

NOAA's National Weather Service

The Madden Julian Oscillation: Can it Play a Significant Role in Improving Forecasts of Hydrologically Significant Rainfall for Week Two?

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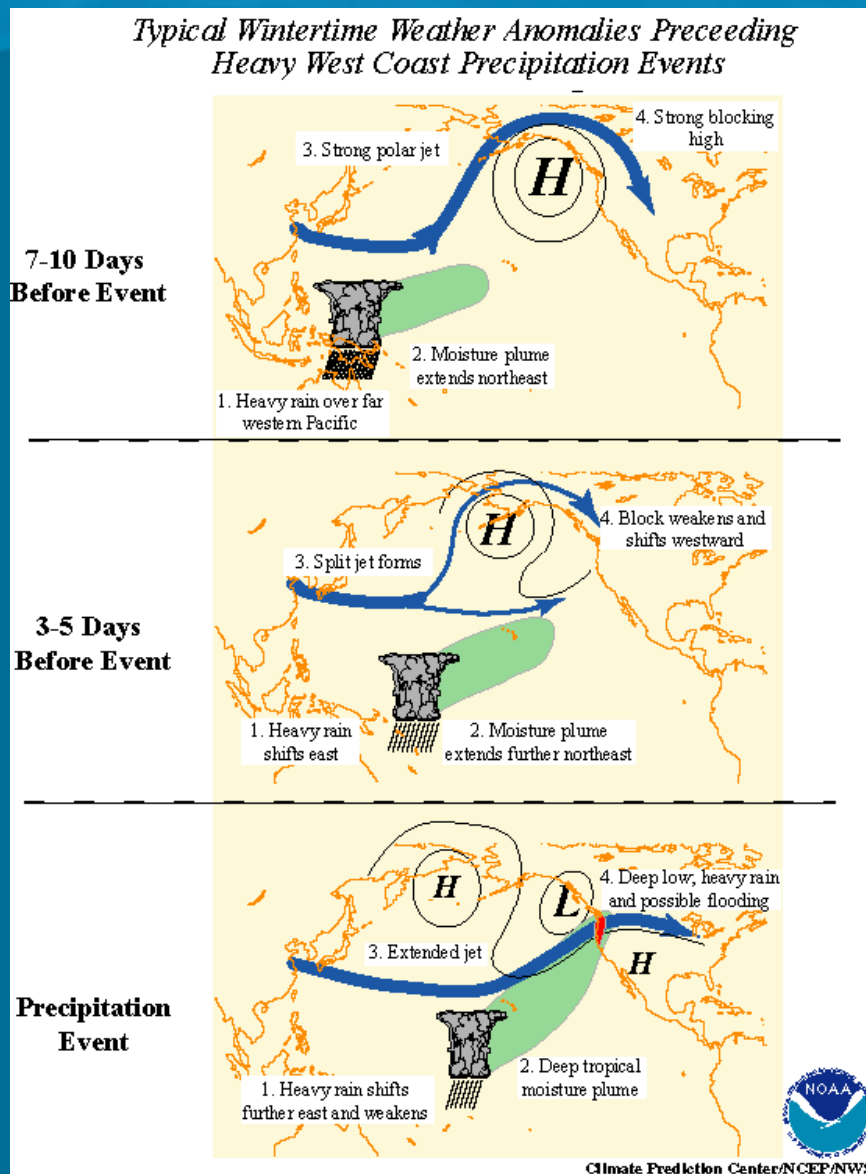
*California Extreme Precipitation Symposium
June 2006*

Review

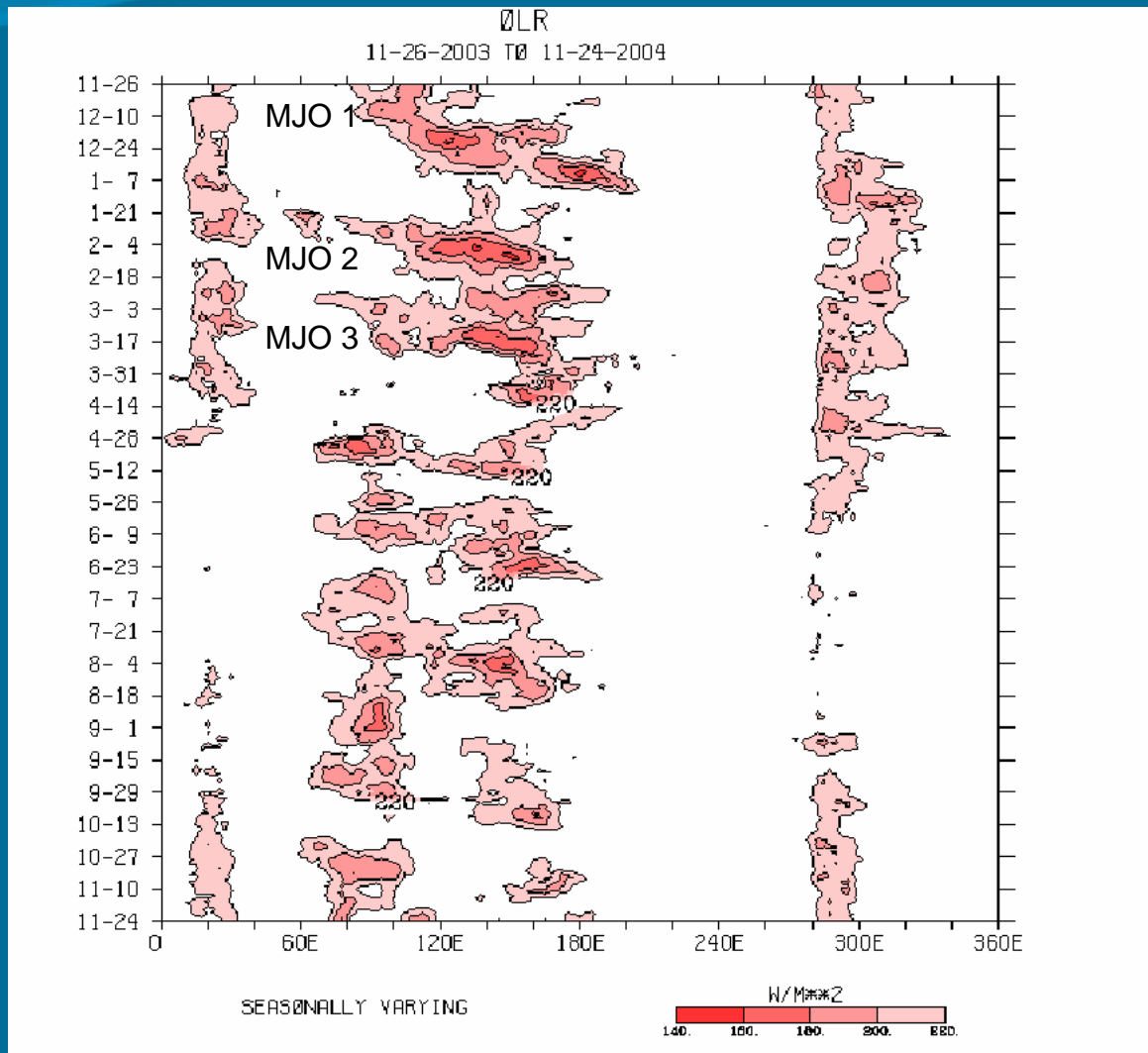
- ***Past research by Climate Prediction Center has noted a relationship between MJO and West Coast flooding***
 - Meteorological situations exist that may be precursors to significant hydrologic events along West Coast. Up to 14 days prior to flood.
 - Relatively new to the forecaster is the knowledge of the impact of the Madden Julian Oscillation and its relationship to flooding along the West Coast.
 - Pattern recognition will be key to the success of this. Something forecasters do very well.
 - Experimental CDC MJO Web graphics and discussions have greatly aided the forecaster in monitoring the MJO.

Possible 10-14 Day Heads-up – Climate Weather Connection

CPC MJO Graphic Used in Winter Weather Briefings



Monitoring MJO – 7.5N – 7.5S



Napa River at St Helena

MJO # 1 Identified

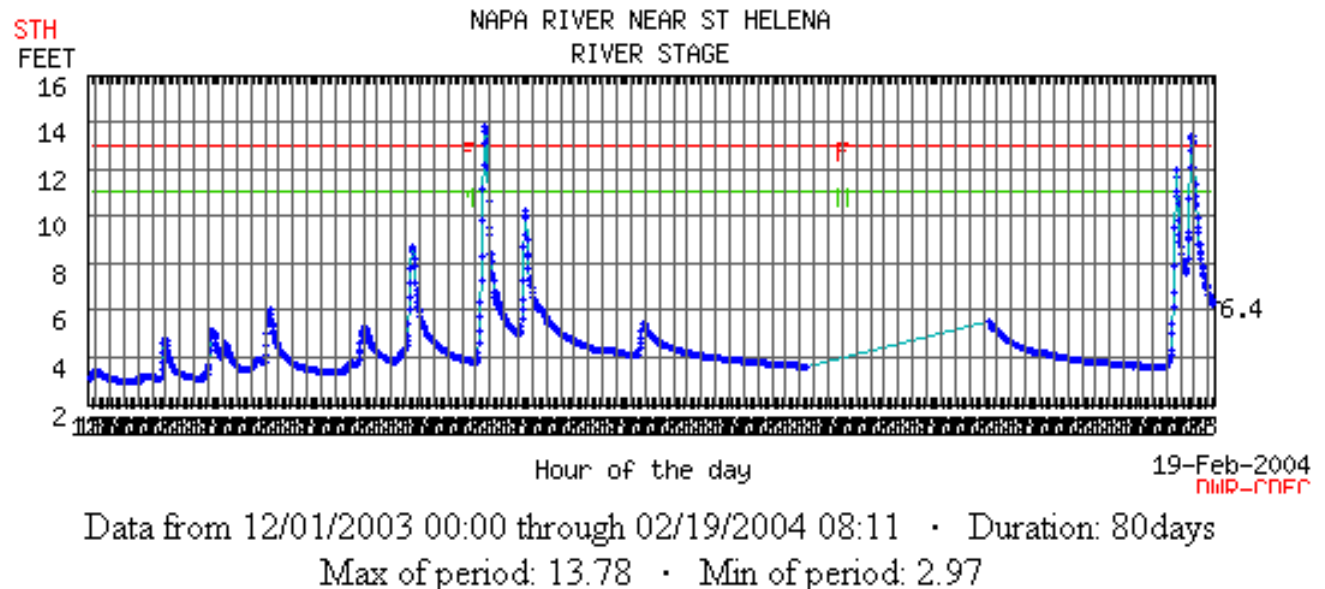


About 12 days
flood

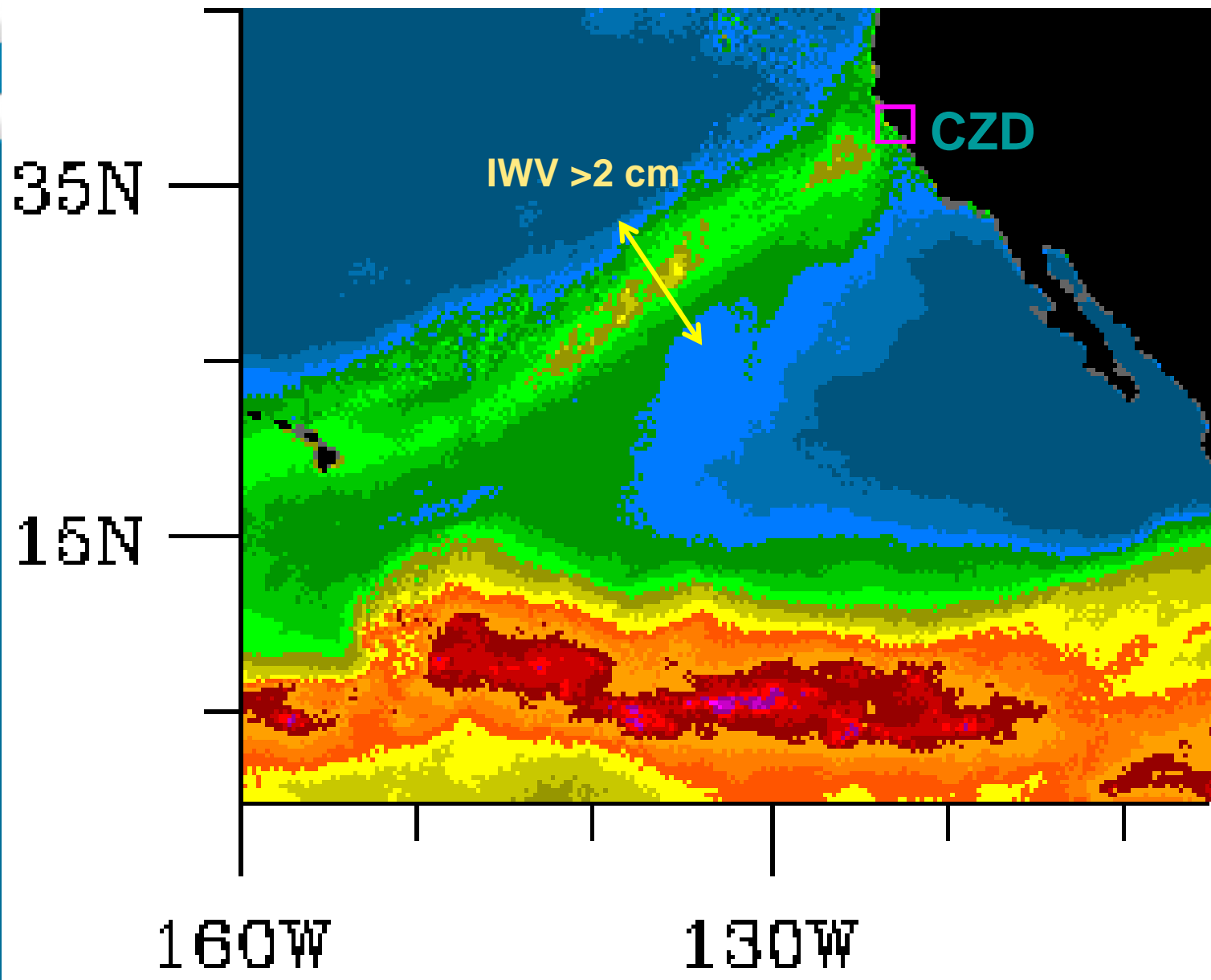
MJO # 2 Identified



About 14 days
flood



16 Feb 2004 Daily IWV composite



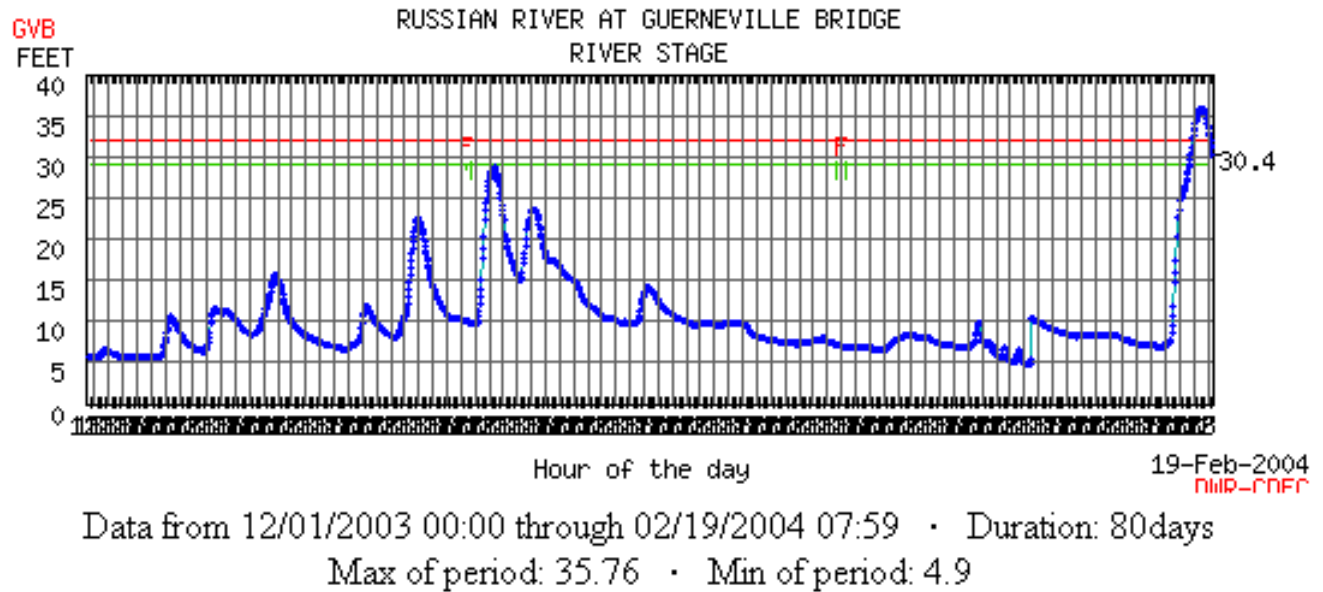
Russian River at Guerneville

MJO # 1 Identified

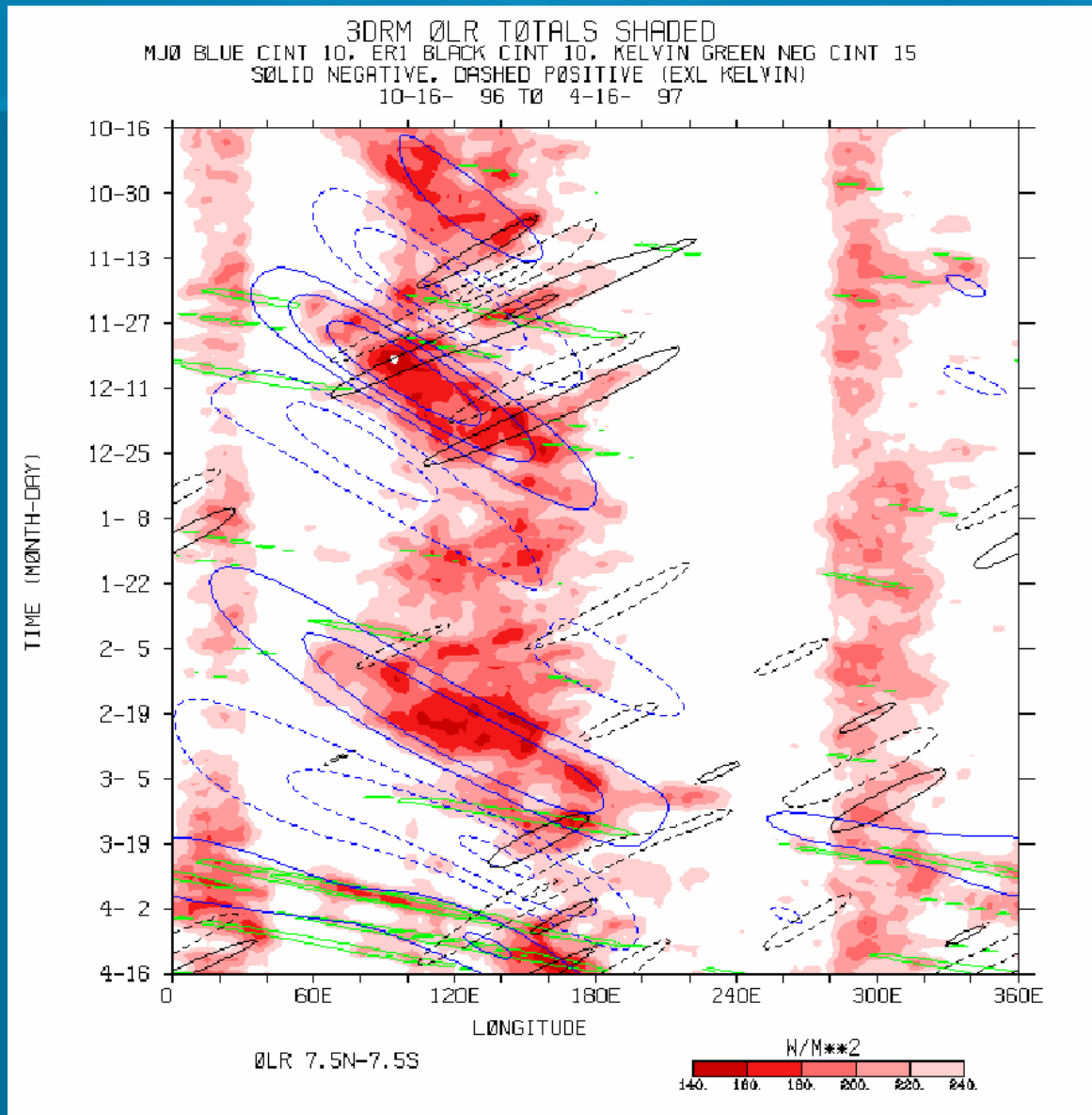
↓
About 12 days
near flood

MJO # 2 Identified

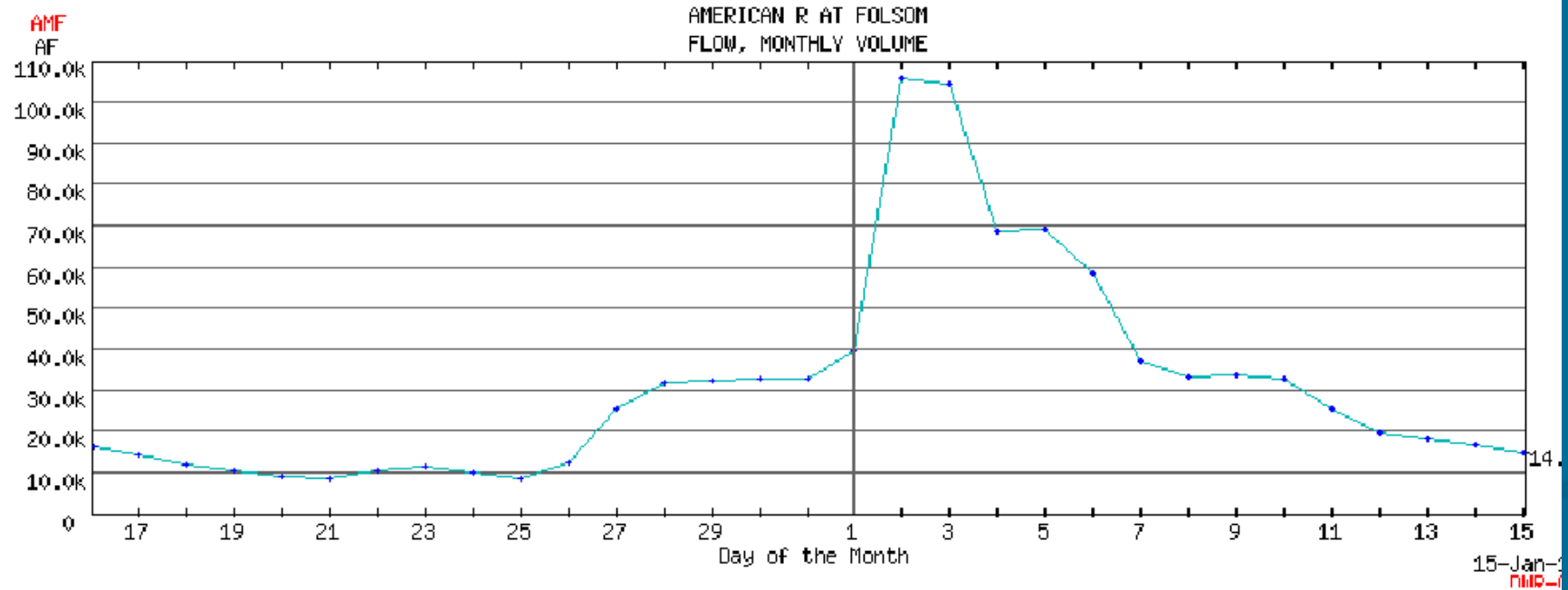
↓
About 14 days to
flooding



The New Years Flood of 1997

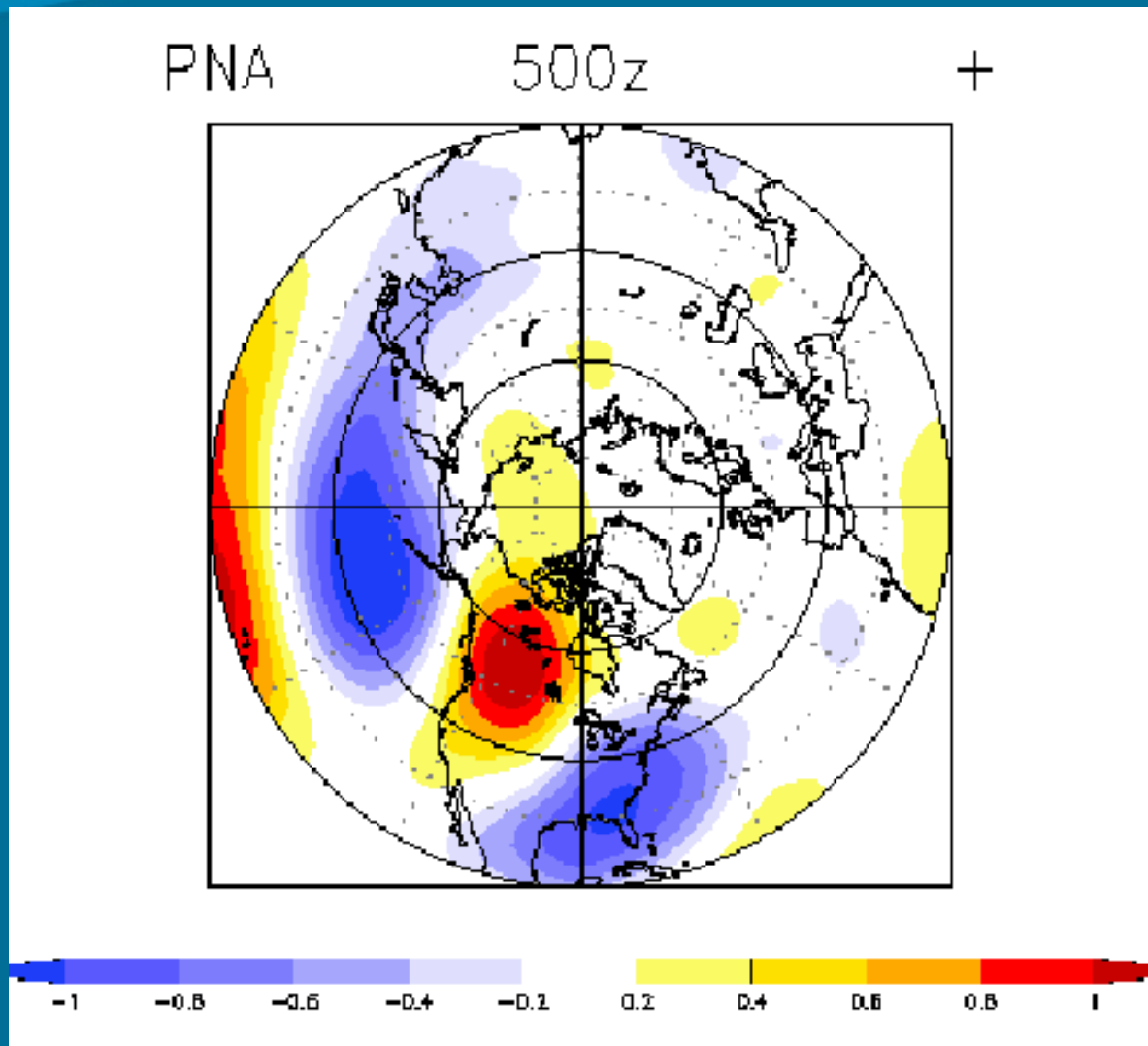


The New Years Flood of 1997

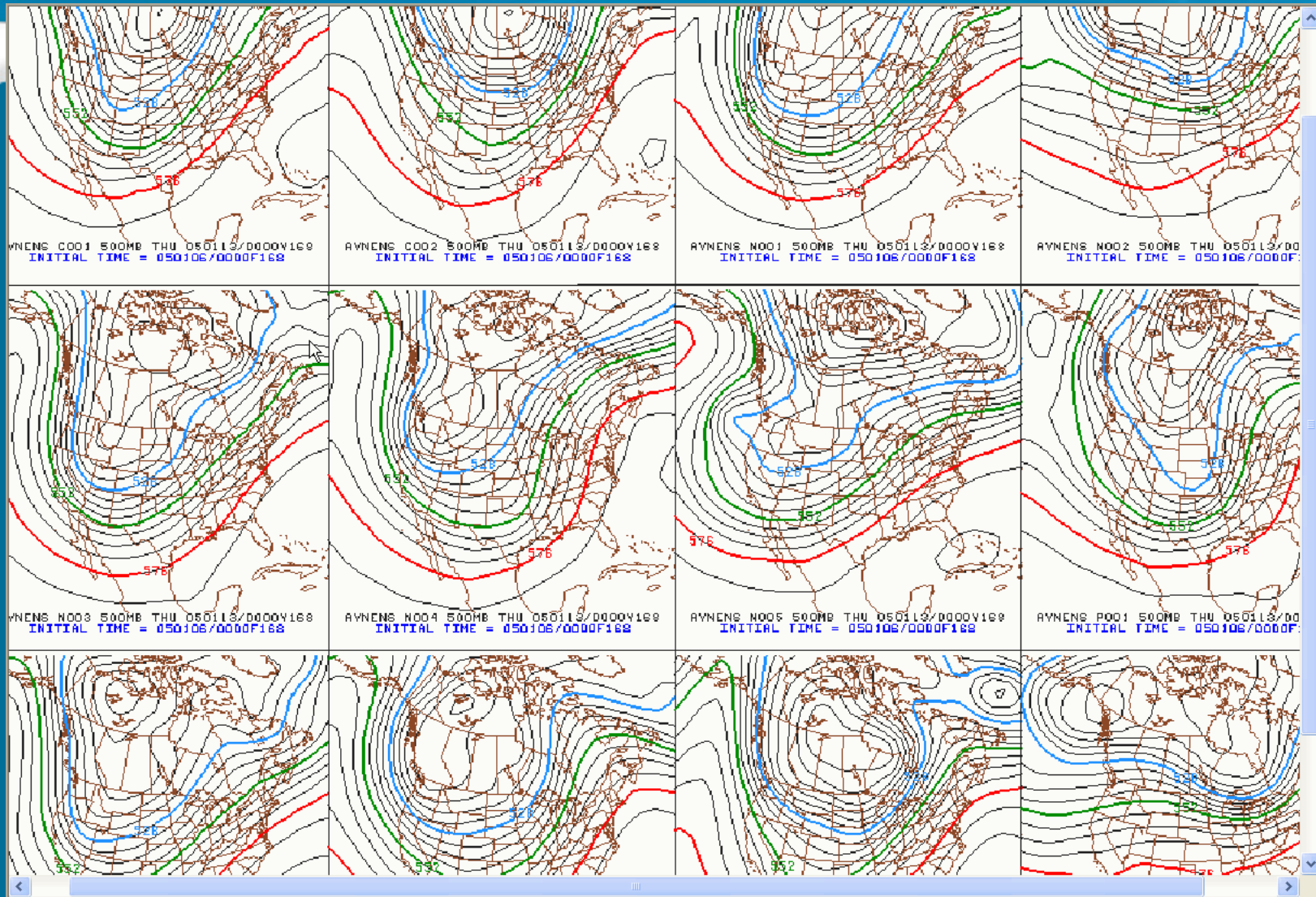


Data from 12/15/1996 00:00 through 01/15/1997 00:00 · Duration: 31days
Max of period: 105920 · Min of period: 8279

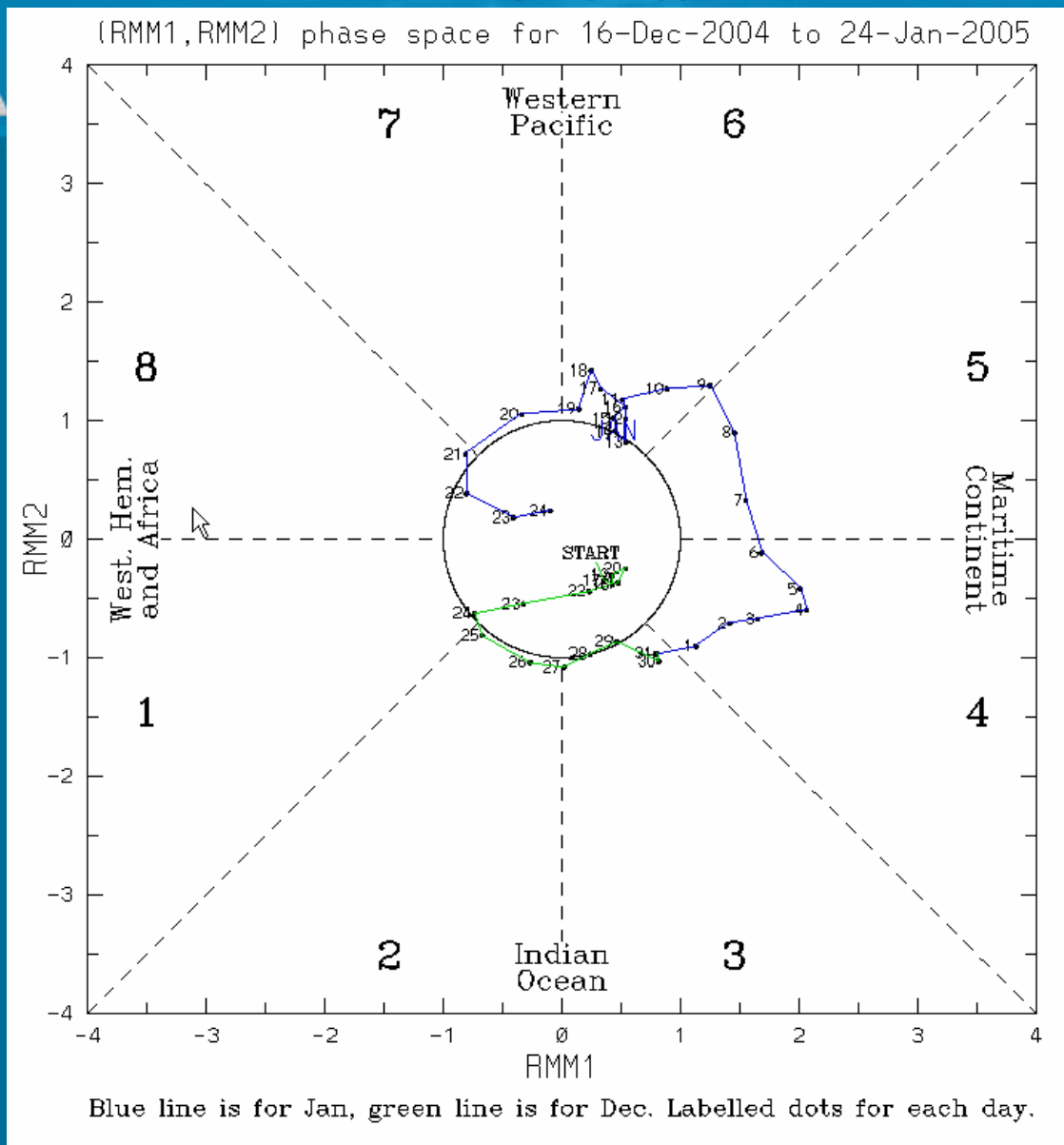
MJO Impacts Conditional on PNA Pattern?



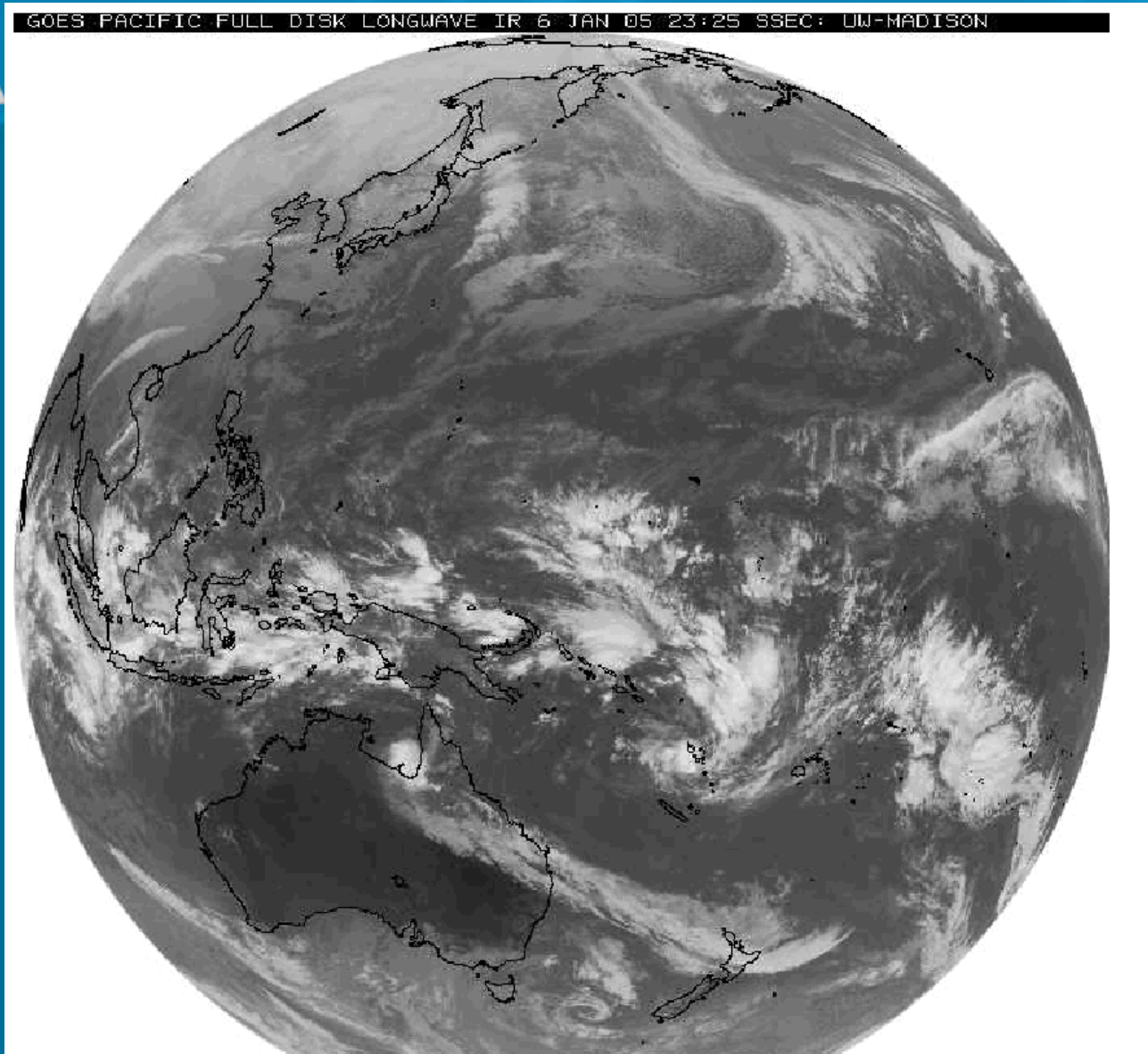
MJO and Ensemble Members



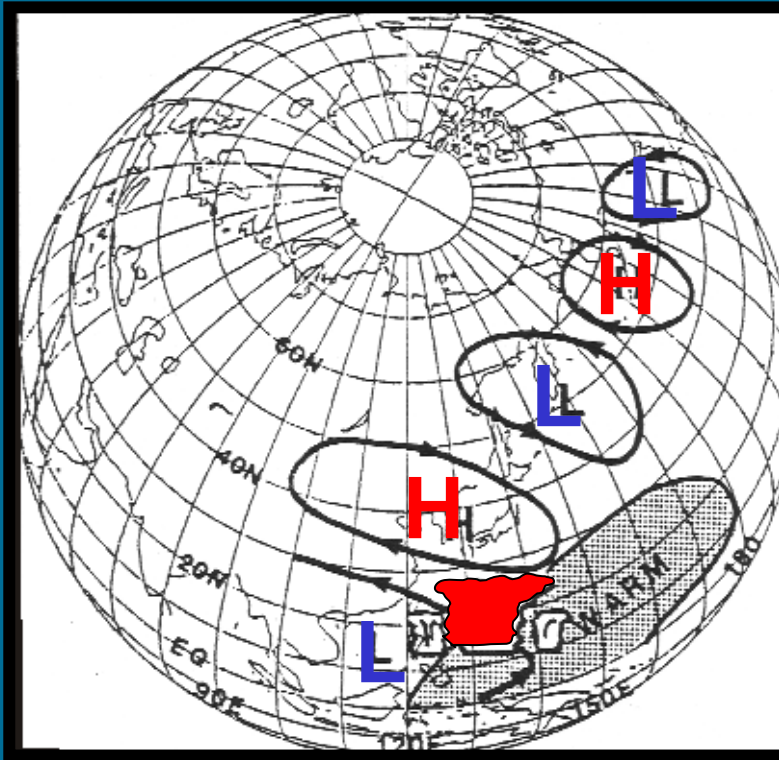
MJO Status



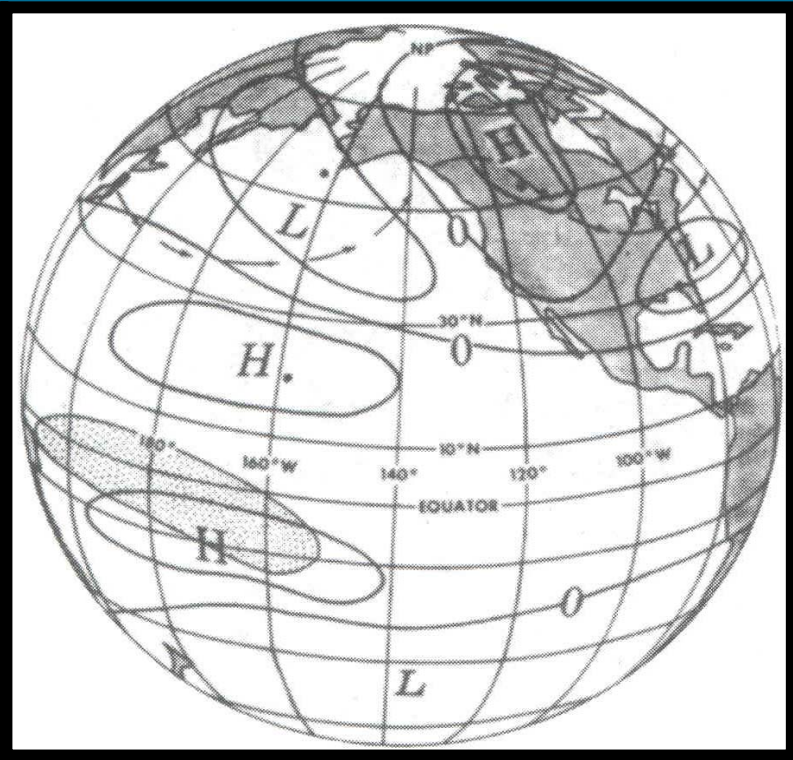
MJO Status



Rossby Wave Dispersion Initiated by Tropical Convection

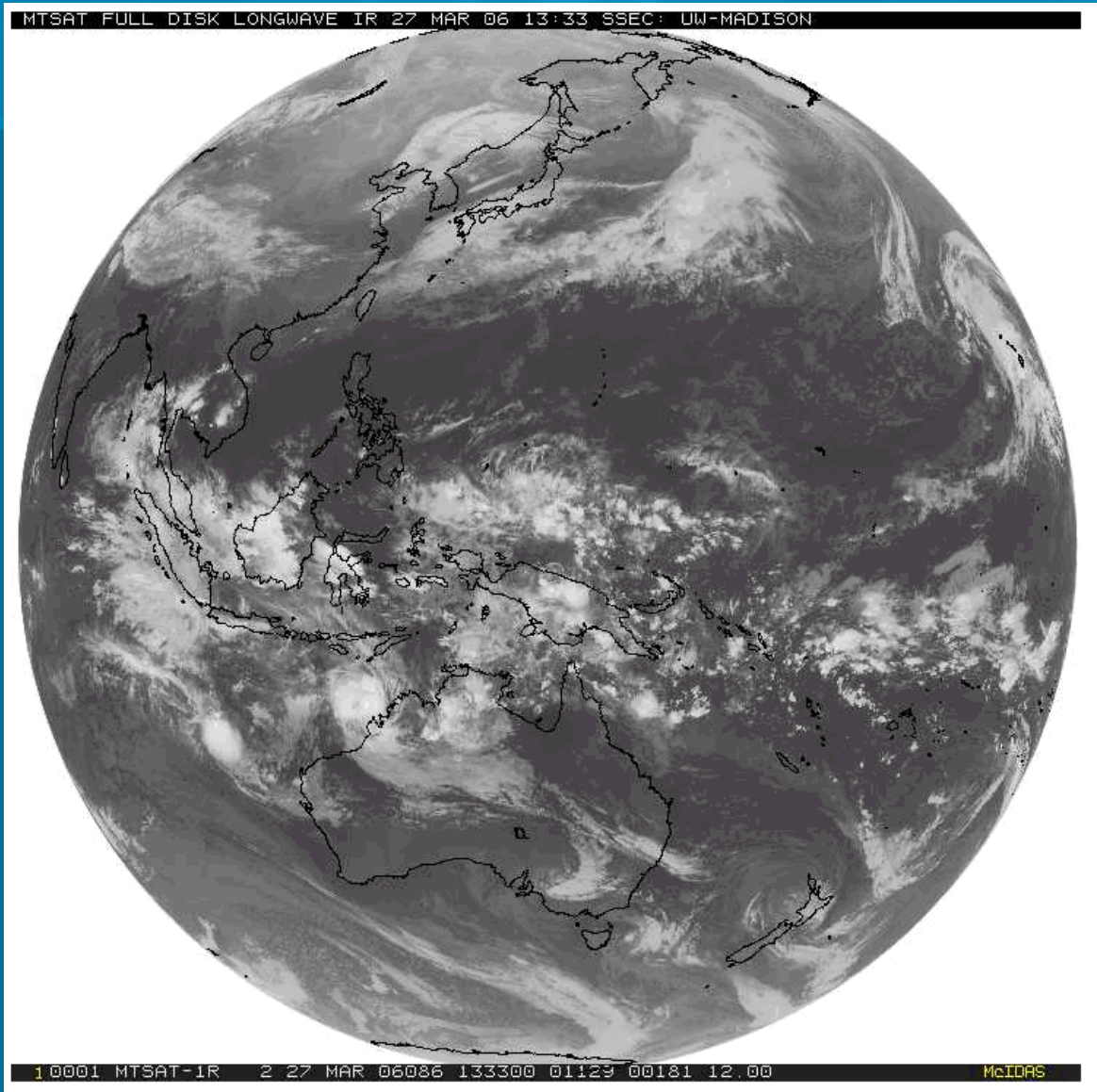


Nitta, JMSJ, 1987

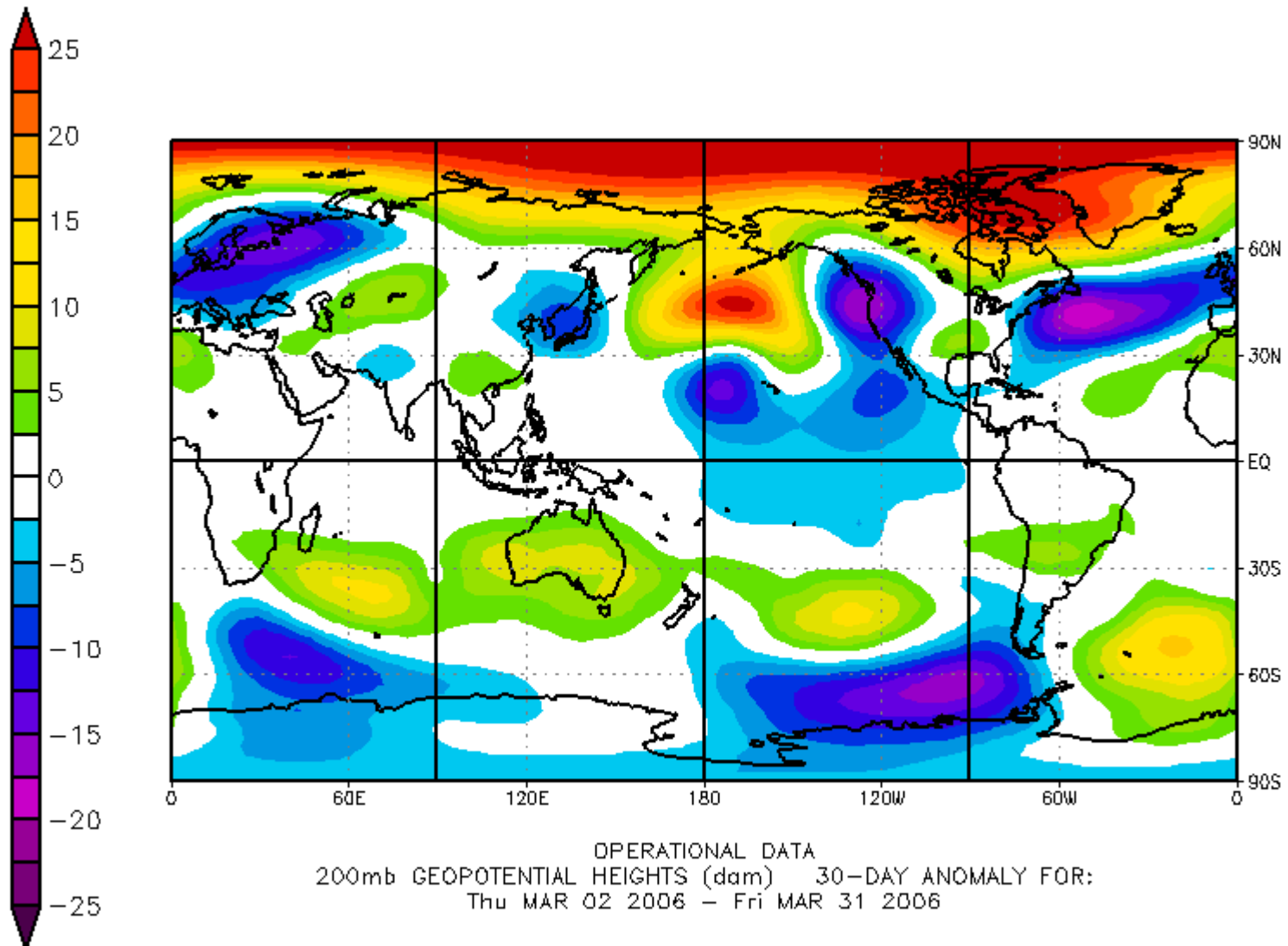


Horel and Wallace, Monthly Weather Review, 1981.

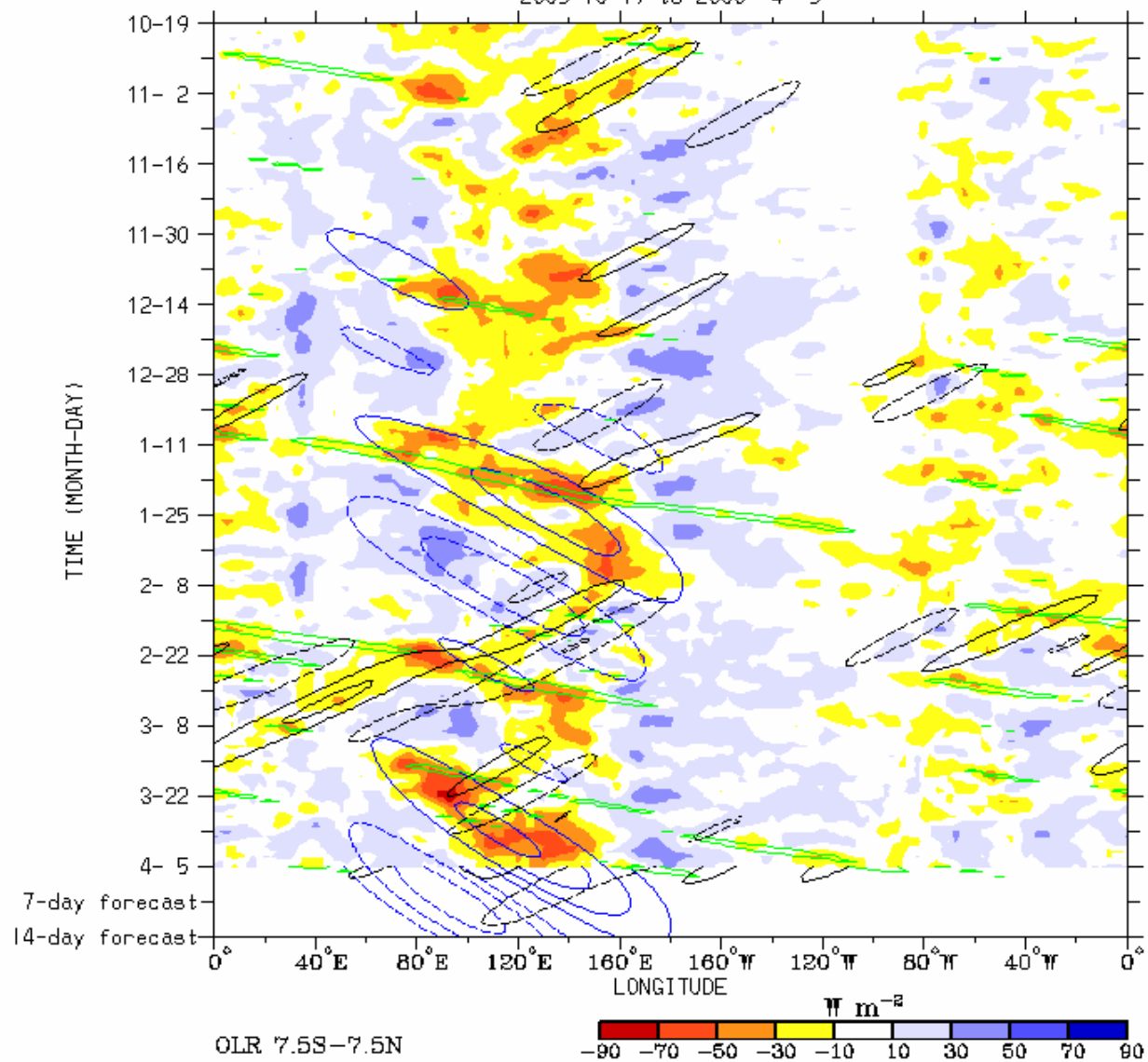
MJO Status



MJO Status



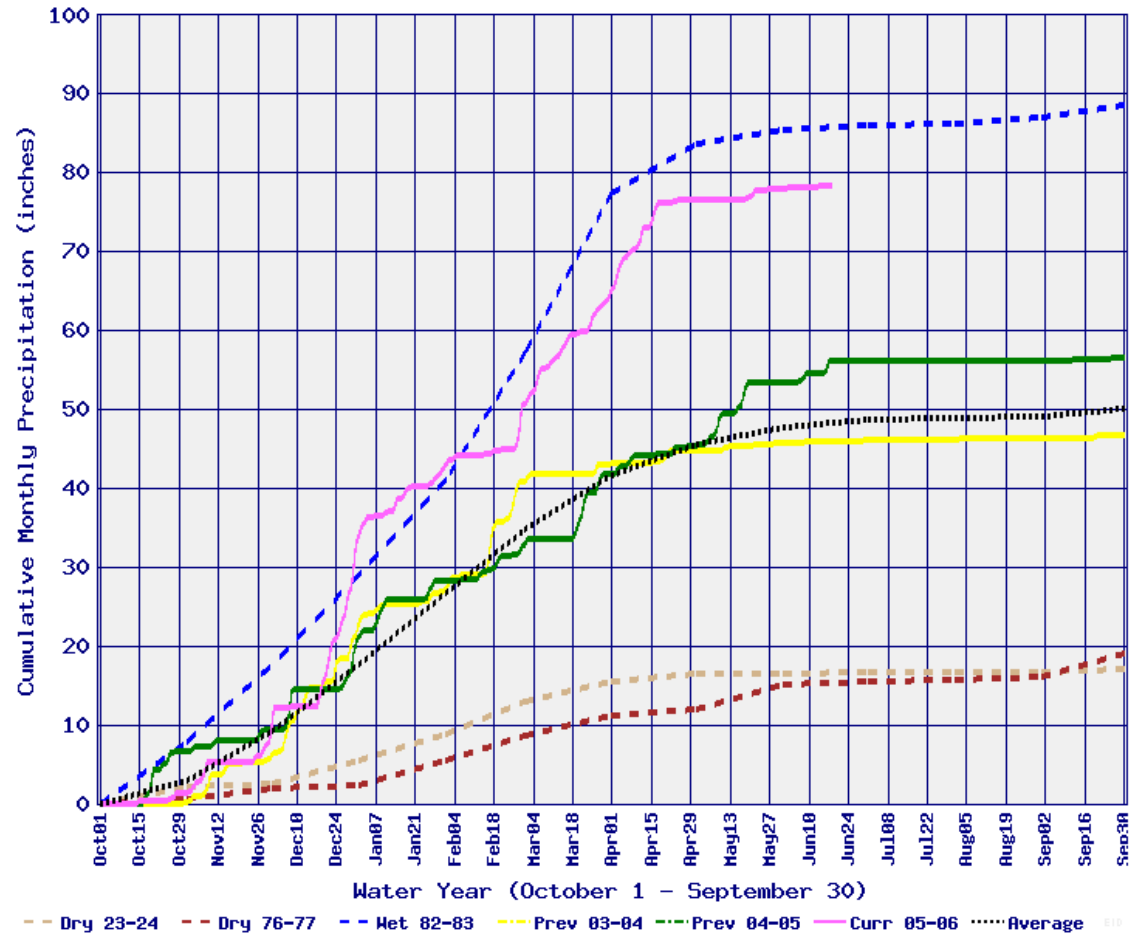
Real-time filtering superimposed upon 3drn OLR Anomalies
MJO blue CINT 10, ER1 black CINT 10, Kelvin green CINT 15
Negative contours solid, positive dashed (exl Kelvin)
2005-10-19 to 2006- 4- 5



California 8-Station Index 2005-06

California Northern Sierra Precipitation

8-Station Index, June 19, 2006



Recurving Tropical



Geostationary Satellite Images

[GOES EAST](#) | [GOES WEST](#) |
[MET-5](#) | [MET-8](#) | [MTSAT](#) |
[FY2C](#)

Latest Image/Animation:

- Image
- 4 Image Animation
- 8 Image Animation

Geographic Coverage:

- Full Disk

Imager Channel:

- Visible 0.73 μm
- Shortwave IR 3.75 μm
- Water Vapor 6.75 μm
- Longwave IR 10.8 μm

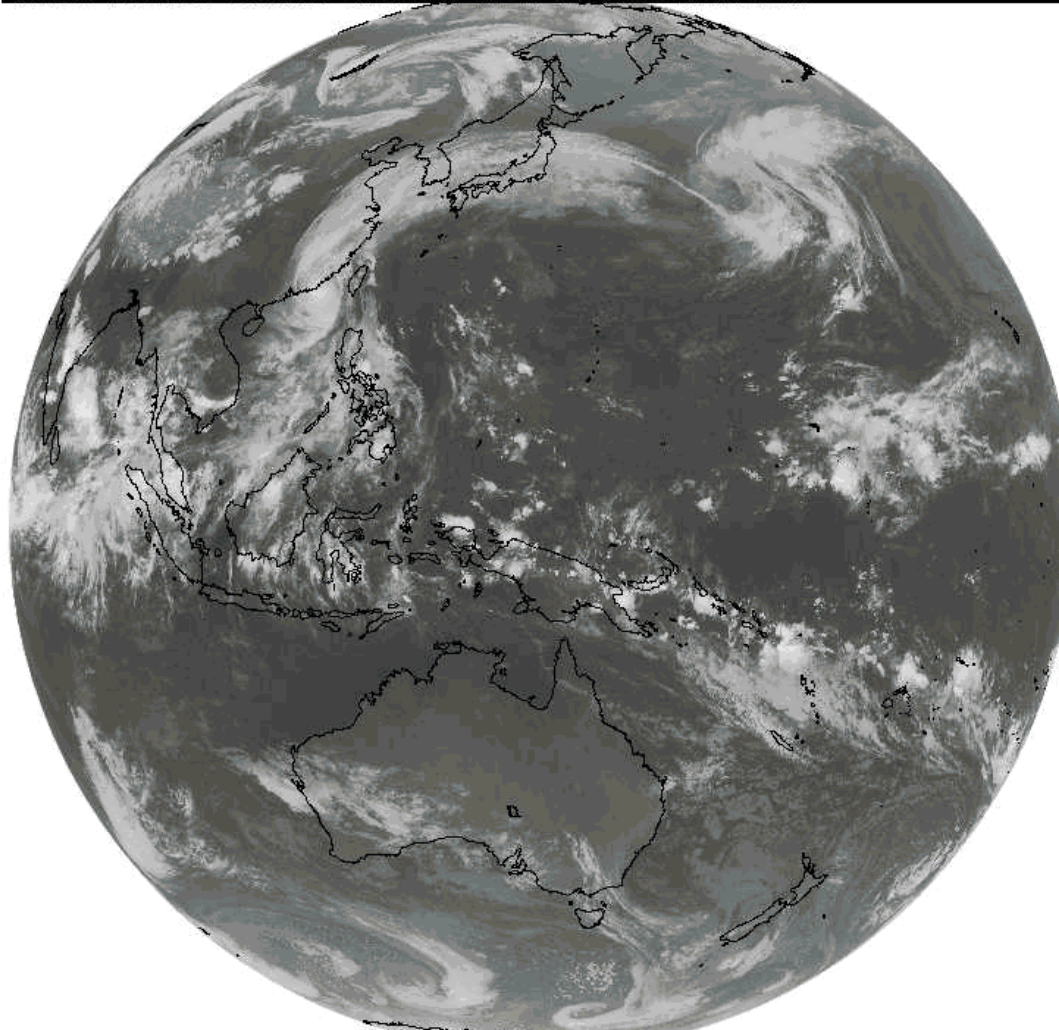
Image Quality/File Size:

- Lower/Small
- Higher/Large

[Back to Real-Time Data](#)

[SSEC Webmaster](#)

MTSAT FULL DISK LONGWAVE IR 17 MAY 06 13:33 SSEC: UW-MADISON



1 0001 MTSAT-IR 2 17 MAY 06137 133300 01129 00181 12 00

McIDAS

Conclusions

- *Recognition by forecaster of MJO and large scale synoptic regime (PNA) may provide sufficient information to identify potential for major precipitation event leading to flooding in week two.*
 - Can make better use of ensembles through identification of those members that infer MJO impacts – undercutting of long wave ridge by enhanced subtropical jet.
 - Not all MJOs lead to flooding and not all floods are related to presence of MJO.
 - What looks like a developing MJO may fade or may be related to Kelvin waves. Leads to false alarms.
 - Better understanding of interaction of the intra-seasonal tropical convection and mid-latitude circulations. Rossby wave dispersion. Recurving tropicals in Western Pacific. THORPEX.
 - If reliability can be improved water managers could make more informed decisions on reservoir operations well in advance.
 - Forecasters now keying on tropical convection Indian Ocean and Western Pacific during cool season. Also SSMI/AMSU TPW.

