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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CICS-NC – Carl Schreck
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Review of Conditions
During the Past Week
Summary of Recent Conditions

The MJO further strengthened during the past week with the enhanced phase shifting eastward to the western Pacific (WPAC). Equatorial Rossby wave (ERW) activity also appears evident across the Indian Ocean (IO) and Maritime continent (MC) further impacting anomalous convection in these areas. During the past week, enhanced convection was observed for portions of the equatorial central and eastern IO including the DYNAMO array, many areas of the MC and much of the western Pacific including areas near Manus. There was more enhanced convection over the IO than anticipated and may be a result of contributions from ERW activity. Suppressed convection was confined to Africa, the southwest IO and parts of Australia.

Westerly wind anomalies continued over the majority of the equatorial IO during the past week with some tendency for the largest positive anomalies shifting eastward from the southeast IO to areas near the eastern MC and northern Australia, especially in recent days. Considerably warmer than average SSTS remain across most of the southern IO south of 10S.

The WH MJO index increased considerably in amplitude during the past week with the latest enhanced phase location in Phase 7. Model MJO index forecasts from one week ago were very good as they indicated the increase in amplitude and eastward propagation observed over the past week. Forecasts from two weeks ago, were not able to maintain eastward propagation beyond their Week-1 forecast, nor the larger eventual observed amplitude. The previous DYNAMO outlooks verifying for the past week were poor and generally out of phase with the observed anomalous convection across the IO. The suppressed phase of the strengthening MJO was overcome by other factors in this region over the past week, one of which may be the impact from ERW activity. No tropical cyclones developed in the southern IO during the period.
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
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 -- 03FEB2012

CDAS 850 mb Vector Wind Anomalies -- 01FEB2012

CDAS 850 mb Vector Wind Anomalies -- 02FEB2012

CDAS 850 mb Vector Wind Anomalies -- 31JAN2012
Zonal wind shaded, direction by vector
Westerly total/anomalies (red shades)
Easterly total/anomalies (blue shades)
Equatorial Cross Section

Pressure Longitude Cross-section -- 5N - 5S
Anomalous U-W (streamlines), Specific Humidity (shaded) (g/kg)
JAN 28 2012 -- FEB 03 2012
Velocity Potential

29 JAN 2012

06 FEB 2012

Degrees K

224 226 228 230 232 234 236 238 240 242 244 247 250 253 256 259 262 265 268 271 274

Degrees K

224 226 228 230 232 234 236 238 240 242 244 247 250 253 256 259 262 265 268 271 274
MJO Index Validation

1 Week Ago

Forecasts from: 20120131

2 Weeks Ago

Forecasts from: 20120123
Verification

X ➔ Denotes TC development location

Observed 7-day mean OLR anom from day 20120130
Forecast Graphics
Outlook and Forecast Rationale

The MJO index forecasts indicate continued MJO activity with very good model consensus for eastward propagation of substantial amplitude through much of the period. There is some spread between the models for the eventual amplitude and phase by the end of Week-2. A few, including the two most skillful models (ECMWF and UK Met Office ensemble means) forecast the enhanced phase may near the western IO by the very end of Week-2. The enhanced phase of the ERW across the IO likely will to continue to shift westward away from the central IO, replaced with its suppressed phase.

The outlook for Week-1 favors suppressed convection across the central and eastern IO extending southeastward to northern Australia. This is supported by MJO composites keyed to Phases 7/8, statistical MJO and ERW forecasts and some raw model precipitation guidance. Model forecast guidance also indicates elevated chances for tropical cyclogenesis for parts of the south-central IO.

Moving into Week-2, there remains favored conditions for suppressed convection from the eastern IO southeastward to stretch across the southern MC and northern Australia. La Nina background conditions may tend to keep weekly mean convection close to average for some areas of the MC and the far western Pacific. A considerable challenge of the forecast is to determine the onset of potential enhanced convection for portions of Africa and the western IO. Currently the outlook favors renewed enhanced convection associated with the eastward progression of the MJO for areas of the southwest IO to near the DYNAMO array. There is moderate forecast confidence for the timing of this redevelopment of enhanced convection.

**Probability of at least moderate strength MJO (Outside WH unit circle with eastward propagation):**
- Week-1: 90%
- Week-2: 90%
- Week-3: 70%
DYNAMO Forecast

Tropical Hazards/Benefits Outlook
Climate Prediction Center

Week 1 - Valid: Feb 08, 2012 - Feb 14, 2012

Week 2 - Valid: Feb 15, 2012 - Feb 21, 2012

Tropical Cyclone Formation
- High
- Moderate

Confidence

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.

× DG  + Gan  ○ Ship1  ○ Ship2

Produced: 02/07/2012
MJO Index Forecasts
OLR Spatial Forecast Maps – Tropical Modes

Courtesy: Carl Schreck CICS-NC

Madden-Julian Oscillation in OLR

Kelvin Waves in OLR

W/m^2
OLR Spatial Forecast Maps – Tropical Modes

Courtesy: Carl Schreck CICS-NC

Equatorial Rossby Waves in OLR

Sum of MJO, Kelvin, ER
OLR/u850 Spatial Forecast Maps – Tropical Modes

Courtesy: Paul Roundy - SUNY

Daily snapshots
ECMWF Forecasts

ECMWF Weekly Average of Ensemble Mean Forecast

Date: 02/06/2012 -- 02/12/2012 (Week 1)
U - V Wind(Vector, m/s), RH(Color, %) at 850hPa

Date: 02/13/2012 -- 02/19/2012 (Week 2)
U - V Wind(Vector, m/s), RH(Color, %) at 850hPa

Date: 02/06/2012 -- 02/12/2012 (Week 1)
U - V Wind(Vector, m/s) at 10m, Precip(Color, mm/day)

Date: 02/13/2012 -- 02/19/2012 (Week 2)
U - V Wind(Vector, m/s) at 10m, Precip(Color, mm/day)
GFS / CFS Forecasts – Week-1
Ensemble GFS Forecasts – Week-1

GEFS precip for week 1 from: 20120207

NOAA - Climate Prediction Center

GEFS apricip for week 1 from: 20120207

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

GFS fcst Precip for week 2 from: 20120206all

GFS - CMORPH fcst Precip for week 2 from: 20120206all

REVH vs. A-Wind for week 2 from: 20120206all (850hPa)
Ensemble GFS Forecasts – Week-2

GEFS precip for week 2 from: 20120214

GEFS aprecip for week 2 from: 20120214

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Operational GFS Precipitable Water and 10 m Anomalous Wind

GFS frcst A_PWAT vs. A_Wind 10m for week 1 from: 20120206all

GFS frcst A_PWAT vs. A_Wind 10m for week 2 from: 20120206all

NOAA - Climate Prediction Center
Comments, Suggestion and Questions?