



The Bureau  
of Meteorology

# Application of SAR, scatterometry, and microwave imagery during Severe Tropical Cyclone Fina

## 12-25 November 2025

Note: Peak 105kn 24 Nov: strongest Nov. TC in Australian records

Landfalls:

NT: Cobourg Peninsula 1230UTC 21 Nov. (equal earliest TC crossing with Ines 1973);

Melville Island (briefly) 06UTC 22 Nov.

WA: Berkely River Mouth 1330UTC

VLAB 22 February 2026

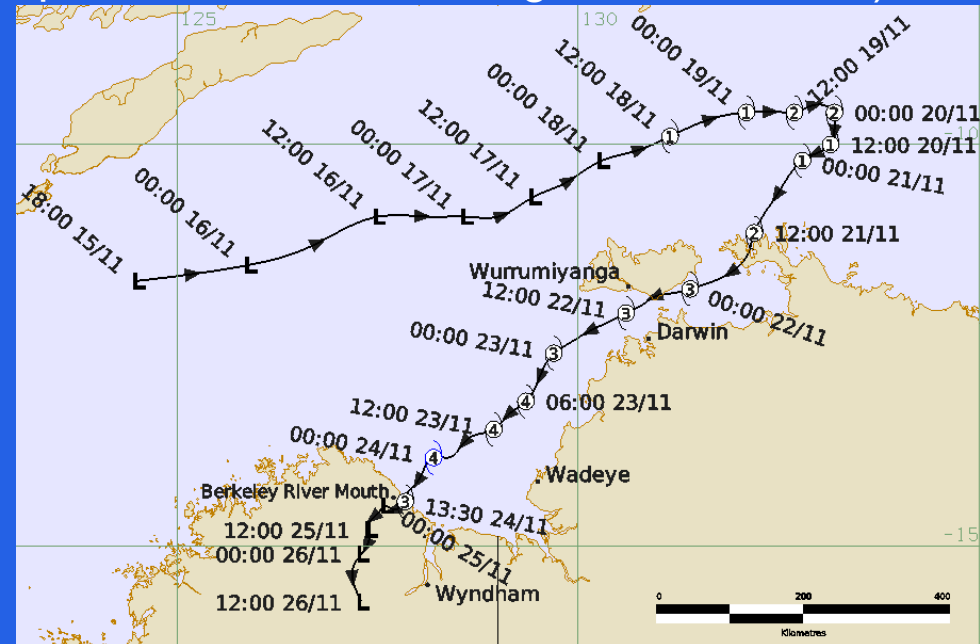
Joe Courtney

Bureau of Meteorology,

Perth Australia

Images: courtesy

US NRL, NOAA STAR, KNMI



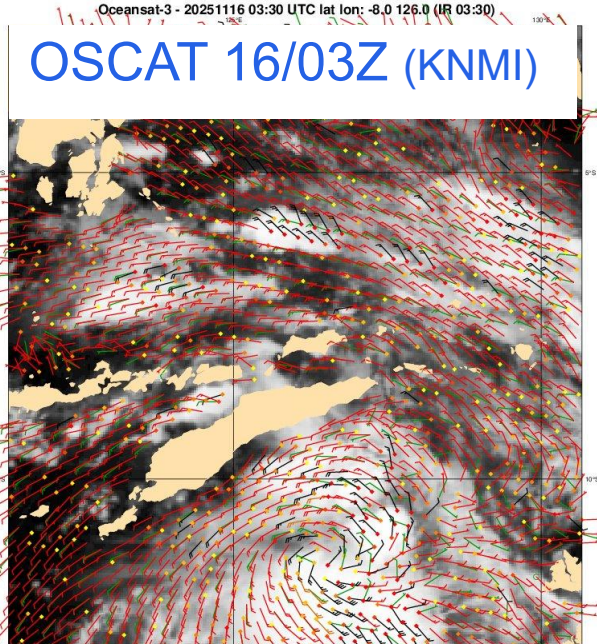
# Pre-Fina 16-17 Nov

## Value of scat/radiometers

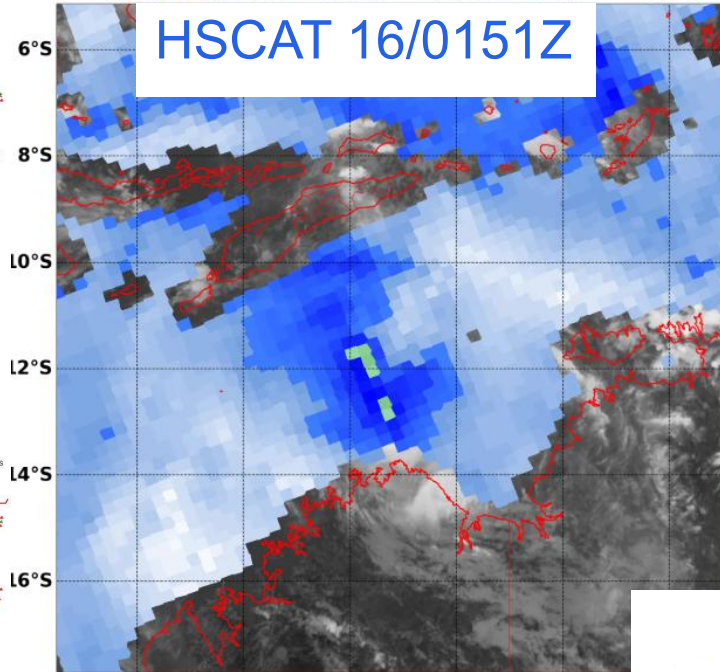
SH97 INVEST at 2025-11-16 01:54:15  
 HY-2C HSCAT windspeed at 2025-11-16 01:51:32  
 HIMAWARI-8 AHI Infrared-Gray at 2025-11-16 01:20:00  
 Data copyright 2021 EUMETSAT, Imagery NRL-MRY

SH97 INVEST at 2025-11-16 23:54:45, NRL-Monterey  
 METOP-B ASCAT windbarbs at 2025-11-16 23:53:43  
 HIMAWARI-8 AHI Infrared-Gray at 2025-11-16 23:20:00

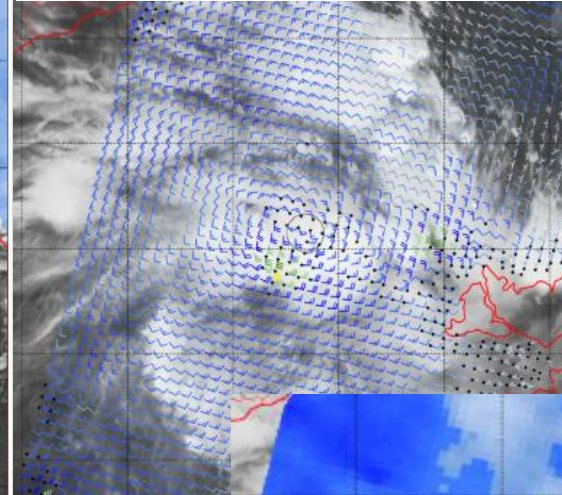
### OSCAT 16/03Z (KNMI)



### HSCAT 16/0151Z

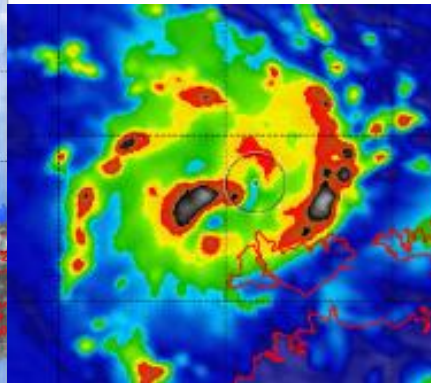
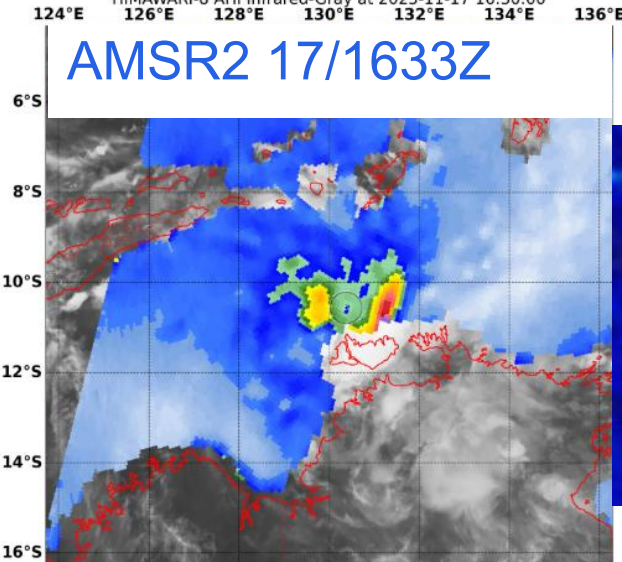


### ASCAT-B 16/2353Z

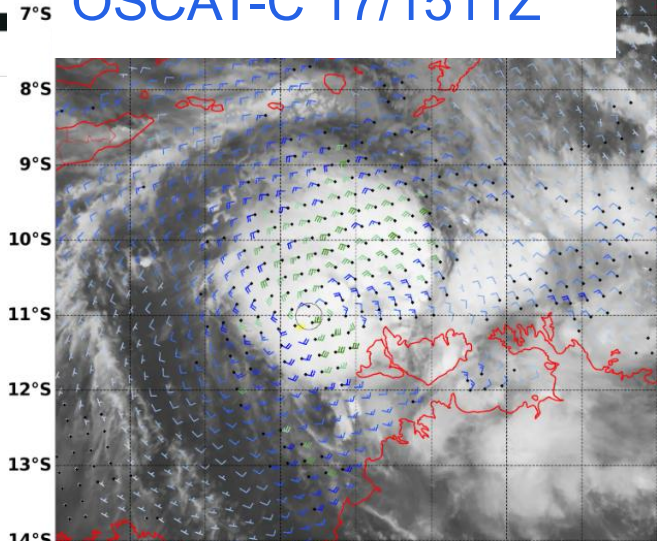


SH97 INVEST at 2025-11-17 15:13:00, NRL-Monterey  
 OCEANSAT-3 OSCAT windbarbs at 2025-11-17 15:11:35  
 HIMAWARI-8 AHI Infrared-Gray at 2025-11-17 14:50:00

### AMSR2 17/1633Z



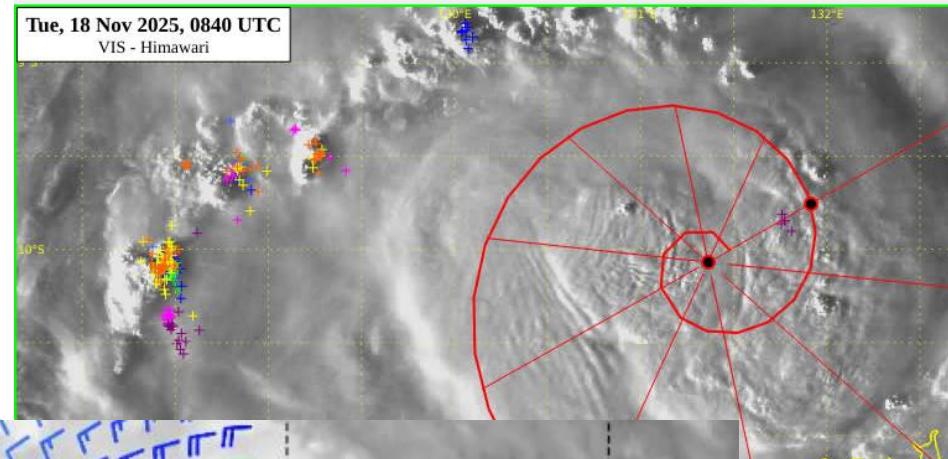
### OSCAT-C 17/1511Z



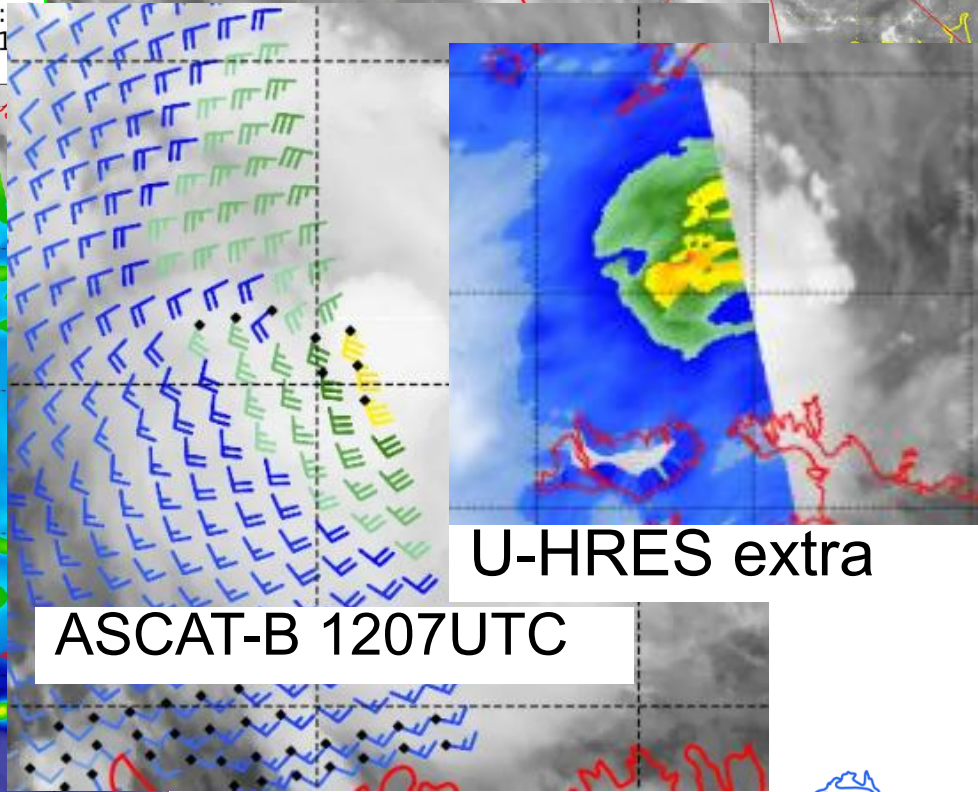
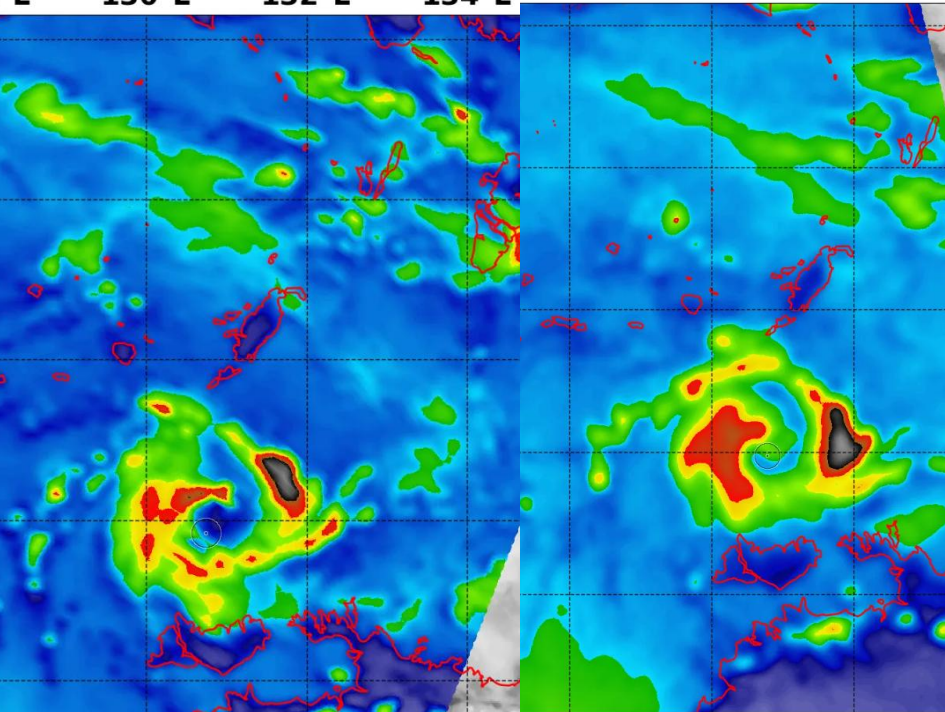


# Fina 18 Nov microwave curvature; confirmation of gales

- Strong microwave signature
- ASCAT 12Z gales
- 09UTC Dvorak DT=3.0 from 0.7 curve band wrap



1 GMI 89H at 2025-11-18 06:47:56 F18 SSMIS 91H at 2025-11-18 07:07:00  
 AHI Infrared-Gray at 2025-11-18 06:47:56 ARI-8 AHI Infrared-Gray at 2025-11-18 07:07:00  
 128°E 130°E 132°E 134°E 128°E 130°E 132°E



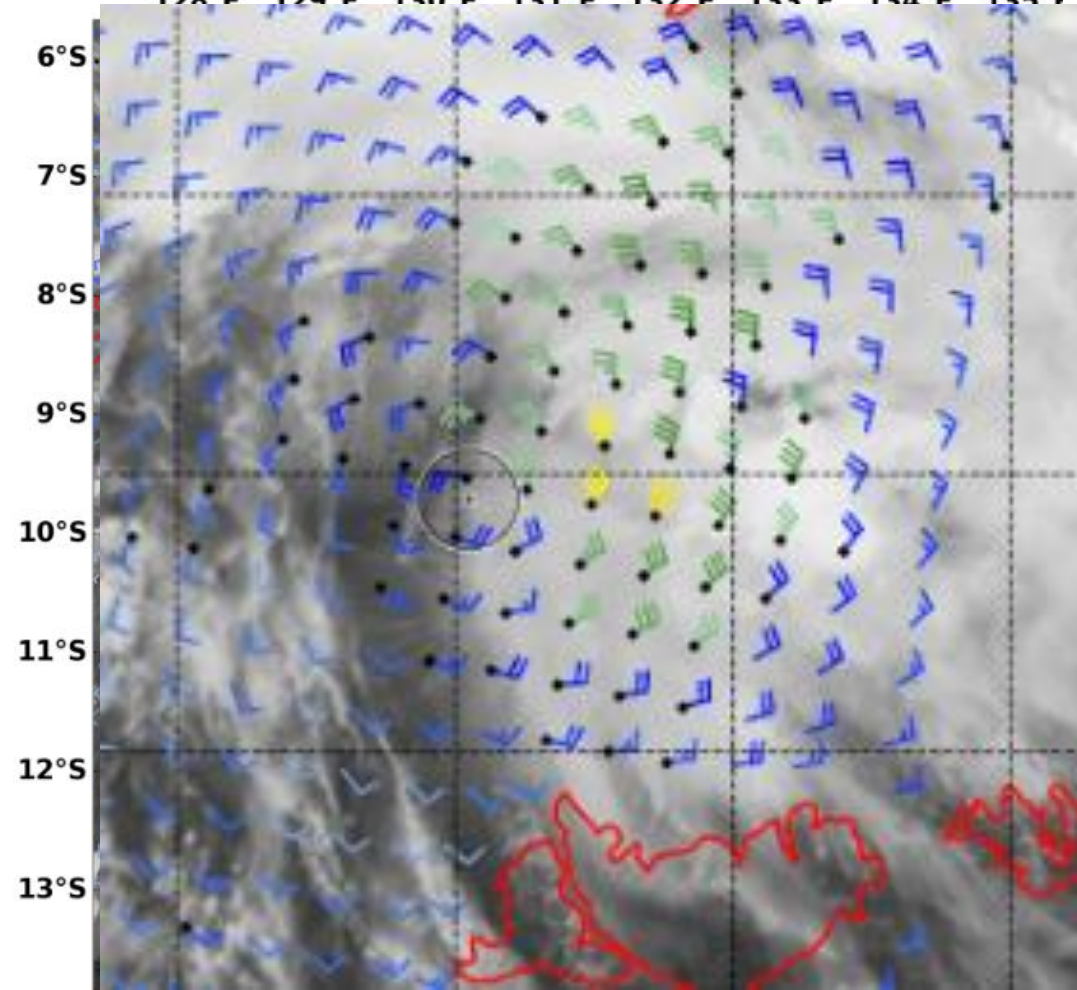
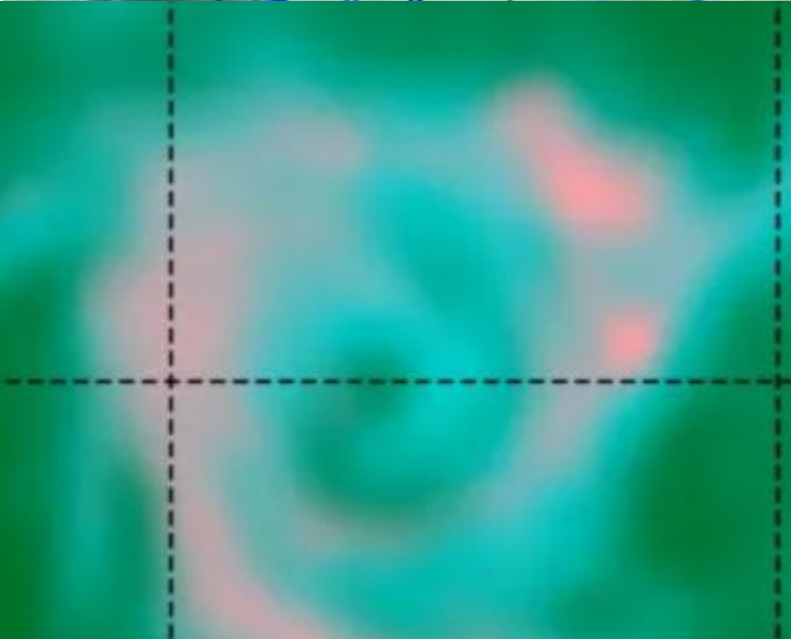
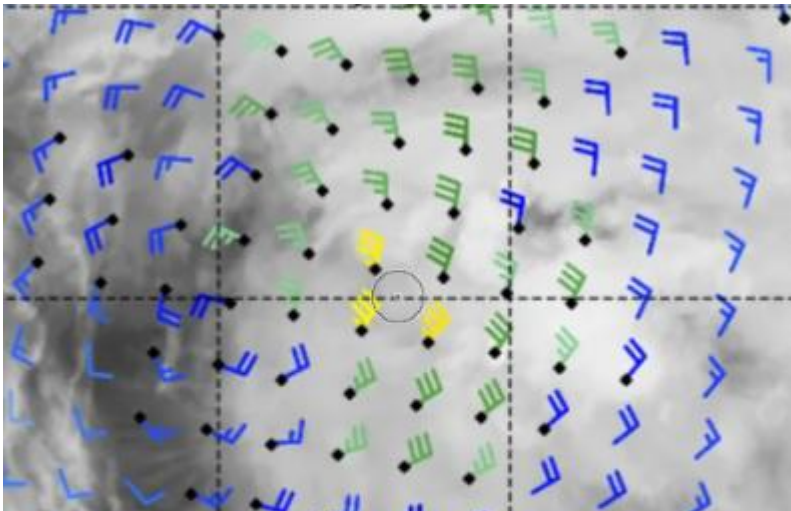


# Limitations of some scat solutions: OSCAT positions

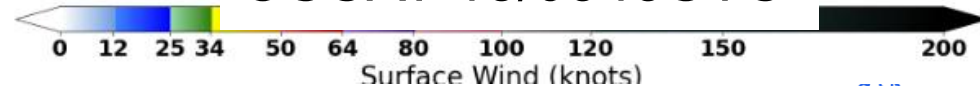
Where is the centre?

Beware model solutions

SH97 INVEST at 2025-11-18 03:45:11, NRL-Monterey  
 OCEANSAT-3 OSCAT windbarbs at 2025-11-18 03:43:45  
 HIMAWARI-8 AHI Infrared-Gray at 2025-11-18 03:10:00

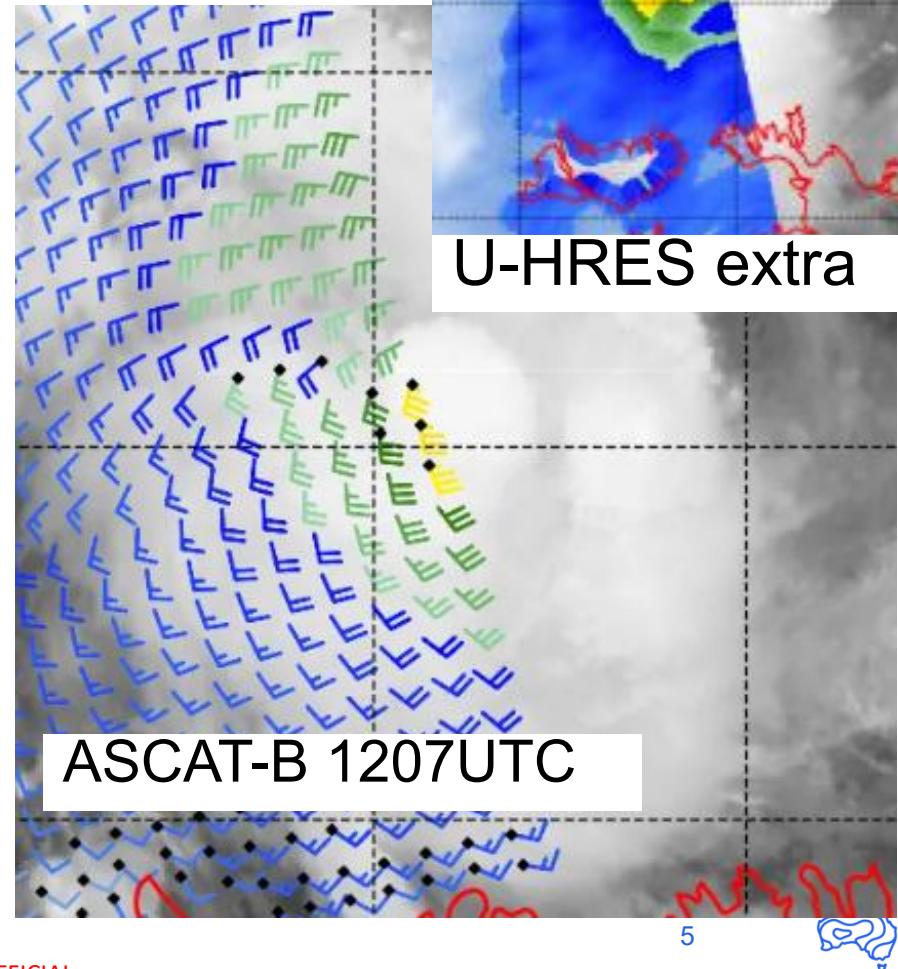
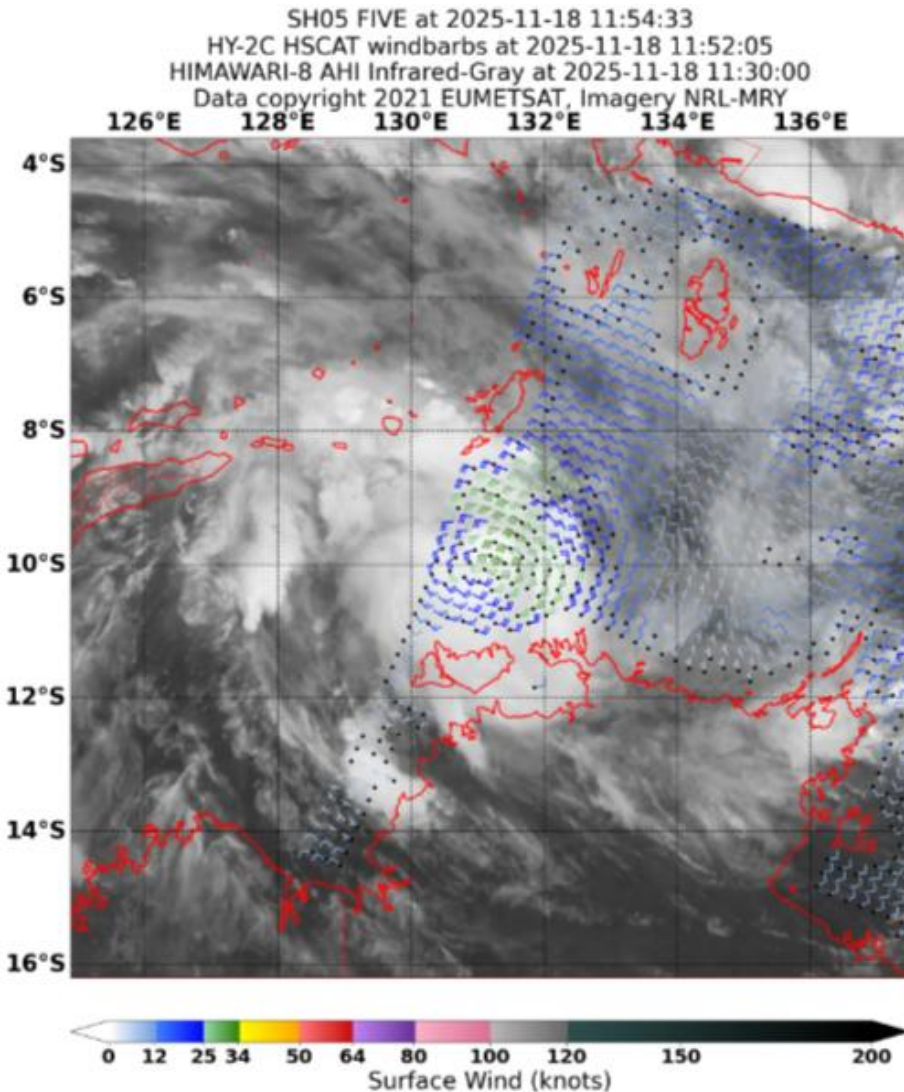


OSCAT 18/0343UTC



# Limitations of some scat solutions:

## Resolution HSCAT/OSCAT Vs ASCAT

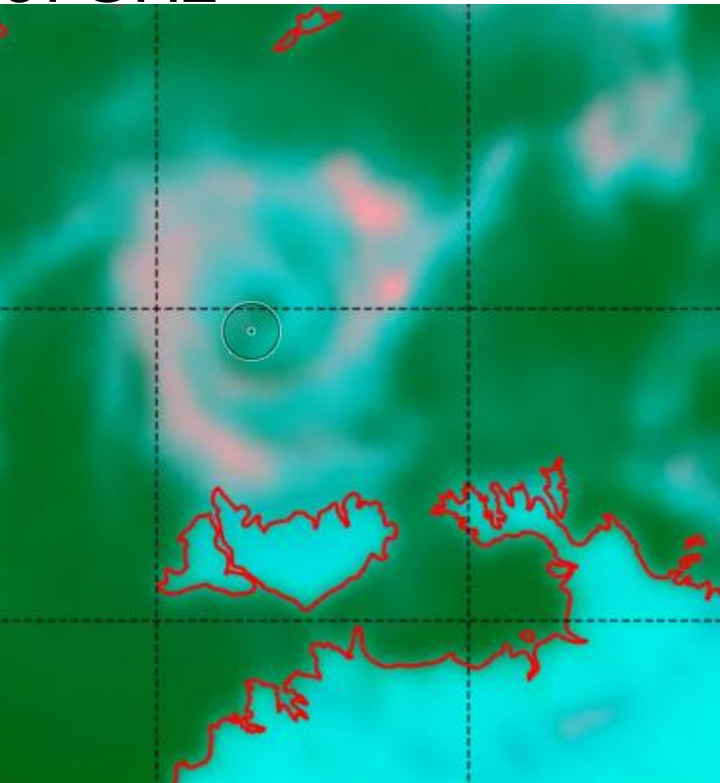




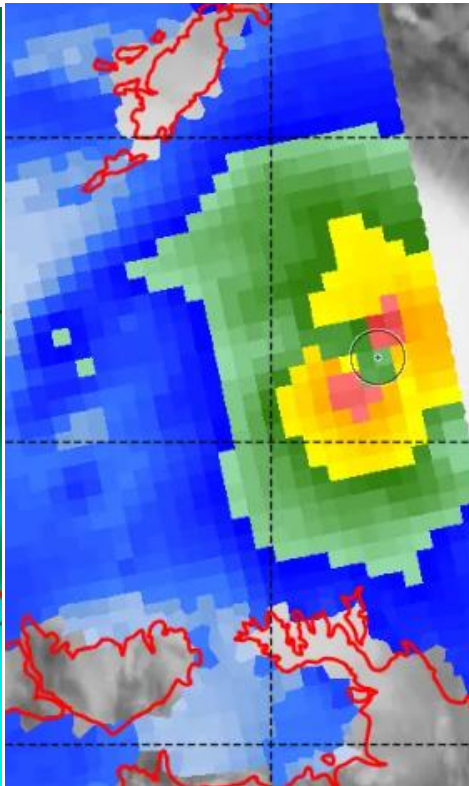
**Fina 20 Nov**

**first peak then subtle weakening on microwave**

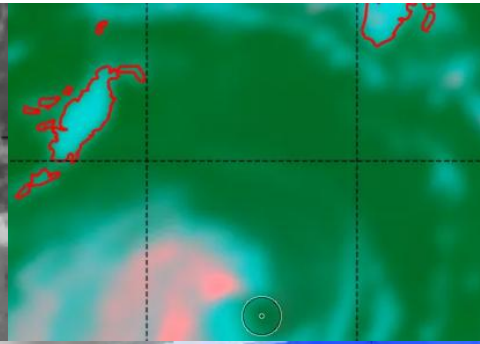
AMSR2 18/0449UTC  
37GHz



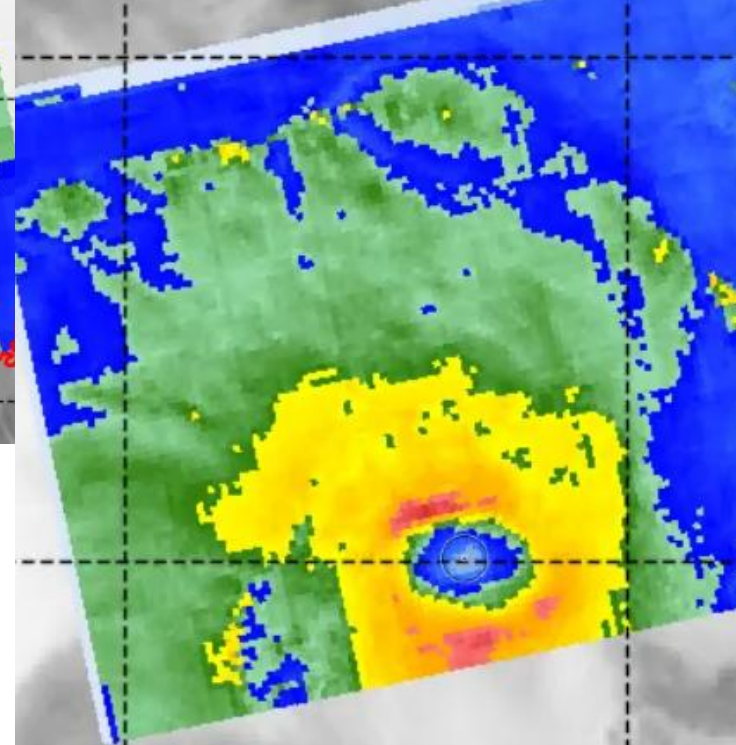
ASCAT-C 1228UTC



AMSR2 1602UTC



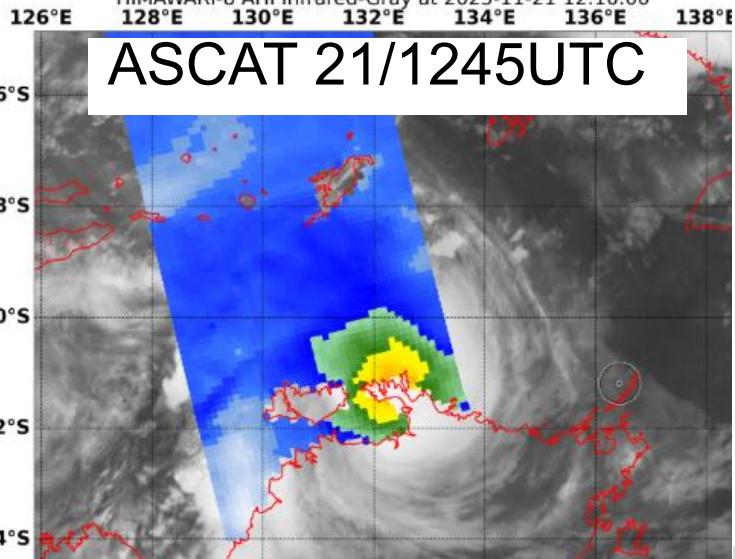
SAR 0929UTC



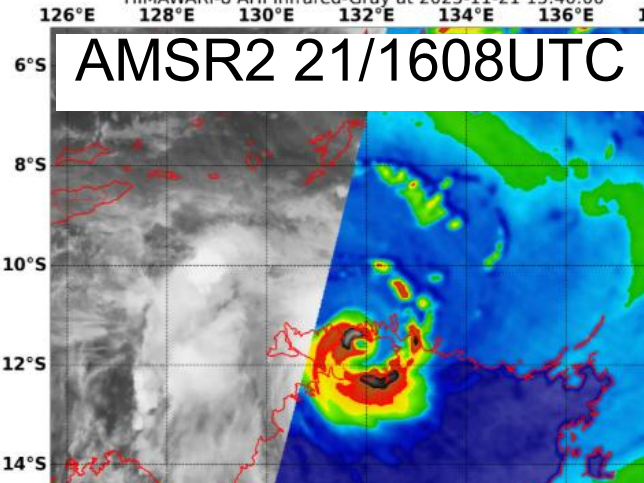


# Fina 21 Nov Intensification in Van Dieman Gulf

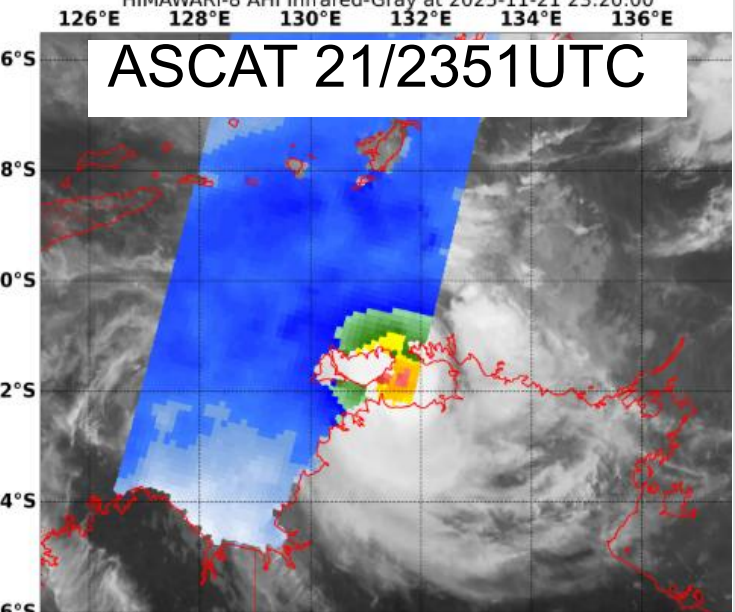
SH05 FINA at 2025-11-21 12:45:56, NRL-Monterey  
METOP-B ASCAT windspeed at 2025-11-21 12:44:00  
HIMAWARI-8 AHI Infrared-Gray at 2025-11-21 12:10:00



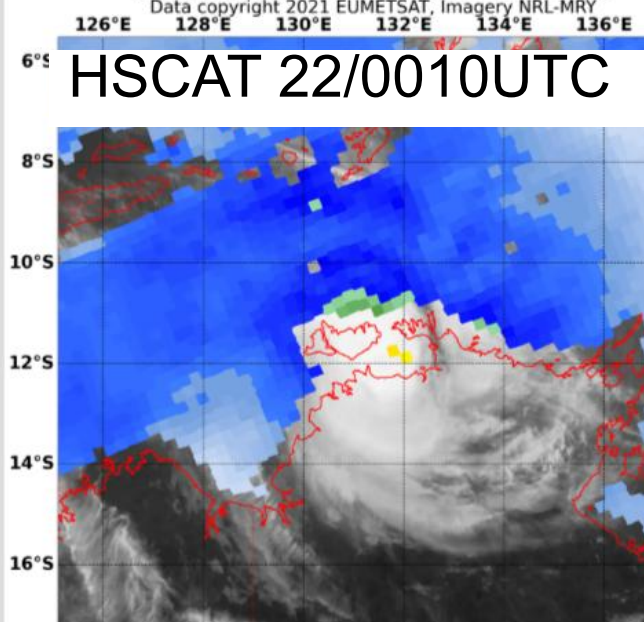
SH05 FINA at 2025-11-21 16:11:16, NRL-Monterey  
GCOM-W1 AMSR2 89H at 2025-11-21 16:08:43  
HIMAWARI-8 AHI Infrared-Gray at 2025-11-21 15:40:00



SH05 FINA at 2025-11-21 23:51:47, NRL-Monterey  
METOP-B ASCAT windspeed at 2025-11-21 23:49:37  
HIMAWARI-8 AHI Infrared-Gray at 2025-11-21 23:20:00

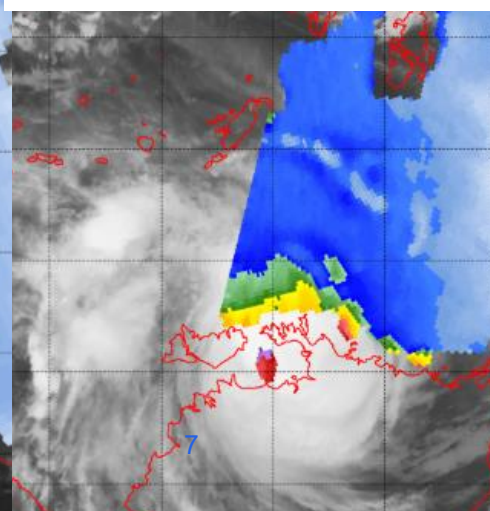


SH05 FINA at 2025-11-22 00:10:58  
HY-2C HSCAT windspeed at 2025-11-22 00:08:13  
HIMAWARI-8 AHI Infrared-Gray at 2025-11-21 23:30:00  
Data copyright 2021 EUMETSAT, Imagery NRL-MRY



SH05 FINA at 2025-11-21 16:11:26, NRL-Monterey

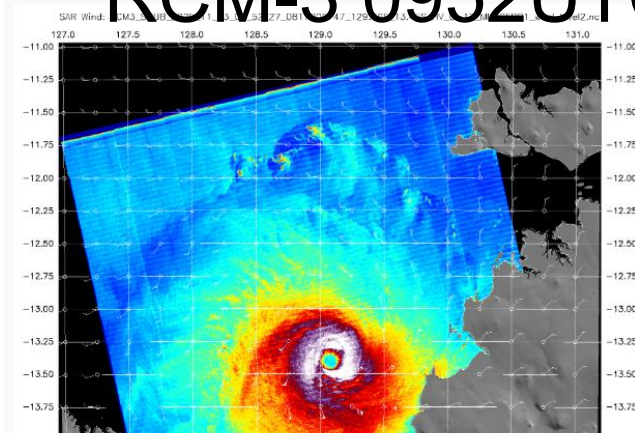
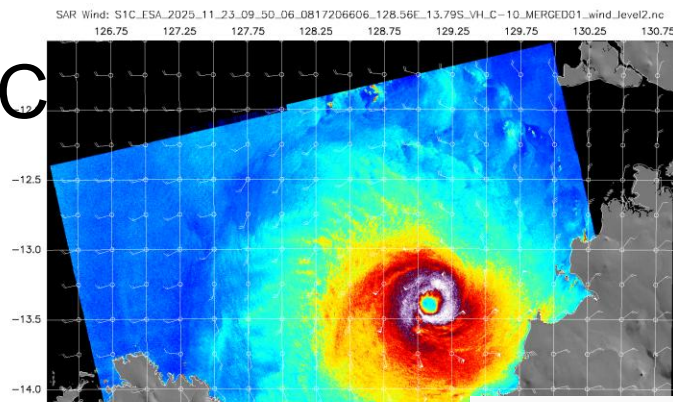
**AMSR2 21/1608Z**



# Fina 23 Nov Coincident SAR 23 Nov 10Z

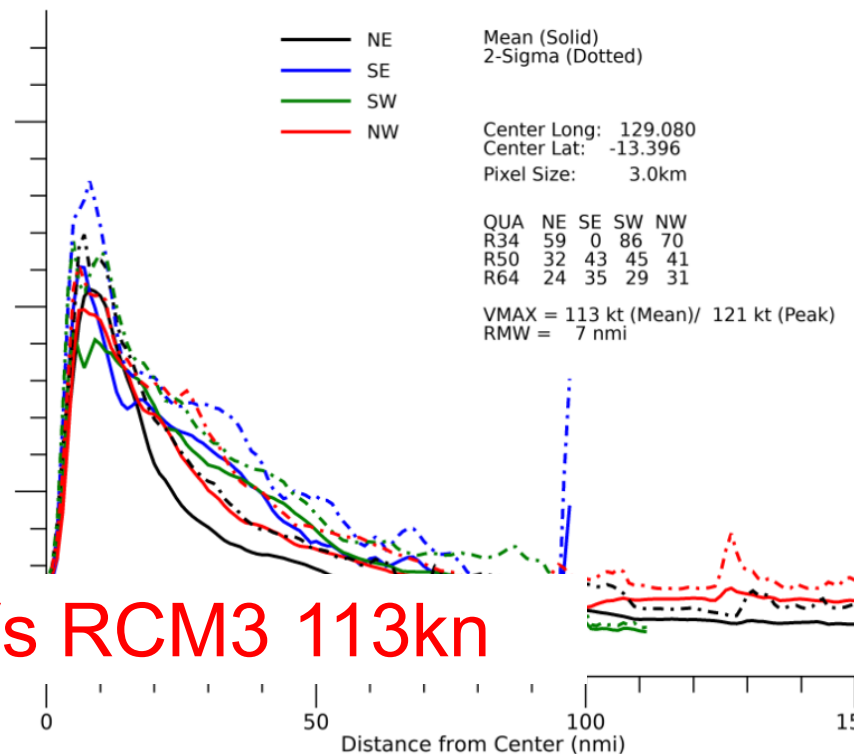
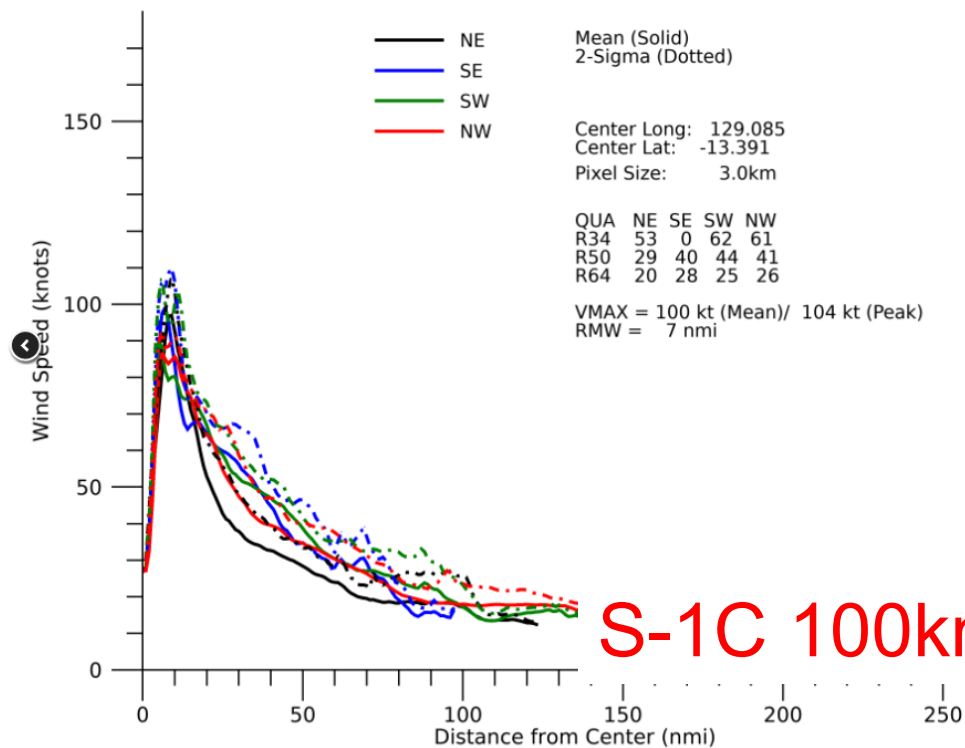
## RCM-3 0952UTC

## S-1C 0950UTC



SENTINEL-1C Profile Winds by Quadrant: SH052026 / FINA  
23 Nov 2025 09:50 UTC

RCM-3 Profile Winds by Quadrant: SH052026 / FINA  
23 Nov 2025 09:52 UTC



**S-1C 100kn Vs RCM3 113kn**

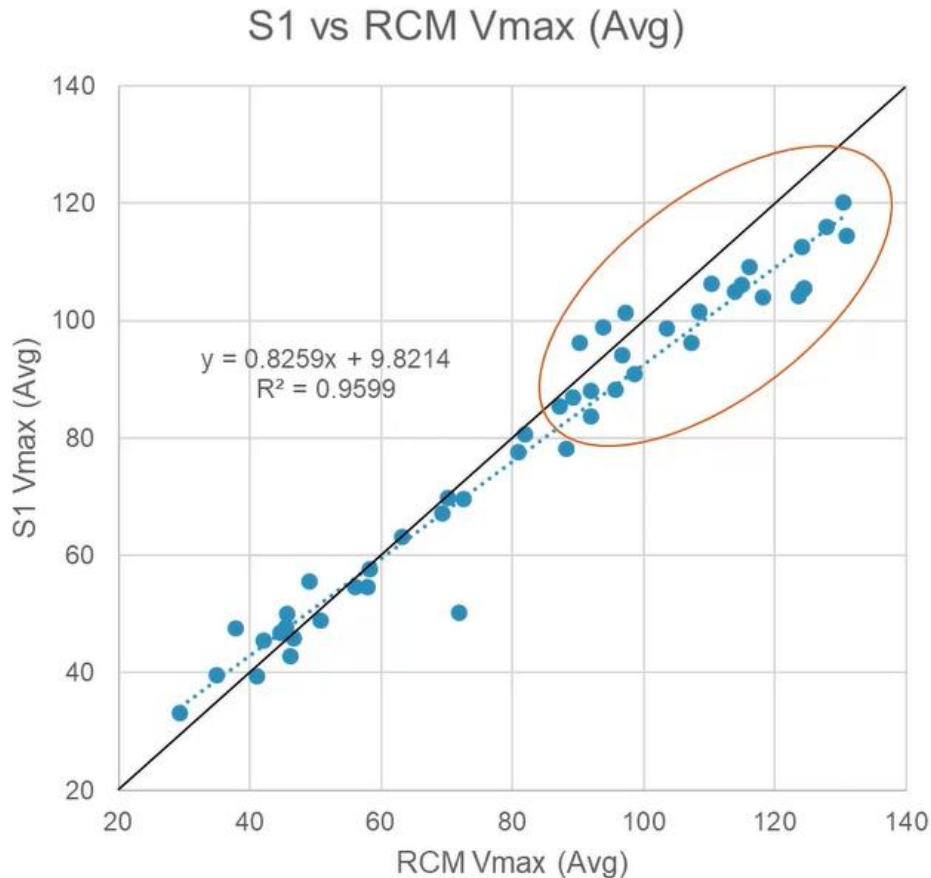




# S1 lower than RCM

Credit Chris Jackson (NOAA STAR)

## Geophysical Model Functions



### Preliminary Findings:

- The RCM and RS2 GMFs match closely and don't require revision within an acceptable range of natural variability (~5 kt)
- There is a slight systematic low bias in the S1 winds GMF on the order of -10 kt, particularly at winds >100 kt (see left)
- Work is underway to correct for this bias using the RCM and RS2 models as reference and current storms will be reprocessed before next season

# Fina 22-24 Nov Peak intensity

OFFICIAL

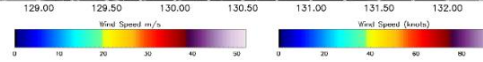
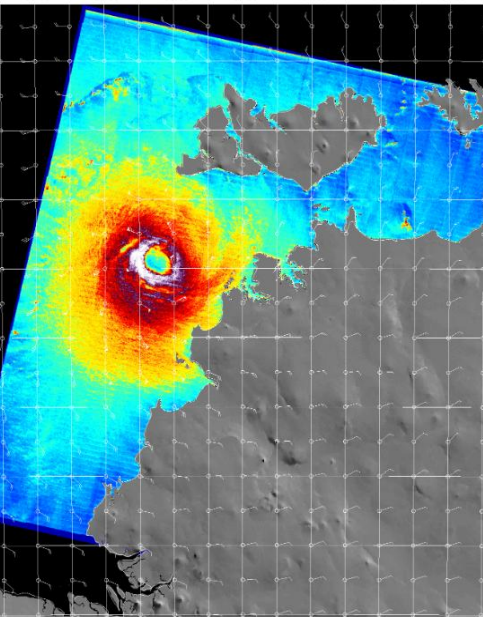
RCM-2 22/2051Z

RCM-3 23/1059Z

RCM-2 23/2059Z

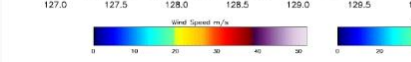
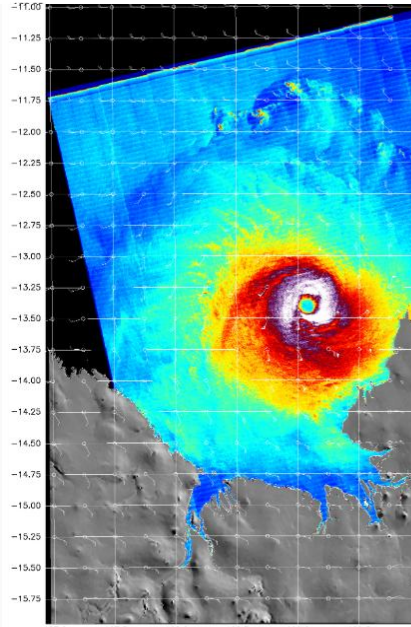
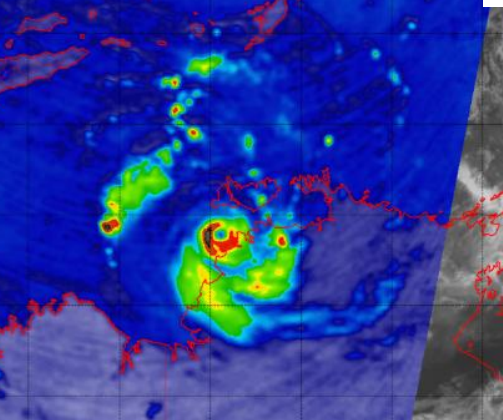
RCM-3 24/1000Z

RCM2\_SHUB\_2025\_11\_22\_20\_51\_25\_0817159885\_130.53E\_12.80S\_JV\_C-12\_MERGED01\_wind\_level2.nc



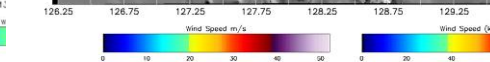
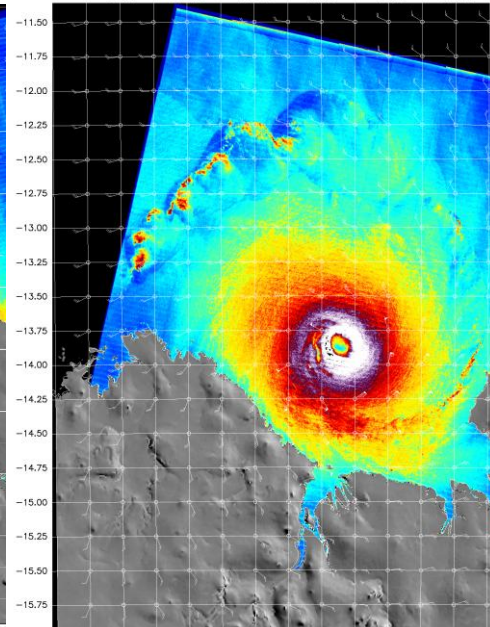
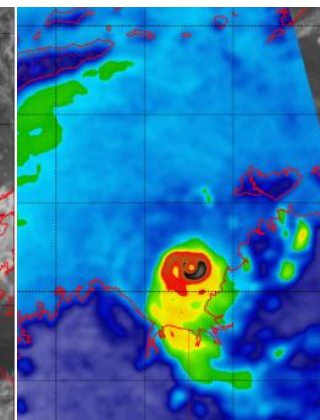
SH05 FINA at 2025-11-22 16:54:33, NRL-Monterey  
GCOM-W1 AMSR2 89V at 2025-11-22 16:52:14  
HIMAWARI-8 AHI Infrared-Gray at 2025-11-22 16:20:00

AMSR2 22/1652Z



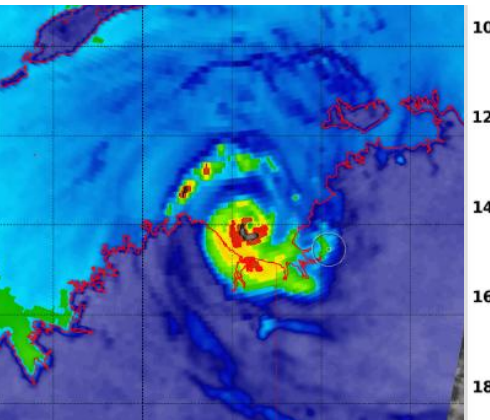
SH05 FINA at 2025-11-23 10:37:30, NRL-Monterey  
GCOM-W1 AMSR2 89V at 2025-11-23 10:35:14  
HIMAWARI-8 AHI Infrared-Gray at 2025-11-23 10:00:00

SSMIS 23/1035Z

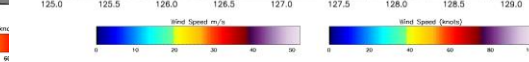
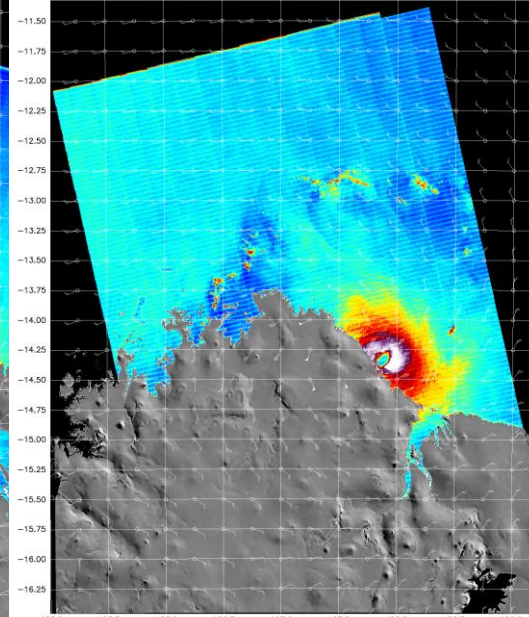


SH05 FINA at 2025-11-23 20:59:42, NRL-Monterey  
GCOM-W1 AMSR2 89V at 2025-11-23 20:57:14  
HIMAWARI-8 AHI Infrared-Gray at 2025-11-23 20:30:00

WSFM 23/2128Z

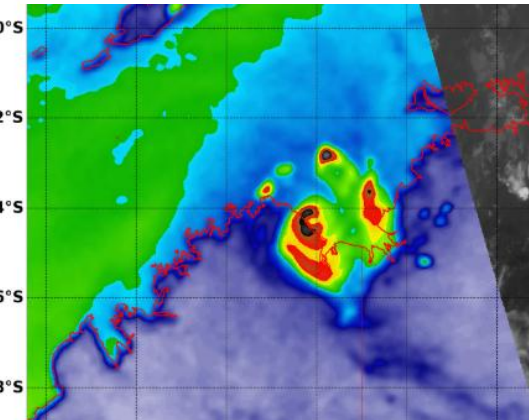


RCM3\_SHUB\_2025\_11\_24\_10\_00\_22\_0817293622\_127.15E\_13.89S\_JV\_C-12\_MERGED01\_wind\_level2.nc



SH05 FINA at 2025-11-24 08:00:00, NRL-Monterey  
F18 SSMIS 91H at 2025-11-24 07:58:00  
HIMAWARI-8 AHI Infrared-Gray at 2025-11-24 08:00:00

SSMIS 24/0758Z





# Summary

Fina: small system that survived in favourable environment navigating near land  
Scatterometry, SAR, microwave, radiometers from many sources – vital for analysis

Links:

NOAA STAR for SAR

[https://www.star.nesdis.noaa.gov/socd/mecb/sar/sarwinds\\_tropical.php?year=2026&storm=SH052026\\_FINA](https://www.star.nesdis.noaa.gov/socd/mecb/sar/sarwinds_tropical.php?year=2026&storm=SH052026_FINA)

NOAA STAR for Scat <https://manati.star.nesdis.noaa.gov/datasets/ASCATBData.php>

NRL: <https://science.nrlmry.navy.mil/geoips/tcweb4/>

KNMI: [https://scatterometer.knmi.nl/tile\\_prod/](https://scatterometer.knmi.nl/tile_prod/) (no archive)

## Questions?

