At the Met Office we understand that the accurate prediction of tropical storms and cyclones is vital to your on- and offshore operations in South East Asia. This report provides information on the general conditions which have been experienced since December 2014, as well as an analysis of the incidence of tropical cyclones during that period.
GENERAL CONDITIONS

The period December to April is dominated by North East Monsoon conditions. Across the region we have compared this period’s wind speeds and wave heights against the background of average and extreme conditions. Studying our model datasets at points in the gulf of Thailand, offshore Malaysia and the Java Sea we have calculated the long term (2001-2014) average and maximum and minimum wave heights (figure 1) and wind speeds (figure 2) and compared them against the most recent month’s data.

They show that conditions were generally close to or slightly above average and well within the expected range. Noticeable exceptions are the higher than average wave heights offshore of Malaysia in December and January and wave heights and wind speeds exceeding the monthly maximum during April in the Java Sea.

WIND AND WAVE PEAKS

Wind speeds and wave heights in the Gulf of Thailand peaked in December and January, with the strongest event occurring during the 16 and 17 December 2014 (map of wave heights shown in figure 3) where strong north easterlies blew through the South China Seas, causing significant wave heights in excess of 6m offshore of Vietnam. Similar conditions caused the maximum wave heights and wind speeds offshore of Malaysian Sarawak during 1 and 2 January 2015. The largest storm event in the Java Sea occurred during 24 and 25 April. Strong westerly winds caused significantly larger than normal wave heights for the time of year (~2 m) (figure 4).
The beginning of 2015 saw a record breaking start to the west Pacific typhoon season, with four named storms (winds ≥ 39 mph) before the end of March. Three of these storms — Mekkhala, Higos and Maysak — developed into typhoons, with Maysak (figure 5) reaching category 5 on the Saffir-Simpson Hurricane Wind Scale\(^1\) with winds in excess of 160 mph.

This is the first time since 1965 that there have been four or more tropical storms in the west Pacific before the end of March. The number of typhoons (three) is also the highest in the era of reliable records (since World War II). Maysak was the strongest typhoon to develop in March since Typhoon Mitag in 2002, and remains the strongest typhoon of the west Pacific 2015 season to date.\(^2\)

Since Maysak, the west Pacific has continued to see high levels of tropical cyclone activity, with two more intense typhoons (Noul and Dolphin) forming in May. This high level of activity is evident in the Accumulated Cyclone Energy (ACE) index, a measure of the strength and duration of storms during the season. By the end of May, the total ACE Index for Western Pacific had already exceeded 100, which is the highest on record for this point in the year since 1970 when reliable data became available. This value is well above the previous records set in 1976 (94.7) and 2004 (80.0).\(^3\)

### MODEL PREDICTIONS

The Met Office works closely with regional specialised meteorological centres worldwide, providing the latest computer model predictions of the likely track and intensity of tropical cyclones. This information is then combined with guidance from other models by official warning centres to produce their forecasts and guidance. The Japan Meteorological Agency is the official warning centre in the west Pacific.

The Met Office also provides updates on current tropical storms via the dedicated Twitter feed @metofficestorms.
EL NIÑO

In May this year the Met Office and other forecast centres around the world declared that an El Niño had begun in the tropical Pacific. The most powerful fluctuation in our climate system, El Niño can change the likelihood of floods, droughts, heatwaves and cold seasons for different regions around the world. It is still too early to determine with confidence the strength of El Niño, but suggestions are that weak conditions will strengthen from September 2015 onwards.

The impact of El Niño varies across the globe but is linked to warmer temperatures and drier conditions in South East Asia. This can result in poor monsoons for the region. Current forecasts suggest that there is a high likelihood of a moderate temperature increase (1-1.5 °C) against the average for the region from July to September. With regards to rainfall, the probabilities are variable across the region but the difference from average rainfall could be as much as -2.5 mm per day in some areas, as indicated in figures 7 and 8.

MET OFFICE AND ASIAN DEVELOPMENT BANK PARTNERSHIP

Earlier this year the Met Office signed an agreement with the Asian Development Bank (ADB) with the aim of working together to build greater resilience to weather and climate extremes in Asia and the Pacific.

Many countries across Asia and the Pacific are at the forefront of experiencing the direct and secondary socio-economic impacts of a changing climate – higher temperatures, sea-level rise and extreme weather conditions.

The ADB is providing support to develop knowledge on climate change, and this collaboration will give them access to our world-leading climate information and enrich the Met Office’s experience of development challenges and opportunities in Asia and the Pacific.

This collaboration by the Met Office with the ADB is an example of our continued drive to pull science expertise through to applicable service delivery with partners such as the ADB. It forms an integral part of our increasingly strong links across South East Asia, and the Philippines in particular.
SCIENTIFIC CONSULTANCY

Scientific consultancy can facilitate understanding of weather risks by analysing the past using our 15-year global hindcast dataset as well as examining projections for future climate change. The impacts on operating platforms and vessels at the design and development phases of current and future assets in your portfolio can then be understood. Whether that’s investigating natural variability, sea-level rise, the likelihood of a greater number of extreme events, even higher significant wave heights due to stronger winds, or looking at historical storm tracks using our hindcast and data from the World Meteorological Organization (WMO) and Joint Typhoon Warning Centre; the Met Office can work with you to understand and reduce your future environmental risks.

www.metoffice.gov.uk/offshore

Make informed decisions with our validated historical metocean dataset, science consultancy and forecast services. For more information call us on +44 1224 629831 or email marine@metoffice.gov.uk