

# Sixth Session of the ASEAN Climate Outlook Forum (ASEANCOF-6)

**Consensus Bulletin for June-July-August 2016 Season** 

## Introduction

The Sixth ASEAN Climate Outlook Forum (ASEANCOF-6) was organised by the Philippine Atmospheric, Geophysical, and Astronomical Services Administration, with the assistance of the ASEAN Specialized Meteorological Centre (ASMC). The ASEANCOF-was convened via email correspondence between the National Meteorological Services (NMSs) of all 10 ASEAN Member countries: Brunei, Cambodia, Indonesia, Lao, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam and experts from the WMO Global Producing Centres (GPCs): Japan Meteorological Agency, (JMA), National Centers for Environmental Protection (NCEP, NOAA), Centro de Previsão de Tempo e Estudos Climáticos (CPTEC/INPE), United Kingdom Met Office (UKMO), and WMO Lead Center for Long Range Forecast Multi-Model Ensemble (WMO LC-LRFMME)

The aim of the forum is to provide collaboratively developed and consensus-based seasonal climate outlooks and related information on a regional scale. The forum outlook and its activities contribute significantly to one of the key roles of the ASEAN Specialised Meteorological Centre (ASMC), which is to conduct climate and seasonal prediction for ASEAN region through pooling the expertise of ASEAN National Meteorological Services. The consensus outlook for the June-July-August 2016 season for the ASEAN region benefits from the guidance of the WMO GPC model outputs, as well as other global providers. In particular, use is made of the multi-model ensemble forecasts from WMO LC-LRFMME as well as country-level forecasts developed by the participating national experts. The forum reviewed the present climate conditions in the Southeast Asia region, and discussed the various global and regional climatic factors that will influence the JJA season in the area. In

particular, the forum took into account the significant influence of the El Niño Southern Oscillation (ENSO) and the Indian Ocean Dipole (IOD) on the climate over Southeast Asia.

# **Conditions and Outlook for JJA 2016**

Recent analyses of sea surface temperature anomalies (SSTA) and atmospheric conditions over the tropical Pacific have confirmed that the on-going El Niño is in its decaying stage and is likely to end before Northern Hemisphere Summer 2016. In May 2016, positive weak SSTAs were observed confirming that an ENSO-neutral condition is likely to develop in May-June-July 2016 season.

During June-July-August 2016, most international climate outlook models favor the development of La Niña condition. La Niña is characterized by persistent cooler tropical Pacific SST anomalies (-0.5°C or below) and stronger easterly winds over the tropical Pacific Ocean. While varying in local impacts, La Niña events are generally associated with wetter-than-average rainfall conditions over the ASEAN region, especially in the southern half of the region.

The IOD is predicted to be in a persistent negative state starting in JJA 2016 and is likely to continue towards the end of 2016. Negative IOD is generally associated with warmer than SSTA in tropical eastern Indian Ocean in contrast with cooler than normal SSTA in tropical western Indian Ocean. While negative IOD can potentially reinforce the impacts of La Niña, the low skills of climate models for IOD during JJA 2016 should be taken into consideration.

A limited assessment of few models revealed the presence of anomalous anticyclones (at 850-hPa) over northeastern Philippines suggesting weaker-than-normal southwest monsoon and enhanced wet southwesterly wind flow towards northern Southeast Asia.

Taking into consideration the national-level forecasts, the present status of the climate conditions affecting Southeast Asia, and the forecasts available from the GPCs and other global centres, the forum agreed on the following consensus-based outlook for the JJA 2016 season for the Southeast Asia region:

### RAINFALL

For the upcoming Northern Hemisphere summer monsoon season (June-July-Aug), there is a slightly enhanced probability of above normal rainfall over the Maritime Continent, which includes most parts of Borneo, Singapore, and southern Sumatra. Slightly enhanced probabilities of below normal rainfall are predicted over northern Philippines. Elsewhere over the region, there are slightly enhanced probabilities for near normal rainfall.

#### **TEMPERATURE**

Above normal temperatures are very likely over much of the Southeast Asia region for the upcoming Northern Hemisphere summer monsoon season (June-July-Aug), with the highest probabilities over the Philippines and mainland Southeast Asia.

Refer to Annex A for reference on what is meant by "above, near, or below normal" in the outlook. For more information on the Northern Hemisphere summer monsoon outlook and further updates on the national scale, the relevant NMSs should be consulted (see Annex B). The review for the DJF 2015-16 consensus outlook from ASEANCOF-5 is included in Annex C for reference.

Consensus Maps for JJA 2016





## Acknowledgements

The forum would like to thank the National Meteorological Services of the ASEAN Member countries for conveying their national-level forecasts, the Global Producing Centres, and other participating international climate modelling centres for their products and expertise made available for this climate outlook forum. The forum would also like to thank the WMO Secretariat for providing support and guidance for this bulletin.

### Annex A: Rainfall and temperature tercile climatologies

The following figures are rainfall and temperature tercile boundary climatologies to reference against the consensus outlook. Only a single source of data for each variable is provided. For more representative climatologies, reference should be made also against observational datasets known to better characterise local patterns (e.g. quality-controlled station data from the respective National Meteorological Services).



Figure A1: Rainfall mean climatology in mm/month (left) and the temperature mean climatology (right) for JJA from 1981-2010 from TS3p21 (CRU, UEA).



Figure A2: Rainfall climatologies of the lower tercile boundary (left) and the upper tercile boundary (right) for JJA from 1981-2010 from TS3p21 (CRU, UEA) in mm/month.



Figure A3: Temperature climatologies of the lower tercile boundary (left) and the upper tercile boundary (right) for JJA from 1981-2010 from TS3p21 (CRU, UEA).

# Annex B: National Meteorological Services' Contact Information

- Brunei Darussalam Meteorological Department (BDMD)

http://www.met.gov.bn/weather

- Department of Meteorology, Cambodia

http://www.cambodiameteo.com/map?menu=3&lang=en

- Badan Meteorologi, Klimatologi dan Geofisika, Indonesia (BMKG)

http://www.bmkg.go.id

- Department of Meteorology and Hydrology (DMH), Lao

http://dmhlao.etllao.com/

- Malaysian Meteorological Department (MMD)

http://www.met.gov.my/

- Department of Meteorology and Hydrology (DMH), Myanmar

http://www.dmh.gov.mm/

- Philippines Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)

http://www.pagasa.dost.gov.ph/

- Meteorological Service Singapore Government (MSS)

http://www.weather.gov.sg/home/

- Thai Meteorological Department (TMD)

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

- National Center for Hydro-Meteorological Forecasting (NCHMF), Vietnam

http://www.nchmf.gov.vn/Web/en-US/43/Default.aspx

# Annex C: Review of Consensus Outlook DJF 2015-16

The following was the consensus outlook for DJF 2015-16:

### RAINFALL

For the upcoming Northern Hemisphere winter monsoon season (Dec-Jan-Feb), there is a strongly enhanced probability of below normal rainfall over the Philippines and the north-eastern part of Borneo Island. Over the eastern Maritime Continent and over the northern part of Mainland Southeast Asia, there are slightly enhanced probabilities of above normal rainfall. Elsewhere over the region, there are slightly enhanced probabilities for normal or below normal rainfall.

#### TEMPERATURE

Above normal temperatures are very likely over much of the Southeast Asia region for the upcoming Northern Hemisphere winter monsoon season (Dec-Jan-Feb), with the highest probabilities over the central and western Maritime Continent.

# **Consensus Maps for DJF 2015-16**



In review, temperature outlook for DJF 2015-16 was largely consistent with observations in the region, which experienced above normal conditions in general (Figure 1).



Figure 1: Temperature Percentiles for DJF 2015-16. Image credit: NOAA.

For rainfall, the outlook was consistent with below normal conditions experienced in the central parts of the region around 0 to 10°N, and for Java. It was also generally consistent for the above and near normal conditions over the upper parts of the mainland Southeast Asia, and for parts of the islands over the eastern Maritime Continent. The outlook did not capture observed conditions over the western Maritime Continent where it went for near normal conditions when instead above normal was observed. It was noted that consensus for this particular sub region was of low confidence during this time of the year due to the poor skill from models for the corresponding season. Also, in December 2015, Typhoon Melor crossed northern Philippines where it brought significant amount of rainfall during its passage.



Figure 2: Rainfall tercile categories with brown shaded areas showing below normal, grey showing near normal and green showing above normal conditions. Image credit: IRI Data Library.