

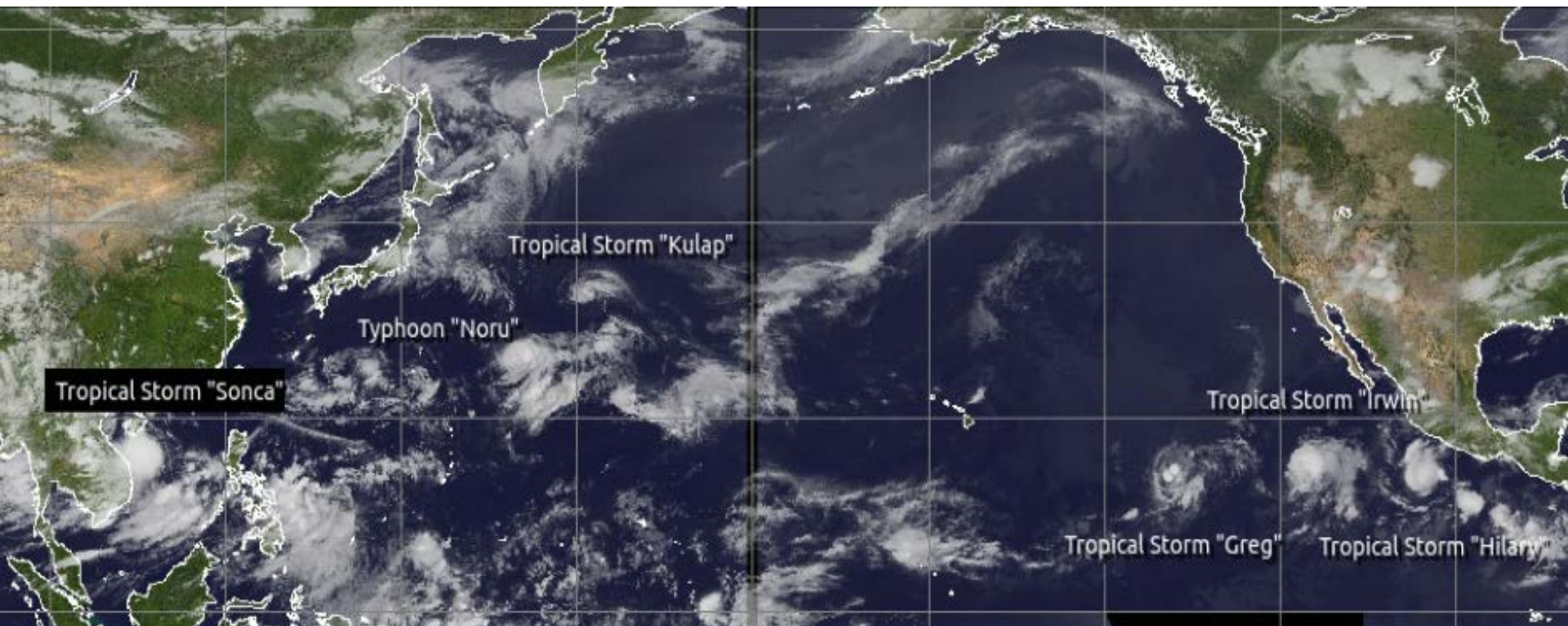


Joint Typhoon Warning Center

Tropical Cyclone Reconnaissance Using Satellites



July 2017 Tropical Cyclone Out-Break



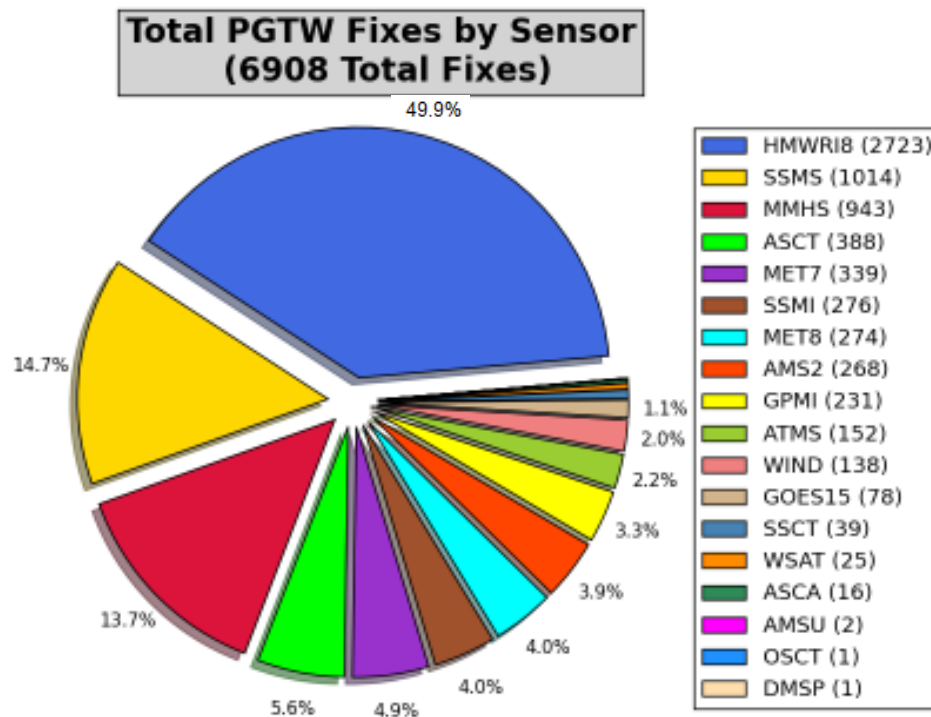
2018 TCORF / 72nd IHC

13-15 March 2018

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2017 TC Recon – JTWC Fixes By Sensor



- Exclusively remotely sensed data – satellite/radar
 - Aircraft recon ended in 1987
- Infrared/Visible Imagery Fixes via Mark IVB every 3 hours—49.4% of total
- Microwave/scatterometer fixes as available—50.6% of total

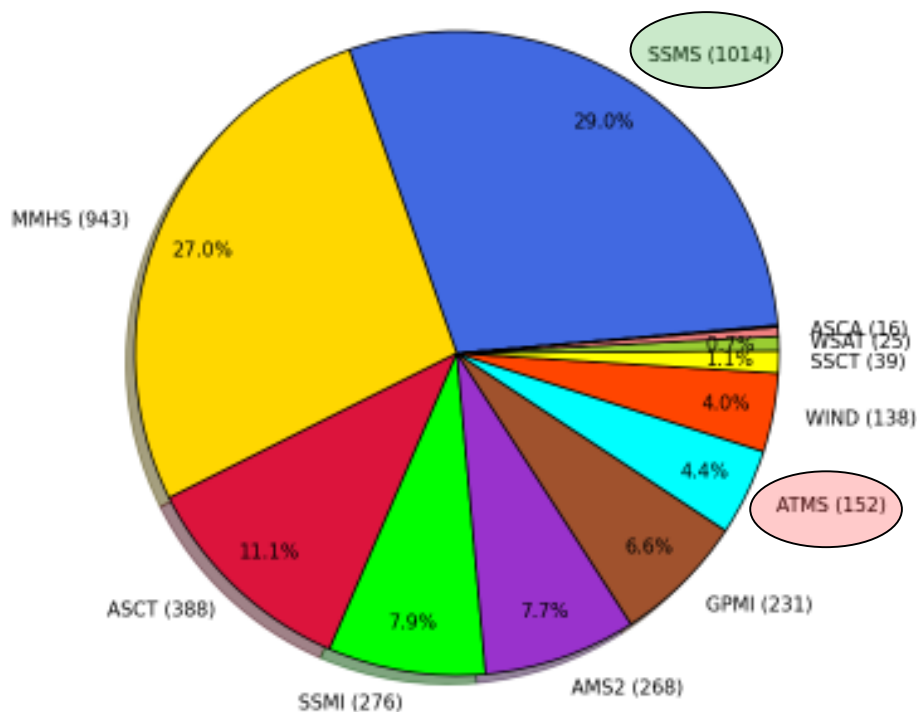
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2017 TC Recon – JTWC Microwave Fix Data



**Microwave Fixes by Sensor
(3493 Total Fixes)**



JTWC uses microwave imagery from:
DMSP, NOAA, JPSS, GPM, GCOM-W1, Coriolis, METOP A&B

JTWC uses scatterometry from:
USN (Coriolis WINDSCAT), ISRO (ScatSat1 OSCAT) and EUMETSAT (METOP A&B ASCAT)

SSMI/S: 1014 (29.0%)

MHS: 843 (27.0%)

ASCT: 388 (11.1%)

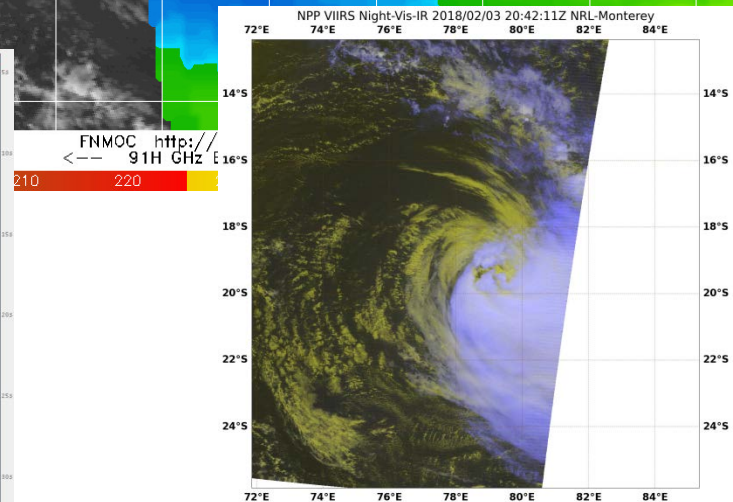
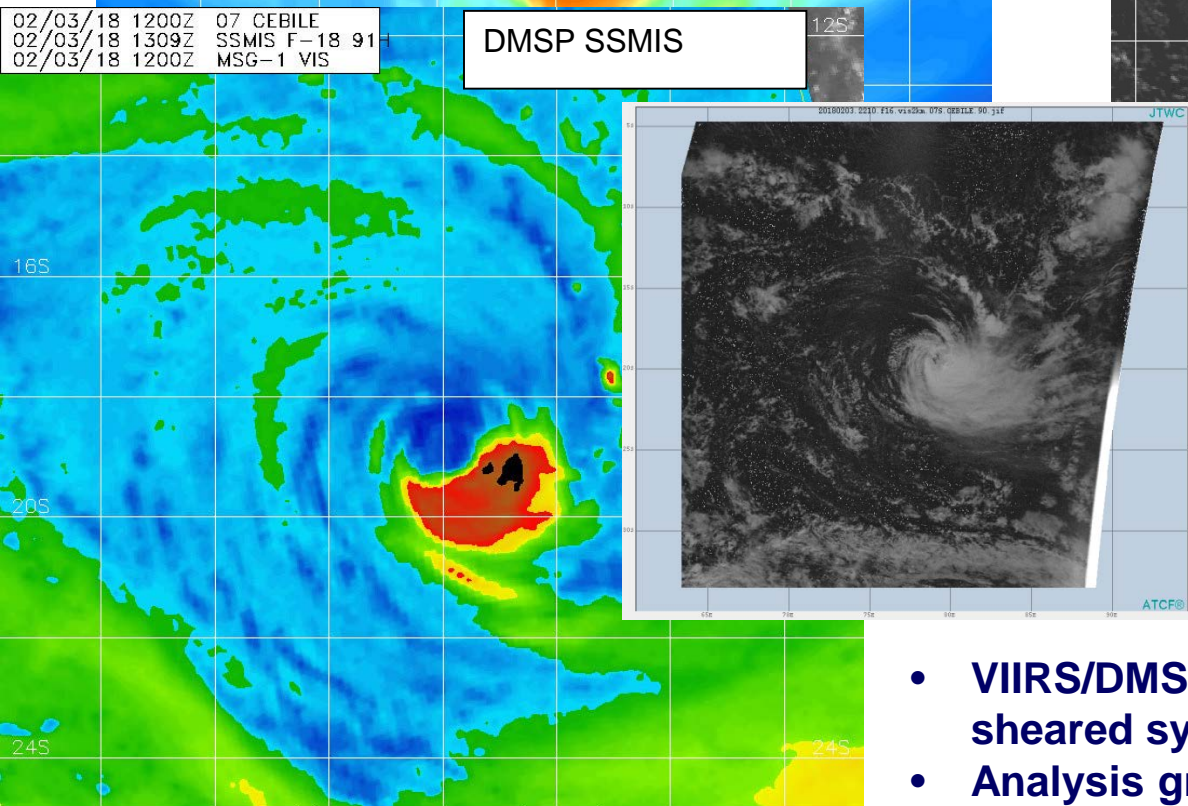
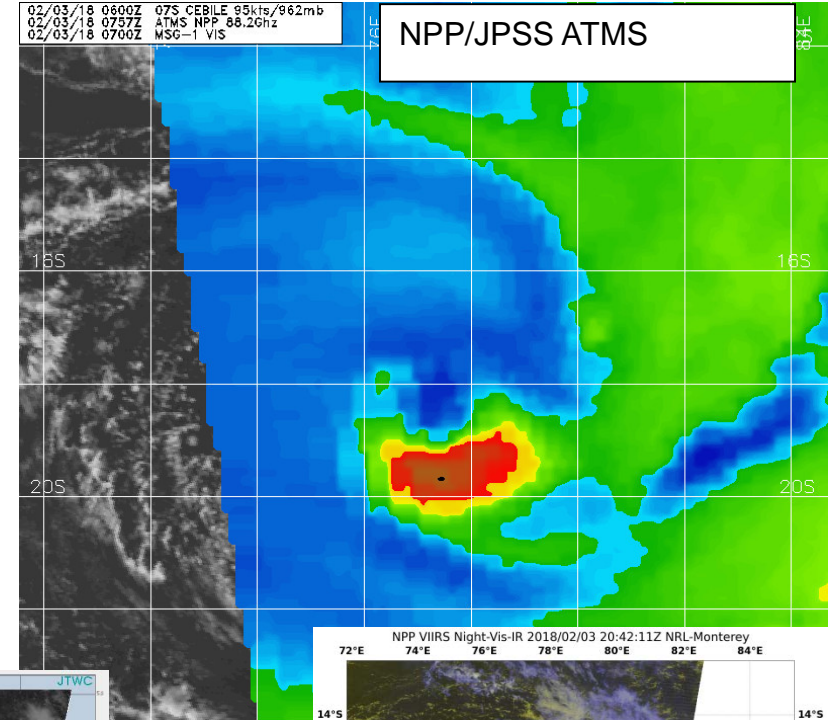
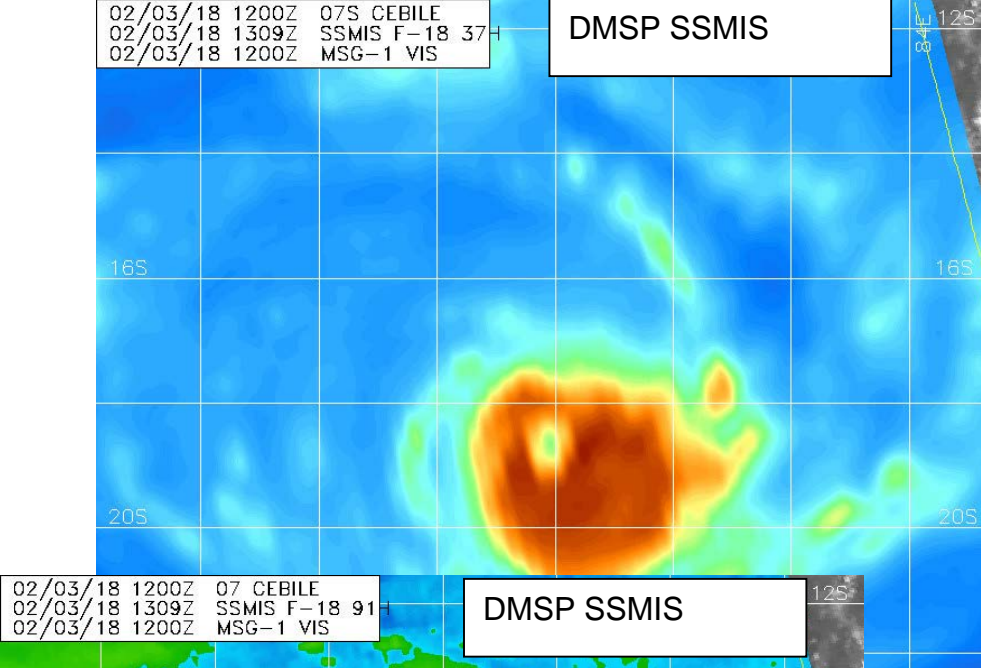
SSMI: 276 (7.9%)

AMS2: 268 (7.7%)

GPMI: 231 (6.6%)

ATMS: 152 (4.4%)

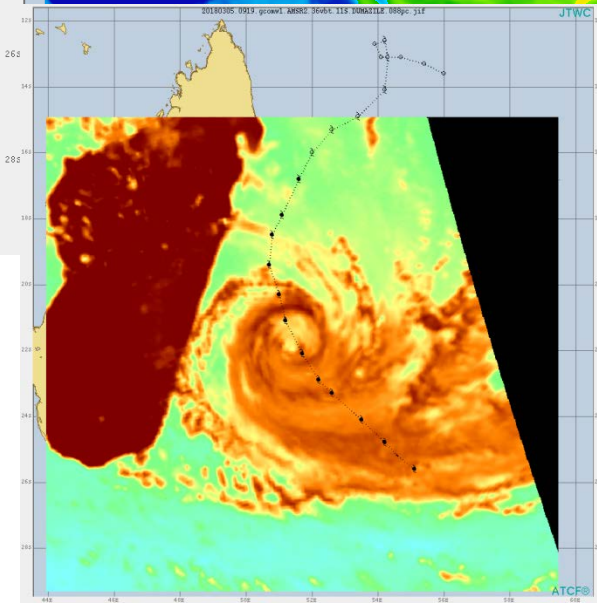
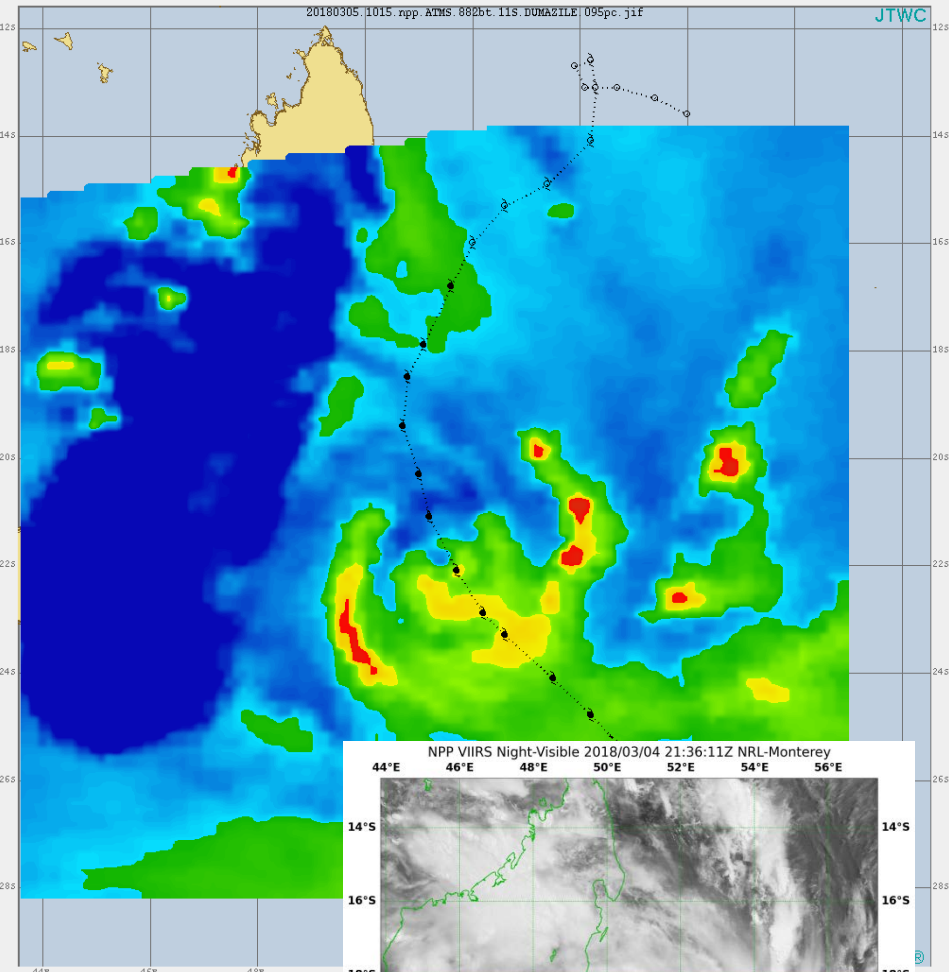
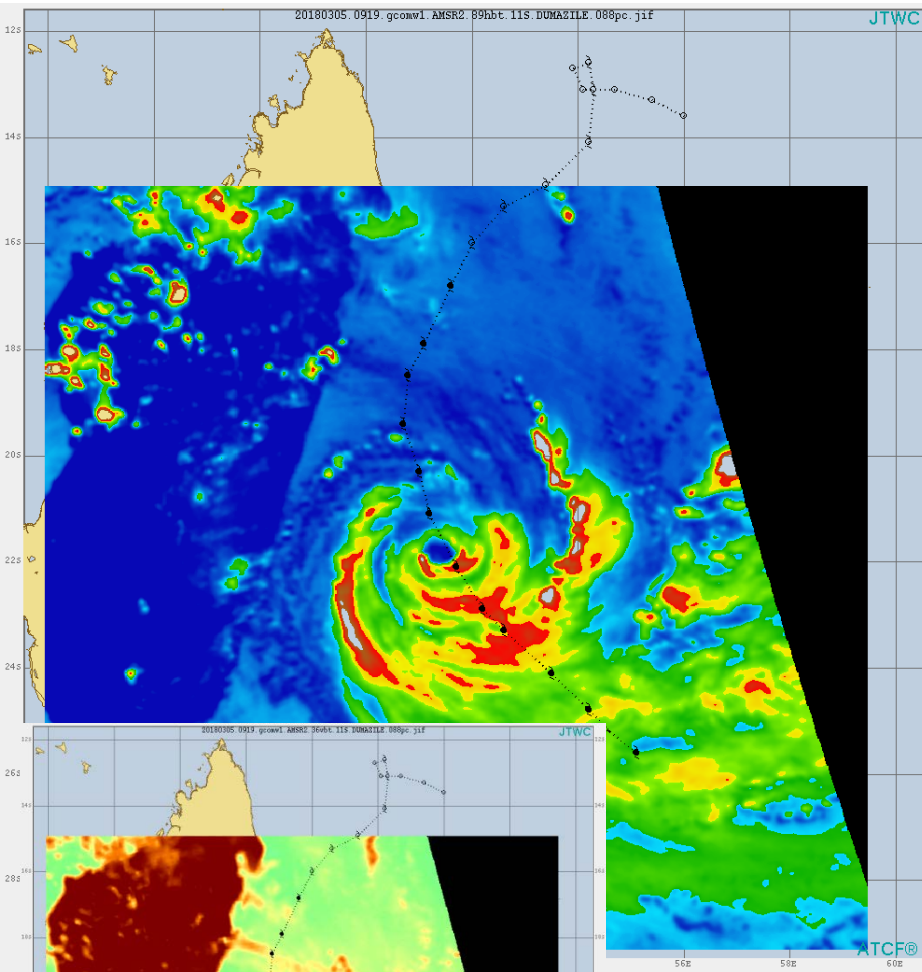
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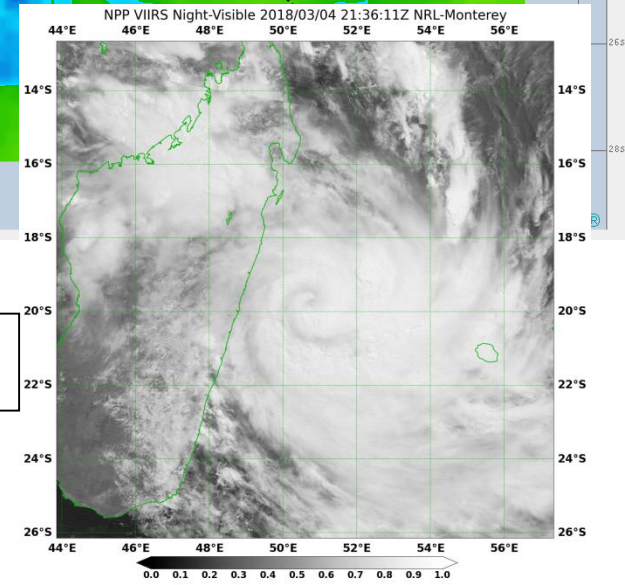
- VIIRS/DMSP Night VIS especially useful in sheared systems, BUT...
- Analysis gravitate toward Hi-Res GEO for animation capability

GCOM AMSR-2
5 March 18 0919Z

NPP/JPSS ATMS
5 March 18 1015Z



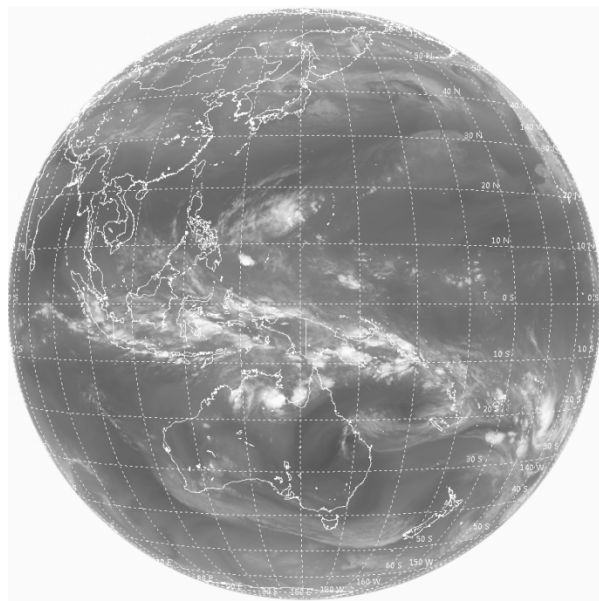
NPP/JPSS VIIRS
4 March 18 2136Z



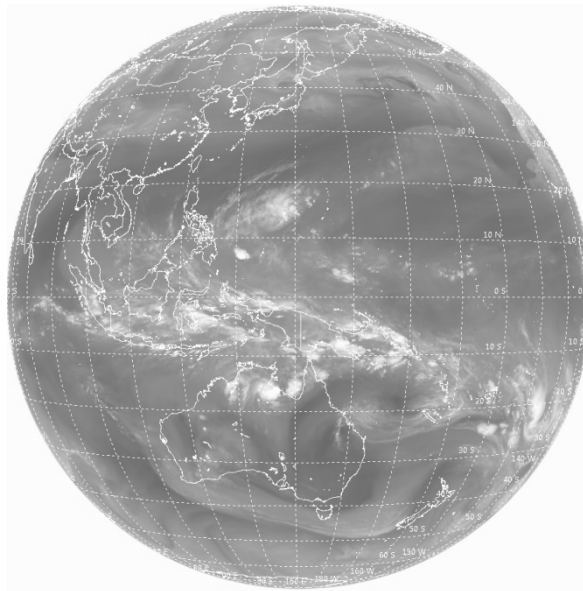


Himawari-8

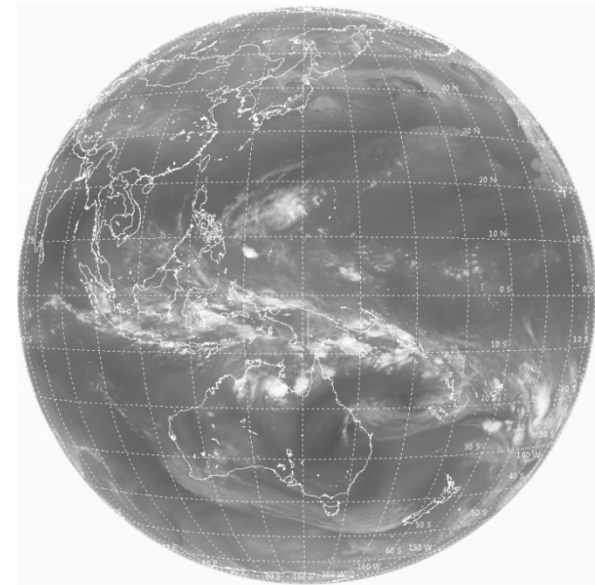
3 Water Vapor Channels



Himawari-8
Low Water Vapor (7.3)



Himawari-8
Mid Water Vapor (6.9)



Himawari-8
High Water Vapor (6.2)

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Low, Mid, High Water Vapor As 3 channel MSI

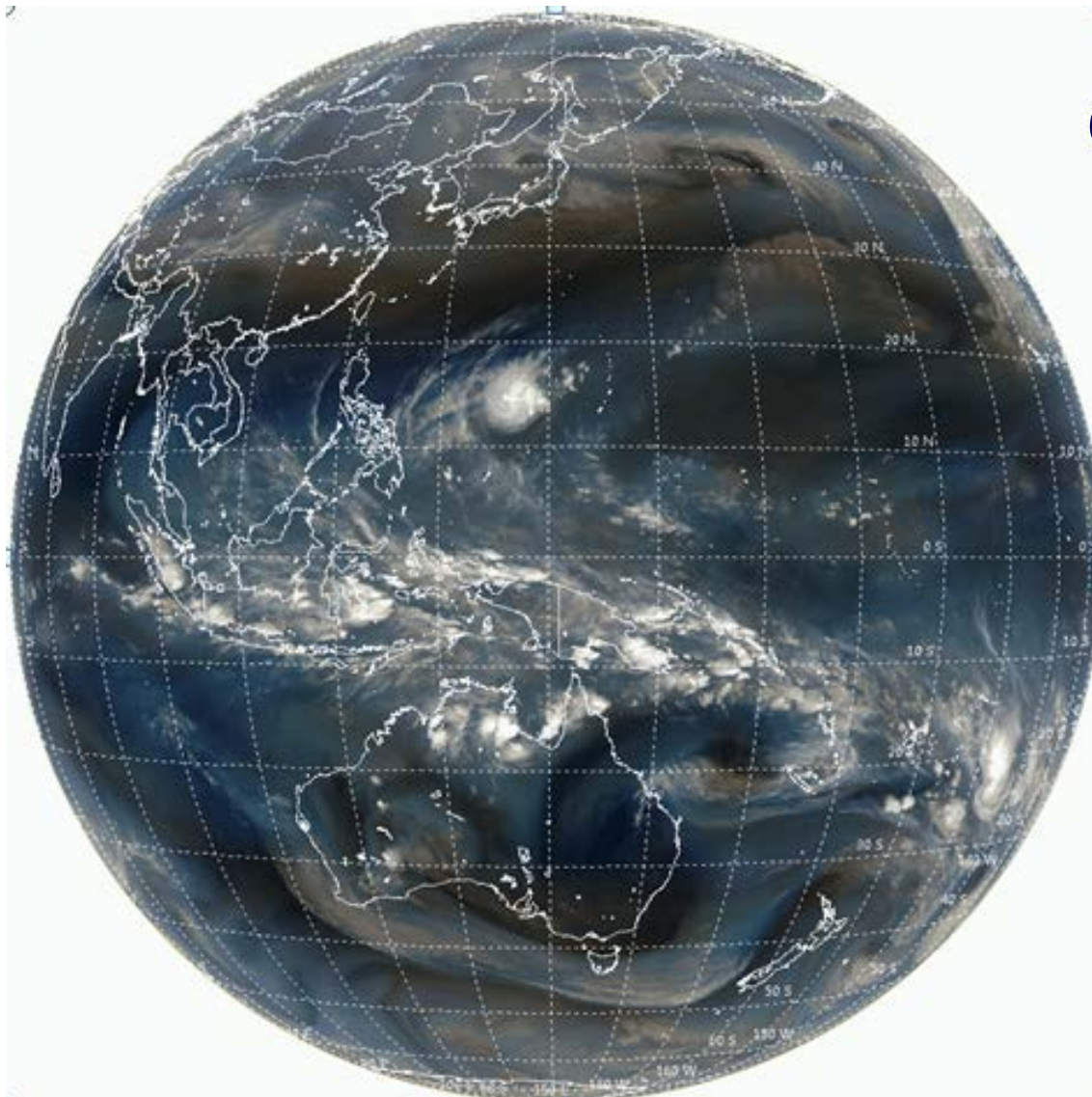


TUTT

Circulations

Air Mass

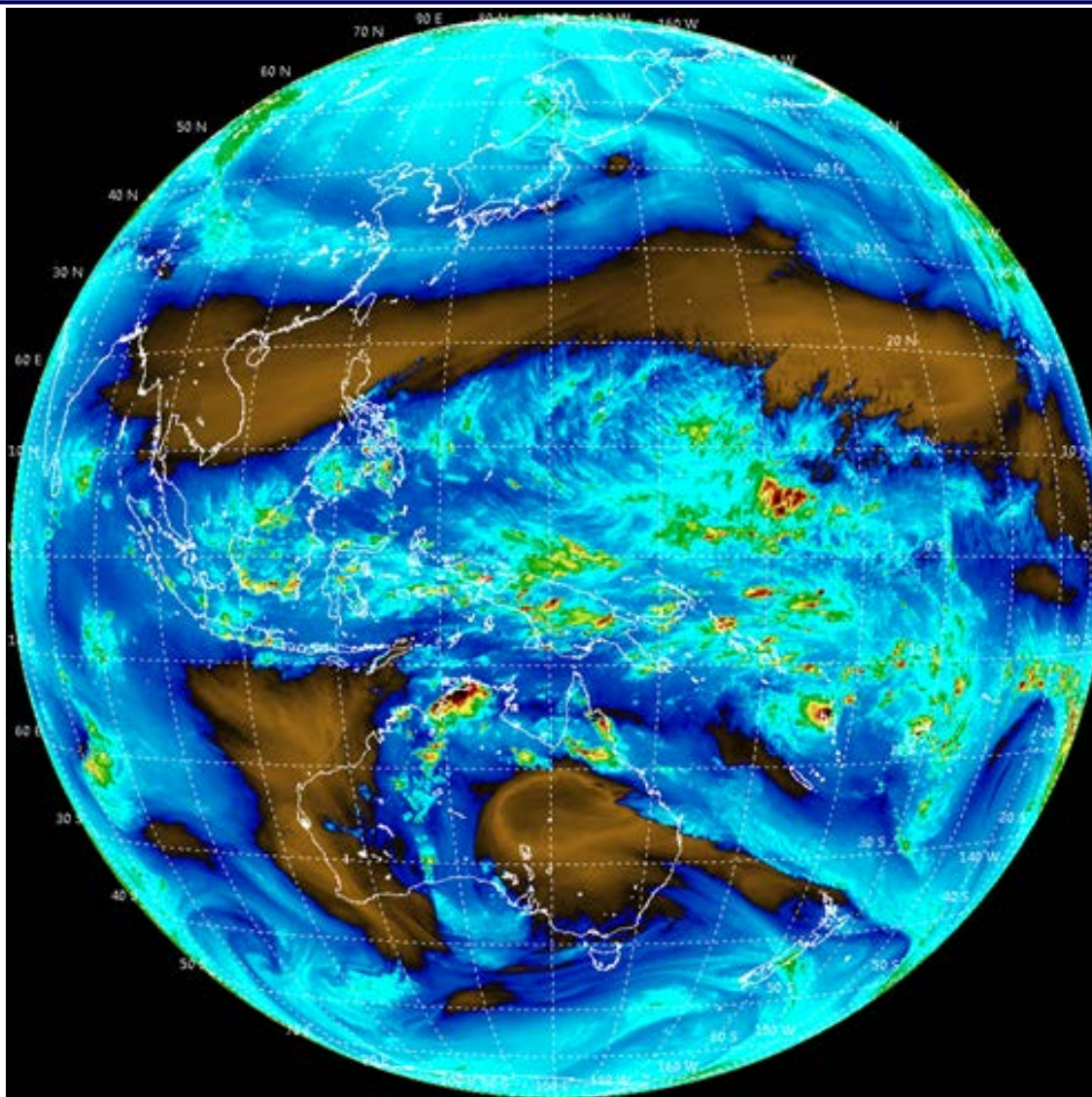
Jet Stream



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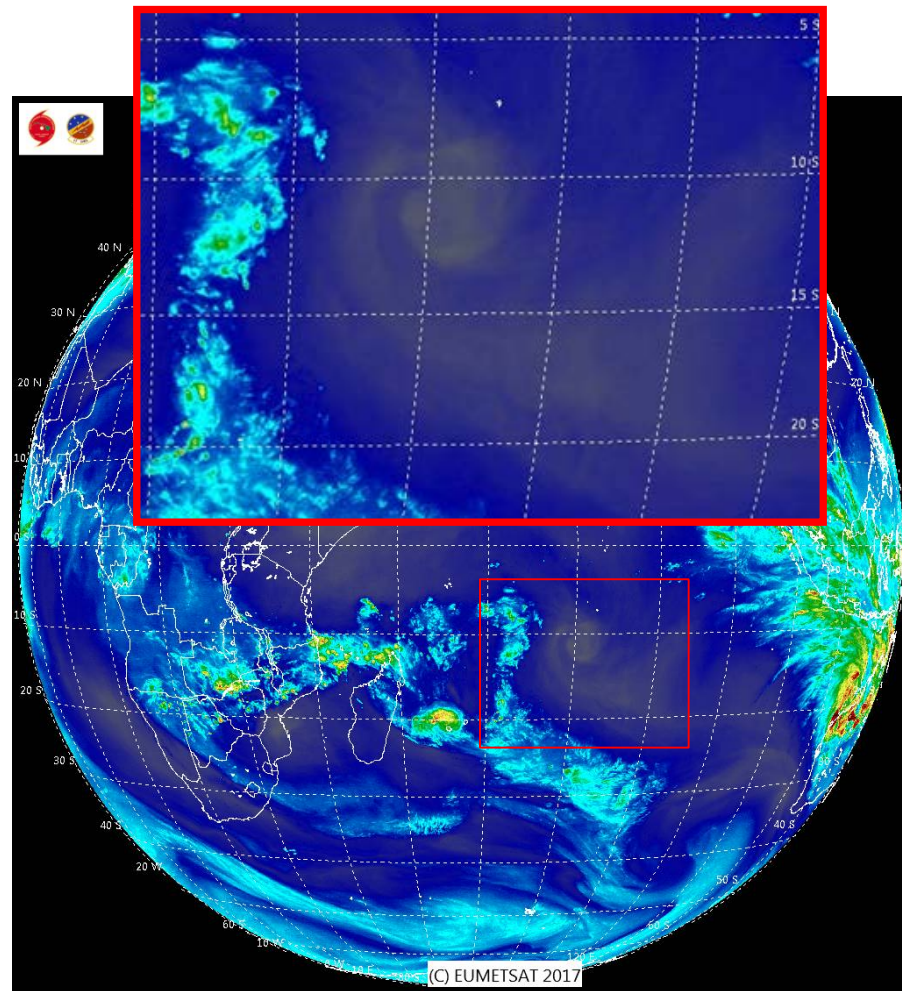
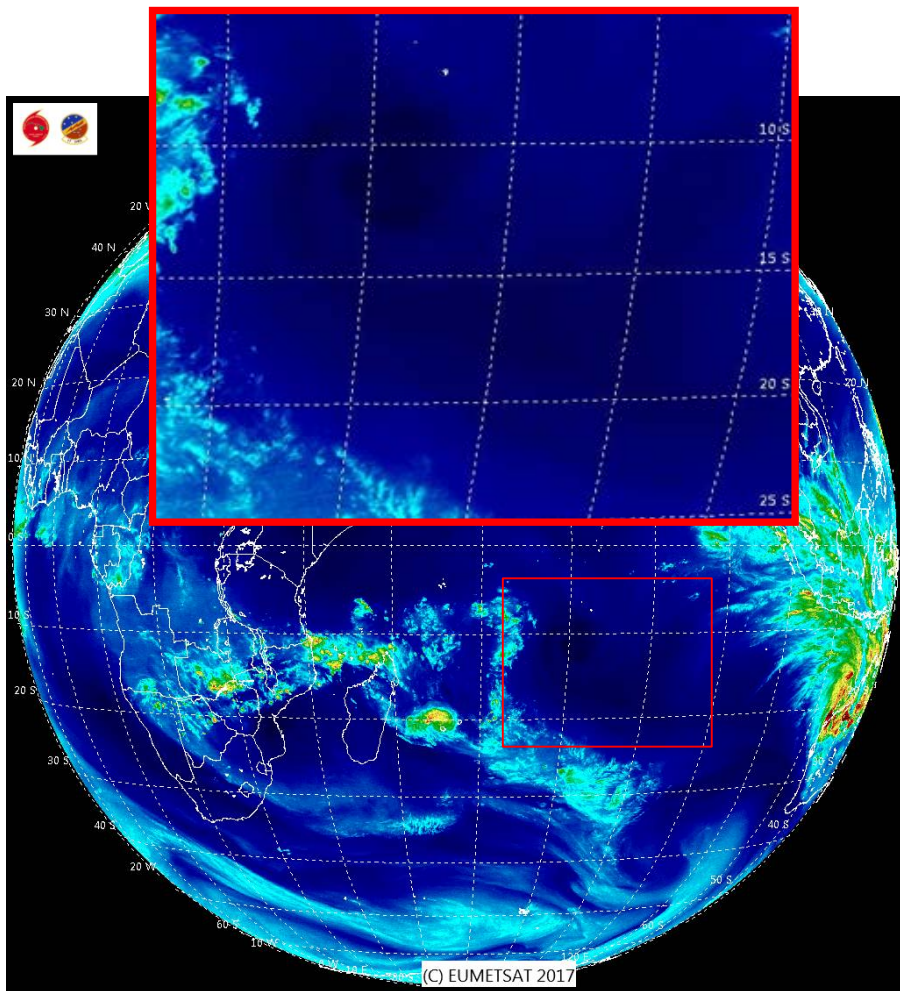
Improving Circulation/TUTT ID



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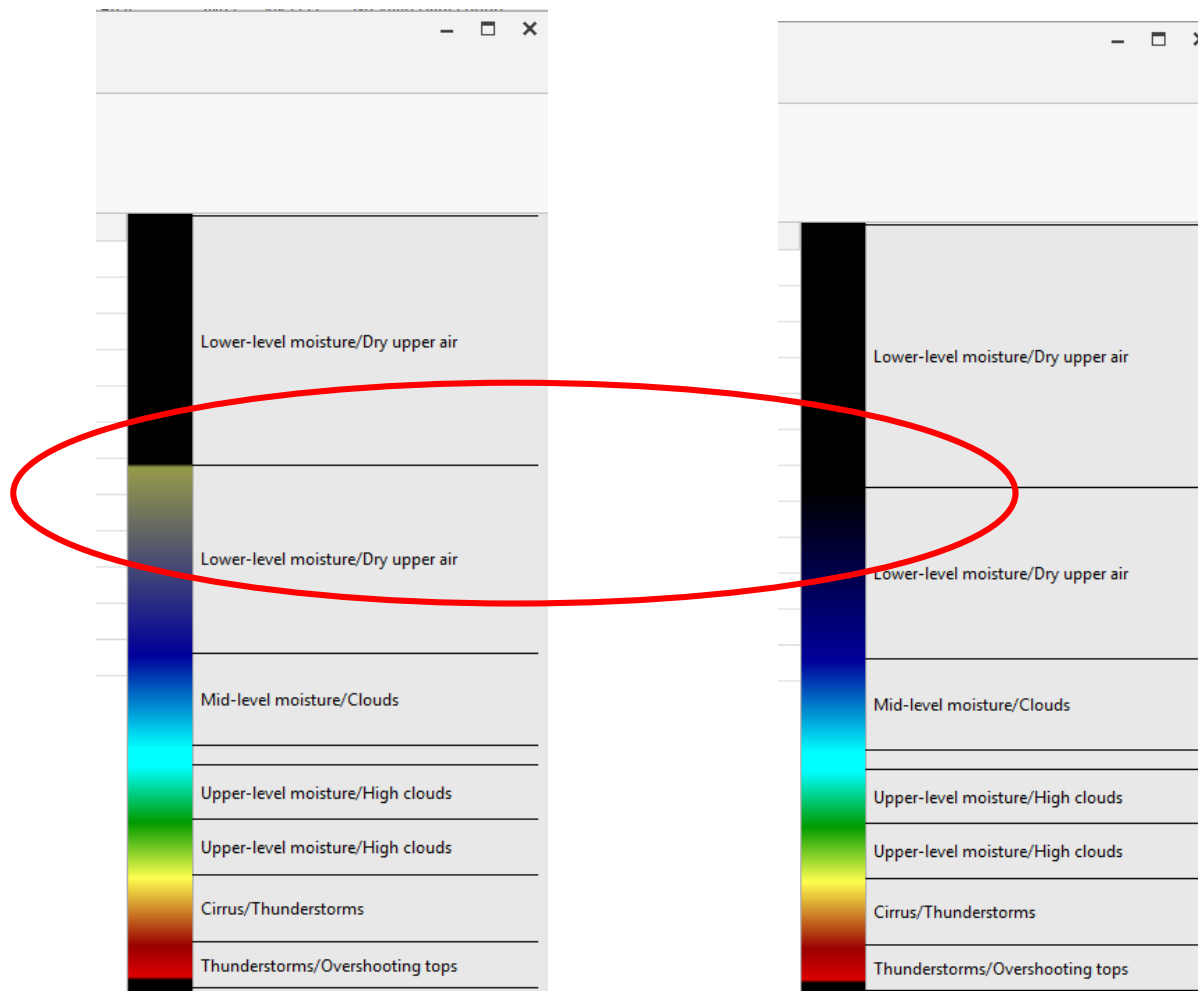
Improving Circulation/TUTT ID



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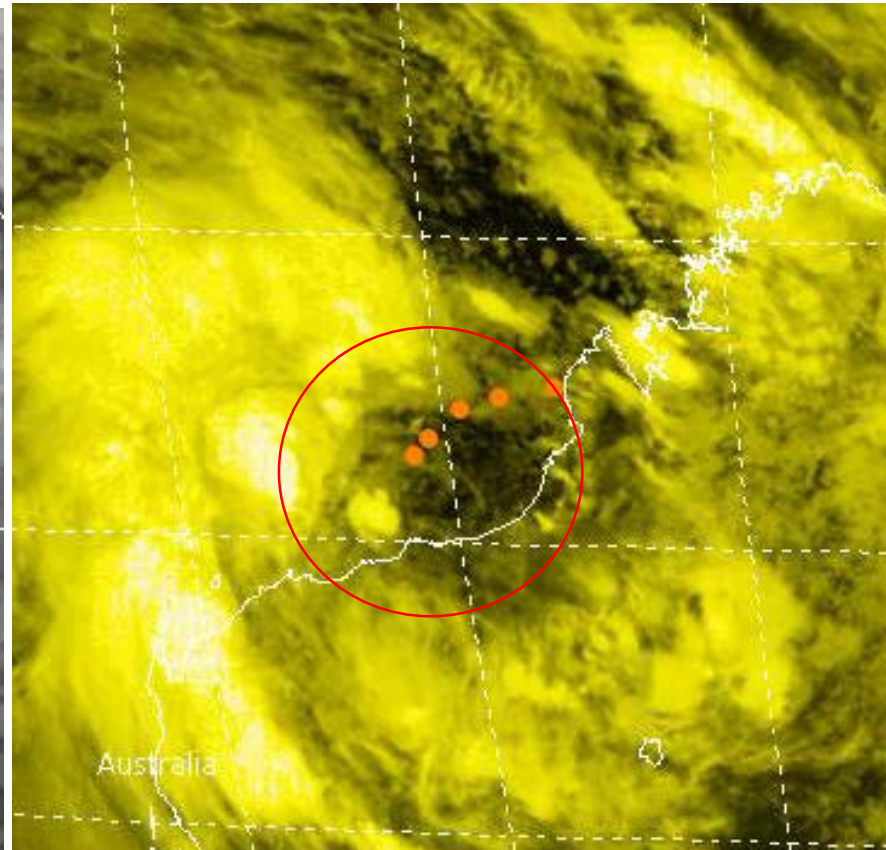
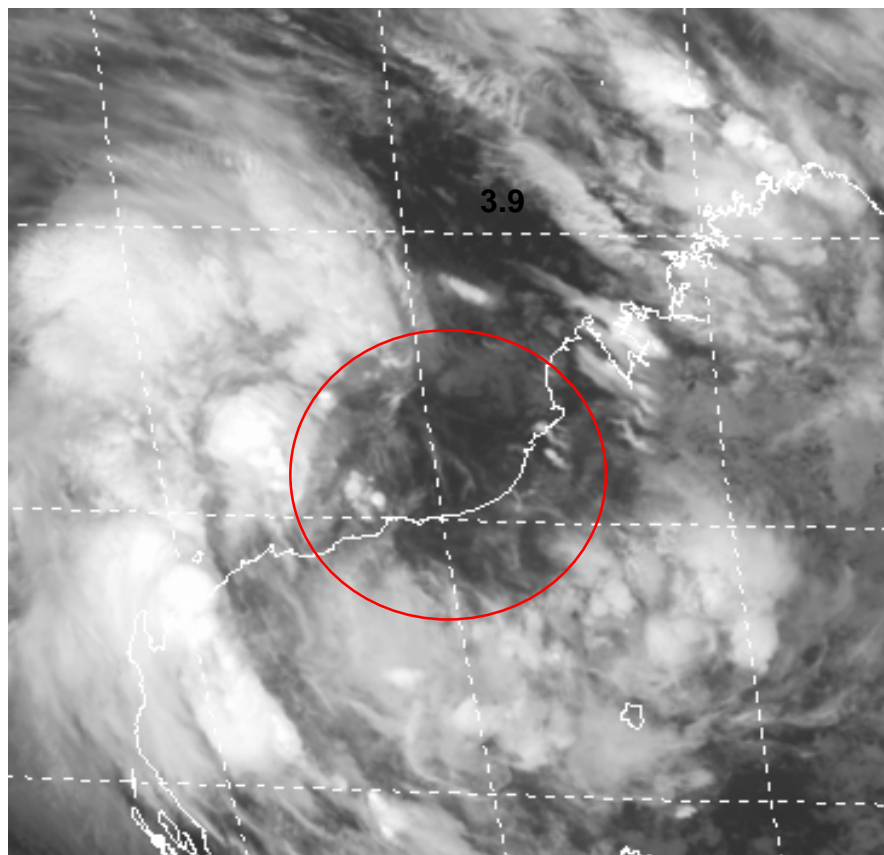
Improving Circulation/TUTT ID



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Improving Fix Position at Night



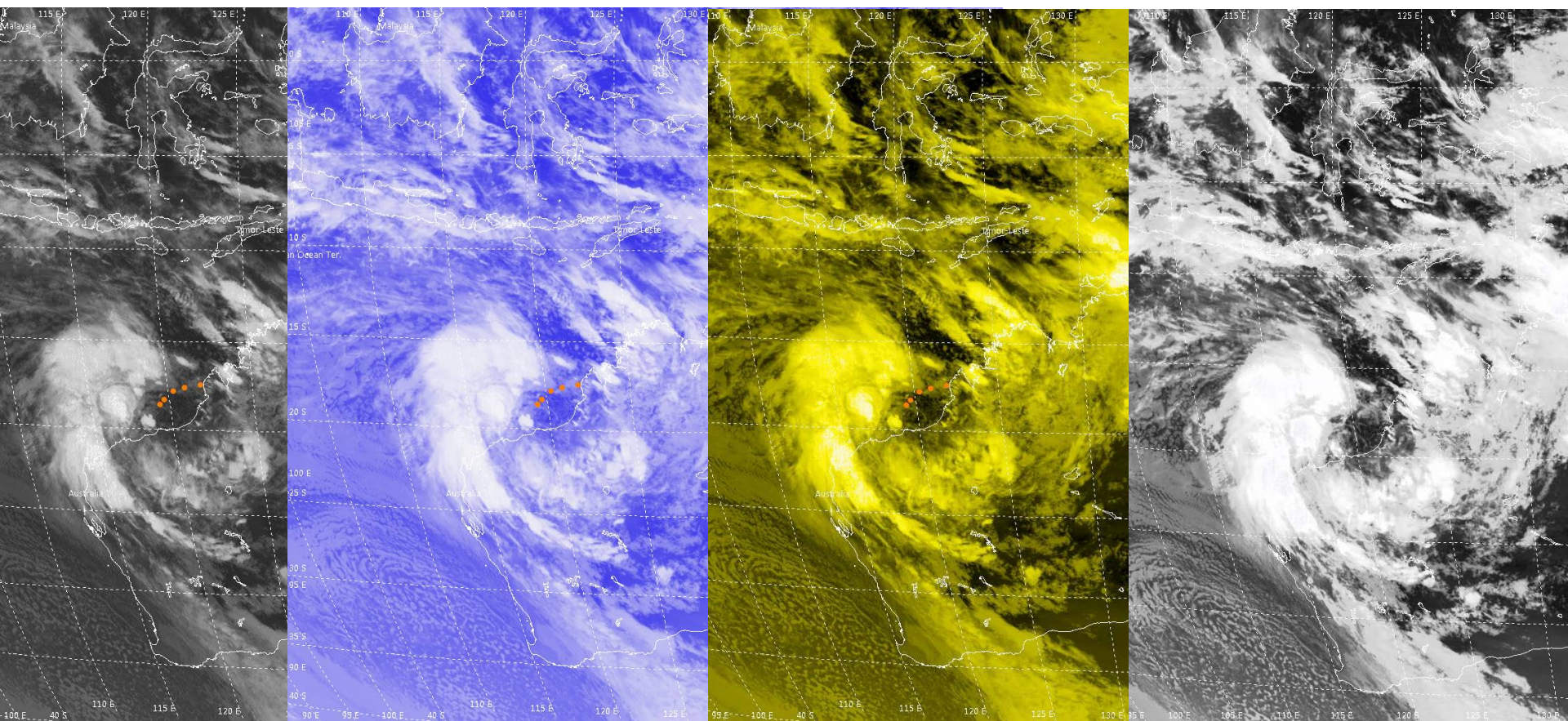
Enhancement on 3.9 channel makes low-level features more evident than Thermal Blue

3.9 Micron Channel Available on H-8 / GOES-16

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Improving Fix Position at Night

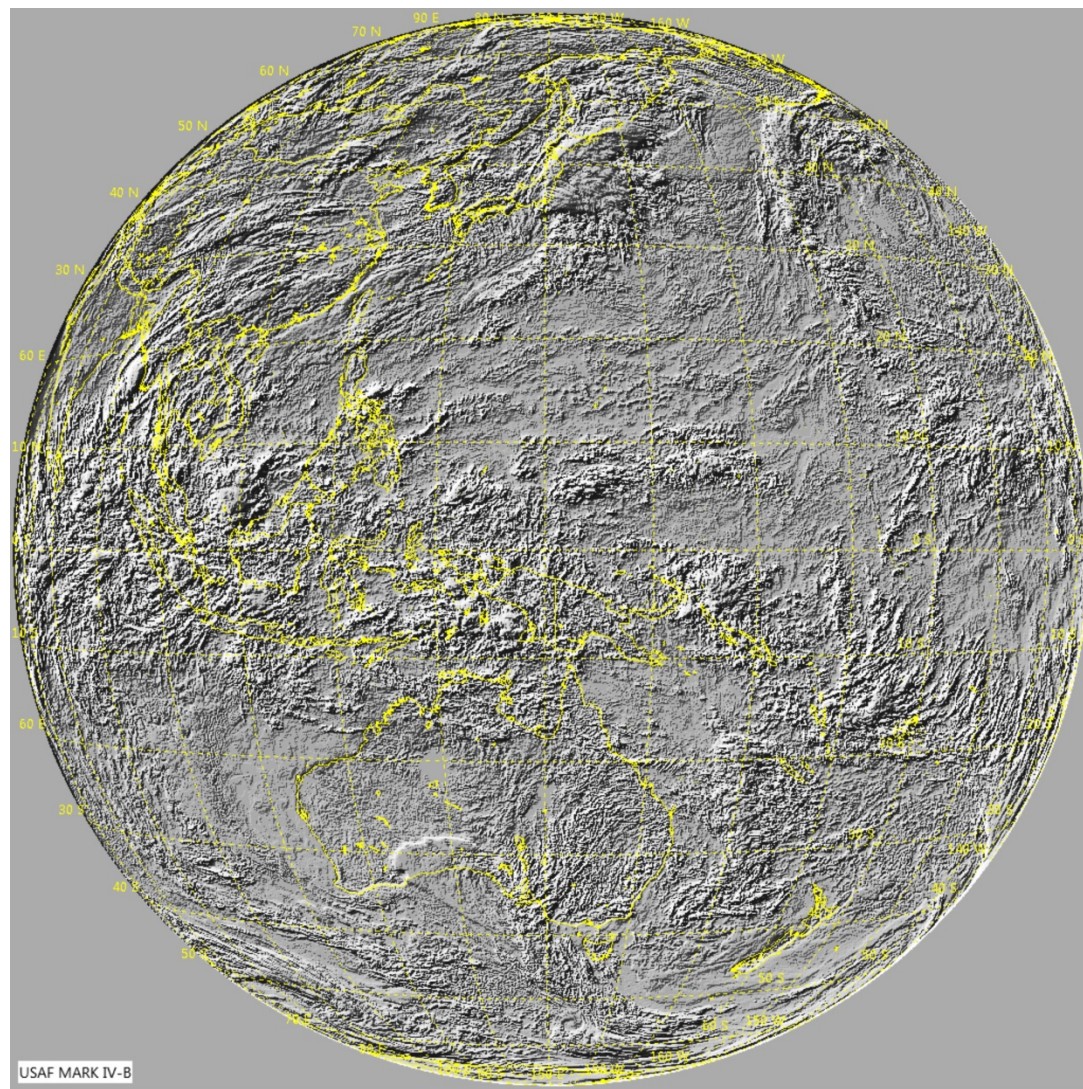


***Once the temperature breaks and gradients are determined,
overall colors can be easily changed based on users preference***

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Shaded Relief

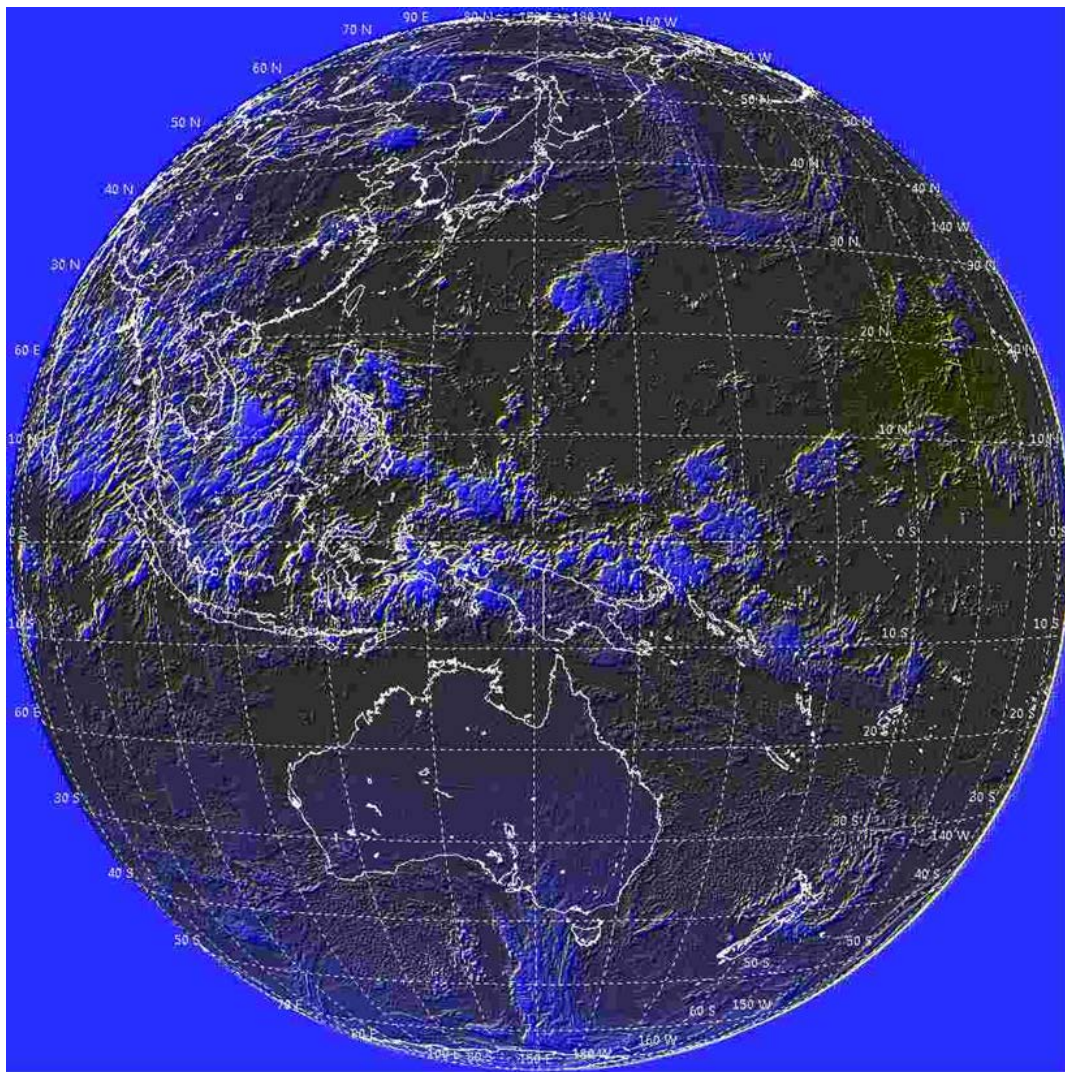


The shaded relief function on Lockheed Martin Mark IVB is a matrix derived convolution of the IR image. It has very similar results as the combination of the Sobel horizontal and vertical edge convolution filter, which was found to assist with edge detection during image processing. Here it helps pick out low-level information with results nearly as good as visible satellite imagery.

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MDREW — “Nighttime Vis”

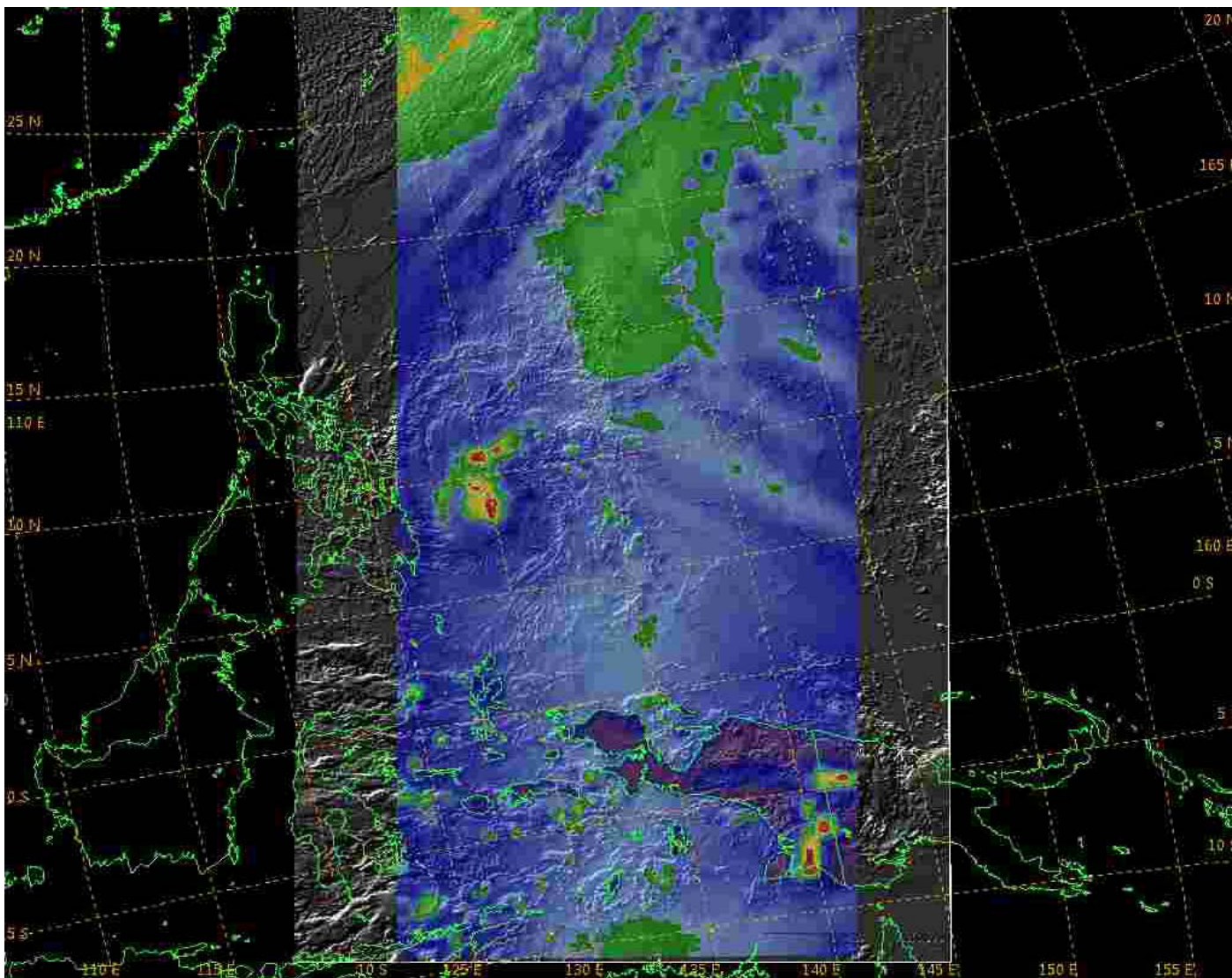


The Maritime-Diurnal-Relief-Enhanced-Wavelength (MDREW) is an RGB product using the shaded relief of the 3.9 for the red and green and an unfiltered 3.9 for the blue. Can be used during day or night, but is somewhat sensitive to reflected solar radiation during daylight hours.

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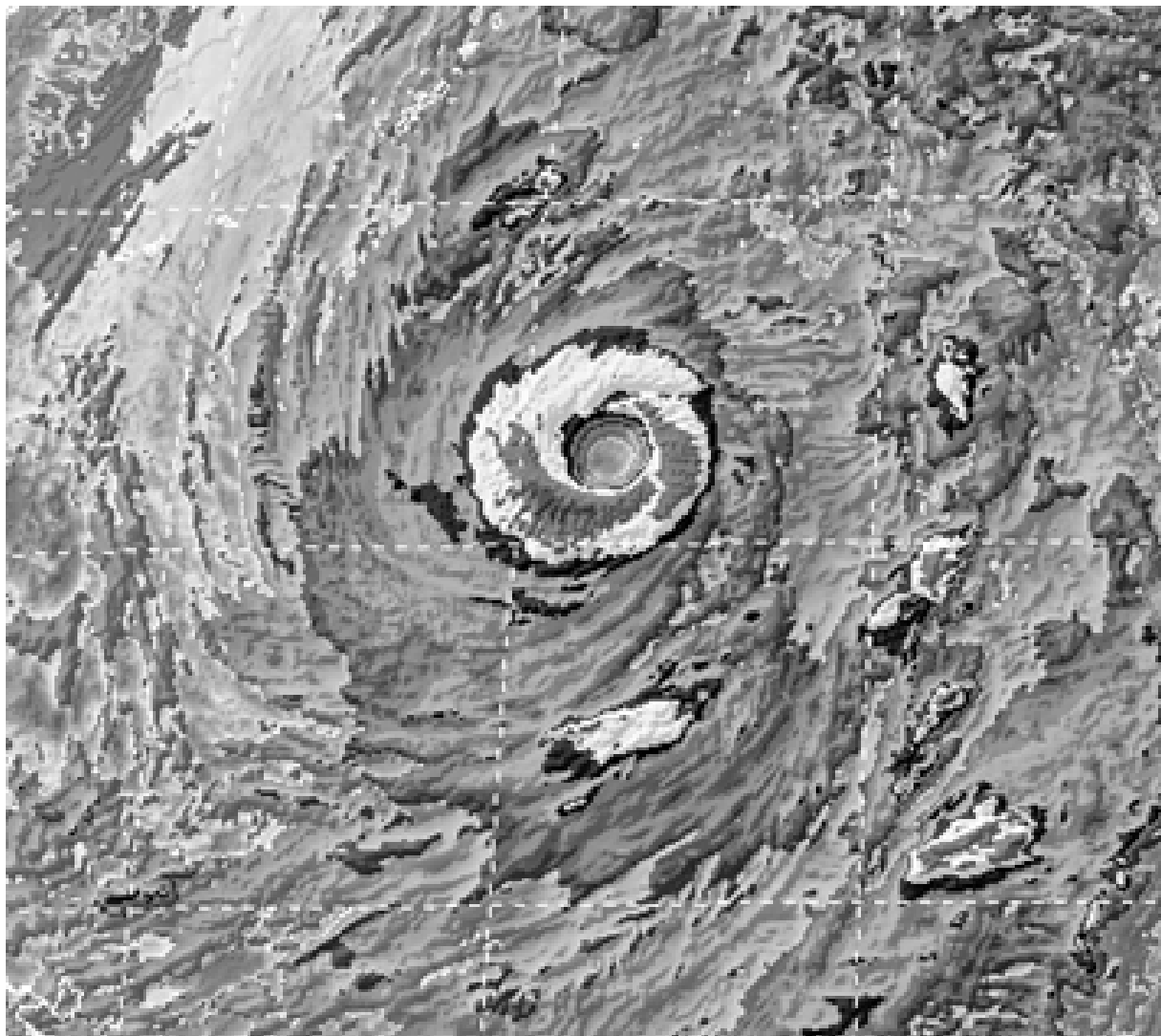
Microwave Imagery Shaded Relief



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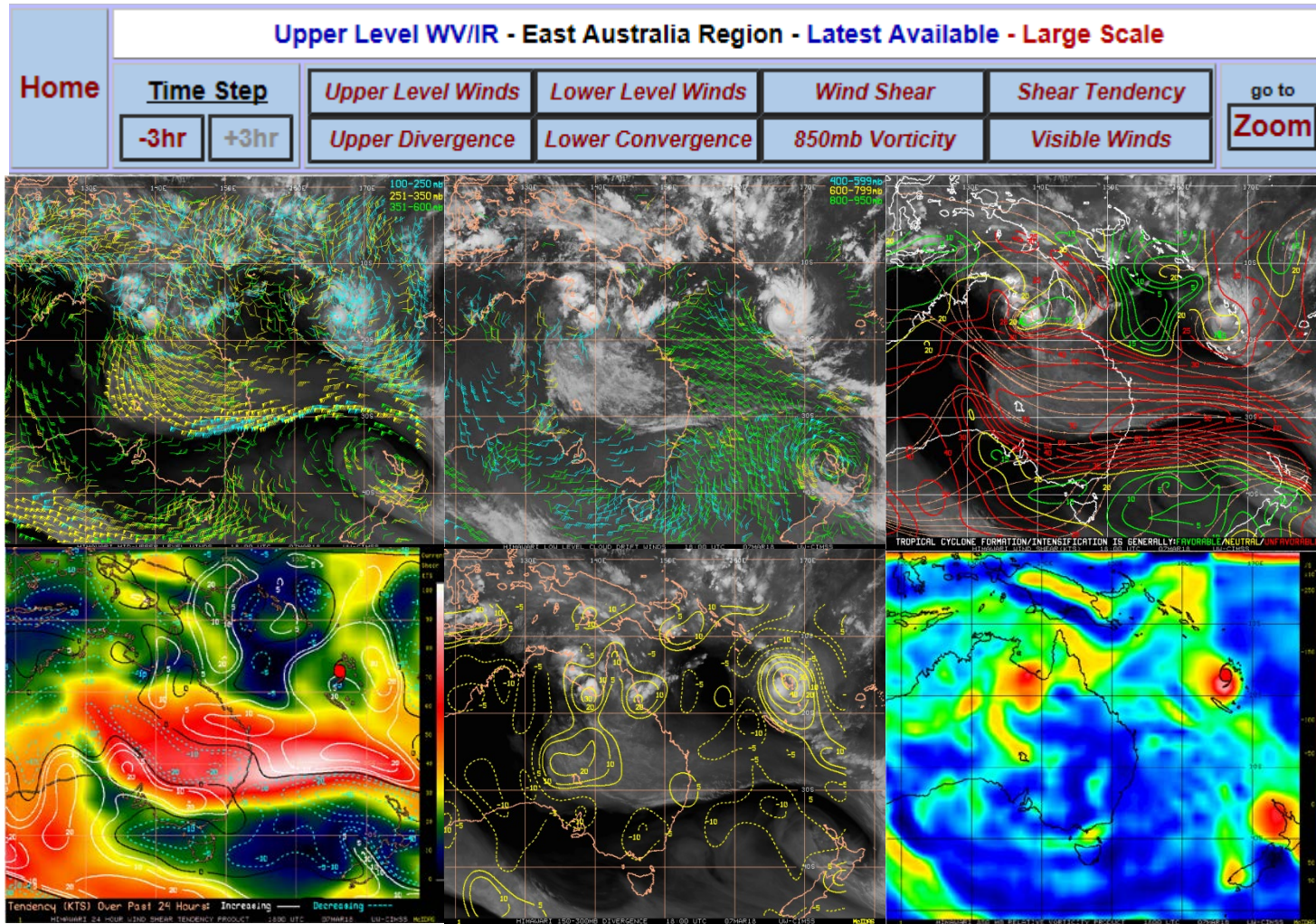
IR BD Enhancement Shaded Relief



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CIMSS & CIRA Products



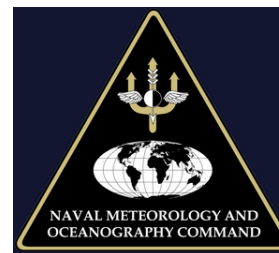
Requirement submitted to replicate at 557 Weather Wing (formally AFWA) for access on AFWWEBS to support daily operations

Similar requirement will be submitted for select products on the CIRA RAMMB website

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Multi-Agency Collaboration

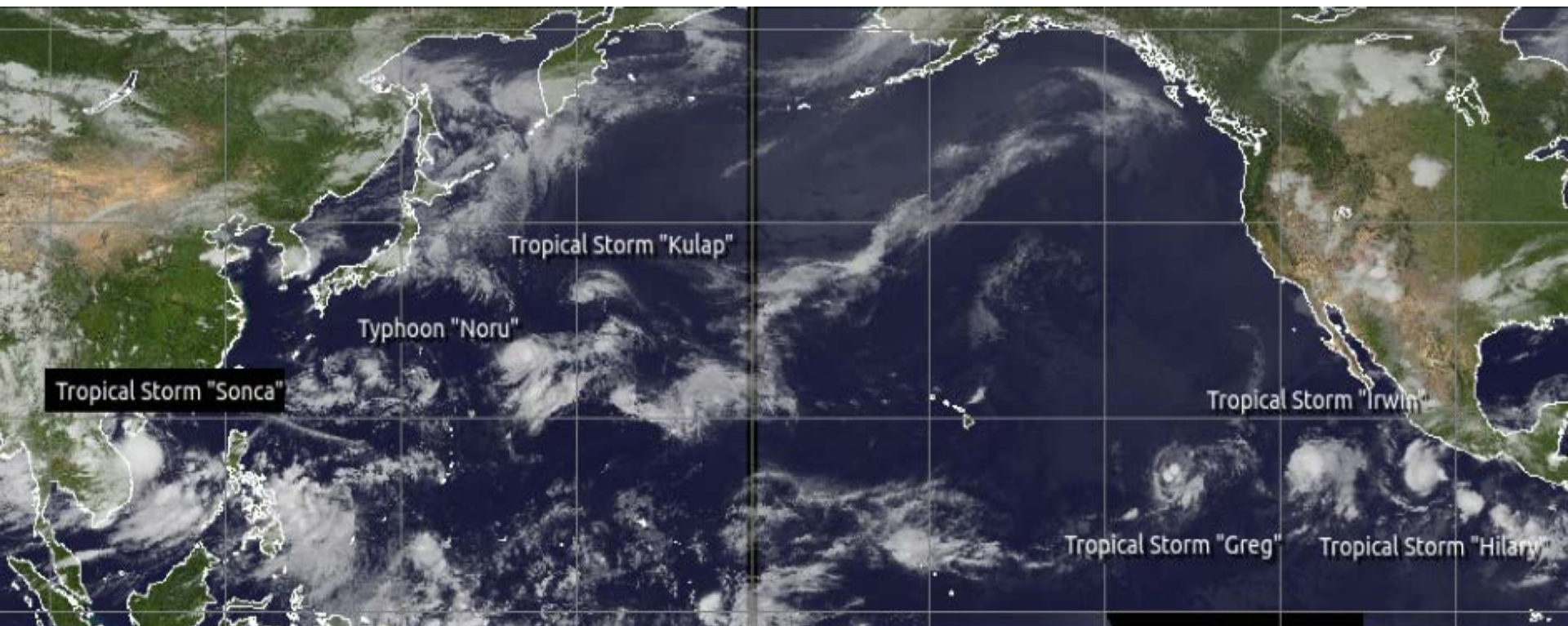


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Questions?

July 2017 Tropical Cyclone Out-Break



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