**DYNAMO Forecast Discussion** -- DYNAMO MJO Forecast Team, August 24, 2011

**Recent Conditions:** During the past 1-2 weeks, the main tropical subseasonal coherent modes of variability have been rather weak or poorly defined. MJO activity continued to be unimpressive as it has been for much of the last couple of months and even KW and ERW activity has been rather weak (slides 7 and 8). Despite this, however, convection increased markedly across the central Indian Ocean during the past week with much of the DYNAMO campaign area experiencing enhanced convection, especially over eastern areas (slide 9). Drier-than-average conditions were experienced near the Philippines, across the South China Sea and over western portions of the Maritime Continent.

The monsoon circulation across SE Asia has been very weak in recent weeks and this is indicated by easterly wind anomalies stretching from the Philippines into the Bay of Bengal to southern India (slide 10). Across the DYNAMO site, weak easterly anomalies have been evident in part associated with the enhanced convection that has developed. At 200-hPa (slide 12), strong upper-level westerly anomalies are evident across the entire region and this has aided the venting of convection. This area has shifted east in the most recent five days. SST anomalies (slide 13) remain positive across most of the equatorial Indian Ocean, however, there are small negative anomalies near the southern portion of the site.

The WH MJO index indicates little coherent activity (slide 15) during the past week. Most operational models did a good job in forecasting the gradual increase in amplitude and location towards Phase 2 with forecasts from August 8th (slide 16). Due to the lack of strong signals across the DYNAMO regional domain, the previous GTH outlooks did not highlight many areas in Week-1 and no areas were highlighted in Week-2 (slide 17). Enhanced convection across the western Indian Ocean near Africa and the drier-than-average conditions near the Philippines verified well, but the area of enhanced convection forecast for the western Indian Ocean was too limited.

**Forecast:** The MJO index model forecasts indicate a potential strengthening MJO signal with propagation through Phases 2 and 3 by the end of Week-2 (slide 20). Other modes (KWs and ERWs) are expected to play less of a role compared to this signal (slides 21-22).

For Week-1 (slide 32), MJO composites support enhanced rainfall for portions of India, the Bay of Bengal and portions of SE Asia. A robust gyre circulation in the western Pacific is expected to support the flow of moisture and anomalous convergence across the lower South China Sea and Philippines into the western Pacific as seen in GFS and CFS model forecast output (slides 23-29). Model guidance generally favors drier-than-average conditions across much of the central and eastern Indian Ocean. However, there is likely to be a second area of enhanced rainfall along a convergence line in the Southwest Indian Ocean northeast of Madagascar extending to the southwest corner of the campaign site. Above-average SSTs also favor enhanced convection in this area as well as waters off the coast of central east Africa.

For Week-2 (slide 32), enhanced rainfall remains favored from India stretching to the Philippines. This is supported by MJO composites and GFS and CFS model guidance. There remains a tilt toward drier-than-average conditions across much of the equatorial central Indian Ocean as the potential suppressed phase of the MJO may begin to enter by the end of this period and model guidance strongly suggests a continuation of below average rainfall.

**Probability of at least moderate strength MJO (Outside WH unit circle with eastward propagation):**
Week-1: 80%, Week-2: 60%, Week-3: 20%
Weekly Briefing Objectives

1. **Review recent conditions** across the DYNAMO local and regional domain (Africa to the far western Pacific)
   -- Anomalous convection and winds, SST, etc.
   -- Status of subseasonal modes of climate variability (MJO, KWs, ERWs, etc.)
   -- Review performance of model forecasts (MJO index, raw guidance)
   -- Review recent “official” outlook from DYNAMO MJO forecast team

2. **Provide assessment, interpretation and outlook** for next two weeks
   -- Review MJO index forecasts
   -- Review forecasts of KWs and ERWs
   -- Review model forecast guidance
   -- Provide forecast rationale for “official” outlook
Weekly Briefing Schedule

1. MJO-GTH technical conference call Monday afternoon EDT

2. Draft forecast discussion will be prepared and sent to the DYNAMO MJO forecast team overnight EDT for discussion, adjustments and suggestions

3. Final GTH outlook and forecast discussion created early Tuesday afternoon

4. Briefing figure materials created and sent to EOL data catalog by COB Tuesday

5. DYNAMO weekly briefing (time not yet determined)
DYNAMO MJO Forecast Team

NOAA

- Jon Gottschalck – Head of Forecast Operations (CPC) (co-lead)
- Augustin Vintzileos – Research Meteorologist (CPC/ESSIC) (co-lead)
- Matthew Rosencrans – Meteorologist (CPC)
- Michelle L’Heureux – Meteorologist (CPC)

External

- Paul Roundy – Professor (SUNY, U.S.A.)
- Carl Schreck – Post-doctoral fellow (NCDC-CICS)
- Matt Wheeler – Senior Research Scientist (BOM, Australia)
Weekly Briefing Targets

1. Broad scale conditions over the regional DYNAMO domain

2. Focus on weekly average conditions, not day to day variability unless necessary

3. Focus on assessment and impacts from main subseasonal modes of climate variability (MJO, KW, ERW, etc.), modulated by model forecast guidance

4. Set template of figures, but some plots will be removed if not relevant and vice-versa others will be added given the conditions
Please Note: Many additional NCEP model forecast graphics (in addition to what is included here) are available at the DYNAMO data catalog and span from hourly to Week-2.

NOAA/CPC and ESSIC/CICS Work supported by NOAA’s Climate Program Office
Review of Conditions During the Past Week
OLR Time Longitude – Total Anomalies

OLR anomalies: 7.5°S - 7.5°N

3-Apr-2011 to 21-Aug-2011

Courtesy:
Carl Schreck
NCDC-CICS
OLR Time Longitude – Tropical Modes

Ovals are projections of leading modes: MJO (blue), KW (green), ER-1 (black)

Courtesy: Carl Schreck NCDC-CICS

OLR anomalies: 7.5°S - 7.5°N
3-Apr-2011 to 21-Aug-2011 + 21 days

OLR anomalies: 2.5°N - 17.5°N
3-Apr-2011 to 21-Aug-2011 + 21 days
Weekly OLR Spatial Anomalies

Observed 7-day mean OLR anom from day 20110815

Observed 7-day mean OLR anom (filt) from day 20110815
Zonal wind shaded, direction by vector
Westerly total/anomalies (red shades)
Easterly total/anomalies (blue shades)

Pentad averages for last 5 days
(bottom) and 5 days previous (top)
Zonal wind shaded, direction by vector
Westerly total/anomalies (red shades)
Easterly total/anomalies (blue shades)

Daily averages for last 4 days
Zonal wind shaded, direction by vector
Westerly total/anomalies (red shades)
Easterly total/anomalies (blue shades)

Pentad averages for last 5 days (bottom) and 5 days previous (top)
Sea Surface Temperature

SST (°C) 17 AUG 2011

SST Anomalies (°C) 17 AUG 2011
Equatorial Cross Section

Pressure Longitude Cross-section -- 5N - 5S
Mean U-W (streamlines), Specific Humidity (shaded) (g/kg)
AUG 15 2011 -- AUG 21 2011

Pressure Longitude Cross-section -- 5N - 5S
Anomalous U-W (streamlines), Specific Humidity (shaded) (g/kg)
AUG 15 2011 -- AUG 21 2011
Last 60 Days of Observations: Aug. 22, 2011

MJO Index
MJO Index Validation

1 Week Ago
Forecasts from: 20110816

2 Weeks Ago
Forecasts from: 20110808
X ➔ Denotes TC development location

Product is updated once per week. The product targets broad scale conditions integrated over a 7-day period for US interests only. Consult your local responsible forecast agency.
Overview

Synopsis of active climate modes:

1. MJO weak, but potential strengthening indicated
2. KWs, ERWs not well defined
3. ENSO neutral

Synopsis of factors impacting official forecast:

1. Potential MJO signal
2. GFS and CFS forecast guidance
3. SSTs across the western Indian Ocean
Forecast Graphics
MJO Index Forecasts

MJO Index Forecast for 23Aug2011-06Sep2011

MJO Index Forecast for 23Aug2011-06Sep2011
OLR Spatial Forecast Maps – Tropical Modes

Equatorial Rossby Waves in OLR

Sum of MJO, Kelvin, ER

1-Aug-2011 to 7-Aug-2011
Observed

15N
15S
30N
30S
0

W/m^2

30N
15N
0
15S
30S
0

22-Aug-2011 to 28-Aug-2011
Forecast

Forecast

Forecast

Forecast

Forecast

Forecast

Forecast

Forecast
Operational GFS Anomalous OLR

GFS frcst anom. OLR for week 1 from: 20110822all

GFS frcst anom. OLR for week 2 from: 20110822all

NOAA – Climate Prediction Center
Operational GFS 850-hPa Winds and Mean RH

REVH vs. A—Wind for week 1 from: 20110822all (850hPa)

REVH vs. A—Wind for week 2 from: 20110822all (850hPa)
Operational GFS 200-hPa Winds and Mean RH
Operational GFS Precipitable Water and 10 m Anomalous Wind

GFS forecast A_PWAT vs. A_Wind 10m for week 1 from: 20110822all

GFS forecast A_PWAT vs. A_Wind 10m for week 2 from: 20110822all

NOAA - Climate Prediction Center
CFS Week-1 and Week-2 Forecasts
CFS Ocean Forecasts
CFS Ocean Forecasts

CFS fcst. 8S Temp vs. u for week 1

CFS fcst. 8S Sal. vs. upwelling for week 1
GTH Forecast

Global Tropical Hazards/Benefits Assessment - Climate Prediction Center


Week 2 - Valid: Aug, 31 2011 - Sep, 06 2011

Produced: 08/23/2011

Confidence

High

Moderate

Tropical Cyclone Formation

Development of a tropical cyclone that eventually reaches tropical storm strength.

Above-average rainfall

Weekly total rainfall in the upper third of the historical range.

Below-average rainfall

Weekly total rainfall in the lower third of the historical range.

Above-normal temperatures

7-day mean temperatures in the upper third of the historical range.

Below-normal temperatures

7-day mean temperatures in the lower third of the historical range.

Product is updated once per week. The product targets broad scale conditions integrated over a 7-day period for US interests only. Consult your local responsible forecast agency.