Global Tropics Hazards And Benefits Outlook

1/22/2019

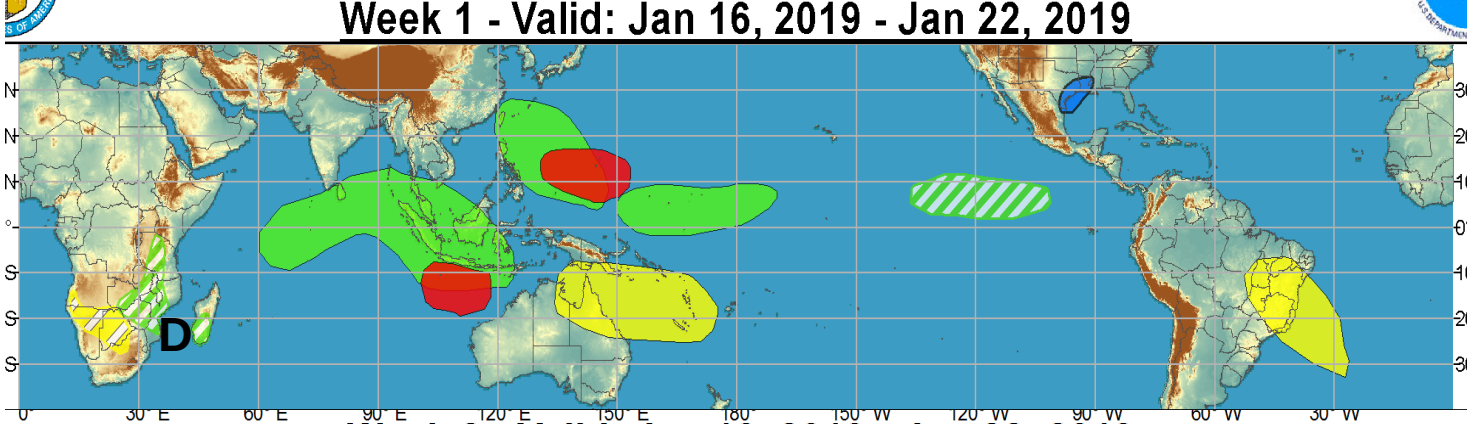
Dan Harnos

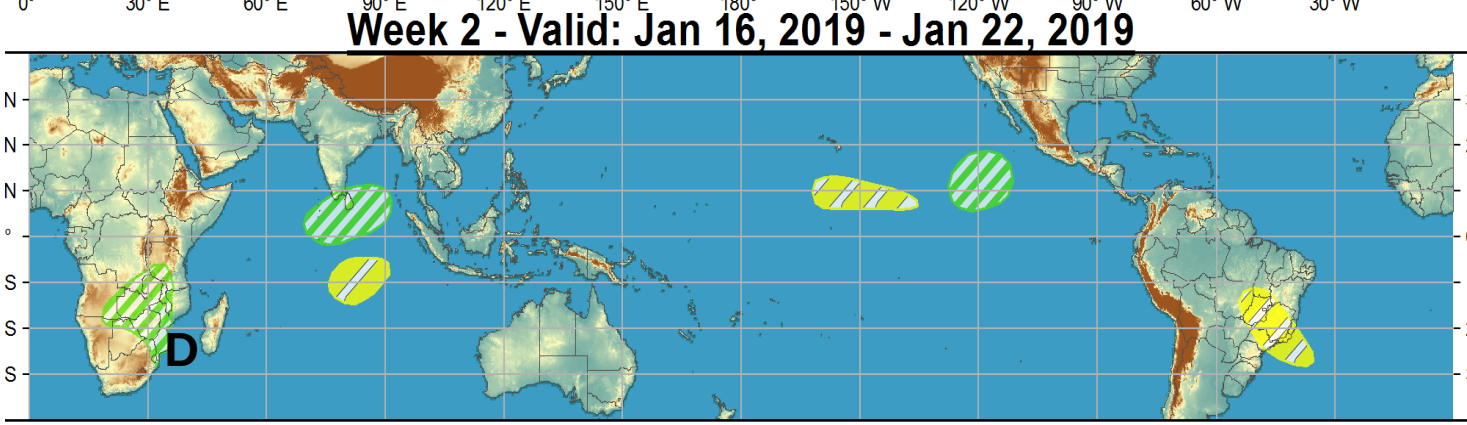
Outline

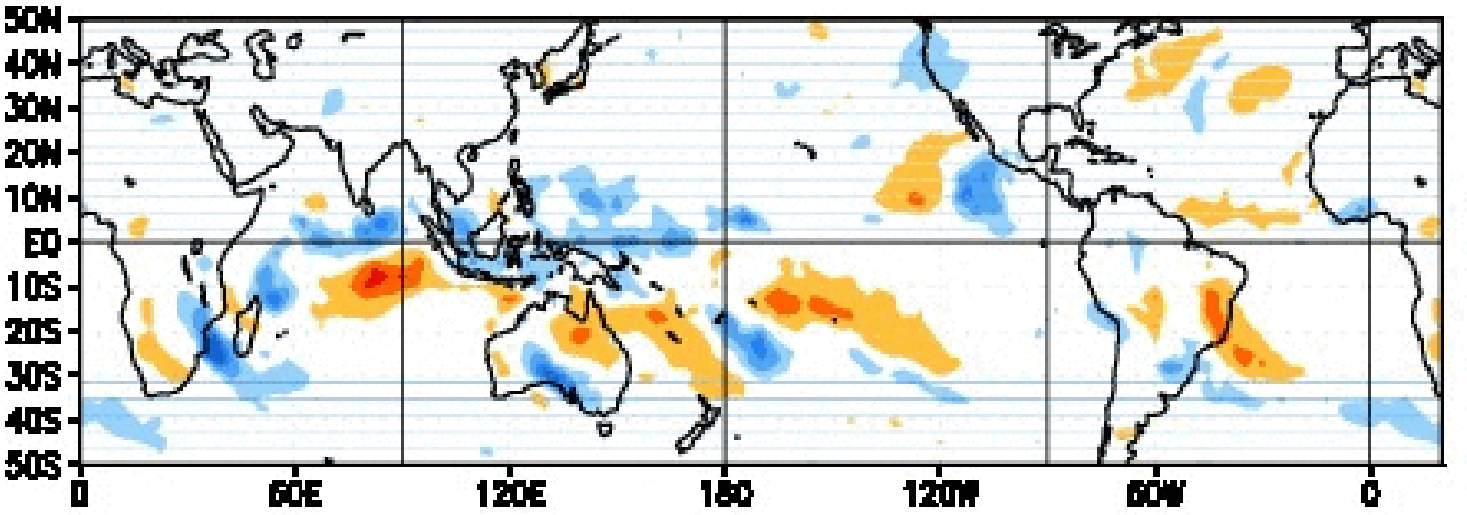
1. Review of Recent Conditions
2. Synopsis of Climate Modes
3. GTH Outlook and Forecast Discussion
4. Connections to U.S. Impacts

Outlook Review

TS Desmond: 1/20-1/21







Cool shading
More clouds/rain

Warm shading
Less clouds/rain

Synopsis of Climate Modes

ENSO: (10 January, 2019 Update)

- ENSO Alert System Status: El Niño Watch

- El Niño is expected to form and continue through the Northern Hemisphere spring 2019 (~65% chance).
- Given the timing and that a weak event is favored, ***significant global impacts are not anticipated*** during the remainder of winter, even if conditions were to form.

MJO and other subseasonal tropical variability:

• The MJO rapidly crossed the Western Hemisphere the past week, and is presently over the Maritime Continent..

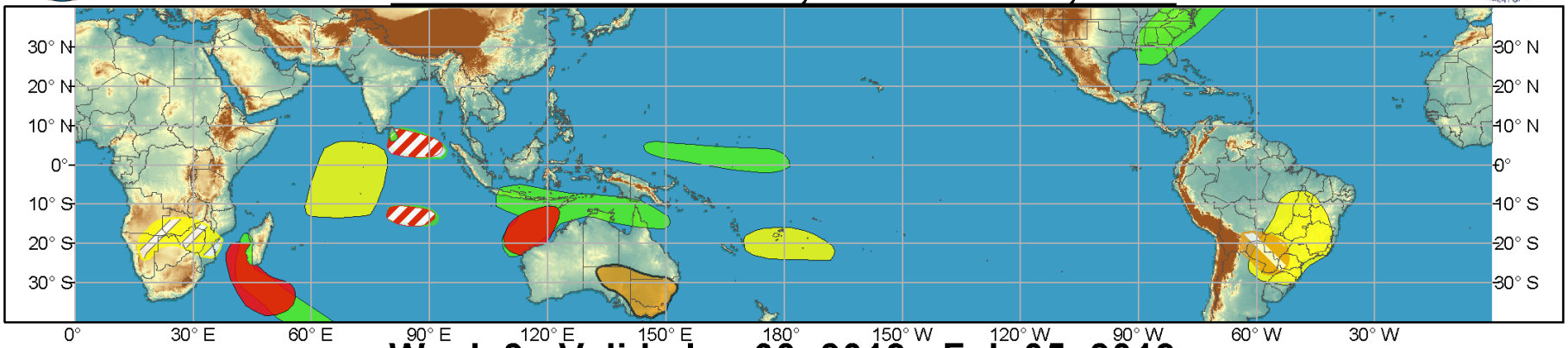
• Dynamical models indicate that the MJO is likely to enter the West Pacific during this week, before stalling and weakening ensues. Some of this could be a result of a competing signal currently over the Western Hemisphere, forced by the extratropics.

Extratropics:

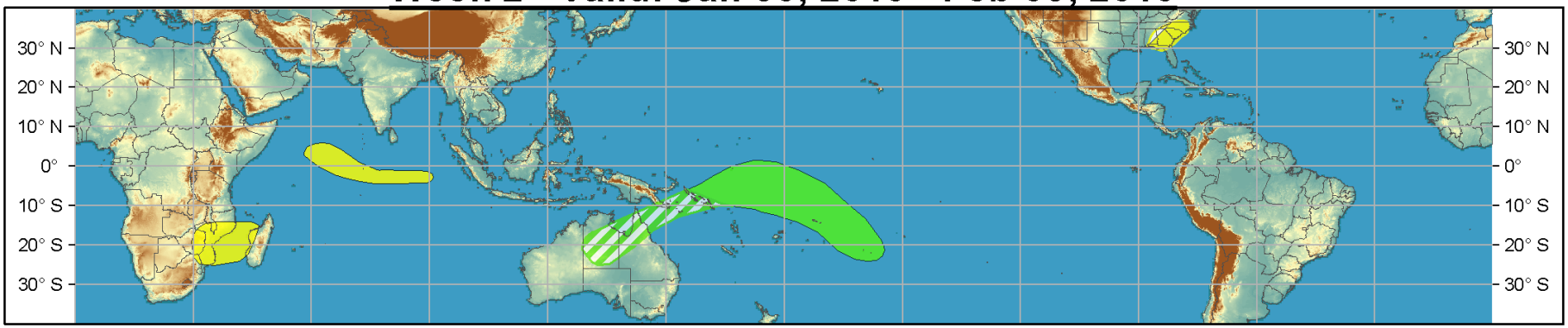
• The North American circulation pattern is not currently consistent with the MJO being over the Maritime Continent, but appears “locked in” to the negative Arctic Oscillation state expected from the signal crossing the Western Hemisphere a week ago. The MJO would support the potential for reinforcing shots of cold air into the eastern U.S. during the first half of February.

Global Tropics Hazards and Benefits Outlook - Climate Prediction Center

Week 1 - Valid: Jan 23, 2019 - Jan 29, 2019



Week 2 - Valid: Jan 30, 2019 - Feb 05, 2019



Produced: 01/22/2019

Forecaster: D.Harnos

	Confidence: High	Confidence: Moderate	
Tropical Cyclone Formation			Development of a tropical cyclone (tropical depression - TD, or greater 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, except from 6/1 - 11/30 for the region from 120E to 0, 0 to 40N. The product targets broad scale conditions integrated over a 7-day period for US interests only. Consult your local responsible forecast agency.

中央氣象局 Central Weather Bureau

UNIVERSITY AT ALBANY State University of New York

EARTH SYSTEM SCIENCE INTERDISCIPLINARY CENTER ESSIC UNIVERSITY OF MARYLAND

Australian Government Bureau of Meteorology

cics.nc

NPS PRAESTANTIA PER SCIENTIAM

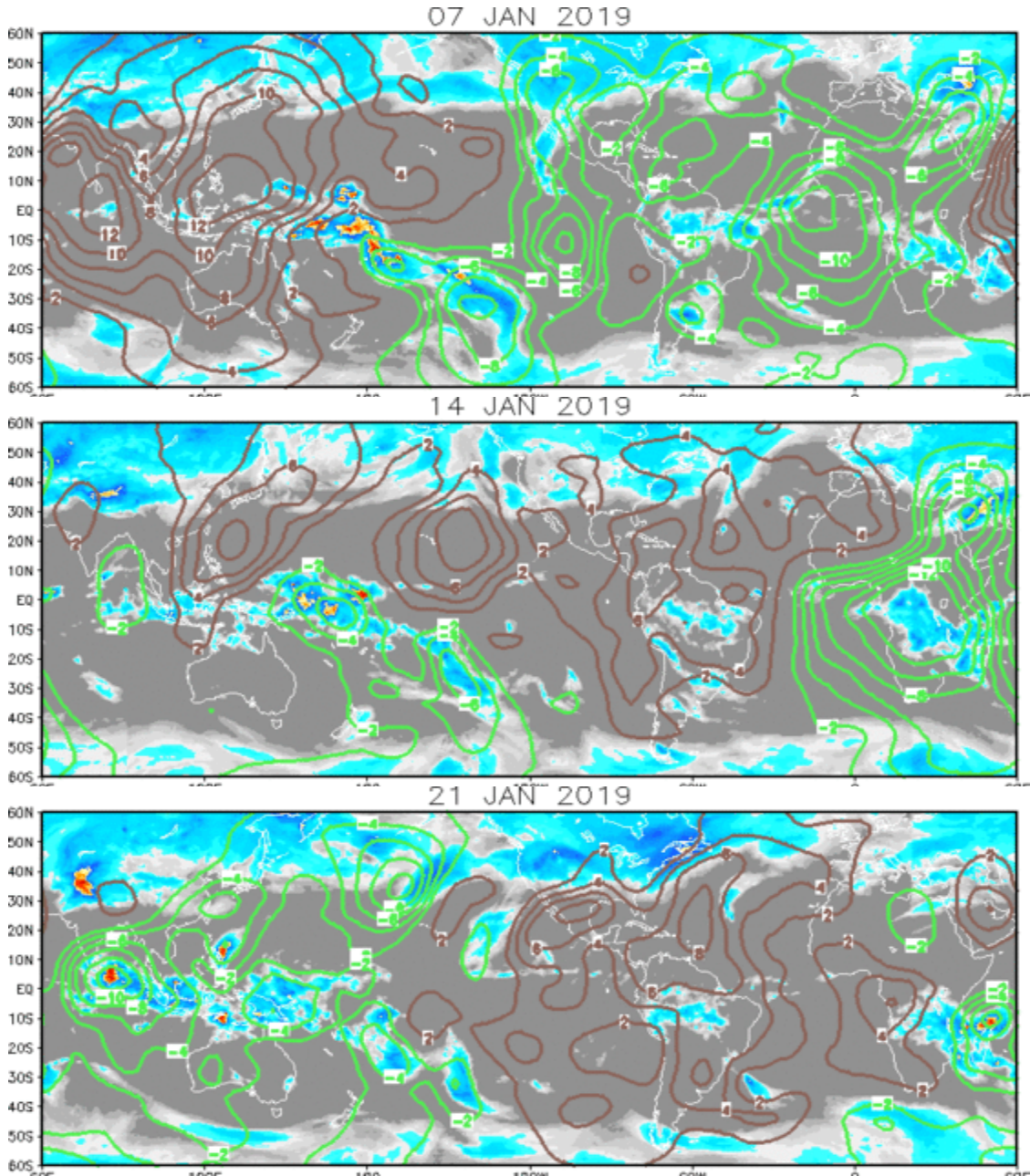
IR Satellite & 200-hpa Velocity Potential Anomalies

Green: Enhanced Divergence Brown: Enhanced Convergence

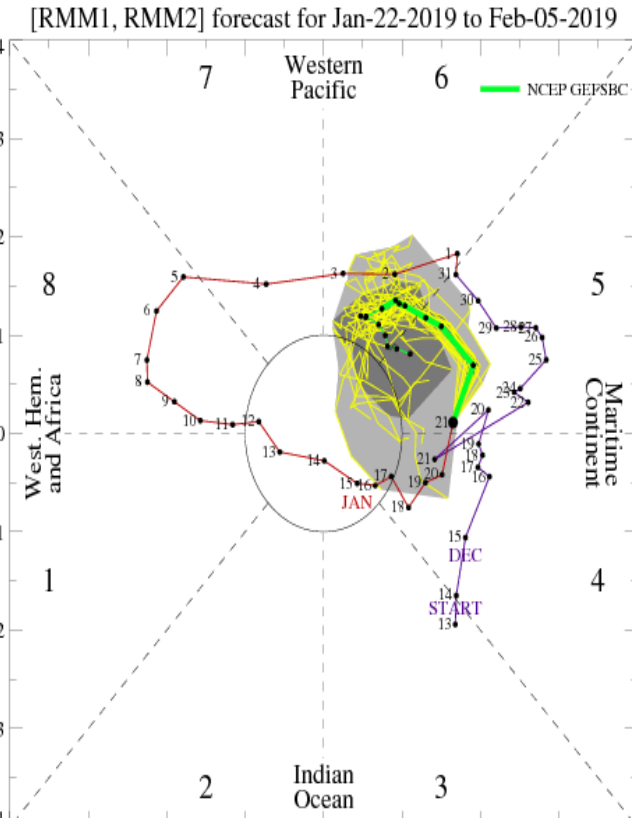
Wave-1 pattern, enhanced convergence from Indian Ocean stretching to Maritime Continent. Convective signal over eastern Pacific and Americas.

Noisy Wave-2 pattern, suppressed convection over the Americas and parts of the Maritime Continent. Enhanced moving from Africa into Indian Ocean, and over SPCZ.

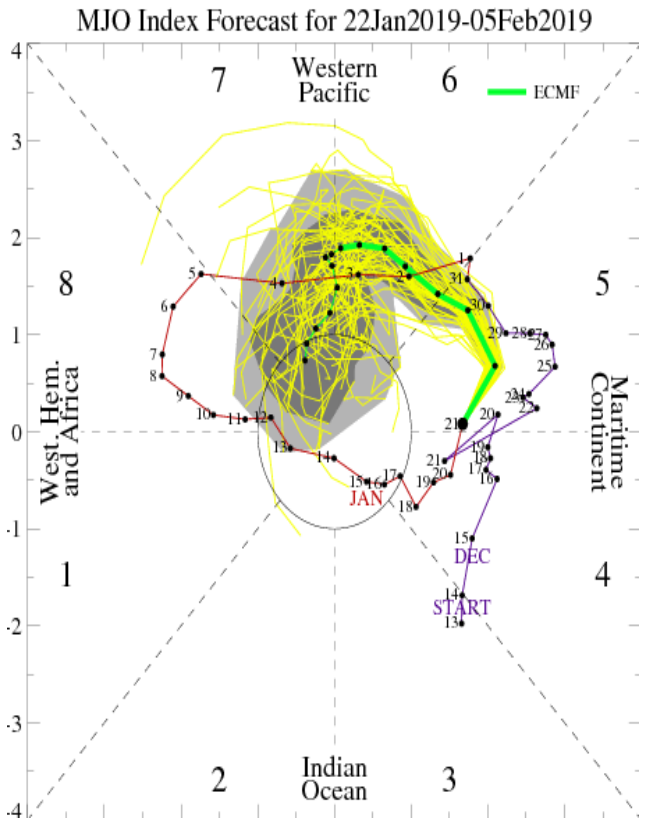
Resumption of Wave-1 pattern with enhanced (suppressed) convection over the Eastern (Western) Hemisphere.



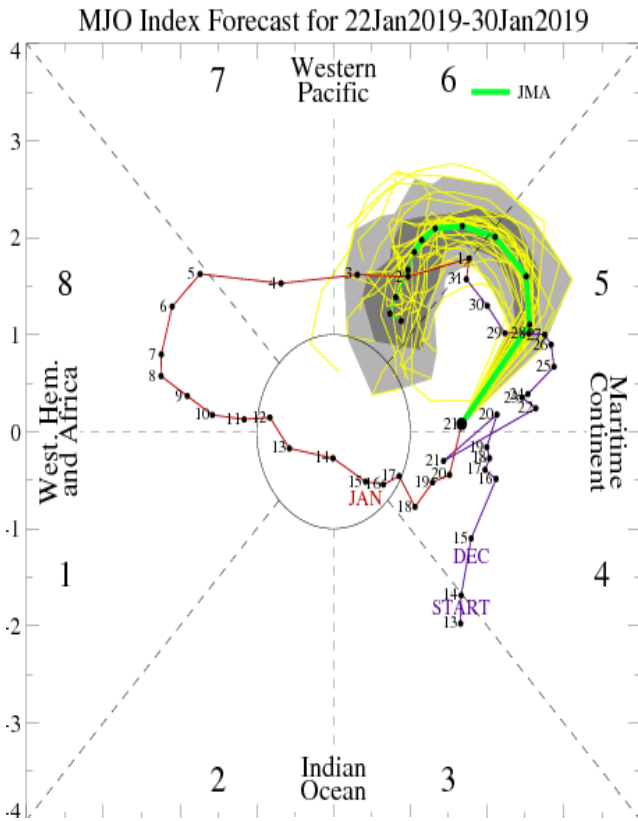
MJO Observation/Forecast



GEFS



ECMWF



CMC

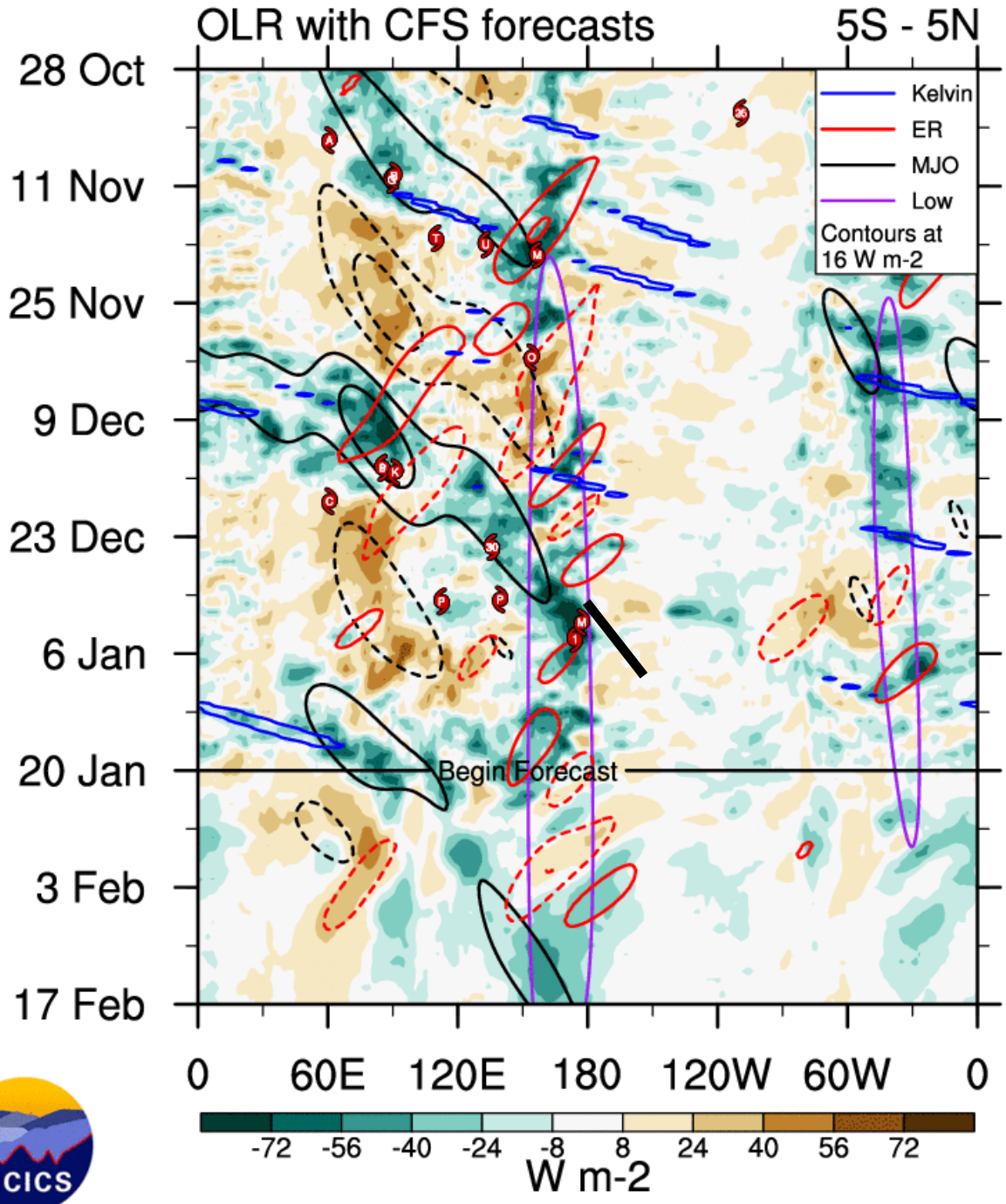
Model guidance consistently brings the MJO into the West Pacific during Week-1, before stalling the signal there in Week-2.

GFS: Emphasizes Rossby wave activity, with the curl back into Phase 5.
ECMWF: Some members continue into the WH, most cross towards Phase 2.
Canadian: Similar to ECMWF (forecast is 5 days shorter).

MJO is expected to be modest and forecast to propagate eastward over the Maritime Continent.

Rossby wave activity is also forecast to continue to be player in the tropics through the next 2 weeks.

The low-frequency pattern is likely to become more influential in the coming weeks.



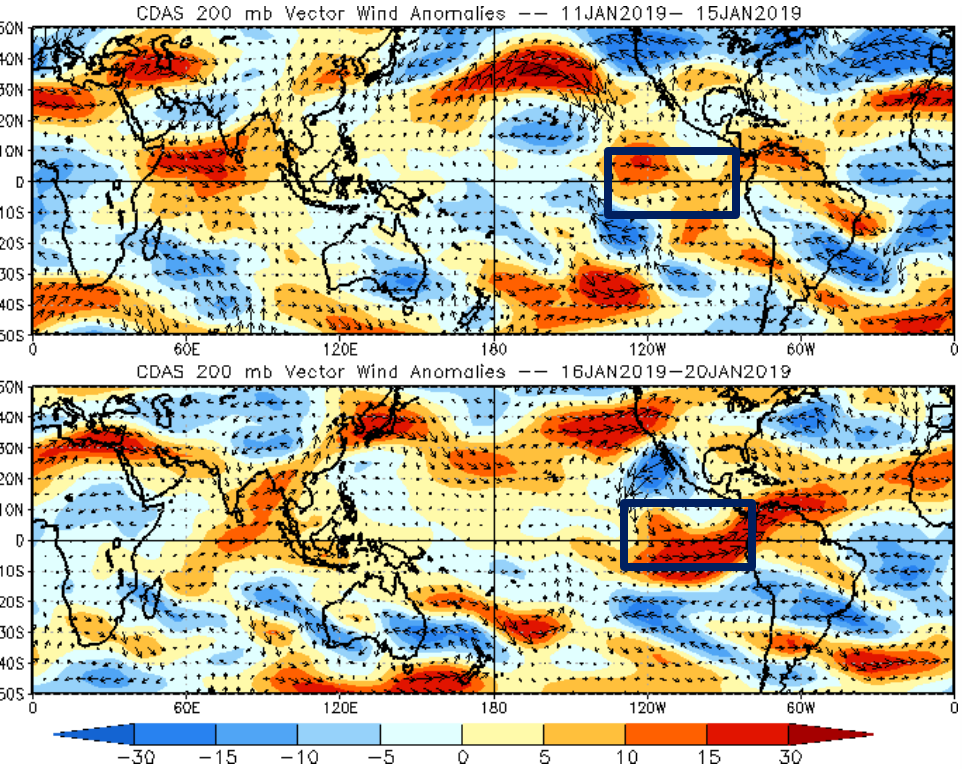
NCICS

ncics.org/mjo

Mon 2019-01-21 1625 UTC

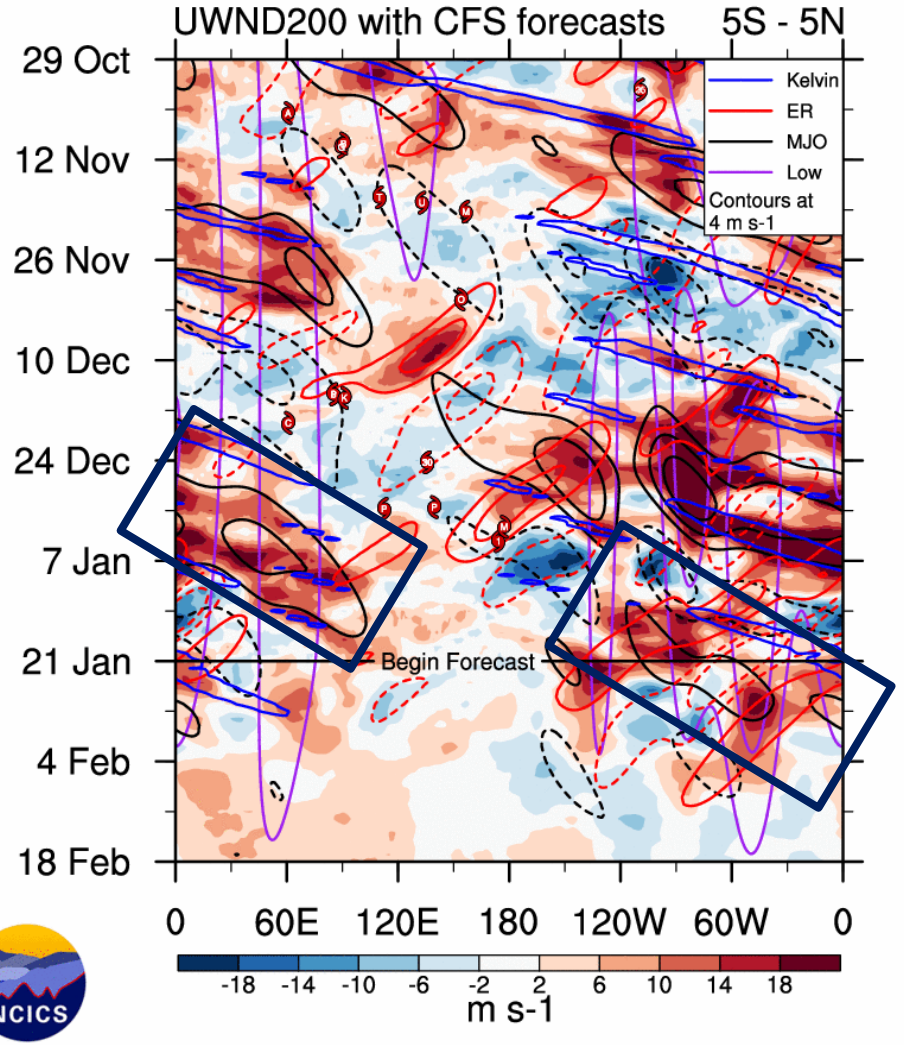
Carl Schreck (cjschrec@ncsu.edu)

So, what's up with the ECMWF?



Cyclonic wavebreaking from the extratropics is causing anomalous westerlies over the East Pacific.

The ECMWF keys on this feature being the primary intraseasonal mode, the CFS (seen at right) shows something similar.



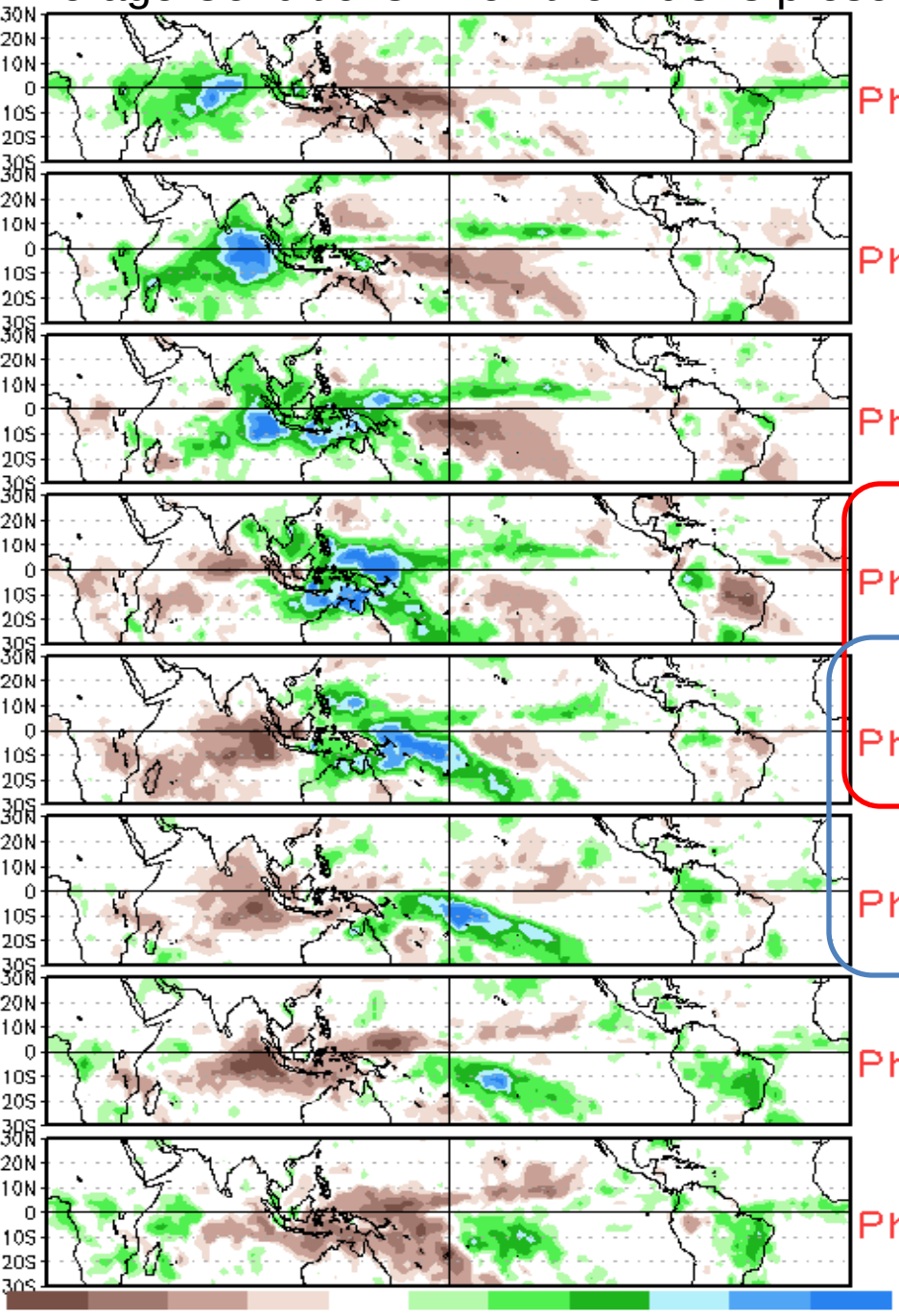
NCICS

ncics.org/mjo

Tue 2019-01-22 1115 UTC

Carl Schreck (cjschrec@ncsu.edu)

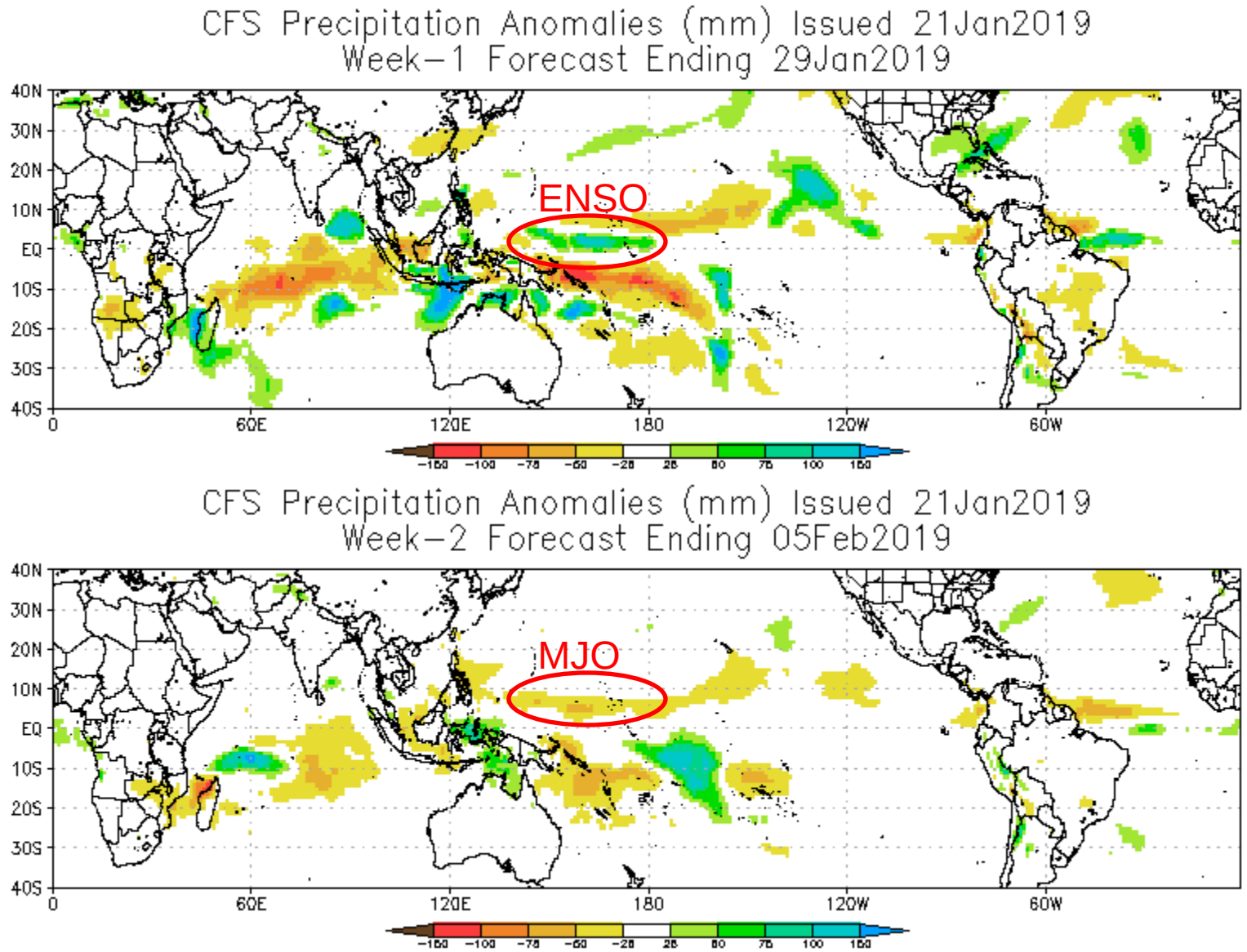
Average Conditions when the MJO is present



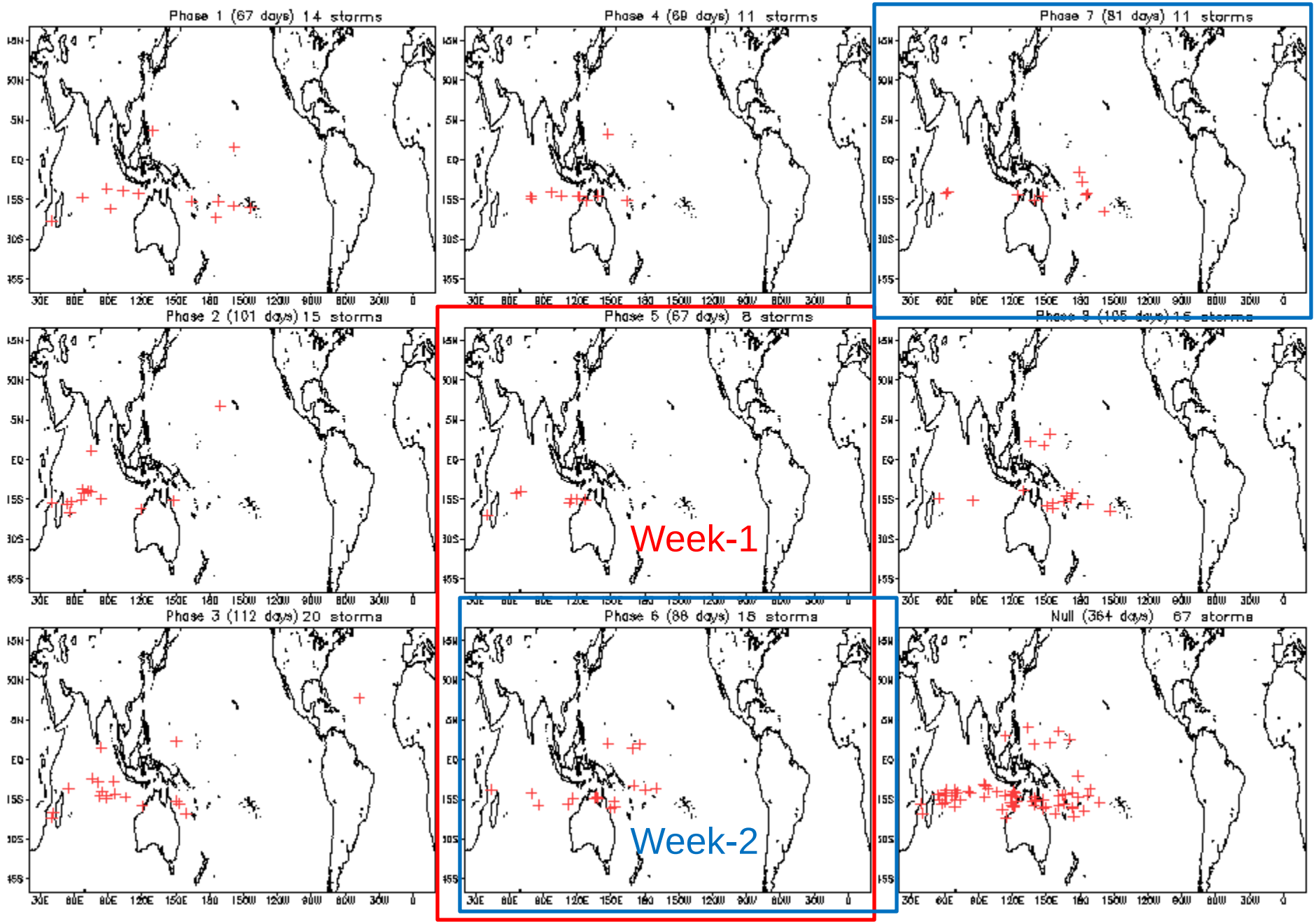
Week-1: Phase 5/6

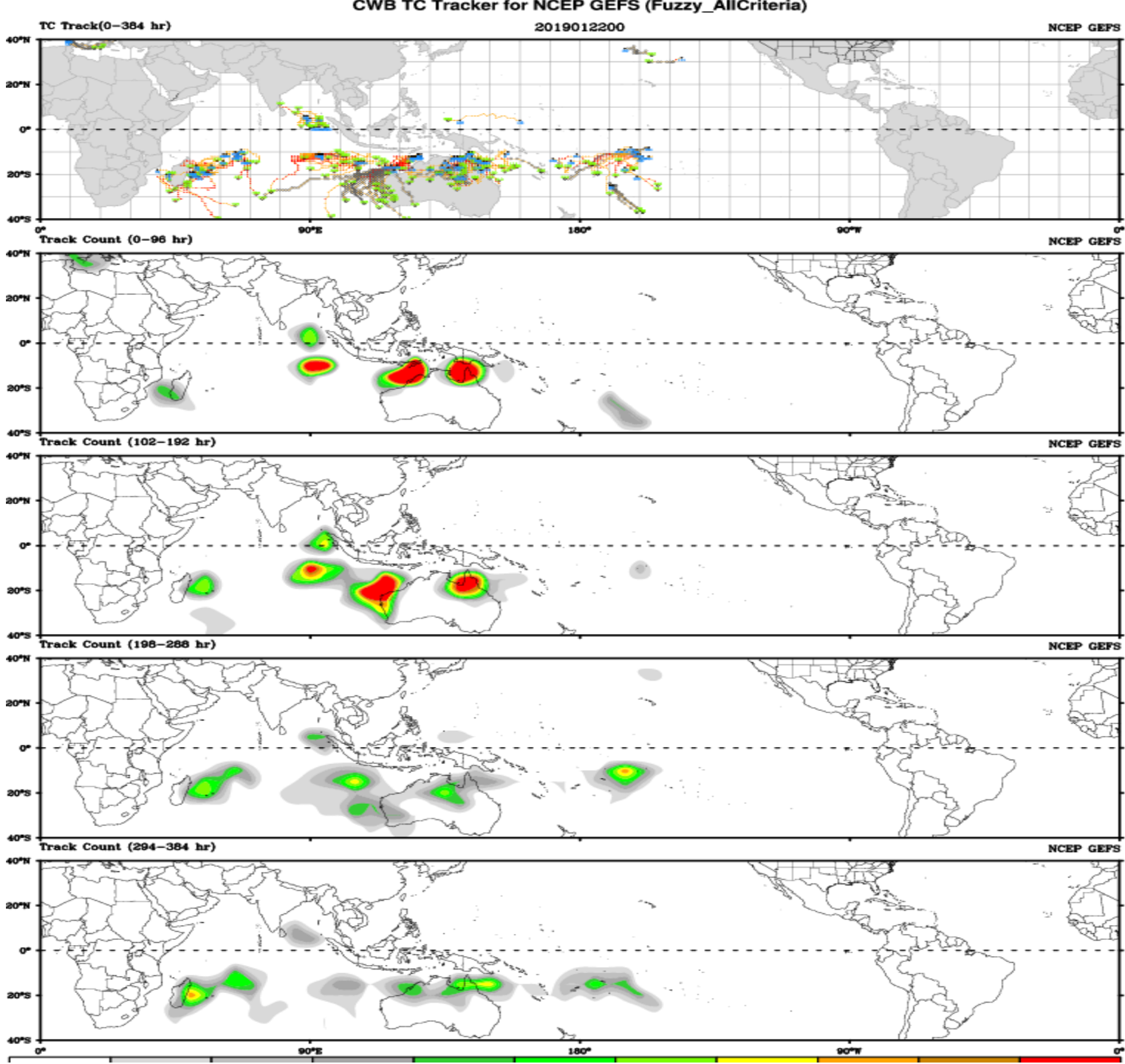
Week-2: Phase 6/7

CAVEAT: These panels are representative of robust MJO events.


CFS Precipitation Anomalies (mm) Issued 21Jan2019
Week-1 Forecast Ending 29Jan2019
ENSO
40N
30N
20N
10N
EQ
10S
20S
30S
40S
0
60E
120E
180
120W
60W
-150 -100 -75 -50 -25 25 50 75 100 150
CFS Precipitation Anomalies (mm) Issued 21Jan2019
Week-2 Forecast Ending 05Feb2019
MJO
40N
30N
20N
10N
EQ
10S
20S
30S
40S
0
60E
120E
180
120W
60W
-150 -100 -75 -50 -25 25 50 75 100 150

January Tropical Storm Formation by MJO phase





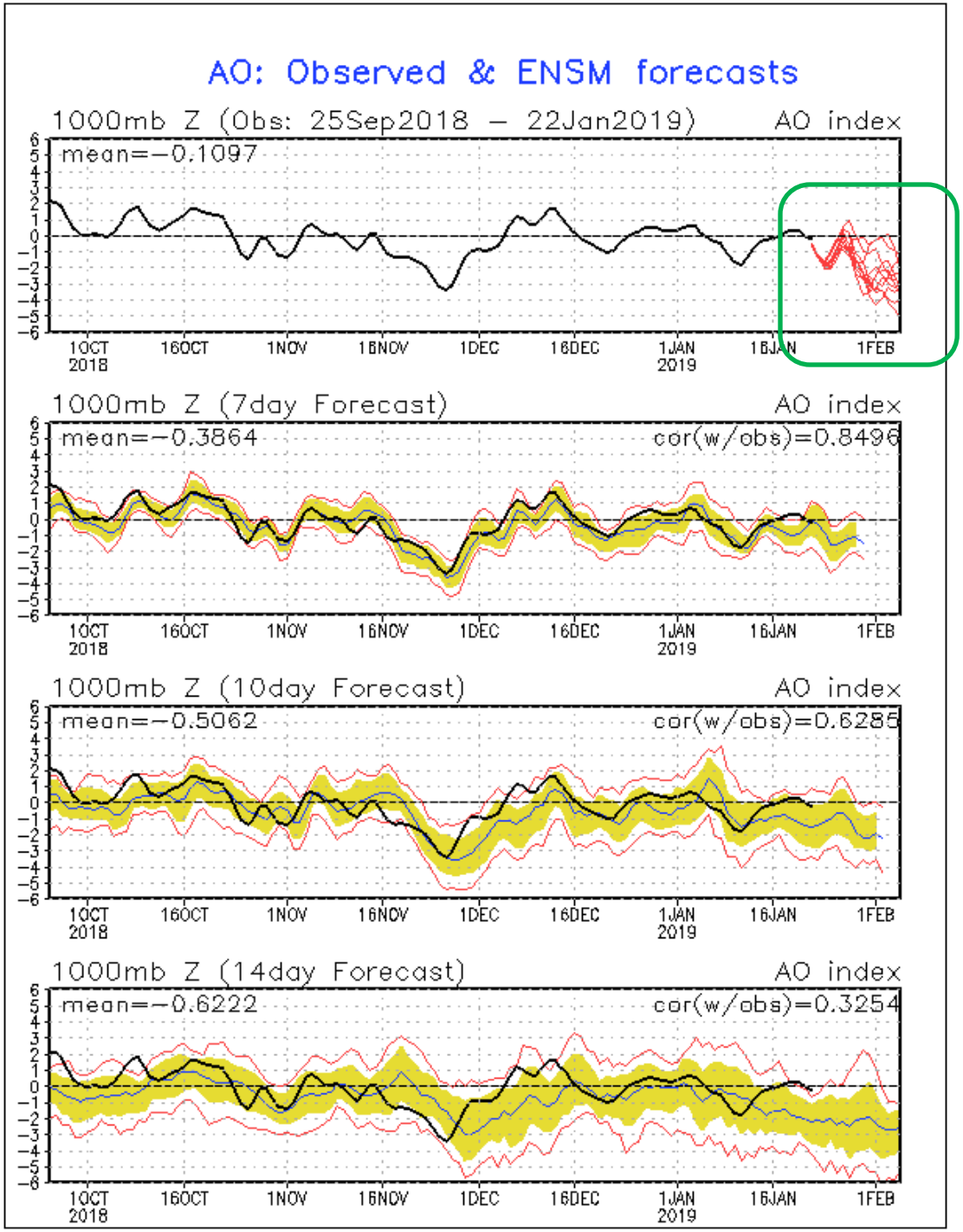
Days 1-4

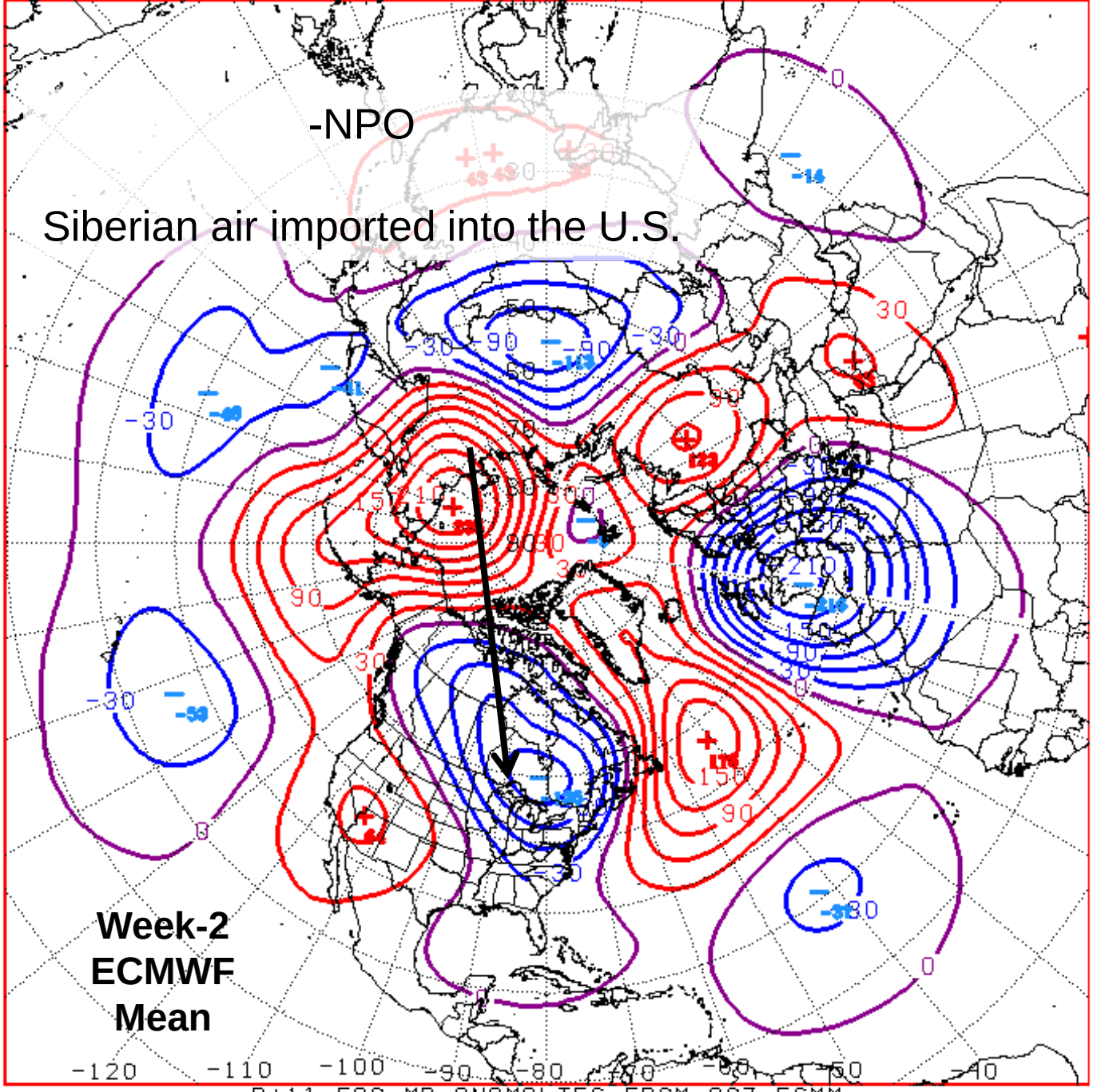
Day 5-8

Day 9-12

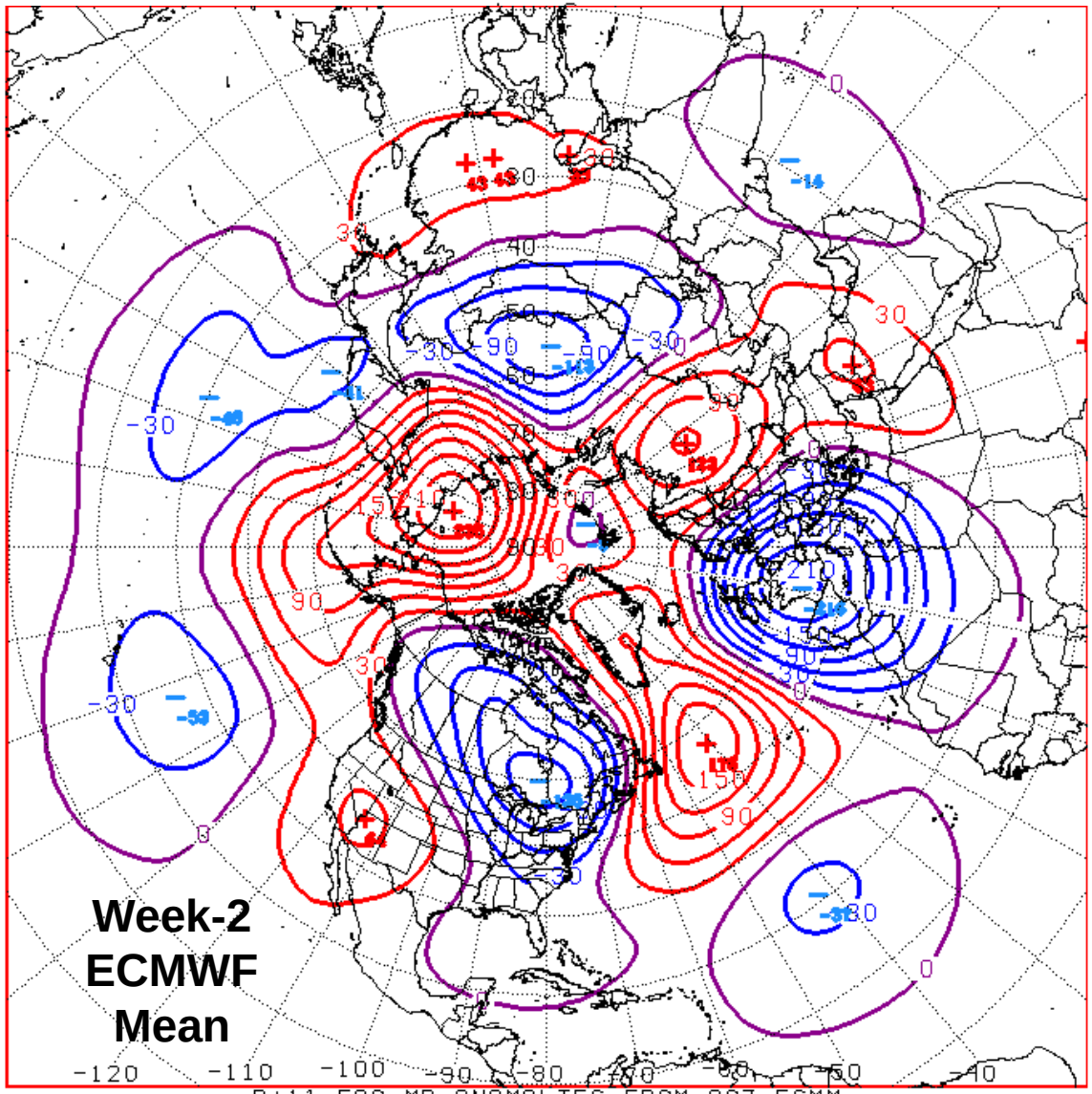
Day 13-15

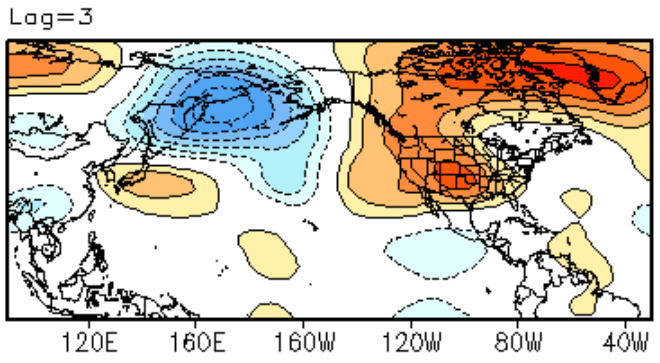
Connections to U.S. Impacts

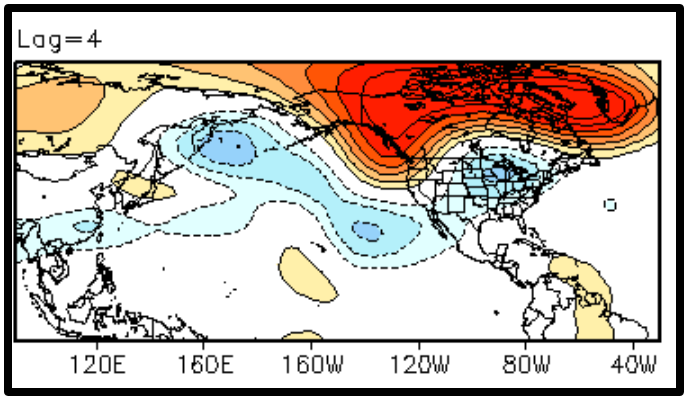

AO: Observed & ENSM forecasts
1000mb Z (Obs: 25Sep2018 – 22Jan2019)
AO index
mean=−0.1097
1000mb Z (7day Forecast)
AO index
mean=−0.3864
cor(w/obs)=0.8496
1000mb Z (10day Forecast)
AO index
mean=−0.5062
cor(w/obs)=0.6285
1000mb Z (14day Forecast)
AO index
mean=−0.6222
cor(w/obs)=0.3254
6 5 4 3 2 1 0 −1 −2 −3 −4 −5 −6
1OCT 2018
16OCT
1NOV
16NOV
1DEC
16DEC
1JAN 2019
16JAN
1FEB

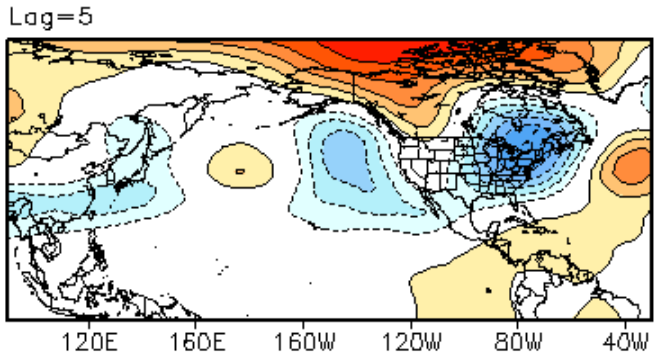

-NPO
Siberian air imported into the U.S.
Week-2
ECMWF
Mean
-120 -110 -100 -90 -80 -70 -60 -50 -40
D+11 500 MB ANOMALIES FROM 00Z ECMM
CPC MAP MADE JAN 22 2019 1000 UTC CNTD FEB 02 2019

RMM Phase 5 200-hPa Height Lagged Composite (djf)







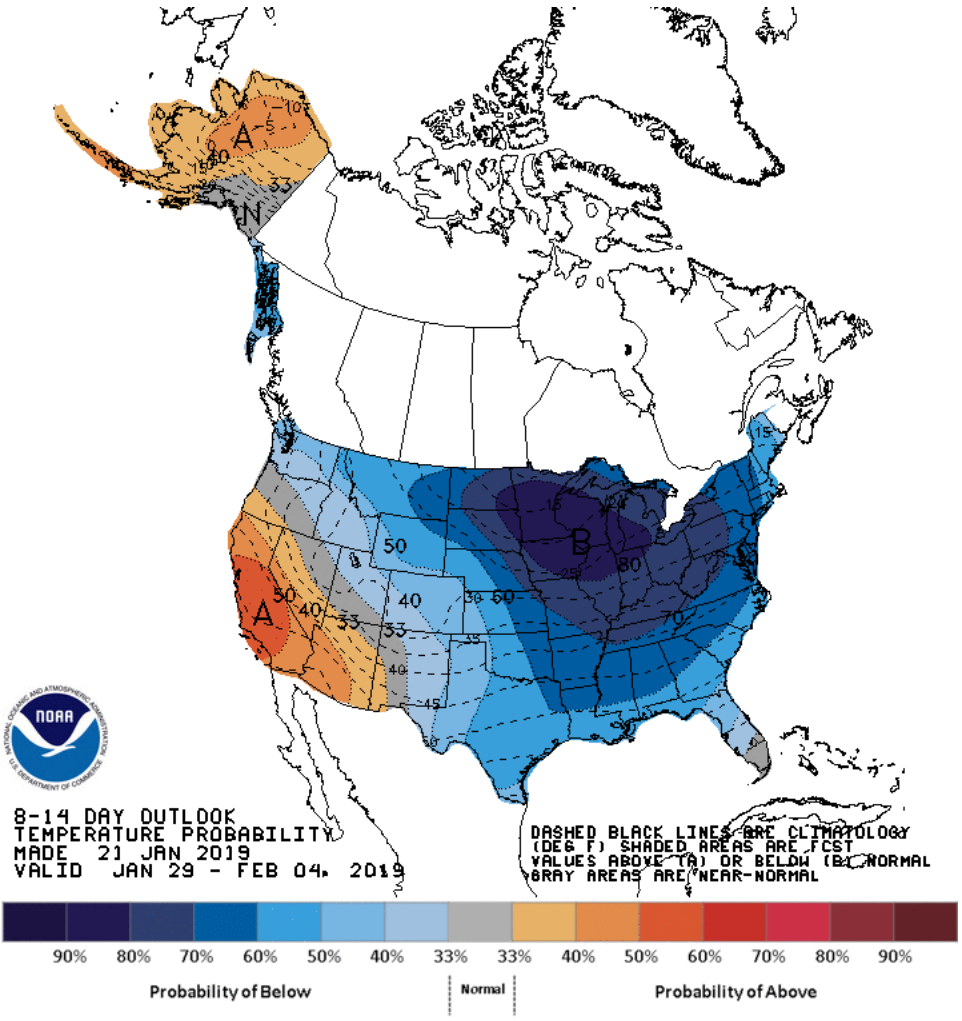


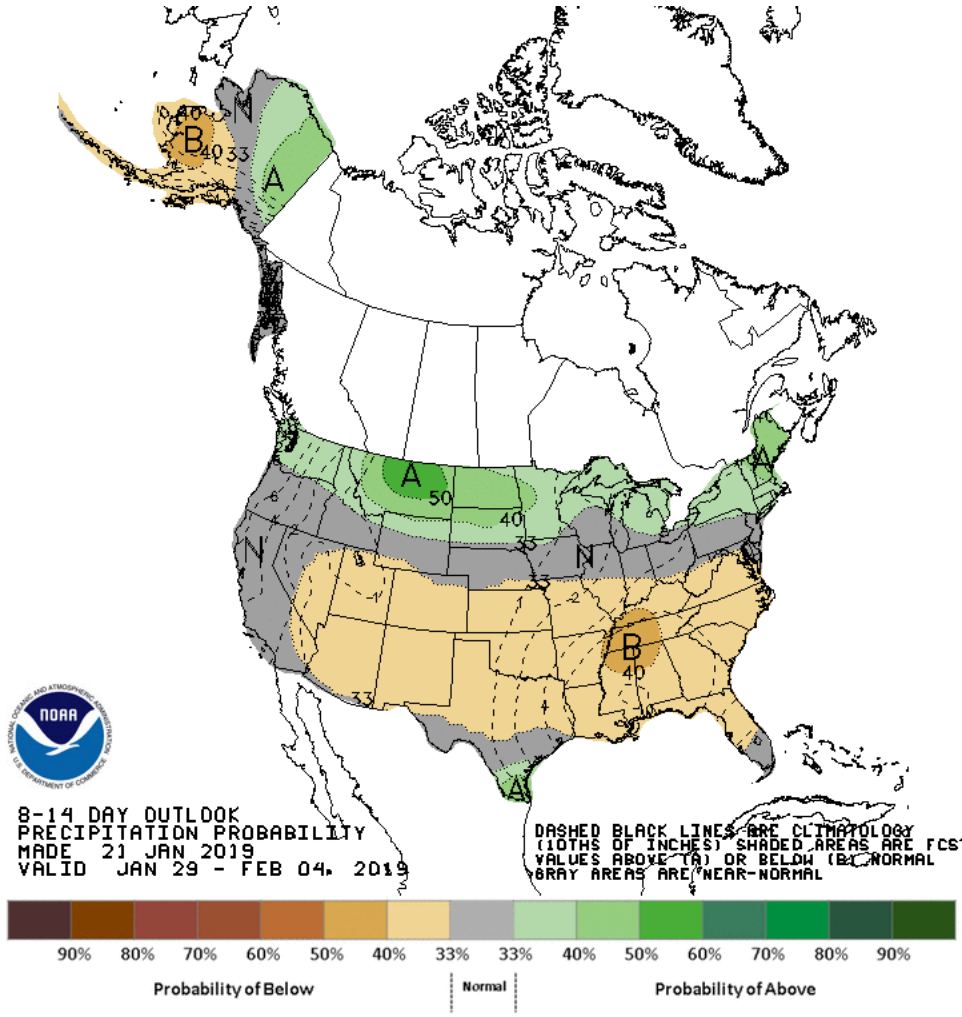
Lag-4 (days 15-19) similarities:

Trough east of Hawaii
Alaska ridge (displaced west)

Troughing over Great Lakes
Ridging across polar latitudes

Week 2 – Temperature and Precipitation

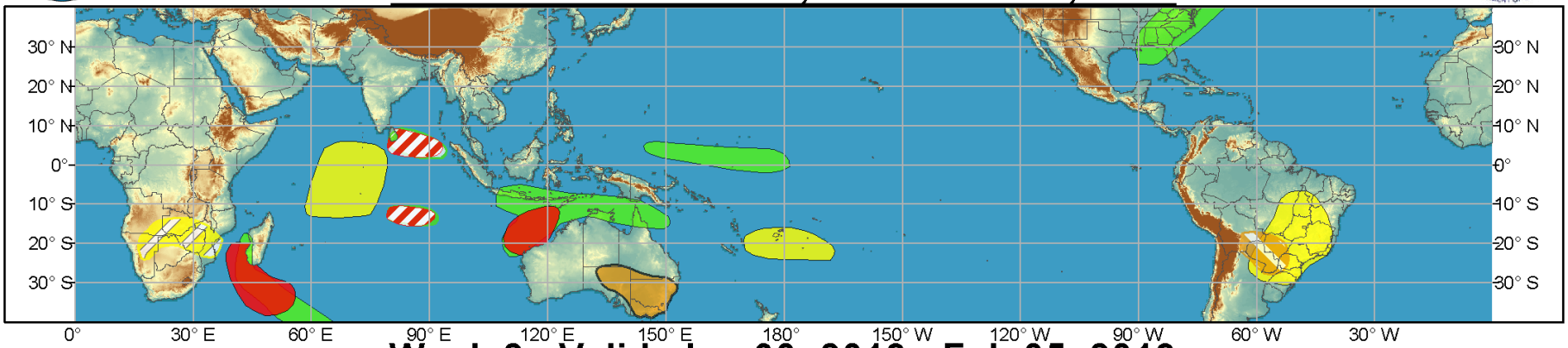




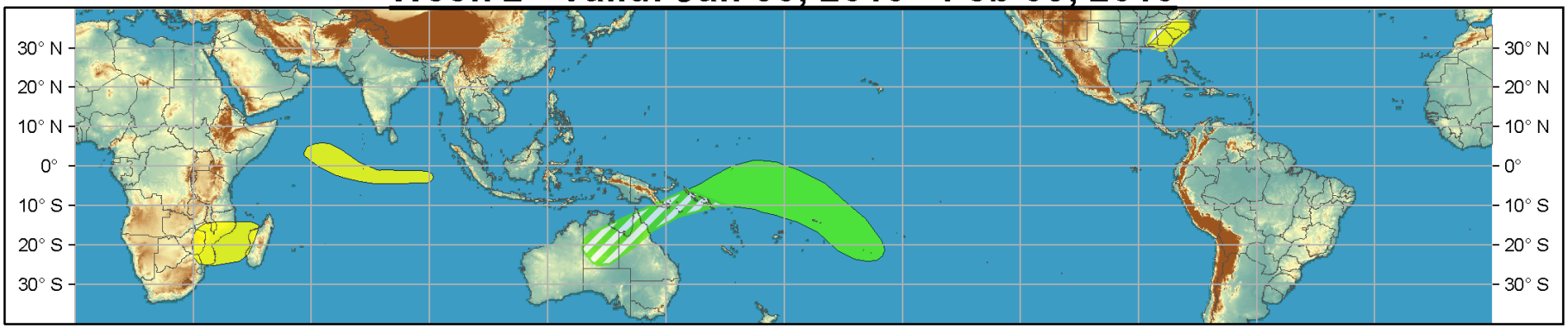
Eastward shift in the ridge-trough today, likely resulting in increasing probabilities for warmth in the Western US.

Global Tropics Hazards and Benefits Outlook - Climate Prediction Center

Week 1 - Valid: Jan 23, 2019 - Jan 29, 2019



Week 2 - Valid: Jan 30, 2019 - Feb 05, 2019



Produced: 01/22/2019

Forecaster: D.Harnos

	Confidence: High	Confidence: Moderate	
Tropical Cyclone Formation			Development of a tropical cyclone (tropical depression - TD, or greater 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, except from 6/1 - 11/30 for the region from 120E to 0, 0 to 40N. The product targets broad scale conditions integrated over a 7-day period for US interests only. Consult your local responsible forecast agency.

中央氣象局 Central Weather Bureau

UNIVERSITY AT ALBANY State University of New York

EARTH SYSTEM SCIENCE INTERDISCIPLINARY CENTER ESSIC UNIVERSITY OF MARYLAND

Australian Government Bureau of Meteorology

cics.nc

NPS PRAESTANTIA PER SCIENTIAM