DYNAMO Weekly Briefing
January 3, 2012

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.

Work supported by NOAA’s Climate Program Office

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Review of Conditions During the Past Week
Summary of Recent Conditions

The MJO was active during the past week with the enhanced phase shifting from the Maritime continent (MC) to the western Pacific. Enhanced convection associated with the MJO and atmospheric Kelvin wave activity contributed to enhanced rainfall over the MC, parts of the western Pacific, northern Australia and the South Pacific Convergence Zone (SPCZ). La Nina also contributed to these wetter-than-average conditions in some areas. South of the equator, there is some evidence of an equatorial Rossby wave (ERW) enhancing rainfall across the southwest Indian Ocean (IO). Twin tropical cyclones resulted in enhanced rainfall as well over the Bay of Bengal and across the south-central IO.

Suppressed convection was observed over the equatorial IO including the northern portions of the DYNAMO array as well as areas northeast of New Guinea. Strong westerlies continued across much of the IO extending into the MC, while upper-level winds remained generally close to average with the stronger westerly anomalies located over northern Australia and across the western Pacific.

The MJO index maintained its amplitude during the past week with eastward propagation to near Phase 6/7. The 200-hPa zonal wind contributed considerably to the index this past week and this signal, to a lesser degree appears to be continuing eastward. Model forecasts of the index from last week were good and clearly indicated a signal shifting east. Two weeks ago, a few models hinted at the increase in amplitude and subsequent eastward propagation observed. The DYNAMO outlook from last week did a good job in highlighting the main areas of anomalous convection through a combination of input from MJO composites and numerical model guidance. The Week-2 outlook was able to reasonably highlight the areas of enhanced rainfall for the southwest IO and across the MC, but failed to specifically highlight the drier-than-average conditions through the northern portion of the array.
OLR Time Longitude – Tropical Modes
Ovals are projections of leading modes: MJO (blue), KW (green), ER-1 (black)
Courtesy: Matt Wheeler - CAWCR
Weekly Spatial OLR

Total field

Anomalies
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)

Pentad averages for last 5 days
(bottom) and 5 days previous (top)
Time-longitude diagrams for zonal wind at 850-hPa and 200-hPa

Westerly anomalies (red shades)
Easterly anomalies (blue shades)
Equatorial Cross Section

Pressure Longitude Cross-section -- 5N - 5S
Mean U-W (streamlines), Specific Humidity (shaded) (g/kg)
DEC 25 2011 -- DEC 31 2011

Pressure Longitude Cross-section -- 5N - 5S
Anomalous U-W (streamlines), Specific Humidity (shaded) (g/kg)
DEC 25 2011 -- DEC 31 2011
Velocity Potential
MJO Index Validation

1 Week Ago

Forecasts from: 20111227

2 Weeks Ago

Forecasts from: 20111219
Verification

X ➔ Denotes TC development location

Observed 7-day mean OLR anom from day 20111225
Forecast Graphics
Outlook and Forecast Rationale

Most dynamical model MJO index forecasts indicate a decrease in amplitude during the period with some minor eastward propagation continuing during Week-1, but ending thereafter. Week-2 forecasts of the MJO index for a signal to enter the IO with amplitude, shown by some of the models last week, is no longer indicated. Most model forecasts are for a generally weak signal during Week-2. The above forecasts would favor enhanced (suppressed) rainfall to continue across the SPCZ (equatorial IO) at least during Week-1. An interesting component of the forecast is whether the upper-level signal remains intact and continues to shift eastward toward the IO with time.

The outlook favors enhanced rainfall for a region across the western MC near the Philippines supported by La Nina and numerical forecast guidance, while the MJO also contributes to a forecast for enhanced rainfall across the SPCZ and suppressed rainfall across the equatorial IO. Numerical forecast guidance supports enhanced rainfall for southeast Africa, Madagascar to the southwest portion of the DYNAMO array as well as an elevated threat for tropical cyclogenesis in the Mozambique Channel. Statistical forecasts of subseasonal variability, using a few different methods, also support most of the highlighted areas.

It is unclear to what extent, if any, the MJO will play during the Week-2 time period and there is high uncertainty for this portion of the forecast. The outlook tends toward a continuation of anomalous enhanced rainfall across parts of the MC and SPCZ region primarily due to La Nina and model forecast guidance. Enhanced rainfall highlighted for southeast Africa and the southwest IO are based on consistent model guidance across centers of which Week-2 forecasts in recent weeks have been quite good.

**Probability of at least moderate strength MJO (Outside WH unit circle with eastward propagation):**
Week-1: 40%, Week-2: 20%, Week-3: 20%
MJO Index Forecasts

MJO Index Forecast for 03Jan2012-17Jan2012

MJO Index Forecast for 03Jan2012-17Jan2012
ECMWF MJO Index Forecast
OLR Spatial Forecast Maps – Tropical Modes

Courtesy: Carl Schreck CICS-NC

Madden-Julian Oscillation in OLR

Kelvin Waves in OLR
OLR Spatial Forecast Maps – Tropical Modes

Courtesy: Carl Schreck CICS-NC

Equatorial Rossby Waves in OLR

Sum of MJO, Kelvin, ER
MJO Composites

Courtesy: CPC
ECMWF Forecasts

ECMWF Weekly Average of Ensemble Mean Forecast

Date: 01/02/2012 -- 01/08/2012 (Week 1)
U - V Wind (Vector, m/s), RH (Color, %) at 850hPa

Date: 01/09/2012 -- 01/15/2012 (Week 2)
U - V Wind (Vector, m/s), RH (Color, %) at 850hPa
GFS / CFS Forecasts – Week-1

16 Member Ensemble Mean Forecast from 02Jan2012
Week 1 Anomalies (mm/day)
3Jan2012–9Jan2012

GFS frcst Precip for week 1 from: 20120102all

GFS – CMORPH frcst Precip for week 1 from: 20120102all

REVH vs. A-Wind for week 1 from: 20120102all (850hPa)
Ensemble GFS Forecasts – Week-1

GEFS precip for week 1 from: 20120103

GEFS apricip for week 1 from: 20120103

NOAA – Climate Prediction Center
GFS / CFS Forecasts – Week-2

GFS frost Precip for week 2 from: 20120102all

GFS - CMORPH frost Precip for week 2 from: 20120102all (850hPa)

NOAA - Climate Prediction Center
Ensemble GFS Forecasts – Week-2

GEFS precip for week 2 from: 20120110

GEFS aprecip for week 2 from: 20120110

NOAA – Climate Prediction Center
Operational GFS Precipitable Water and 10 m Anomalous Wind

GFS fcst A_PWAT vs. A_Wind 10m for week 1 from: 20120102all

GFS fcst A_PWAT vs. A_Wind 10m for week 2 from: 20120102all
Comments, Suggestion and Questions?