

Madden/Julian Oscillation:
Recent Evolution, Current
Status and Forecasts

Update prepared by
Climate Prediction Center / NCEP
August 7, 2006

Outline

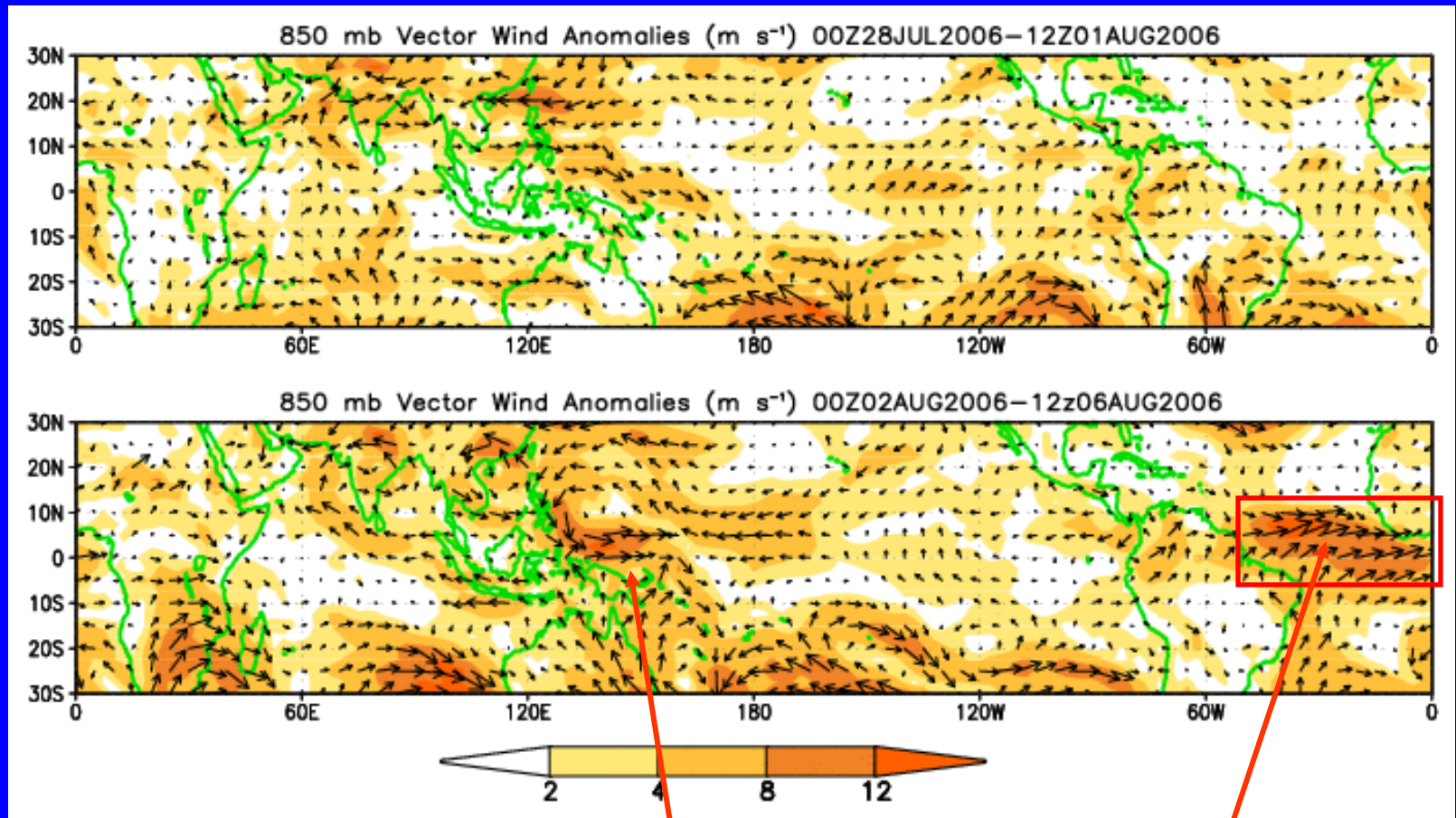
- **Overview**
- **Recent Evolution and Current Conditions**
- **Madden Julian Oscillation Forecast**
- **Summary**

Overview

- The MJO remains weak and the latest observations and model forecasts indicate continued weak MJO activity during the next 1-2 weeks.
- During week 1, there is an increased chance for above normal rainfall for South and Southeast Asia, east China, Japan, the western Pacific, and west-central Africa while below normal rainfall is expected across northern South America and southern Central America. Tropical cyclones Bopha, Maria, and Saomai are expected to impact South China and Japan, while the eastern Pacific may benefit from suppressed tropical cyclone activity.
- During week 2, there is an increased chance for above normal rainfall over Southeast Asia into the western Pacific.
- There is an increased chance of tropical cyclogenesis in western Pacific throughout the period.

850-hPa Vector Wind Anomalies (m s^{-1})

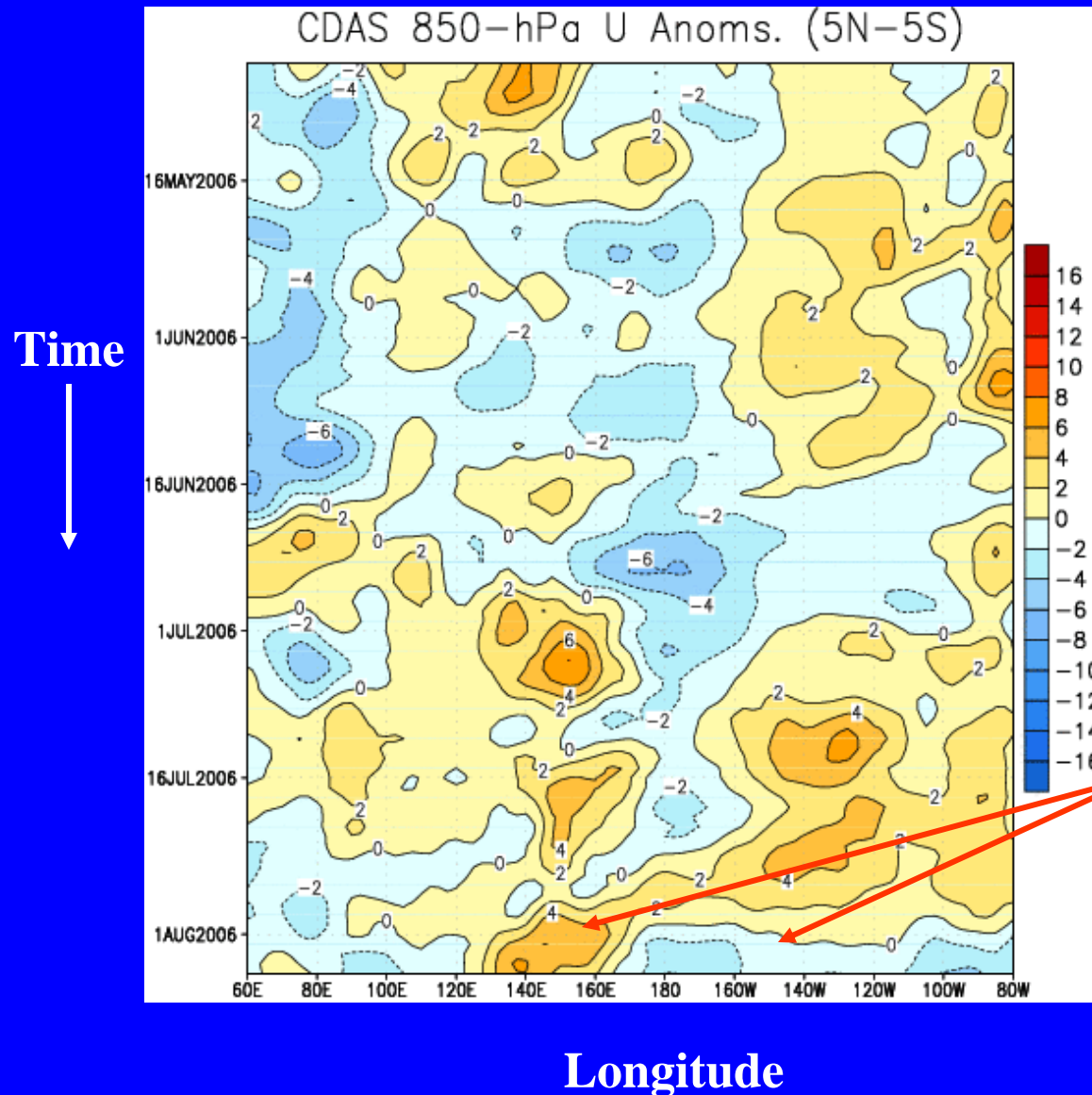
Note that shading denotes the magnitude of the anomalous wind vectors



Westerly anomalies strengthened over the equatorial western Pacific.

Westerly anomalies developed over the Tropical Atlantic.

Low-level (850-hPa) Zonal (east-west) Wind Anomalies (m s^{-1})

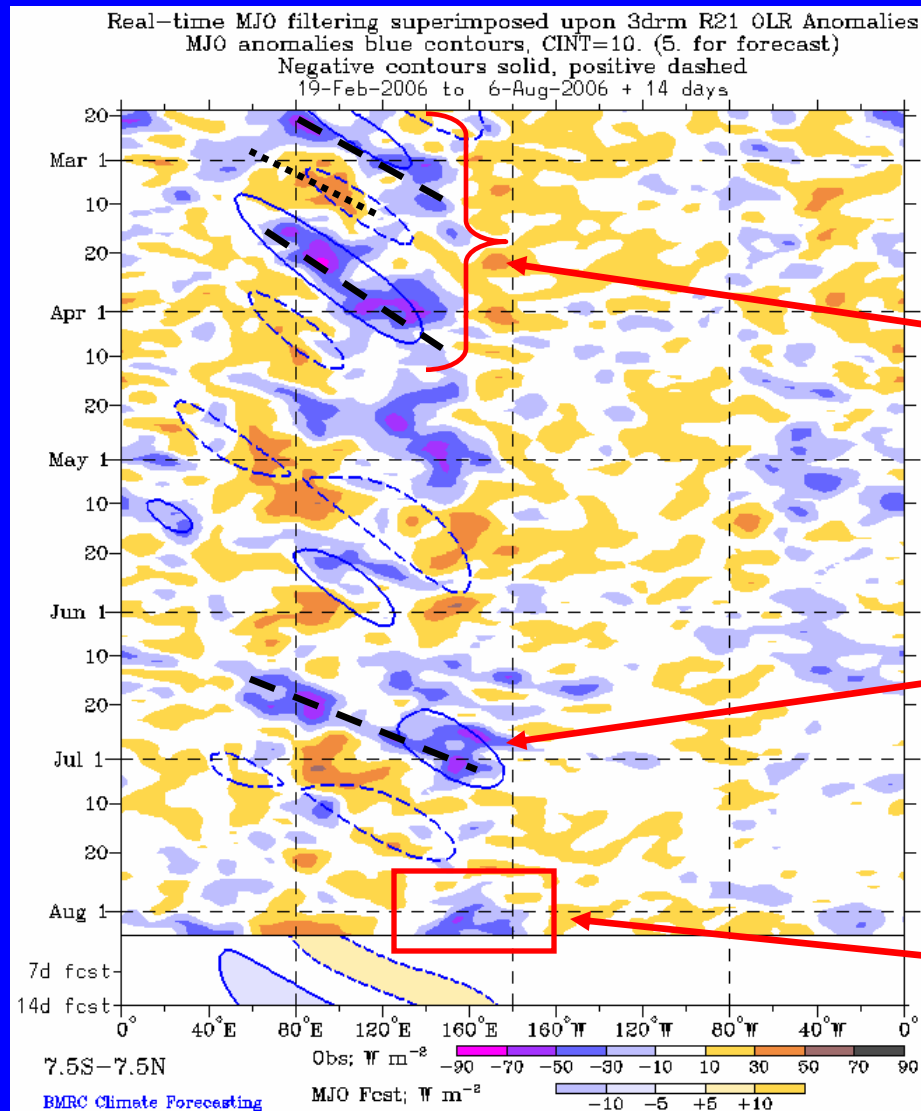


Weaker-than-average easterlies or westerlies (orange/red shading)

Stronger-than-average easterlies (blue shading)

Strong westerly anomalies are evident in the western Pacific with easterly anomalies east of the Date Line.

Outgoing Longwave Radiation (OLR) Anomalies (7.5°S-7.5°N)



Drier-than-average conditions (/red shading)

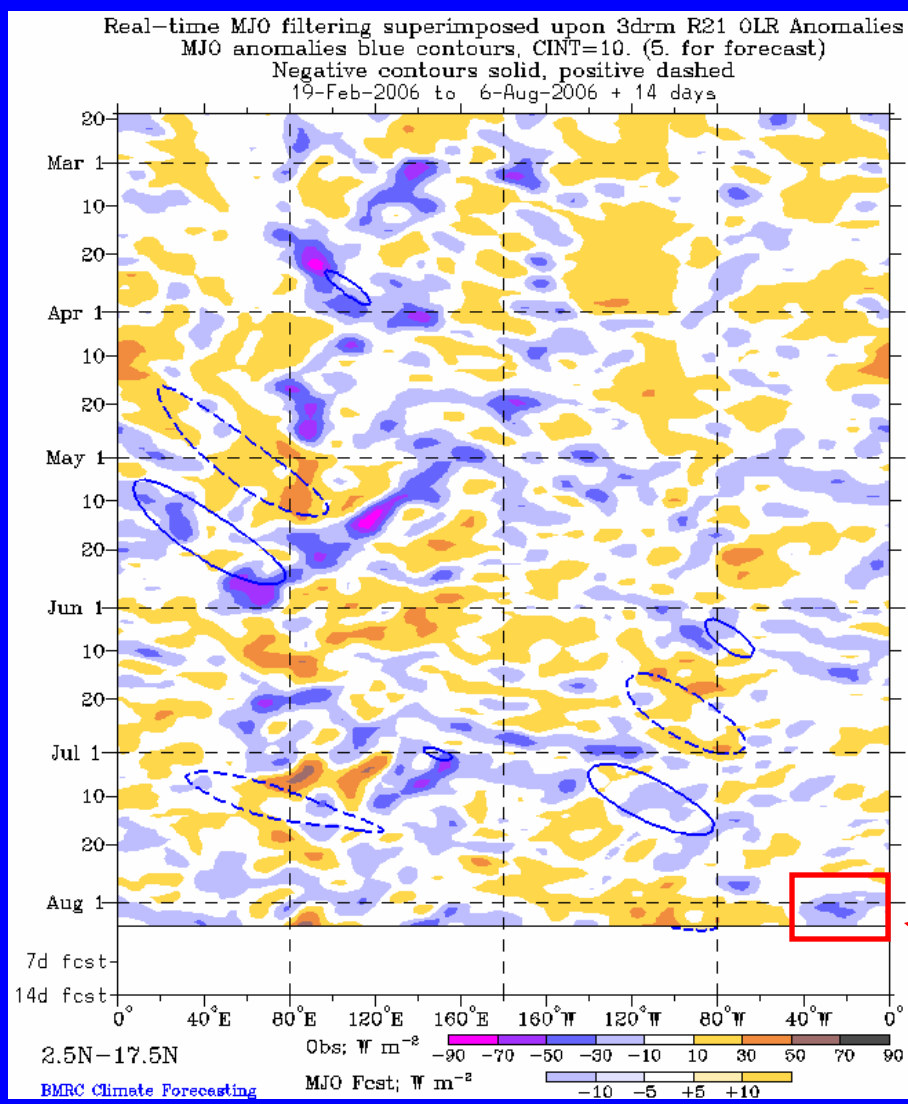
Wetter-than-average conditions (blue shading)

Eastward propagation of OLR anomalies associated with the MJO was evident from February into early April.

A coherent OLR anomaly moved across the Eastern Hemisphere in June.

Enhanced convection developed during the past week in the western Pacific.

Outgoing Longwave Radiation (OLR) Anomalies (2.5°N-17.5°N)

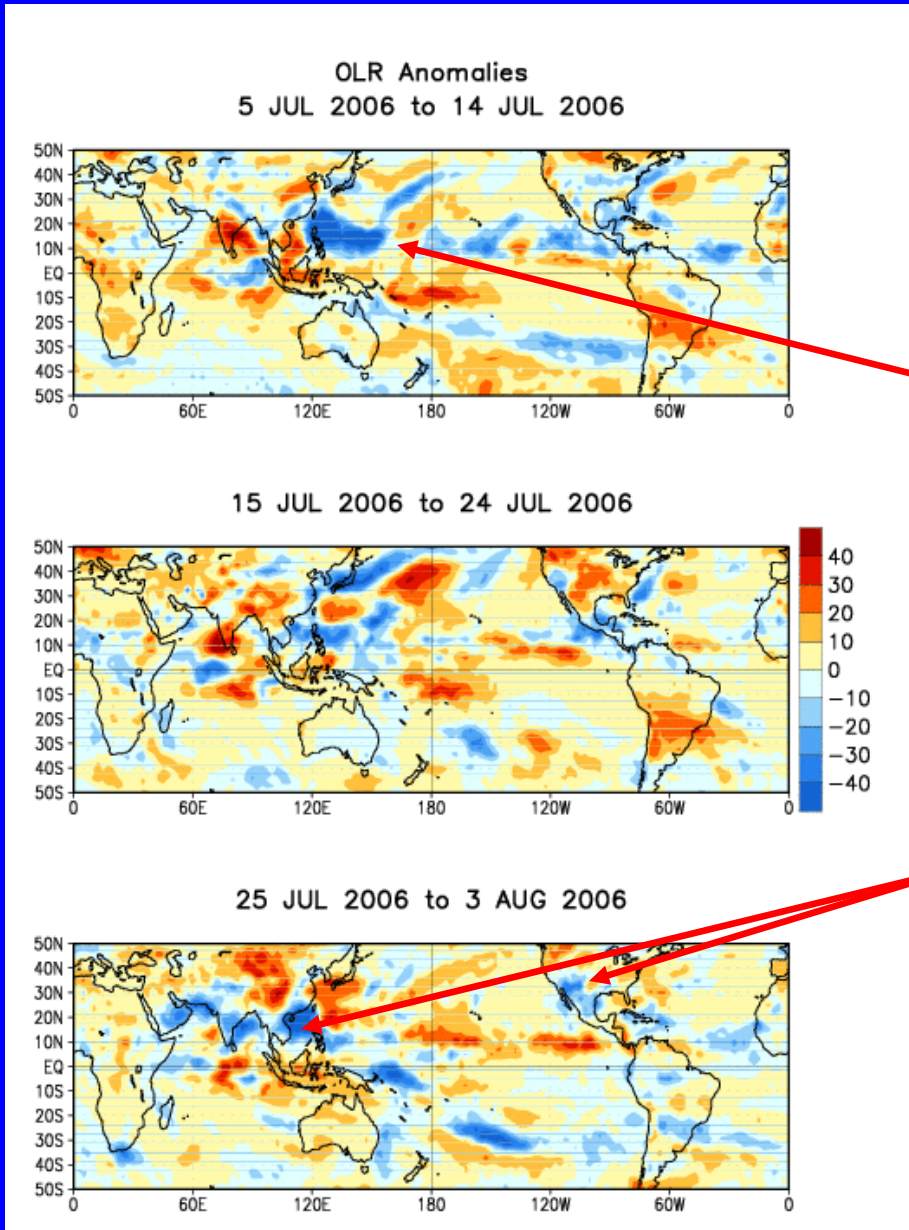


Drier-than-average conditions (/red shading)

Wetter-than-average conditions (blue shading)

Enhanced convection during the past week in the eastern Atlantic and western Africa.

Anomalous OLR: Last 30 days



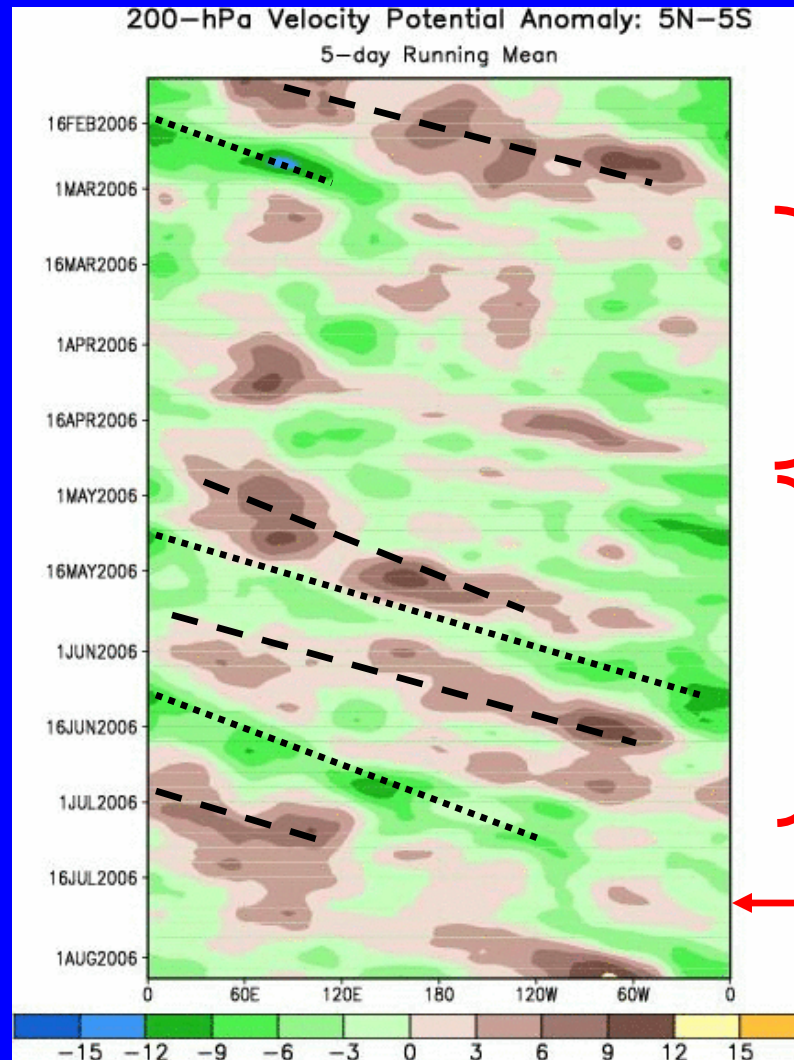
Enhanced convection and tropical cyclone activity were observed in the western Pacific during July.

After a period of suppressed convection during mid July over the North American and South Asian monsoon areas, enhanced convection was noted during late July and early August.

200-hPa Velocity Potential Anomalies (5°S-5°N)

Positive anomalies (brown shading) indicate unfavorable conditions for precipitation. Negative anomalies (green shading) indicate favorable conditions for precipitation.

Time



Longitude

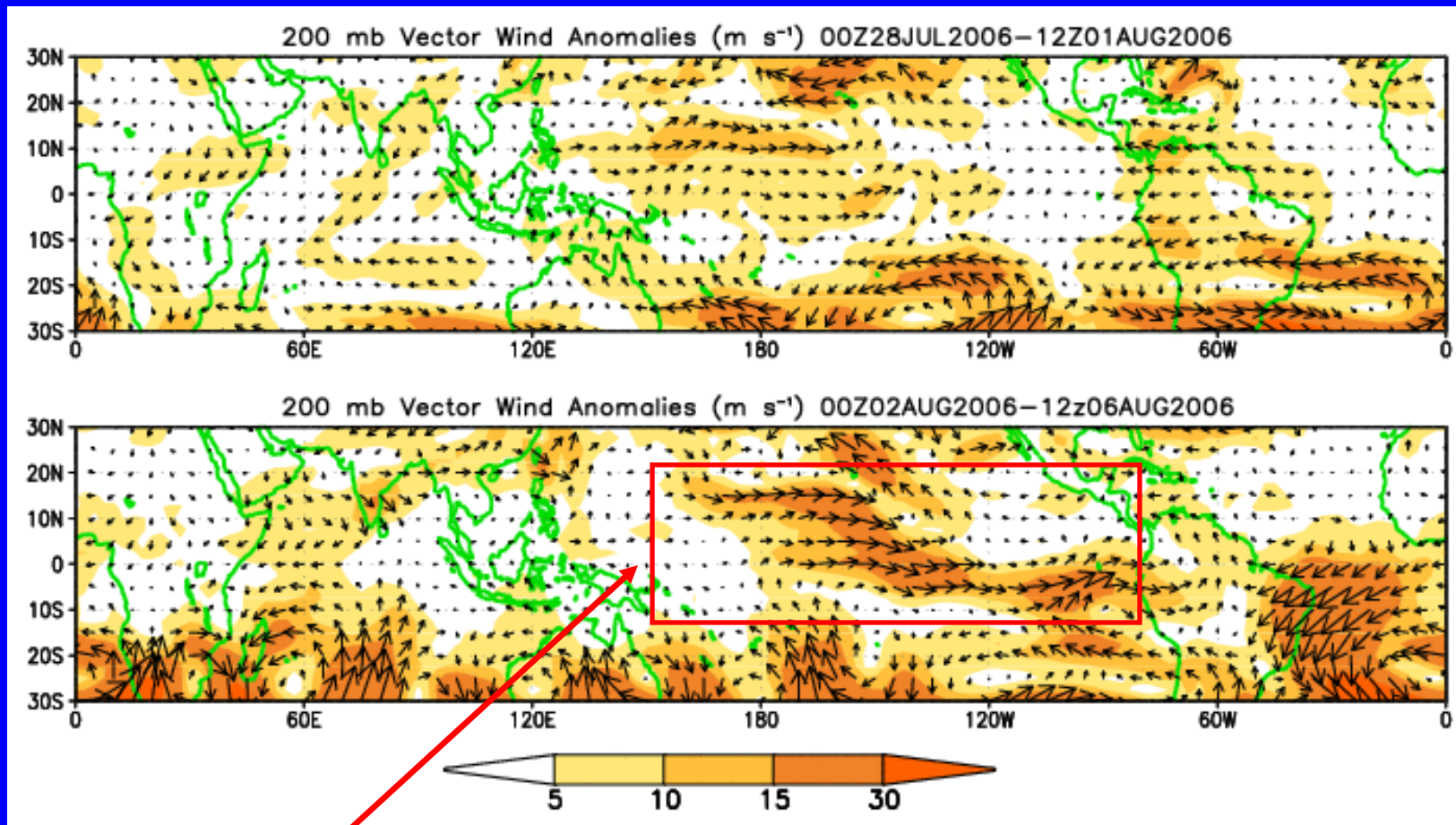
The MJO was incoherent during much of March and April.

MJO activity strengthened during May and June.

During most of July, the pattern became stationary, with enhanced divergence over the eastern tropical Pacific and convergence over the Indian Ocean and Indonesia.

200-hPa Vector Winds and Anomalies (m s^{-1})

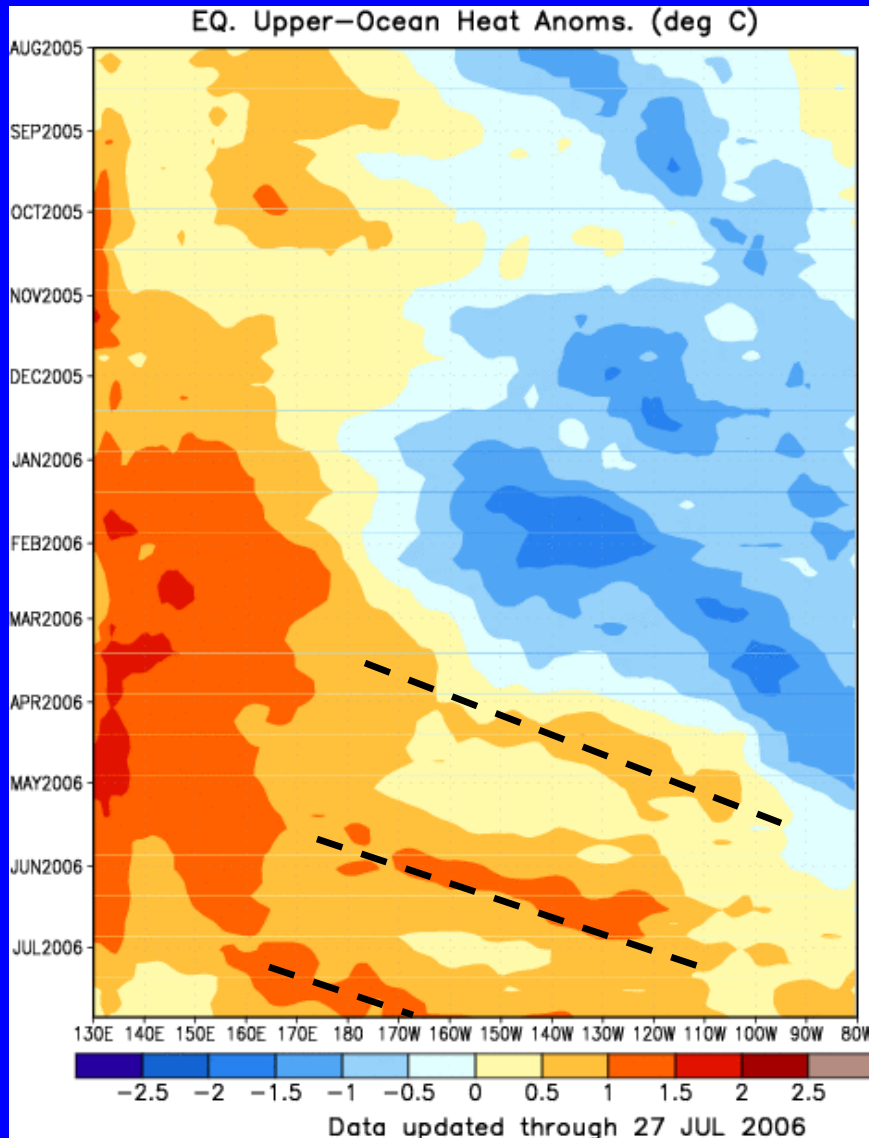
Note that shading denotes the magnitude of the anomalous wind vectors.



Westerly anomalies strengthened in the tropical central Pacific.

Heat Content Evolution in the Eq. Pacific

Time



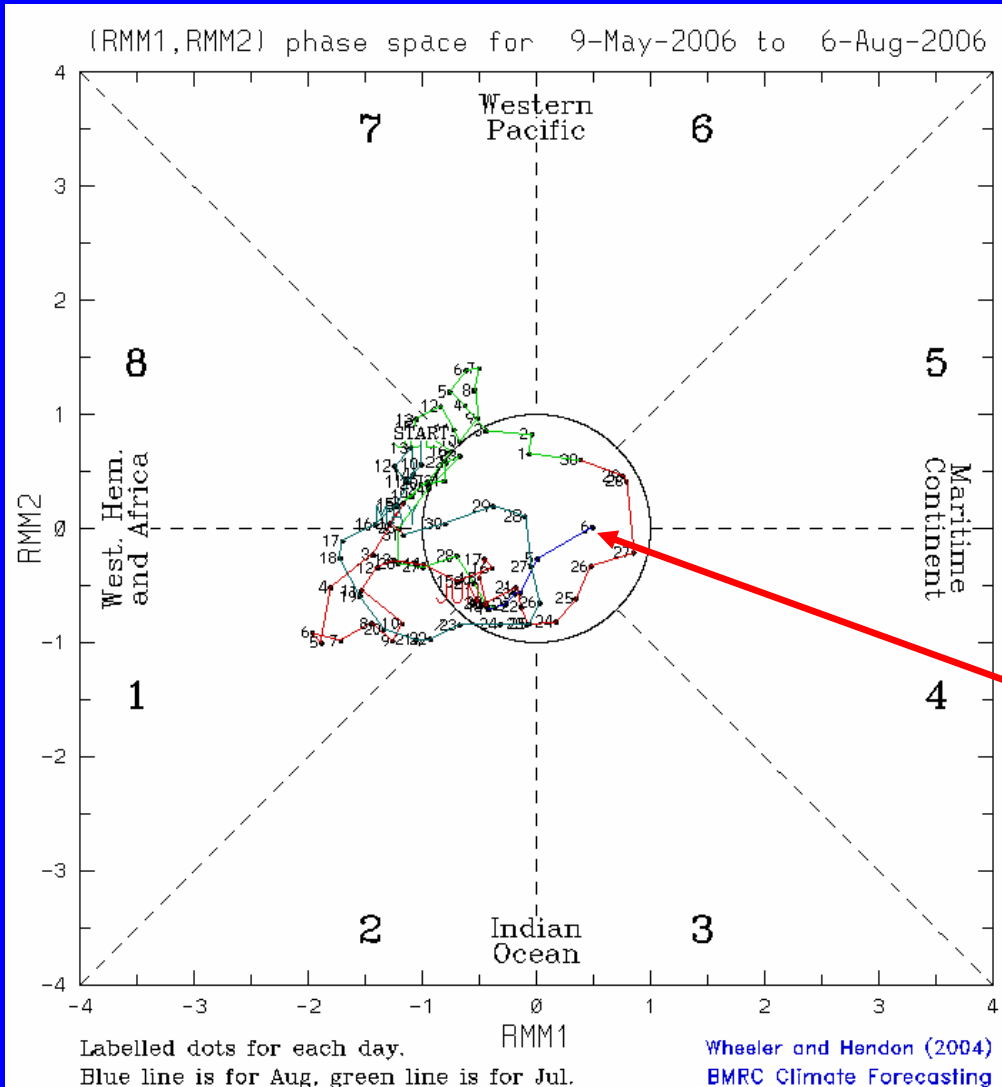
Longitude

Above normal upper oceanic water temperatures expanded from the western Pacific into the eastern Pacific in April in part due to Kelvin wave activity.

MJO Index (Magnitude and Phase)

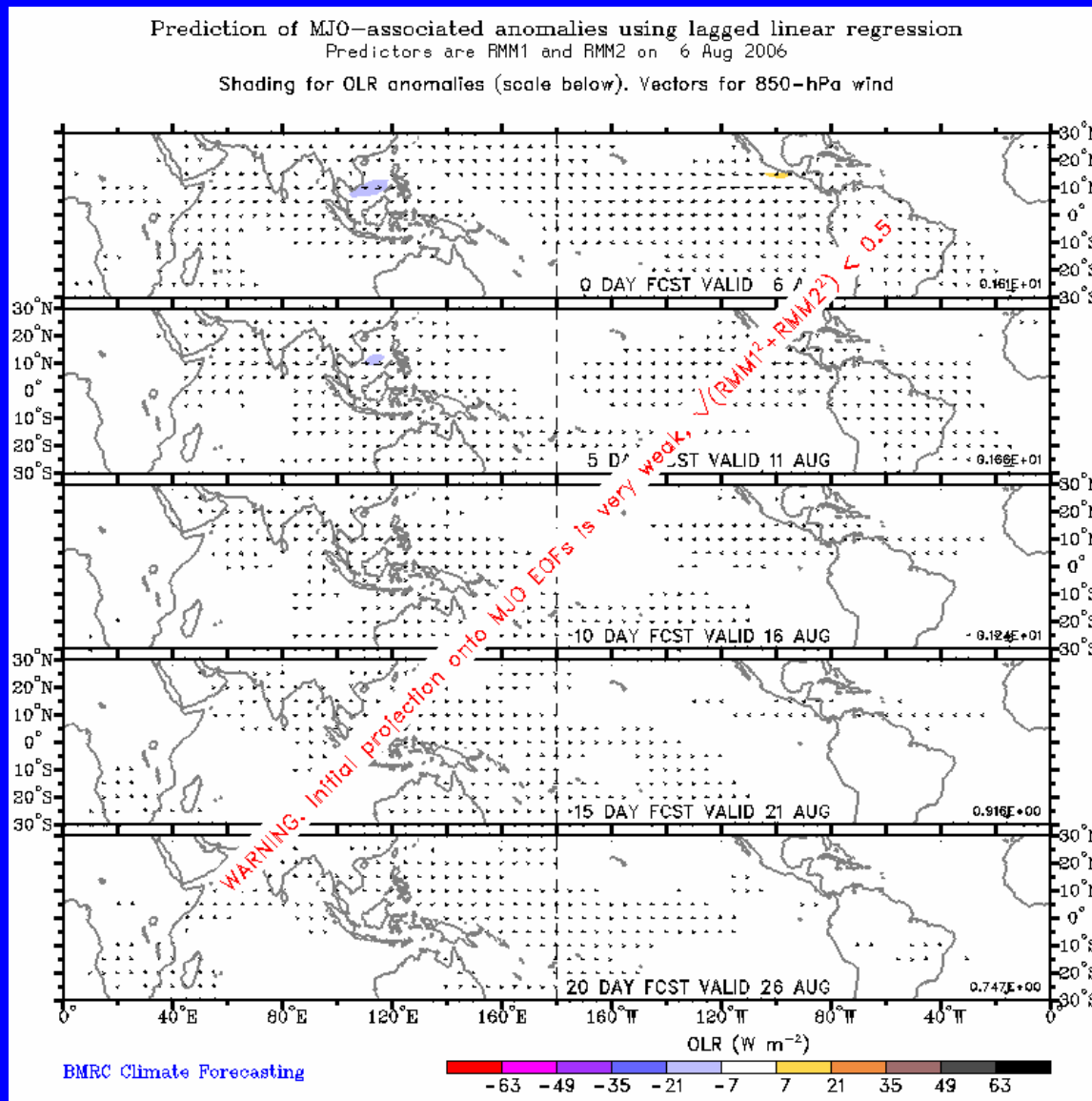
The current state of the MJO as determined by an index based on Empirical Orthogonal Function (EOF) analysis using combined fields of near-equatorially-averaged 850 hPa zonal wind, 200 hPa zonal wind, and satellite-observed outgoing longwave radiation (OLR) (Wheeler and Hendon, 2004).

The axes represent the time series of the two leading modes of variability and are used to measure the amplitude while the triangular areas indicate the phase or location of the enhanced phase of the MJO. The farther away from the center of the circle the stronger the MJO. Different color lines indicate different months.



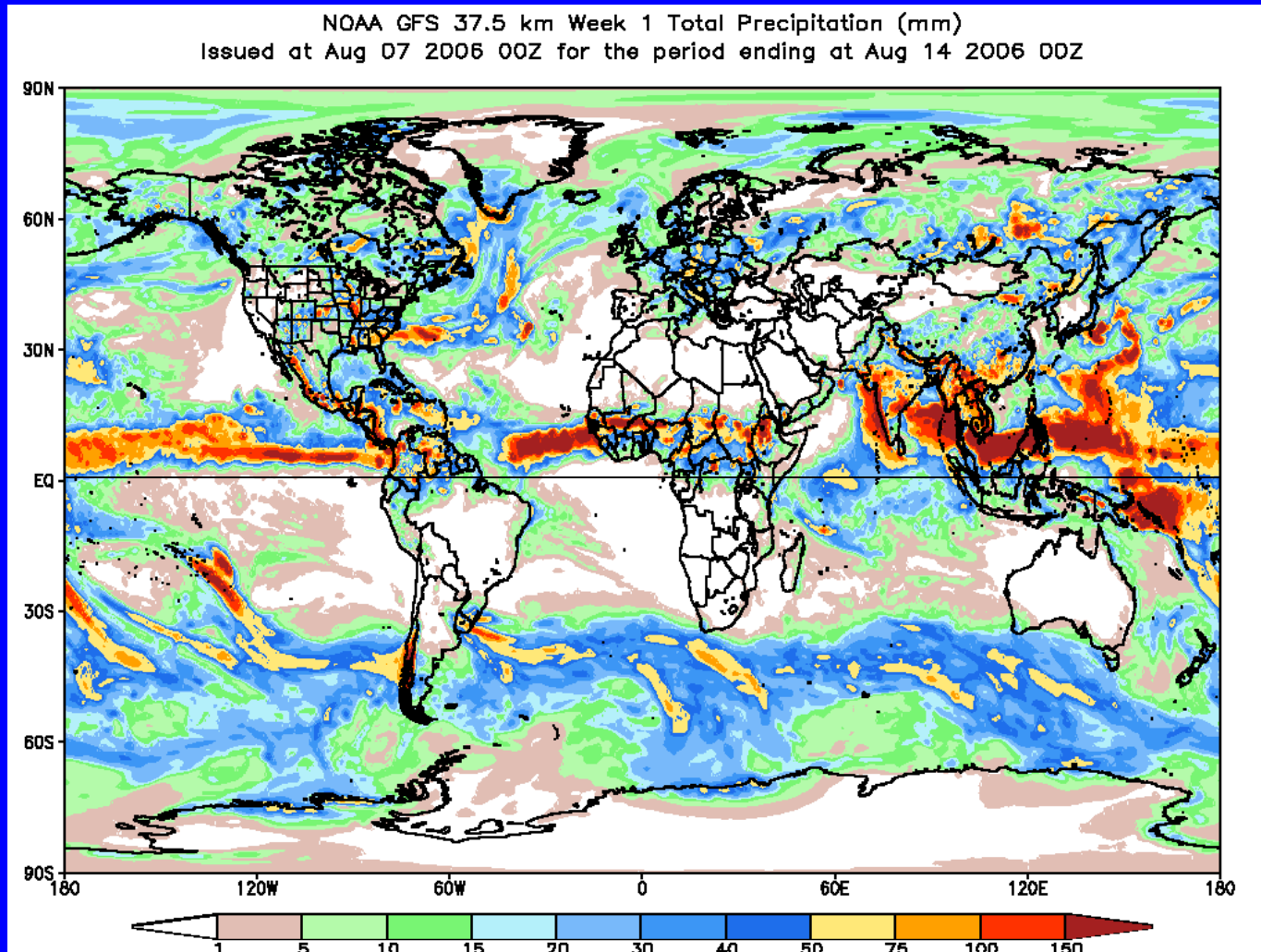
The MJO signal remains weak.

Statistical OLR MJO Forecast



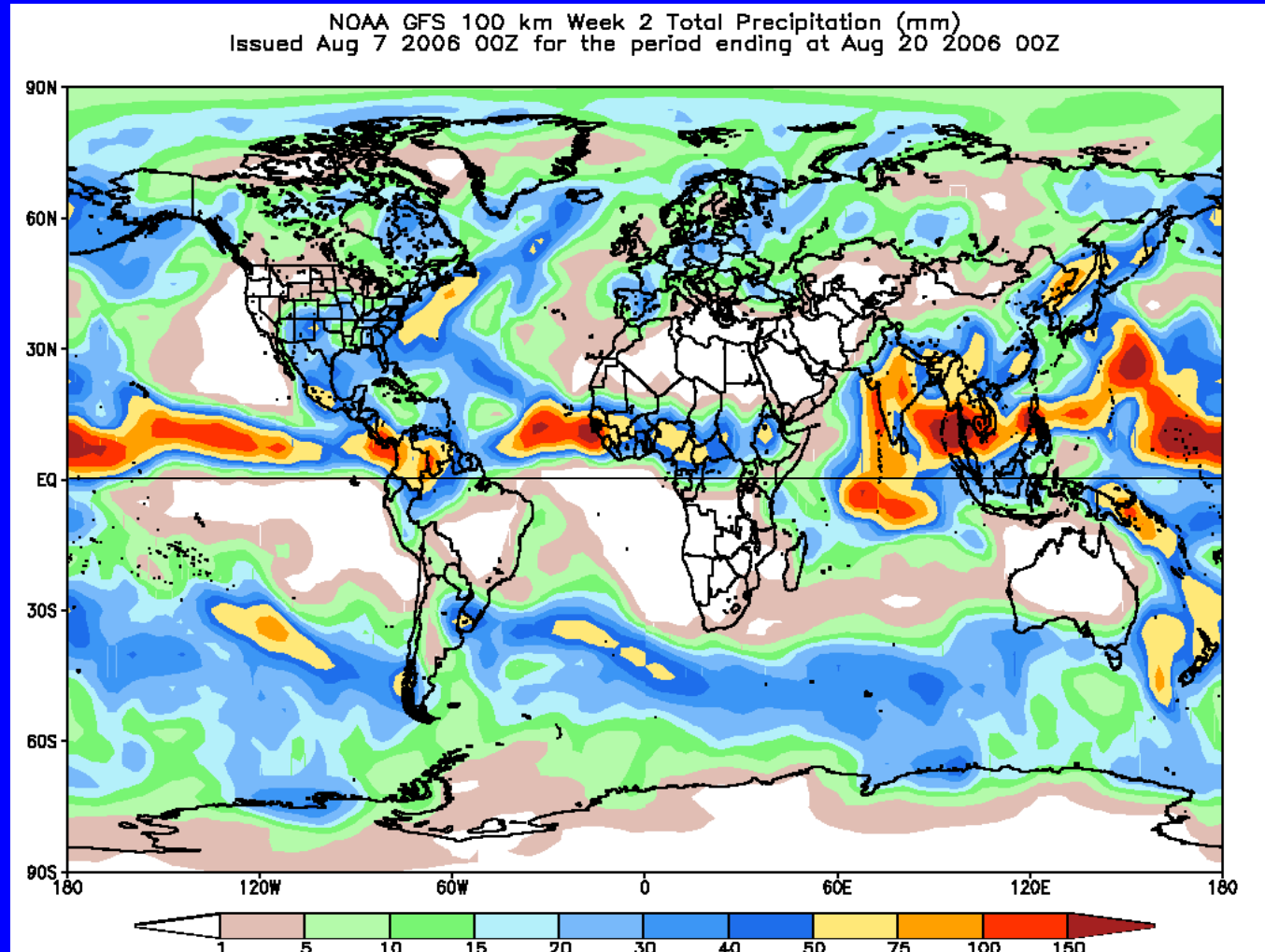
The MJO is expected to remain weak during the next 1-2 weeks.

Global Forecast System (GFS) Week 1 Precipitation Forecast



Abundant rainfall is expected over central India and Southeast Asia as well as central western Africa.

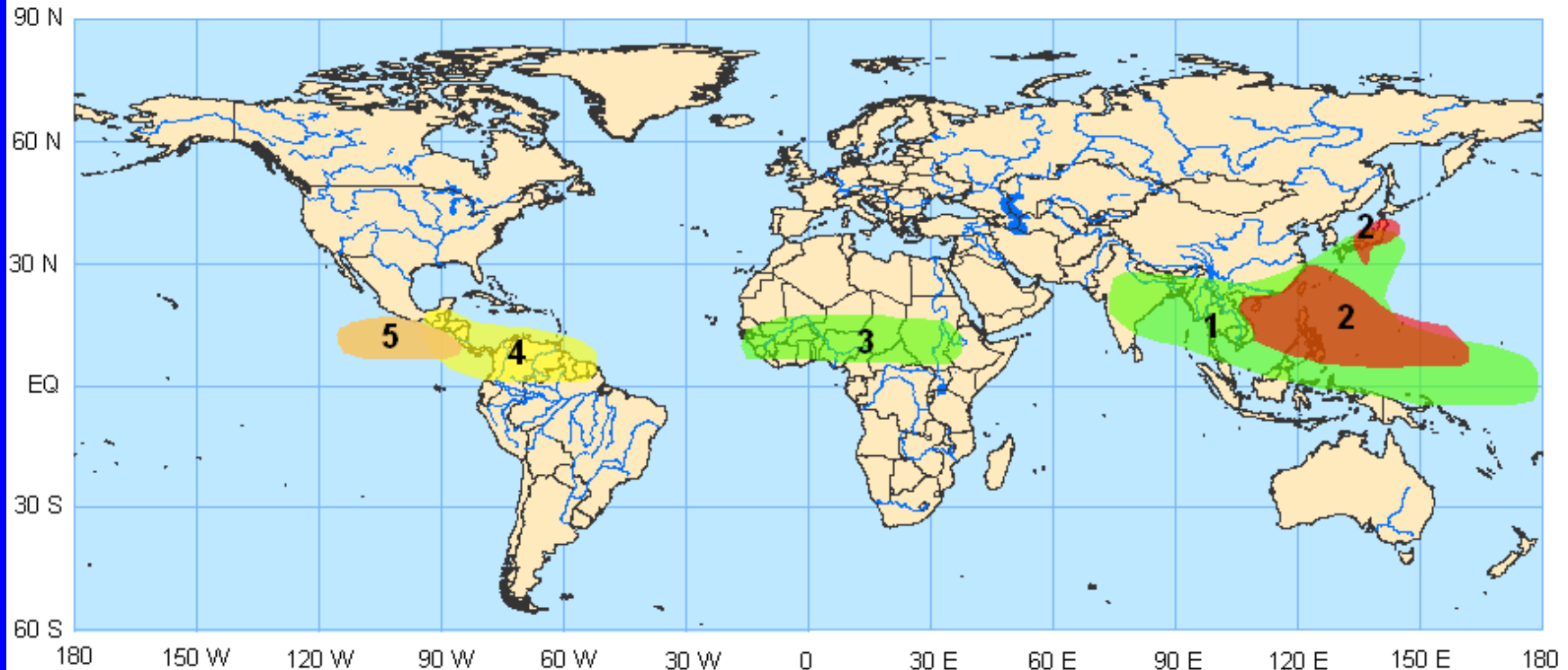
Global Forecast System (GFS) Week 2 Precipitation Forecast



Continued abundant precipitation over South and Southeast Asia as well as the tropical western Pacific.

Potential Benefits/Hazards – Week 1

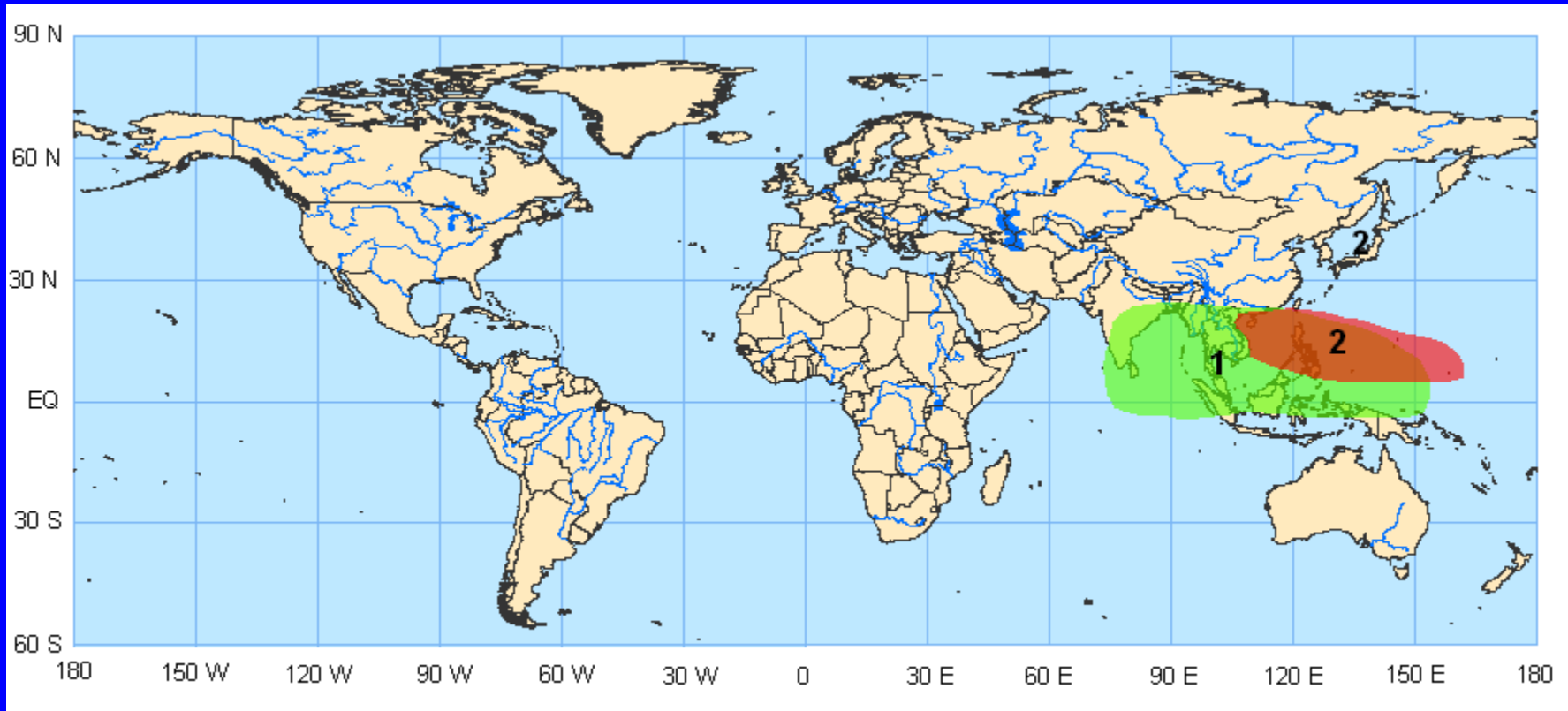
Valid August 8 - 14, 2006



1. Increased chance for above normal rainfall over South Asia, Southeast Asia, the Philippines, east China, Japan, and the western Pacific
2. Tropical cyclones Bopha, Maria, and Saomai will impact South China and Japan, together with increased chance for tropical cyclogenesis in the western Pacific
3. Increased chance for above normal rainfall over west-central Africa
4. Increased chance for below normal rainfall in northern South America, central America, and southern Mexico.
5. Increased chance for suppressed tropical cyclone activity in the eastern Pacific

Potential Benefits/Hazards – Week 2

Valid August 15 - 21, 2006



1. Increased chance for above normal rainfall over Southeast Asia, the Bay of Bengal, the Philippines and the western Pacific
2. Increased chance of tropical cyclogenesis in the western Pacific

Summary

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