DYNAMO Weekly Briefing
December 20, 2011

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 continued to weaken during the past week as the majority of observational indicators show less coherent signals as compared to October, November and early December. The strongest remaining enhanced convective MJO signature is mainly focused across the South Pacific Convergence Zone (SPCZ) with any remaining suppressed phase located in the Indian Ocean (IO). Any residual suppressed phase is being completely overwhelmed by higher frequency signals. The MJO enhanced phase as it shifted eastward during the first half of December may have aided the development of more organized, broad scale convection across the Maritime continent (MC) and SPCZ, areas in which La Nina associated enhanced convection is favored. Up until this time, the La Nina associated convection in these regions has been quite unimpressive.

Weekly averaged OLR anomalies show enhanced convection was observed for areas near and north of the equator across parts of the IO with some weak suppressed convection across the southwest IO. There was considerable convection over portions of the DYNAMO array this past week. Enhanced convection was also observed across the Philippines, northeast Australia, the western Pacific (WPAC) and the SPCZ regions.

The MJO index indicated incoherent behavior during the past week with daily values shifting westward with a low amplitude. This behavior is a combination of interference by other variability and a considerably weakened MJO. The DYNAMO outlook from last week did a reasonably good job in highlighting the narrow region of enhanced rainfall north of the equator in the IO, but this area was shifted to far north and was too narrow. Although some suppressed convection was observed south of the equator, the southern portions of the array received considerably more convection than anticipated. The impact of the MJO suppressed phase was less than previously projected and resulted in a poor forecast for the IO two weeks ago.
Weekly Spatial OLR

Total field

Anomalies
OLR Time Longitude – Tropical Modes

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

Courtesy: Matt Wheeler - CAWCR

Real-time filtering superimposed upon 1-2-1 filt, R21, OLR Anoms
MJO blue CNT-19; n1ER black CNT-19; Kelvin green CNT-15
Negative contours solid, positive dashed (excluding Kelvin)
4-Jul-2011 to 19-Dec-2011 + 14 days

NOAA
NATIONAL OCEANIC AND ATOMIC ADMINISTRATION
US DEPARTMENT OF COMMERCE
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

CDAS 850 mb Vector Wind Anomalies -- 18DEC2011

CDAS 850 mb Vector Wind Anomalies -- 16DEC2011

CDAS 850 mb Vector Wind Anomalies -- 17DEC2011

CDAS 850 mb Vector Wind Anomalies -- 15DEC2011

NOAA - Climate Prediction Center
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) 14 DEC 2011

SST Anomalies (°C) 14 DEC 2011

NOAA - Climate Prediction Center
Equatorial Cross Section

Pressure Longitude Cross-section -- 5N - 5S
Mean U-W (streamlines), Specific Humidity (shaded) (g/kg)
DEC 12 2011 -- DEC 18 2011

Pressure Longitude Cross-section -- 5N - 5S
Anomalous U-W (streamlines), Specific Humidity (shaded) (g/kg)
DEC 12 2011 -- DEC 18 2011
Velocity Potential

12 DEC 2011

19 DEC 2011
MJO Index

Last 60 Days of Observations: Dec. 19, 2011
MJO Index Validation

1 Week Ago

Forecasts from: 20111213

2 Weeks Ago

Forecasts from: 20111205
Verification

Denotes TC development location

Observed 7-day mean OLR anom from day 20111212

Development of a tropical cyclone that reaches a max. sustained wind of 83 km/hr.

Weekly total rainfall in the upper tercile.

Weekly total rainfall in the lower tercile.
Forecast Graphics
Most MJO index dynamical model forecasts indicate continued incoherent activity during the upcoming 1-2 weeks with varying periods for which the amplitude of the index increases/decreases near the MC. Eastward propagation is not indicated by nearly all models during the period. The forecasts of the MJO index continue to be affected by other modes of variability (both higher and lower frequency) and it may still be a little too early to indicate a complete end to the recent MJO activity, however, continuation of this MJO event is becoming increasingly unlikely. La Nina associated enhanced convection may be becoming strongly entrenched across the MC and this may be the reason for the general persistent nature of the MJO index forecasts in Phases 4 and 5 over the period.

The outlook favors a large area of enhanced rainfall from the DYNAMO array across the MC to the western Pacific and SPCZ. There is an elevated threat for tropical cyclone development for waters north of Australia. This week’s outlook relies heavily on forecast model guidance and La Nina conditions due to a weak and unclear MJO signal over the next 1-2 weeks. There is good consensus among model guidance for the areas of forecast enhanced rainfall noted above and in some of these areas the forecast is consistent with the increased development of La Nina associated anomalous convection. For Week-2, the outlook tends toward continuation of the anomalous enhanced rainfall for the MC and SPCZ. There is high uncertainty for areas in the IO, however, some forecast tools indicate the potential for enhanced rainfall across some areas of the IO but forecast confidence is low.

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

Tropical Hazards/Benefits Outlook
Climate Prediction Center

Week 1 - Valid: Dec 21, 2011 - Dec 27, 2011

Week 2 - Valid: Dec 28, 2011 - Jan 03, 2012

Confidence
High  Moderate

Tropical Cyclone Formation
- Development of a tropical cyclone that reaches a max. sustained wind of 63 km/hr.

Above-average rainfall
- Weekly total rainfall in the upper tercile.

Below-average rainfall
- Weekly total rainfall in the lower tercile.

Produced: 12/20/2011
MJO Index Forecasts

MJO Index Forecast for 20Dec2011-03Jan2012

MJO Index Forecast for 20Dec2011-03Jan2012
ECMWF MJO Index Forecast

ECMWF MONTHLY FORECASTS
FORECAST BASED 19/12/2011 00UTC

Day 1
Day 15
Day 5
Day 20
Analysis

Western Pacific

West Hem. and Africa

Maritime Continent

Indian Ocean
OLR/u850 Spatial Forecast Maps – Tropical Modes

Courtesy: Paul Roundy - SUNY

Daily snapshots
OLR Spatial Forecast Maps – Tropical Modes

Courtesy: Carl Schreck CICS-NC

Equatorial Rossby Waves in OLR

Sum of MJO, Kelvin, ER

W/m^2

Projected
MJO Composites

Courtesy: CPC
ECMWF Forecasts

ECMWF Weekly Average of Ensemble Mean Forecast

Date: 12/19/2011 -- 12/25/2011 (Week 1)
U - V Wind (Vector, m/s), RH (Color, %) at 850hPa

Date: 12/26/2011 -- 01/01/2012 (Week 2)
U - V Wind (Vector, m/s), RH (Color, %) at 850hPa

Date: 12/19/2011 -- 12/25/2011 (Week 1)
U - V Wind (Vector, m/s) at 10m, Precip (Color, mm/day)

Date: 12/26/2011 -- 01/01/2012 (Week 2)
U - V Wind (Vector, m/s) at 10m, Precip (Color, mm/day)
GFS / CFS Forecasts – Week-1

16 Member Ensemble Mean Forecast from 19Dec2011
Week 1 Anomalies (mm/day) 20Dec2011–26Dec2011

GFS frcst Precip for week 1 from: 20111219all

GFS - CMORPH frcst Precip for week 1 from: 20111219all

REVH vs. A-Wind for week 1 from: 20111219all (850hPa)
Ensemble GFS Forecasts – Week-1

GEFS precip for week 1 from: 20111220

GEFS aprecip for week 1 from: 20111220

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

GFS GFS Precip for week 2 from: 20111219all

GFS – CMORPH Precip for week 2 from: 20111219all

Week 2 Anomalies (mm/day)

REVH vs. A-Wind for week 2 from: 20111219all (850hPa)
Ensemble GFS Forecasts – Week-2

GEFS precip for week 2 from: 20111226

GEFS aprecip for week 2 from: 20111226

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

GFS frcst A_PWAT vs. A_Wind 10m for week 1 from: 20111219all

GFS frcst A_PWAT vs. A_Wind 10m for week 2 from: 20111219all
Comments, Suggestion and Questions?