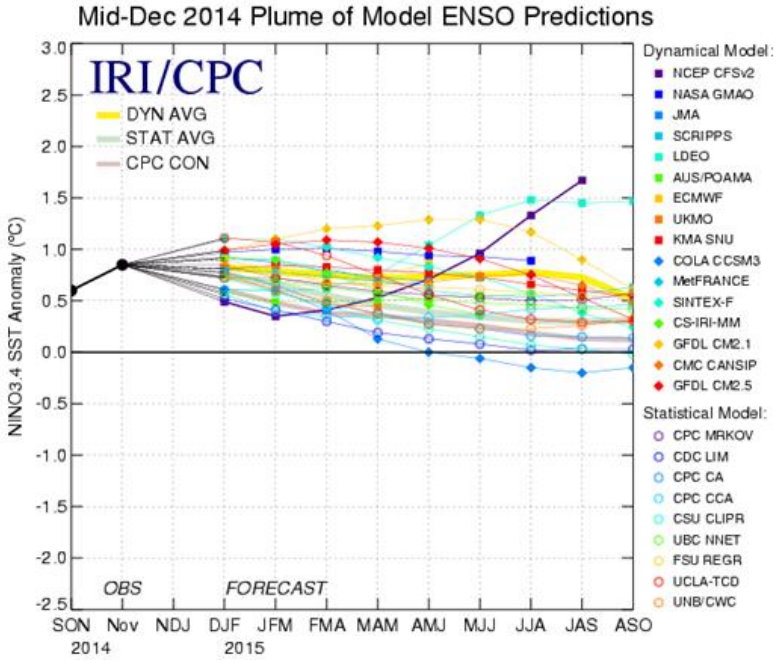

Fig. 3C: Forecasts of El Niño strength (in terms of the Niño3.4 index) for the 1st half of 2015 from various seasonal prediction models of international climate centres. Temperature anomalies above 0.5°C indicate El Niño conditions, below -0.5°C indicate La Niña conditions, and in between indicate neutral conditions, i.e. neither El Niño nor La Niña. Model outlooks and expert opinions suggest a weak El Niño strength to be likely if it occurs (image credit: IRI-CPC).

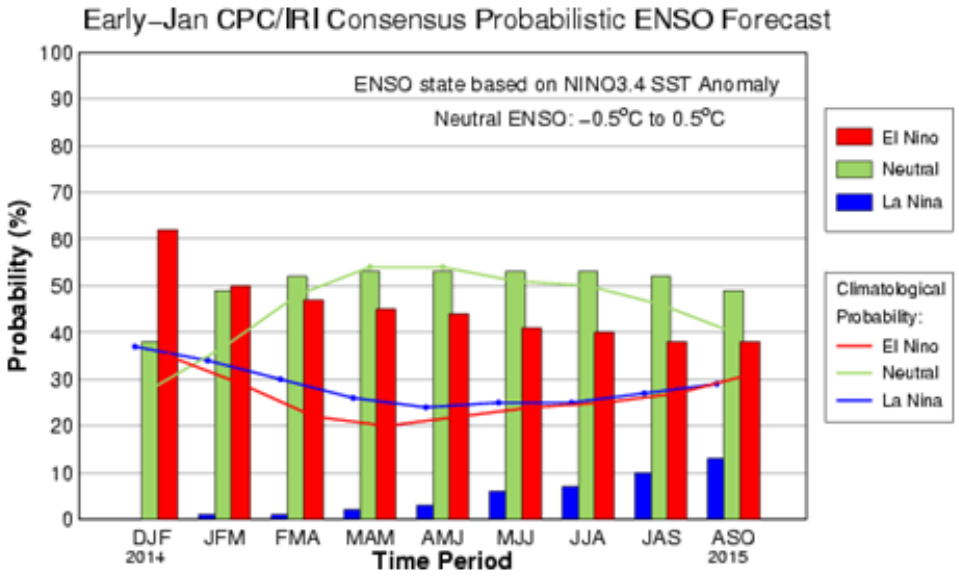

Fig. 3D: Probability of El Niño (red), La Niña (blue) and neutral conditions (green) for the 1st half of 2015. For DJF (December-February) season, there is about 60% chance of El Niño developing based on model predictions showing El Niño conditions and expert assessment (image credit: IRI-CPC)

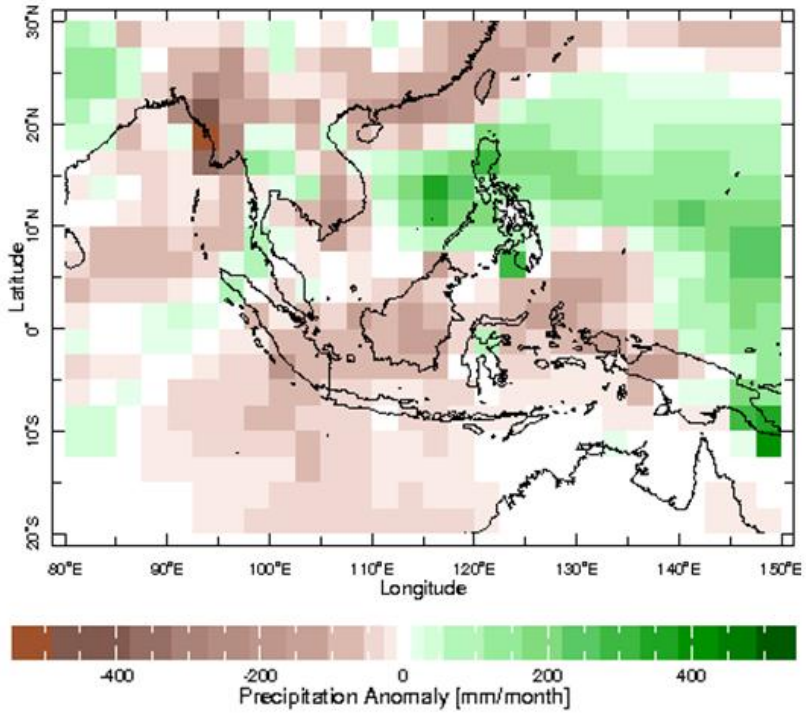

Fig. 3E: June to October rainfall anomaly composite for El Niño years (1982, 1986, 1987, 1991, 1994, 1997, 2002, 2004, 2006, and 2009) showing drier than average conditions (brown shades) mostly in the southern half of the region (image credit: IRI Data Library)

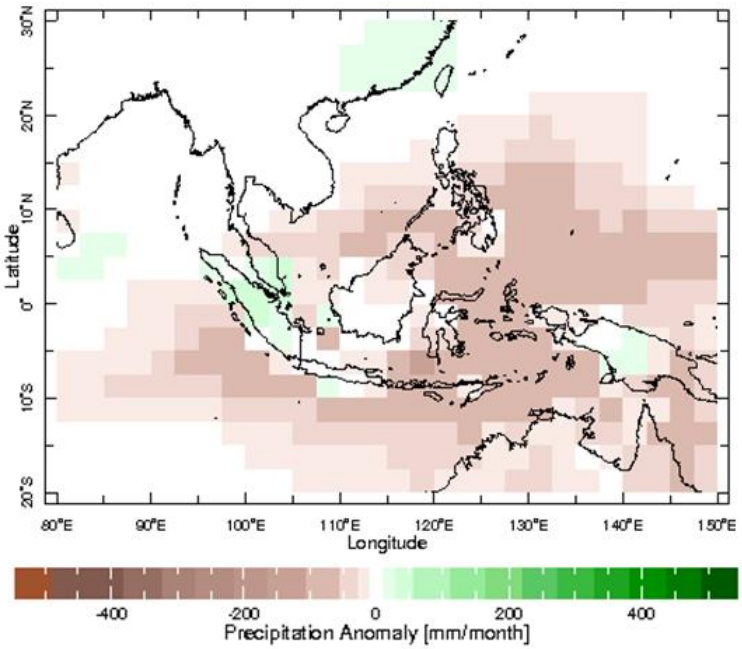

Figure 3F: December to February rainfall anomaly composite for El Niño years (1982, 1986, 1987, 1991, 1994, 1997, 2002, 2004, 2006, and 2009) showing drier than average conditions (brown shades) constrained to mostly the southern and eastern Maritime Continent (image credit: IRI Data Library

4. Outlook

4.1 The prevailing Northeast Monsoon conditions are expected to continue till late March or early April 2015. Dry weather conditions are forecast to prevail over most parts of the northern ASEAN region. In the southern ASEAN region, the current wet conditions are expected till end January 2015 when the Northeast Monsoon season enters into the drier phase.

4.2 The prevailing wet weather conditions in the southern ASEAN region are expected to keep the hotspot activities subdued. However, occasional hotspot activities can be expected to emerge in the fire prone provinces of Sumatra and Borneo during the drier phase of the Northeast Monsoon in February and March 2015.

4.3 For the northern ASEAN region, a gradual increase in hotspot activities can be expected over the next few months, particularly during periods of persistent dry weather. Vigilance should therefore be increased for any escalation in hotspot activities in the fire-prone areas during this period.

4.4 With a weak El Niño expected to become established over the next few months, many parts of the ASEAN region can expect slightly below average to slightly above average rainfall during the outlook period. The rainfall outlook for the ASEAN region for January to March 2015 are shown in Figs. 4A – 4C.

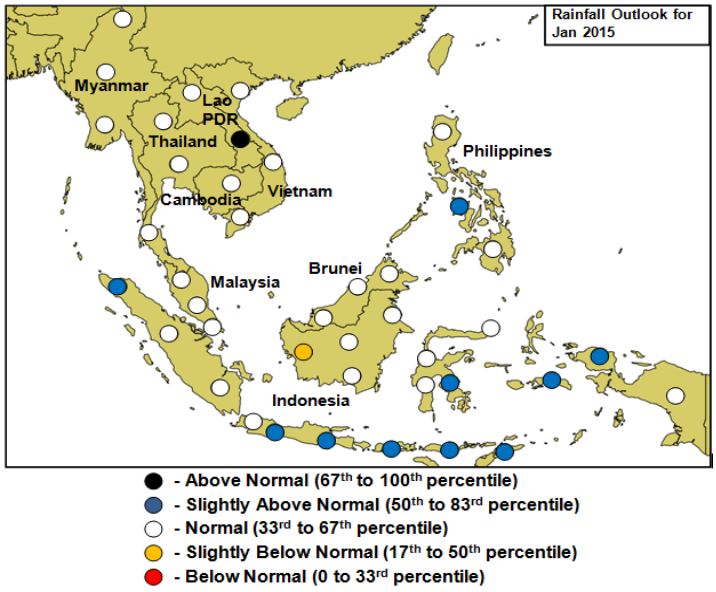

Fig. 4A: Rainfall Outlook for the ASEAN Region (Jan 2015)

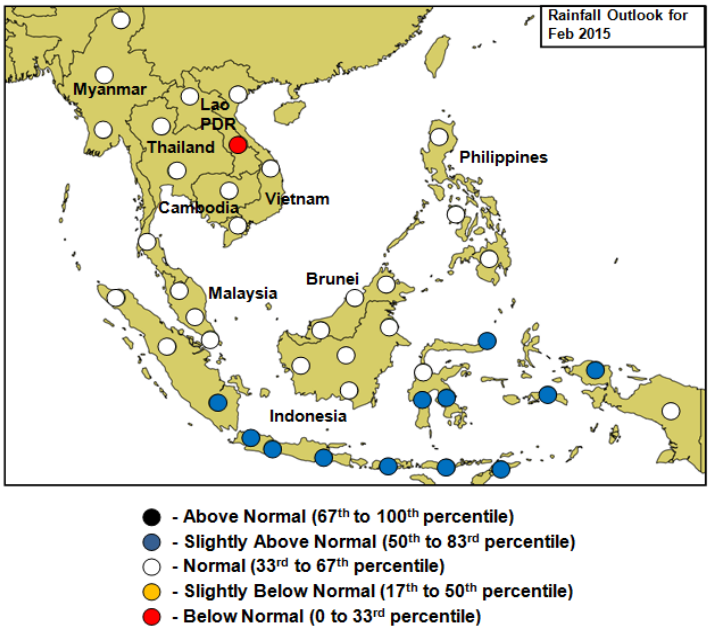

Fig. 4B: Rainfall Outlook for the ASEAN Region (Feb 2015)

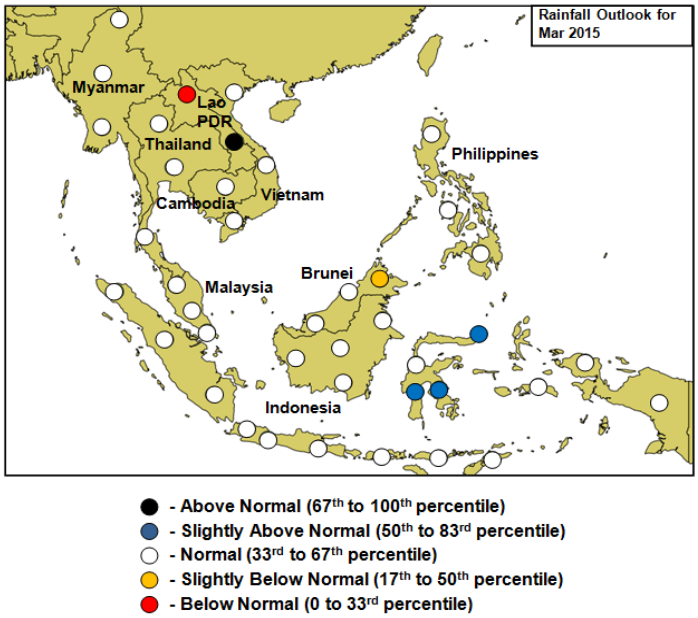

Fig. 4C: Rainfall Outlook for the ASEAN Region (Mar 2015)