MALAYSIAN METEOROLOGICAL DEPARTMENT (MMD)
MINISTRY OF SCIENCE, TECHNOLOGY AND INNOVATION (MOSTI)

Technical Note No. 3 / 2016

Weather Analysis from January until April 2016

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Abstract

In the early of 2016, Malaysia region experienced wet condition due to Northeast Monsoon season. Cold dry air outbreaks from Siberian High produces surges of strong northeasterly flow, which will interact with warm and moist air over the South China Sea and impact the weather over Malaysian region. The analyses were carried out to monitor the condition of the weather during January till April 2016. The data which have been utilised were from the Japanese 55-year Reanalysis (JRA) Project, conducted by the Japan Meteorology Agency (JMA) and the daily rainfall data gained from principal stations of the Malaysian Meteorological Department (MMD). The presence of El-Nino contributed significantly on the wind pattern over Maritime Continent. Starting from January to April 2016, it was clearly indicated that the dominant and drier than normal conditions, which was based on Outgoing Long Wave Radiation (OLR) results. A strong El-Nino condition was present, which is indicated by the sea surface temperature (SSTs) anomalies of greater than 2°C across the east-central equatorial Pacific Ocean.
1. Introduction

During the early part of 2016, strong El Nino had been experienced since November 2015. It was indicated by well above-average sea surface temperature (SSTs) across the Central and Eastern Equatorial Pacific Ocean. Until March 2016, the sea surface temperature (SSTs) anomalies were in excess of 2°C across the east-central equatorial Pacific Ocean. The convection remained much enhanced over the central and east-central tropical Pacific and suppressed over Indonesia region. The prediction of continuation of the strong El-Nino prevails until it weakens with a transition to ENSO-neutral, likely during late spring or early summer 2016 and it is followed by a 75% chance of La Niña condition to be increased in the winter.

As for the typhoon records in the western Pacific Ocean, there were only two tropical cyclones recorded in November and December 2015. The first typhoon called In-Fa (17th to 27th November 2015) which started over the waters of western Pacific and ended at Southeast of Japan. The second typhoon named Melor was detected in the vicinity of the Western Pacific region. It started on 11th December 2015 and vanished over the eastern part of the Philippine Archipelago on 17th December 2015.

2. Data

The data used in this paper were taken from the Japanese 55-year Reanalysis (JRA) Project conducted by the Japan Meteorological Agency (JMA). The daily rainfall data were obtained from the Malaysian Meteorological Department (MMD) principal stations.

3. Result

a) Weather Conditions during January to April 2016

The Northeast Monsoon (NEM) in Malaysia is characterised by persistent northeasterly winds over the South China Sea and coastal areas of Kota Bharu, Kelantan, Malaysia. Cold dry air outbreaks from Siberian High produce surges of strong northeasterly flow, which will interact with warm and moist air over the South China Sea and impact the weather over Malaysia region. The east coast of Peninsular Malaysia experiences prolonged wet weather conditions during the NEM season.
The 925-hpa mean wind analyses from January to April 2016 as depicted in Figure 1 show persistently strong northeasterly wind flow over the South China Sea. This feature shows the NEM condition still exists and its intensity gradually decreased in March. The easterly trade winds dominated the Tropical Western Pacific Ocean in April. Near to the Equator, the winds became light and variable, signalling the retreat of NEM. Such condition exhibits the initial transition period to the Southwest Monsoon.

Figure 1: 925-hPa Mean Wind Analysis (ms⁻¹) for (a) January 2016, (b) February 2016, (c) March 2016 and (d) April 2016
Figure 2: Time-Longitude section of Anomalous Zonal Wind (ms⁻¹) averaged between 10°N and 30°N at 850-hPa from 1st January to 1st May 2016.

The 850-hPa anomalous Zonal Winds averaged between 10 between 10°N and 30°N at 850-hPa from 1st January to 30th April 2016 (Figure 2) shows a significant difference in the wind pattern throughout the region. During early January, the winds were westerlies from the Indian Ocean passing the Malaysia region (95°E to 125°E) until the end of the month. The anomalous easterlies exist at the beginning of February continuously flowing from the Western Pacific Ocean until early March. However, the strong anomalous westerlies persisted during mid-March until May with the light easterly winds across this region. The presence of El-Nino influenced the wind pattern over the Maritime Continent.
b) **Outgoing Long Wave Radiation (OLR)**

The monthly distributions of Anomalous OLR from January to April 2016 are depicted in Figure 3. Starting from January to April 2016, it was clearly indicated the dominant, drier than normal conditions, positive OLR anomaly were seen between 20° N and 5°N. It was in suppressed convection phase, in which most of countries along the Equator experienced dry weather. The prolonged positive anomaly of OLR prevailed across most of the Maritime Continent, depicting the significant impacts of El-Nino on the regional weather. Nevertheless, the South Sumatera, southern part of Borneo Island and southern part of Western Pacific Ocean experienced enhanced convection, with negative anomaly OLR and wetter than normal conditions, till April 2016.

![OLR Maps](image)

**Figure 3:** Anomalous OLR (Wm⁻²) for (a) January 2016, (b) February 2016, (c) March 2016 and (d) April 2016
The distribution of OLR anomaly is shown in Figure 4. Between the Equator to 10°N (left panel), the westward propagating easterly wave from the western Pacific Ocean was observed in January until the middle of February. The negative value of OLR anomaly shows the active convection, which contributed to the wet weather over the South China Sea. In the Malaysian region (95°E to 125°E), suppressed convection was observed and contributed to the dry weather. Meanwhile, in the belt between 10°N to 20°N (right panel), the positive anomalous OLR indicated strong suppressed convection over north of Thailand, Cambodia and Laos during April.
c) Synoptic Climatology

(i) January 2016

The averaged 850 hPa circulation of January 2016 (Figure 5) reveals that the double near equatorial monsoon trough is well-defined. The ridge that located at northern part lies along the Equator while its southern part extends around Equator and 5°S from the Indian Ocean till the Western Pacific Ocean. The northern part of the trough bisects the Indonesian region from Sumatera to Sulawesi. Persistent northeasterly winds of 10 to 20 knots were observed over the South China Sea. This winds condition combined with the monsoon trough caused wet weather conditions, especially in the east coast of Peninsular, as well as coastal Sarawak throughout January. Meanwhile, the northern subtropical ridge is visible between 15°N and 25°N this month. It is quasi-stationary relative to the last month and lies within its climatological average position in January. Over our region northeasterly winds between 5 and 15 knots persisted since December 2015.

Figure 6 depicts the averaged January 2016 upper level circulation. The northern subtropical ridge lies within its long-term position in between 5°N and 15°N from the Arabian Sea till the Western Pacific Ocean. The southern subtropical ridge is also located well - within its normal position in between 10°S and 17°S. Both ridges are quasi-stationary from the last month. The East Asian Jet Streak (EAJS) is well defined. Maximum easterlies were observed near the south-eastern coast of Japan at 140 knots. The EAJS position and intensity are close to their mean climatological values. Over our region southeasterly flow of 10 to 15 knots, dominates in the upper troposphere.

The 10-days (decadal) average atmospheric circulation for the 850 hPa level are shown in Figures 7A, 7B, and 7C, respectively. Throughout the decade, speed convergence from 15 - 20 knots in the South China Sea to around 5 to 10 knots can be observed in the Peninsular Malaysia. These conditions lead to enhanced rainfall over eastern part of Peninsular Malaysia (Kelantan & Terengganu) in January 2016. These wind condition also enhanced convective activities over western part of peninsular (Selangor, Negeri Sembilan & Melaka). Meanwhile for Sarawak during the first decade experienced wet weather especially in Kuching, Kapit and Sibu districts. In the third decade of January 2016, cross-equatorial flow is strongest. Westerly winds of over 10 knots cover much of Java island in Indonesia. Fair weather occurred across
the Peninsular Malaysia during this period, while less rainfall is observed in East Malaysia.

The 10-day averaged 200 hPa circulation is depicted by Figures 8A, 8B, and 8C. Both northern and southern subtropical ridges are well-defined throughout the decades. The northern subtropical ridge is located between 2°N and 15°N during the first decade, and shifted slightly southward to around Equator (Western Pacific Ocean) to 10°N (Arabian Ocean part) in the second decade. During the third decade this ridge shifted back to its normal position and located between 5°N and 15°N. The East Asian Jet Streak (EAJS) is clearly visible throughout the decades. It was located in southern Japan. This EAJS intensified from 140 knots in the first and second decade, to about 160 knots in the final decade. The decadal upper wind flow over our region in the first decade was light and variable, but remained steady southeasterly in the second (5 - 15 knot) and third decade (15 - 30 knot).

Notes:
First decade : 01-10 January 2016
Second decade: 11-20 January 2016
Third decade : 21-31 January 2016

Figure 5 : Monthly Mean Wind at 850 hPa for January 2016
Figure 6 : Monthly Mean Wind at 200 hPa for January 2016
Figure 7A: Monthly Mean Wind at 850 hPa for 1-10 January 2016

Figure 7B: Monthly Mean Wind at 850 hPa for 11-20 January 2016

Figure 7C: Monthly Mean Wind at 850 hPa for 21-31 January 2016

Figure 8A: Monthly Mean Wind at 200 hPa for 1-10 January 2016

Figure 8B: Monthly Mean Wind at 200 hPa for 11-20 January 2016

Figure 8C: Monthly Mean Wind at 200 hPa for 21-31 January 2016
(ii) February 2016

The synoptic circulation in the lower troposphere at the 850 hPa atmospheric pressure level, averaged for February 2016, is depicted in Figure 9. During this period, the double near equatorial monsoon trough feature is well-defined where by its northern component lies along the equator while the southern component is located between 10 to 15°S in the southern hemisphere. Both near equatorial troughs stretch from the Indian Ocean to the Western Pacific Ocean. In the north, the subtropical ridge is clearly observed stretching from the Western Pacific Ocean to Mainland China at the south of Japan between 20 to 25°N. An active low-level anticyclone is evident in India centred at 80°E, 20°N this month. Strong northeasterlies with speeds between 20 to 25 knots were observed in the South China Sea characterised by counter-clockwise turning of low-level winds along the equator and cross-equatorial flow. In comparison to the previous month, that is January 2016, these features were quasi-stationary. Relative to the long-term synoptic circulation, each feature show consistency too. However, a slight increase in low-level wind speed by 5 knots was observed in the Western Pacific Ocean and the South China Sea.

Meanwhile, the monthly averaged upper tropospheric circulation as depicted by Figure 10 reveals that the upper level synoptic circulation and its associated features does not significantly deviate from the long-term average. In this report, the upper troposphere level is defined at the 200 hPa atmospheric pressure level. Over here, the East Asian Jet Streak (EAJS) lies in its usual position to the south of Japan with a maximum westerly wind speed of 150 knots between 30 to 35°N and 140 to 150°E. In the same month, the upper level subtropical ridge is prominently observed from the Western Pacific Ocean at 10 to 15°N to the Maritime Continent and the Indian Ocean in between 5 to 10°N. Its southern counterpart, namely the southern subtropical ridge at 200 hPa is centred along 15°S in the southern Indian Ocean stretching across northern Australia. Across the tropics at the upper atmosphere (200 hPa) southeasterlies dominate at speeds of 20 knots in average. Comparison between the upper level tropospheric circulation of January and February 2016 leads to the general observation that the northern westerlies and tropical easterlies in the upper level show an increase in wind speed by 10 knots accompanied by enhanced upper level divergence in the southern Indian Ocean between 5 to 10°S.

The synoptic evolution at the lower troposphere defined by the 850 hPa atmospheric pressure level for each decade or 10 day interval are shown in Figures
11A, 11B, and 11C. Each decade is characterised by continental winds blowing eastwards from mainland Asia to the western Pacific Ocean followed by clockwise turning at the subtropical ridge causing them to u-turn towards the Maritime Continent and converging with the Pacific easterly trade winds. Northeasterlies show periodic strengthening with peak intensity of 25 to 30 knots in the South China Sea during the first and third decades and a low of 15 to 20 knots during the second decade. This is indicative of periodic surges of cold air from Siberia which intensifies the near equatorial monsoon trough leading to enhanced moisture convergence and hence precipitation at this time. The near equatorial monsoon trough lie along the equator while the subtropical ridge was located along 25°N across the Western Pacific Ocean and also in the Indian subcontinent centred between 15 to 20°N throughout February 2016.

The upper level tropospheric circulation is characterised by significant intra-seasonal oscillation in wind direction and jet streak intensity as depicted decadally by Figures 12A, 12B, and 12C. Strong southeasterlies between 15 to 25 knots prevailed over the Maritime Continent in the first decade followed by a drastic change in wind direction becoming northeasterlies with the same speeds during the second decade and subsequently reverting back to southeasterlies with a reduced speed of 10 to 20 knots in the Maritime Continent. The East Asian Jet Streak (EAJS) displays similar decadal variability, with a starting maximum intensity of 160 knots during the first decade before slackening in the second decade to 140 knots and strengthening back to 160 knots in the final decade.

Notes:
First decade : 01 – 10 February 2016
Second decade : 11 – 20 February 2016
Third decade : 21 – 29 February 2016
Figure 9: Monthly Mean Wind at 850 hPa for February 2016

Figure 10: Monthly Mean Wind at 200 hPa for February 2016

Figure 11A: Monthly Mean Wind at 850 hPa from 1 – 10 February 2016

Figure 12A: Monthly Mean Wind at 200 hPa from 1 – 10 February 2016

Figure 11B: Monthly Mean Wind at 850 hPa from 11 – 20 February 2016

Figure 12B: Monthly Mean Wind at 200 hPa from 11 – 20 February 2016
March 2016

The average monthly synoptic circulation in March 2016 at the lower troposphere or the 850 hPa atmospheric pressure level is shown in Figure 13. The double monsoon trough feature is well-defined over the equator. The northern component lies along the equator while the southern component lies between 5 to 10°S in the Indian Ocean and 10 to 15°S over the western Pacific Ocean. The subtropical ridge is prominent across the western Pacific Ocean along 20°N, and 15 to 20°N along the Indian Ocean. The subtropical ridge has shifted southwards by around 5° since February 2016 but no change was observed for both monsoon troughs. North-easterlies prevailed at speeds between 10 to 15 knots in the South China Sea and 5 knots over our region. Each feature was consistent with its long term characteristic.

The monthly synoptic circulation of March 2016 at the upper troposphere or 200 hPa is depicted in Figure 14. The East Asian Jet Streak located to the south of Japan, between 25 to 30°N and 130 to 150°E has weakened significantly to 110 knots this month (March 2016) from 140 knots in February 2016. The subtropical ridge at this level lies between the equator to 5°N over the Indian Ocean and 5 to 10°N over the western Pacific Ocean. Meanwhile the subtropical ridge at the southern hemisphere lay centred along 10°S stretching across the Indian Ocean and the western Pacific Ocean. These upper tropospheric synoptic features were mostly consistent with their long-term conditions.
The decadal evolution of the synoptic features at the 850hPa atmospheric pressure level throughout March 2016 is depicted in Figures 15A, 15B, and 15C. Over Malaysia, light north-easterlies of speed 5 knots during the first decade changed direction to light northerlies with speeds of up to 5 knots. Cross equatorial flow at 5 knots was evident during each decade. The monsoon trough has moved northwards from 5°S to the equator to 5°N to the equator from the first decade onwards. No tropical disturbances have been detected from January to March 2016 indicating an as yet inactive Pacific Typhoon season.

The synoptic features at the 200 hPa atmospheric pressure level for March 2016 during each decade are depicted in Figures 16A, 16B, and 16C. The East Asia Jet Streak (southern Japan) is shown to be moving westwards with a slight increase in speed throughout the decades. Variable upper level winds with an average speed of 10 knots were observed over Malaysia throughout the decades.

Notes:
First decade : 01 – 10 March 2016
Second decade : 11 – 20 March 2016
Third decade : 21 – 31 March 2016
Figure 15A: Monthly Mean Wind at 850 hPa from 1 – 10 March 2016

Figure 16A: Monthly Mean Wind at 200 hPa from 1 – 10 March 2016

Figure 15B: Monthly Mean Wind at 850 hPa from 11 – 20 March 2016

Figure 16B: Monthly Mean Wind at 200 hPa from 11 – 20 March 2016
(iv) April 2016

The monthly mean circulation in the lower troposphere for April 2016 (Figure 17) shows that the subtropical ridge in the northern hemisphere is located around 16°N over India, and 15°N - 25°N over the north of western Pacific Ocean. Meanwhile, both of the northern near equatorial and southern hemisphere troughs continue to show a double trough features across the region. The northern near equatorial trough is located around 2°N over the Indian Ocean, extends over the Indonesian region and extends further toward the equator over the western Pacific Ocean. This near equatorial trough located within its mean climatological position. On the other hand, the southern hemisphere trough is located in between 3°S and 10°S, within its mean climatological position in April.

In the upper troposphere, the monthly mean circulation for April 2016 is shown in Figure 18. The subtropical ridge in the northern hemisphere is located around 5°N to 10°N over the western Pacific Ocean and extends westward towards the Indian Ocean. In the southern hemisphere, the ridge is apparently located between 8°S to 13°S and located within its mean climatological position. As compared to the last month, the subtropical jet in the northern hemisphere has weakened, thus modulates the weakening of divergence flow over the Malaysian region. The southeasterly and southwesterly winds that prevailed in Malaysia region maintain its speed around 5 to 10 knots from the previous month.

The three decades mean circulation pattern in April 2016 at 850hPa are shown in Figure 19A, 19B, and 19C, respectively. The double trough feature was apparent throughout the decade, the northern near equatorial trough located between the
equator and 5°N over the Indian Ocean, extended over the west Pacific Ocean near the equator. There are two cyclonic vortex embedded in this trough found in the Indian Ocean in the first decade but in the second and third decades there's only one left. This trough in the second and third decades has brought the moisture to the Malaysian region especially in the western part of Peninsular and Sarawak state. Meanwhile the northern subtropical ridge can be clearly observed around 10°N to 20°N over the Southern Indian region until the Indo-China region and 20°N to 30°N over the Pacific Ocean throughout the decades. No tropical disturbances have been detected from January to April 2016 indicating an as yet inactive Pacific Typhoon season.

The three decades mean circulation pattern for April 2016 at 200 hPa level are shown in the **Figure 20A, 20B, and 20C**, respectively. The subtropical jet stream is clearly visible throughout the decades and is located in Japan region. Both the northern and southern subtropical ridges are well established throughout the decades. Over our region, southeasterly and southwesterly winds are noticeable in the last two decades.

**Notes:**

First decade : 01 – 10 April 2016  
Second decade : 11 – 20 April 2016  
Third decade : 21 – 30 April 2016

**Figure 17** : Monthly Mean Wind at 850 hPa for April 2016  
**Figure 18** : Monthly Mean Wind at 200 hPa for April 2016
Figure 19 (A): Monthly Mean Wind at 850 hPa from 1 – 10 April 2016

Figure 20 (A): Monthly Mean Wind at 200 hPa from 1 – 10 April 2016

Figure 19 (B): Monthly Mean Wind at 850 hPa from 11 – 20 April 2016

Figure 20 (B): Monthly Mean Wind at 200 hPa from 11 – 20 April 2016

Figure 19 (C): Monthly Mean Wind at 850 hPa from 21 – 30 April 2016

Figure 20 (C): Monthly Mean Wind at 200 hPa from 21 – 30 April 2016
(d) Rainfall

(i) January 2016

Most areas in Peninsular Malaysia had received less rainfall between below average to average. Northern Pahang, East Johor, coastal areas of Selangor and Northern Perak had recorded rainfall was less than the average. For Kelantan, the number of accumulated rainfall was slightly below average. Meanwhile, Negeri Sembilan, Melaka, Kedah and most of western Johor received more rain which were above average rainfall while other areas recorded a rainfall in average level.

In Sarawak, most areas received rainfall below the average. Kuching, Miri, Limbang, Bintulu, Kapit, Belaga and Sri Aman has received rain less than the average. Other regions recorded rainfall on the average level. The El-Nino effect was greatly affects rainfall in the state of Sabah. The whole area were experienced dry weather and received rainfall less than the monthly average.

(ii) February 2016

Most areas in the north and west of Peninsular Malaysia in the state of Perlis, Kedah, Penang, Perak and Selangor were recorded a reduction of rain about 40% -60% below the average, in total of rainfall amount were below 100 mm. At the same time, there were some areas had received a lot of rain in the East Coast states of Peninsular Malaysia, Negeri Sembilan, Melaka and Johor Barat with anomalies exceeding 60% of the level with an average rainfall amount between 100 mm to 200 mm.

Meanwhile in the Western part of Sarawak in Kuching, Sibu and Mukah, the received rainfall were more than 60% above average with total amount up to more than 1400 mm. Kuching stations have recorded a total rainfall of 1421 mm

Figure 17 (i): Rainfall Map (mm) for January 2016
almost nearly matching with the highest record which were 1558.9 mm in 1964. While in the eastern part of Sarawak, the rainfall recorded was about 40% below the average total rainfall between 200-300 mm.

Figure 17 (ii): Rainfall Map (mm) for February 2016

(iii) March 2016

In Peninsular Malaysia, almost all of parts received less rain more than 60% below the average with total rainfall of about 50 mm. West coast of South Perak, Selangor and Johor Barat received rainfall between 20% to 40% below the level with an average rainfall amount of 100 mm to 200 mm. For Sarawak, in the west part; Kuching, Samarahan, Sibu and Mukah, received more rainfall, which is over 60% above the average level with rainfall between 500 mm to 650 mm. Otherwise in eastern Sarawak state received less rain which were about 20% to 40% below the average with total rainfall between 100 mm to 350 mm. Other areas in the state received rainfall on average level with rainfall between 50 mm to 250 mm. In Sabah, generally in March, which had received very less rain. Kudat, West Coast and Sandakan had received rainfall 60% below the level with an average rainfall of about 50 mm. Meanwhile, the Interior and Tawau received rain 20% to 40% below the average total rainfall between 50 mm and 100 mm.

Figure 17 (iii): Rainfall Map (mm) for March 2016
April 2016

In Peninsular Malaysia, many places had been experienced hot and dry weather conditions. Perlis, Kedah, Perak, Kelantan, Terengganu and Pahang had recorded less total rainfall amount than the average with percentage of anomaly reduced with more than 60%. Pulau Pinang, South of Kedah, Northern of Perak, Pahang and interior of Johor also had recorded the low of rainfall amount which were less than the average. Meanwhile, Selangor, Negeri Sembilan, Melaka and North of Johor also had shown the reduction of the anomaly percentage which were between 20% to 40%.

In Sarawak, the Bintulu, Kapit and Limbang had received less rain than average with the reduction of anomaly percentage between 40% to 60%. In contrast, part of Kuching recorded rainfall exceeding 400 mm, with a percentage of anomalies almost 60%. Other parts such as Mukah, Sibu and Sarikei recorded more rain above the average which were increased the anomalies by 20% to 60%. The El Nino affected the state but the situation shows the sign of El-Nino were gradually weaken. The large part in Sandakan, Lahad Datu and Tawau received less rain than average with percentage of anomalies were between 20% and 40%. Kota Kinabalu and Labuan also received less rainfall than average with the reduction of anomaly percentage between 40% to 60%. Only a portion of Kudat were recorded received less rain than average with percentage exceeds 60%.

![Rainfall Map (mm) for April 2016](image)

**Figure 17 (iv):** Rainfall Map (mm) for April 2016
(e) El-Nino/ Southern Oscillation (ENSO)

In the early of the 2016, during January-February, a strong El Nino are been indicated with the sea surface temperature (SSTs) anomalies were in excess of 2°C across the east-central equatorial Pacific Ocean. The subsurface temperatures in the central and eastern Pacific increased due to down welling Kelvin wave but toward the end of the February, it weakened again in association with the eastward shift of below-average temperature at depth in the central Pacific. Also, low-level westerly wind anomalies and upper level easterly wind anomalies continued over much of the tropical Pacific. The traditional and equatorial Southern Oscillation Index (SOI) values remained negative but weakened relative during February. Convection remained much enhanced over the central and east-central tropical Pacific and suppressed over Indonesia. Collectively, these anomalies reflect the continuation of a strong El Niño.

During March- April, the subsurface temperature anomalies in the central and eastern Pacific decreased substantially in association with the eastward shift of below-average temperatures at depth. Low-level westerly wind anomalies and upper-level easterly wind anomalies continued, but were weaker relative to January. The traditional and equatorial Southern Oscillation Index (SOI) remained strongly negative. In addition, convection was still much enhanced over the central and east-central tropical Pacific and suppressed over parts of Indonesia and northern Australia. The situation shows the continuation of a strong El Niño.

As summary, a transition to ENSO-neutral is likely during late Northern Hemisphere spring or early summer 2016, with a possible transition to La Niña conditions with 50% of chances during the fall.

(f) Typhoon Occurrences

The closest typhoon track from Malaysia belonged to Typhoon Melor that moved westward from 130°E to 120°E between 10°N to 15°N from 13 to 16 December 2016 with Typhoon strength and dissipated on 17 December 2016 in the Philippines near 120°E, above 10°N.

The highest intensity typhoon was Choi-Wan which reached Category. However it was centred around 150°E moving northwards from 20°N to 50°N, far from our region (120°E, 10°N).
(g) **Weather Outlook for May to July 2016**

The Southeast Asia region is transitioning to the inter-monsoonal season, which is typically characterised by light and variable wind condition and afternoon showers. It is expected that the frequent afternoon showers during this season could bring some relief to the warm and dry weather conditions, which had persisted over areas north of the Equator. The rainfall outlook for the Southeast Asian region is generated using the European Centre for Medium Range Weather forecast (ECMWF) seasonal forecast product. Generally, the northern part of Southeast Asia region are expected to experience slightly drier weather condition. Meanwhile, the southern part of Indonesia (except northern part of Sumatera Island) is expected to experience slightly above average rainfall during this period.

4. **References**


http://www.tmd.go.th/en/: Seasonal Forecast
