1. Overview

1.1 During July 2020, most of the equatorial region experienced above-average rainfall (Figure 1). The largest positive anomalies (wetter conditions) were recorded in the coastal equatorial regions based on both satellite-derived rainfall estimates datasets (GSMaP-NRT and CMORPH-Blended). For the Mainland Southeast Asia, below-average rainfall was observed over northern Viet Nam, northern Philippines, and coastal Myanmar. This pattern of below-normal rainfall broadly follows the coastal regions between 15°N to 20°N, although there is some discrepancy between the two satellites for the Rakhine State, Myanmar, where the GSMaP-NRT (Figure 1, left) observed below-average rainfall, while CMORPH-Blended (Figure 1, right) observed near-average rainfall.

1.2 The observed large-scale rainfall anomaly pattern (i.e. above-average rainfall conditions in the equatorial regions and below-average rainfall for some regions of Mainland Southeast Asia and northern parts of the Philippines) is broadly consistent with the predictions in the subseasonal weather outlooks for July 2020 (1-15 July, 16-31 July).

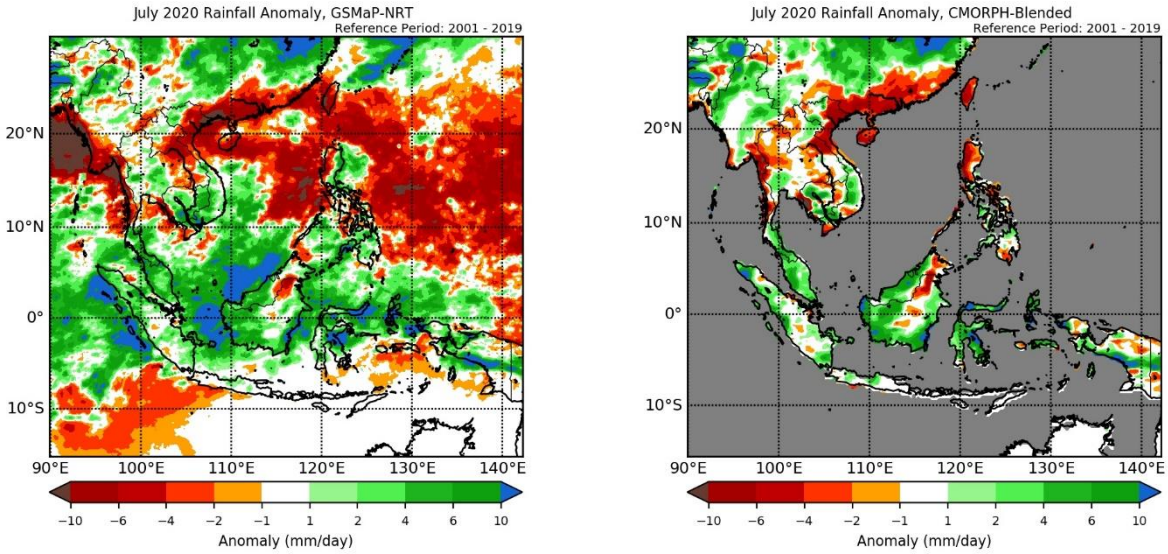

Figure 1: Rainfall anomalies for the month of July 2020 based on GSMaP-NRT data (left) and CMORPH-Blended data (right). The climatological reference period is 2001-2019. Green colour denotes above-average rainfall (wetter), while orange denotes below-average rainfall (drier).

1.3 Most parts of equatorial Southeast Asia experienced near-average temperature during July 2020 (Figure 2), coinciding with areas that experienced wetter conditions during the same period. Warmer anomalies (≥ 0.5°C) are concentrated over Mainland Southeast Asia, northern parts of the Philippines and eastern Maritime Continent. This pattern is similar to the June temperature anomalies.

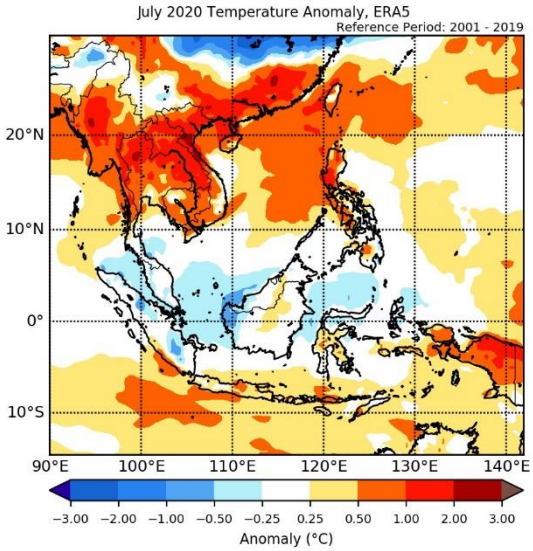

Figure 2: Temperature anomalies for July 2020 based on ERA-5 reanalysis. The climatological reference period is 2001-2019. Red colour denotes above-average temperature (warmer), while blue denotes below-average temperature (colder).

2. Climate Drivers

2.1 During the first half of July 2020, there was no coherent Madden-Julian Oscillation (MJO) signal. In Figure 3, the trace of the MJO moves between Phase 1 and Phase 2, with no clear eastward propagation. However, from the 19th of July, a clearer MJO signal formed and propagated eastward through the Indian Ocean (Phases 2 and 3), reaching the Maritime Continent at the end of the month. Typically in July, Phases 1 and 2 bring drier conditions in northern Southeast Asia while Phases 2 and 3 bring wetter conditions in the western Maritime Continent.

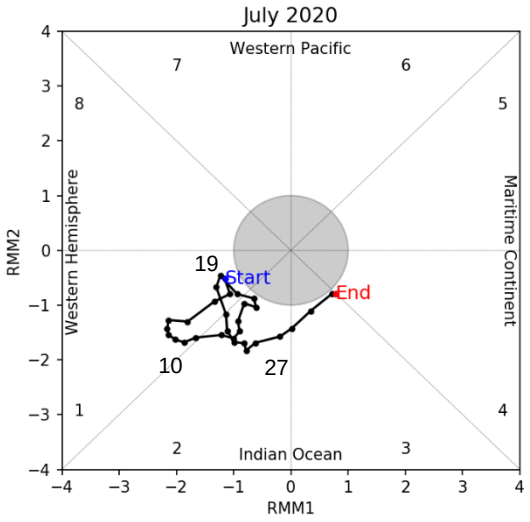

Figure 3: The MJO phase diagram. The diagram illustrates the movement of the MJO through different phases, which correspond to different locations along the equator (denoted in the text with the first day of the month in blue and the last day of the month in red). The distance of the index from the centre of the diagram is related to the strength of the MJO. Values within the grey circle are considered weak or indiscernible (data from the Bureau of Meteorology, Australia).