The Bureau of Meteorology

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

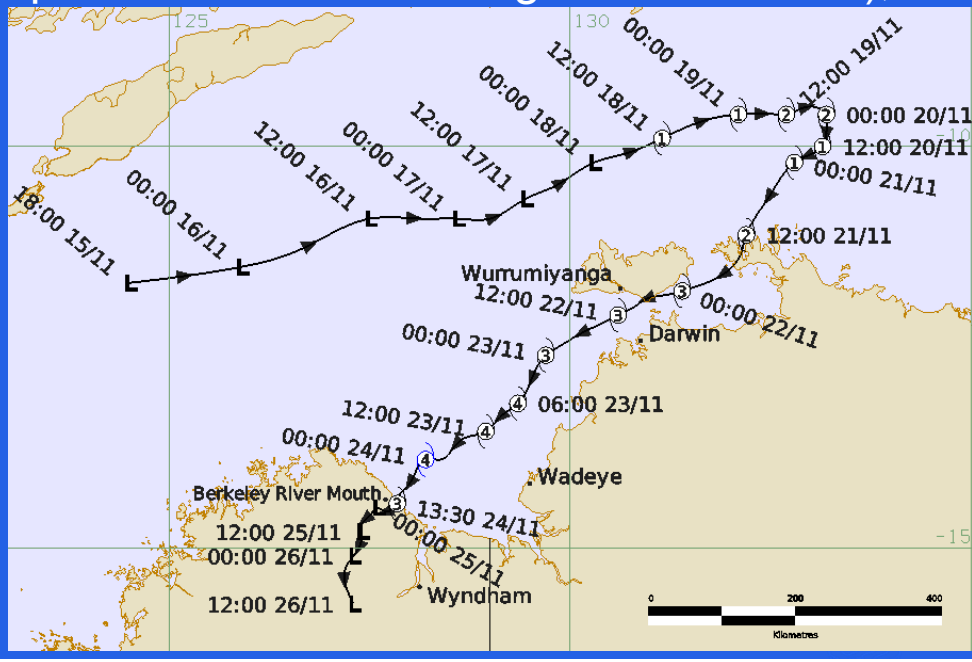
12-25 November 2025

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

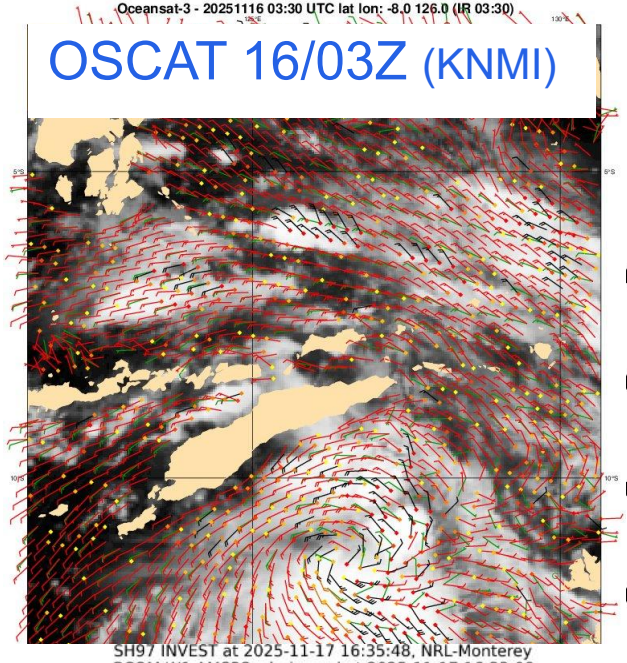


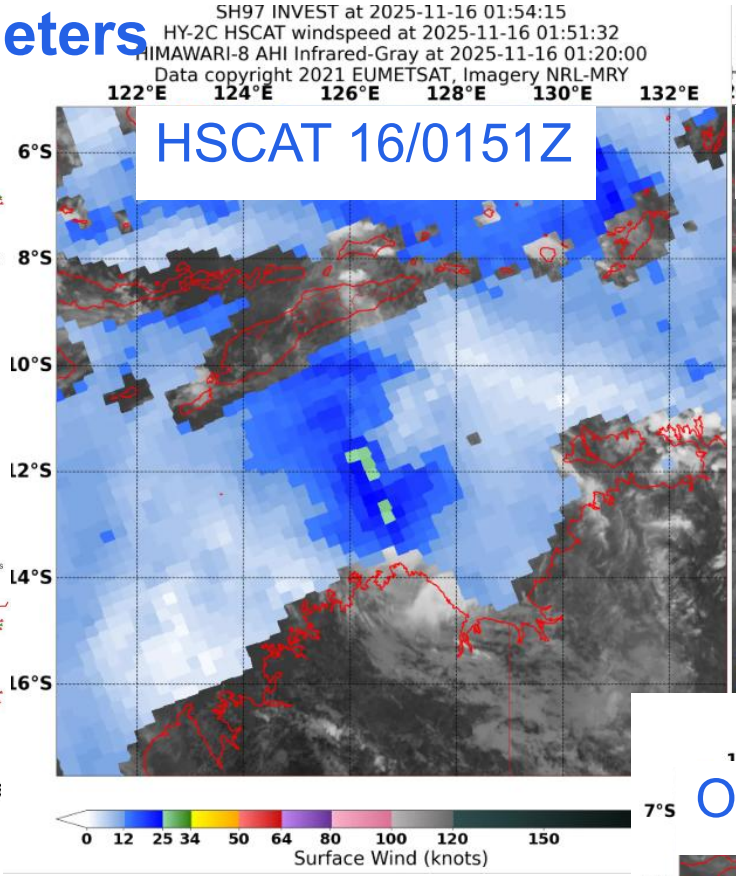
VLAB 22 February 2026

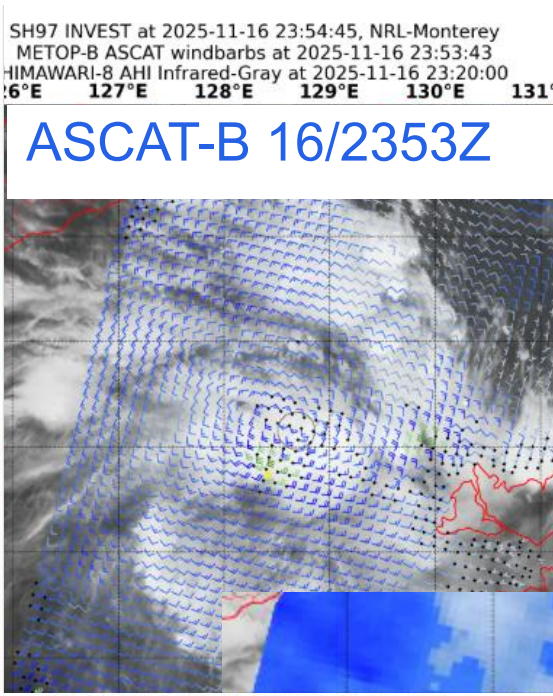
Joe Courtney
Bureau of Meteorology,
Perth Australia

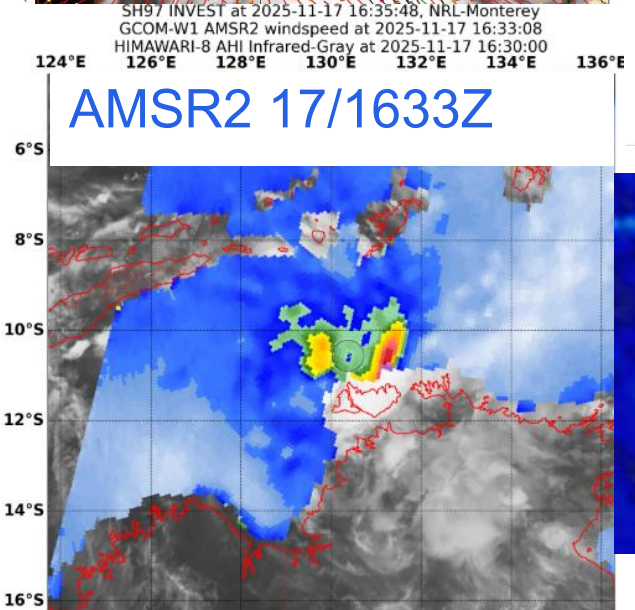
Images: courtesy
US NRL, NOAA STAR, KNMI

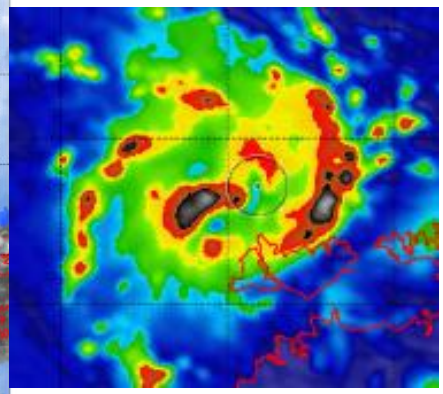
Pre-Fina 16-17 Nov
Value of scat/radiometers

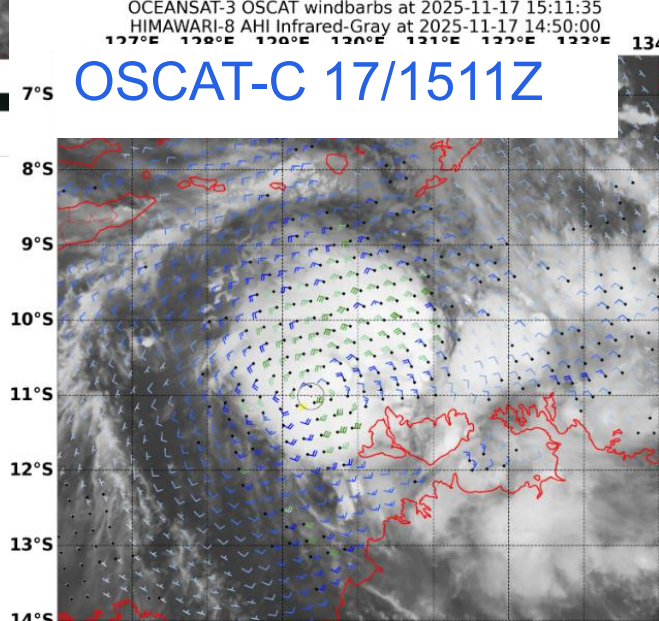






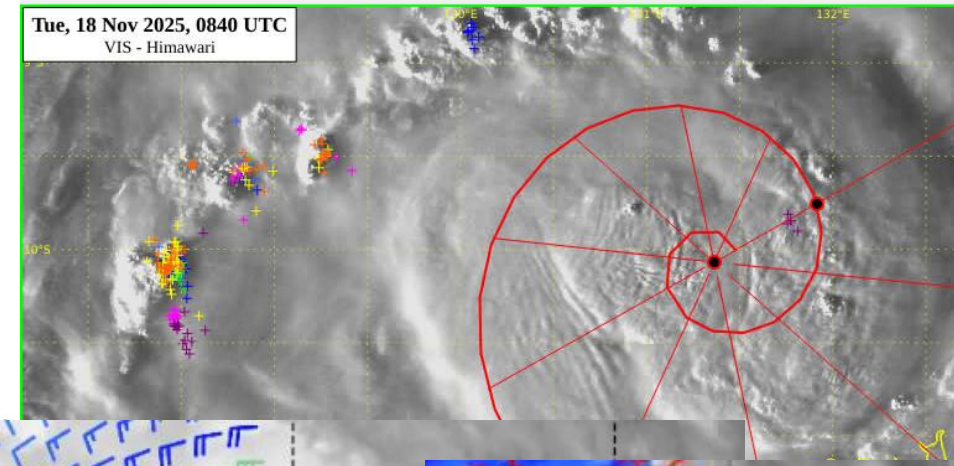


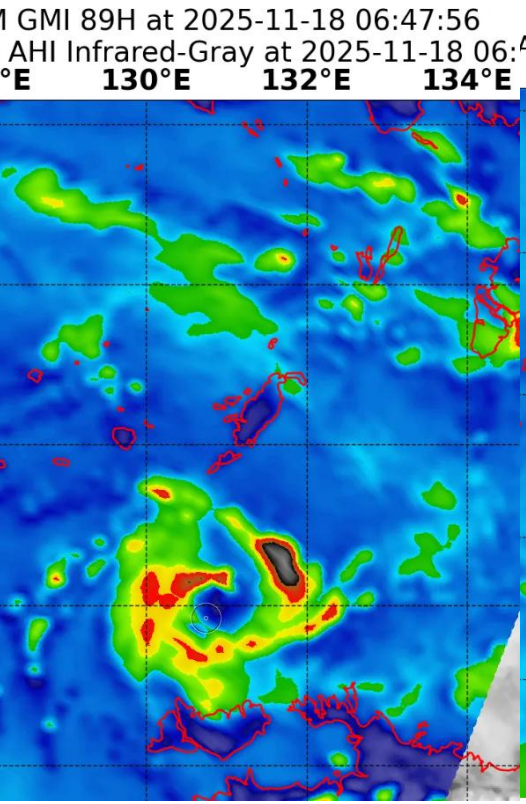


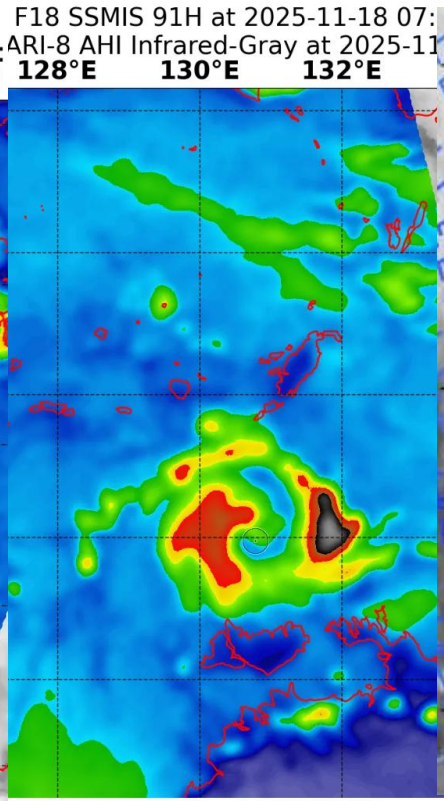


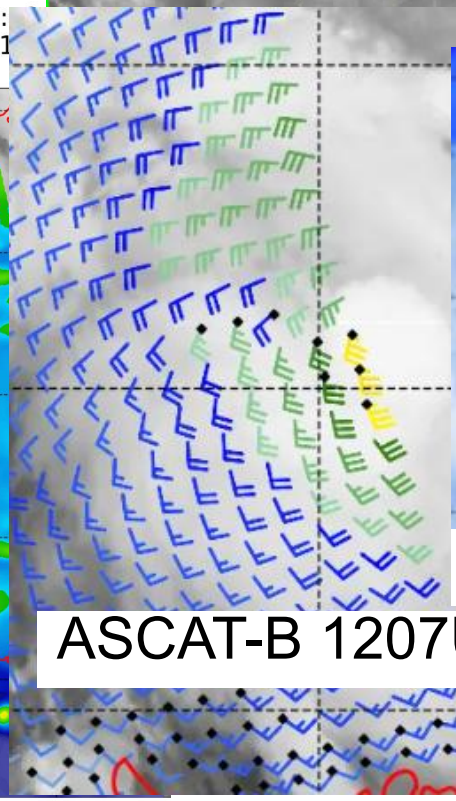
Fina 18 Nov microwave curvature; confirmation of gales

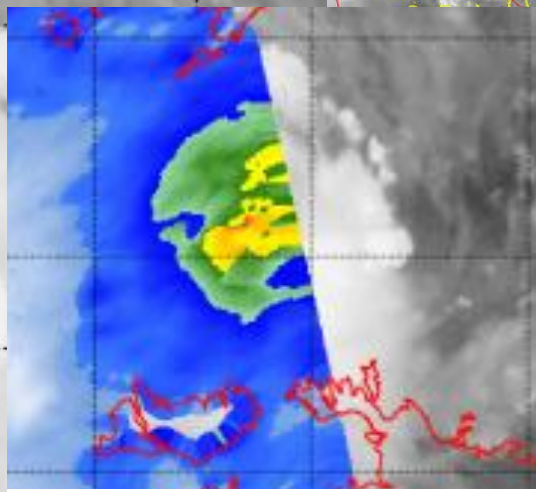
- Strong microwave signature
- ASCAT 12Z gales
- 09UTC Dvorak DT=3.0 from 0.7 curve band wrap











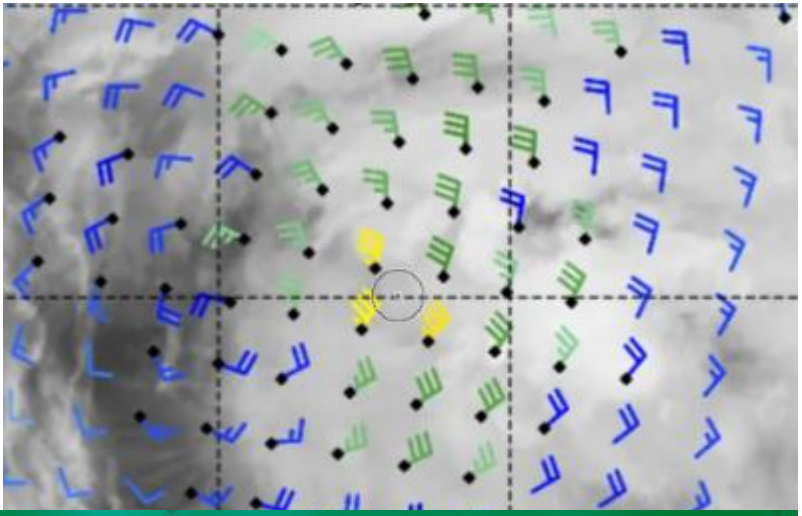
U-HRES extra

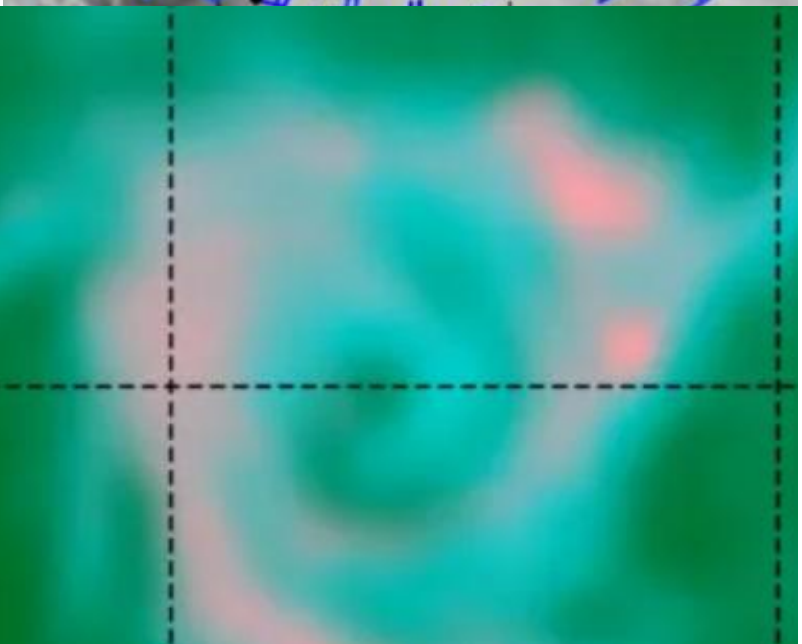
ASCAT-B 1207UTC

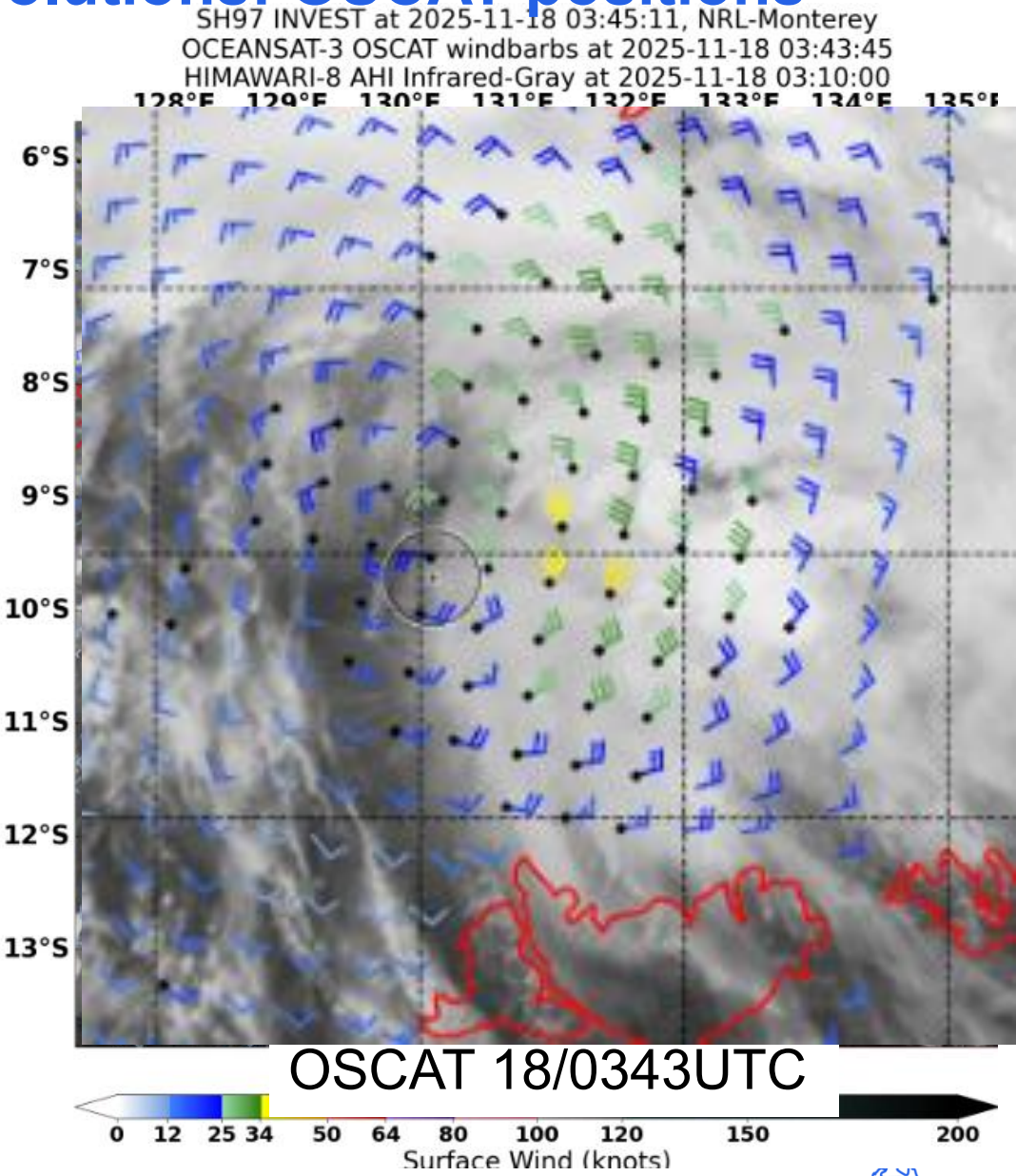
Limitations of some scat solutions: OSCAT positions

Where is the centre?

Beware model solutions

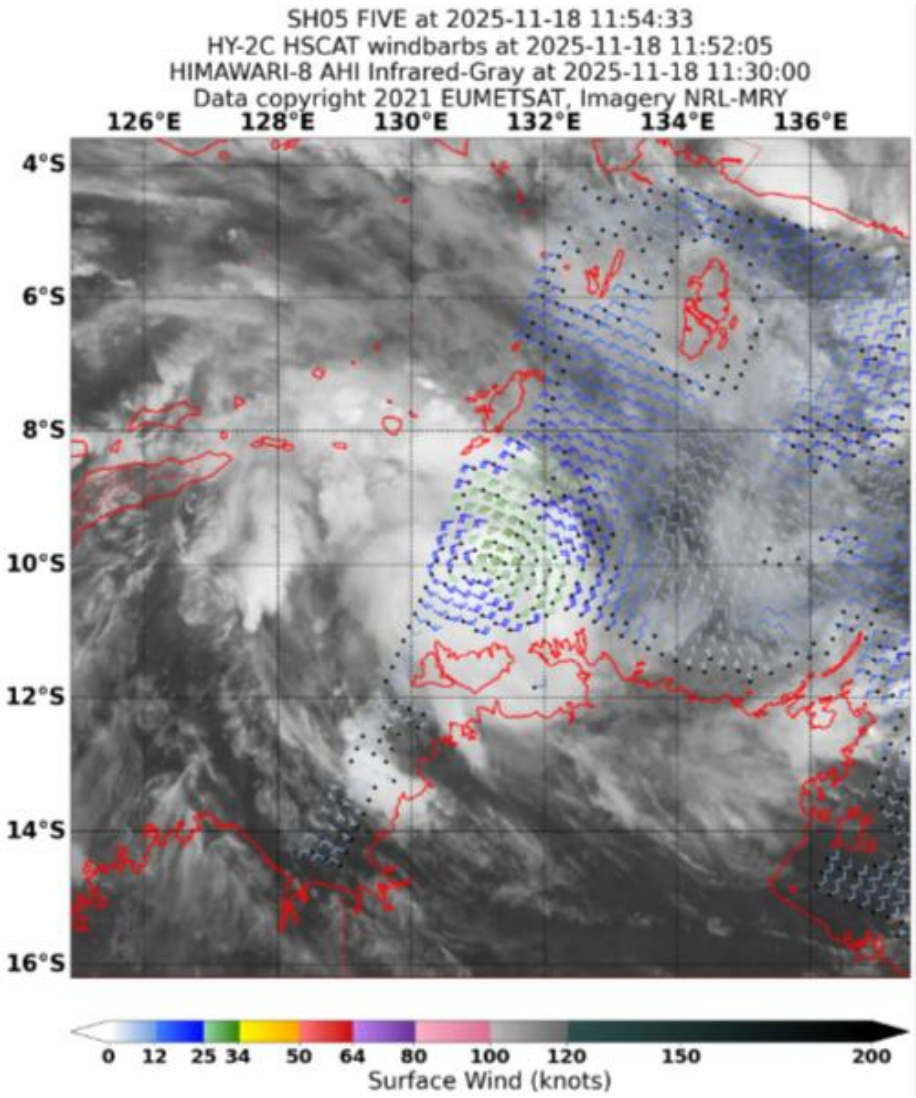


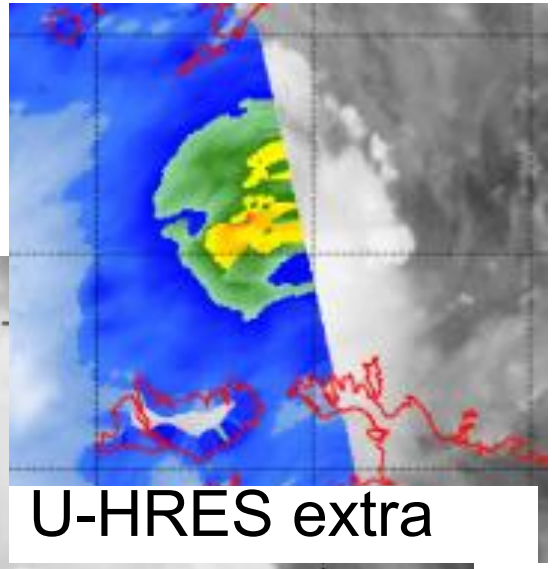




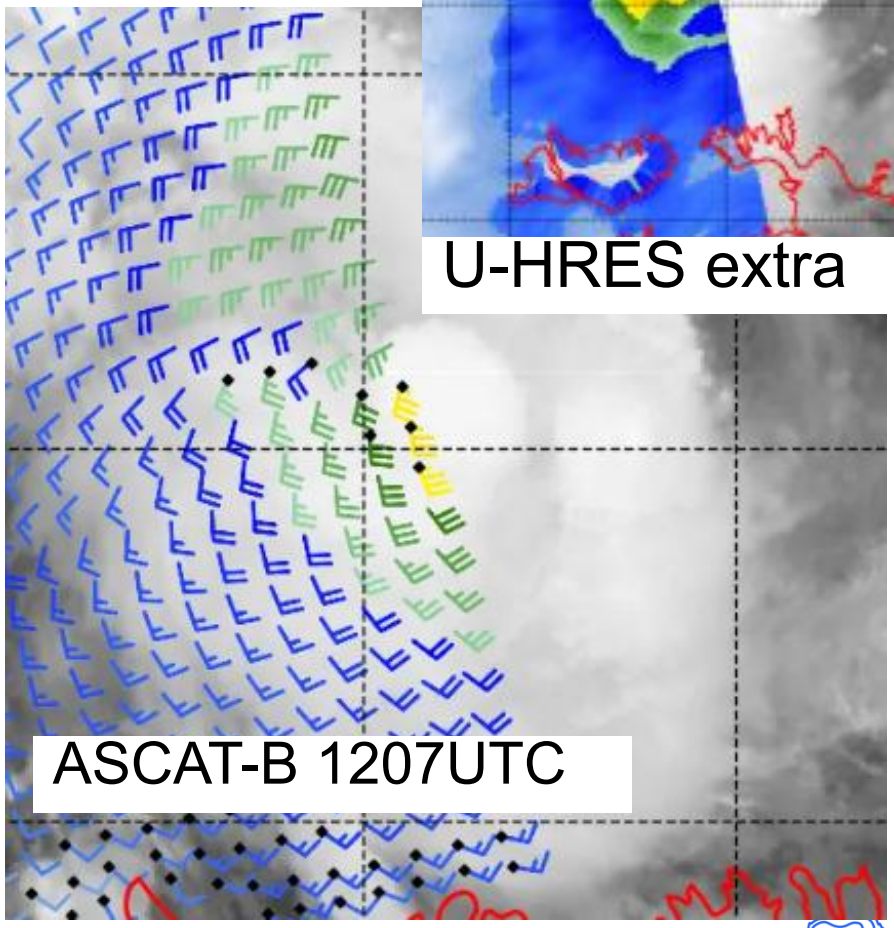
Limitations of some scat solutions:

Resolution HSCAT/OSCAT Vs ASCAT





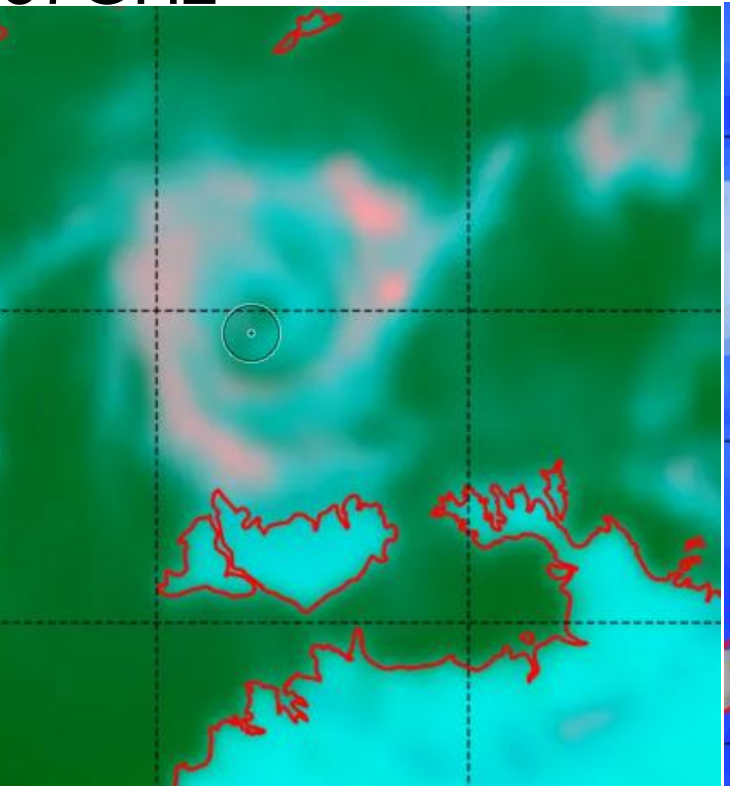
U-HRES extra



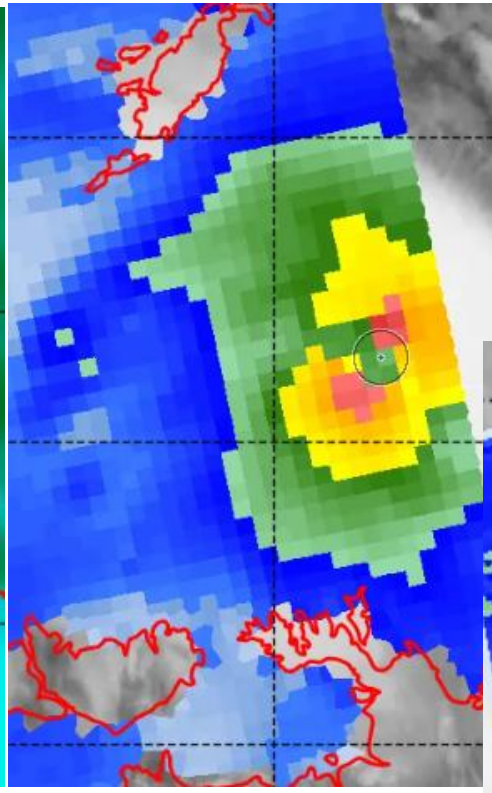
ASCAT-B 1207UTC

Fina 20 Nov
first peak then subtle weakening on microwave

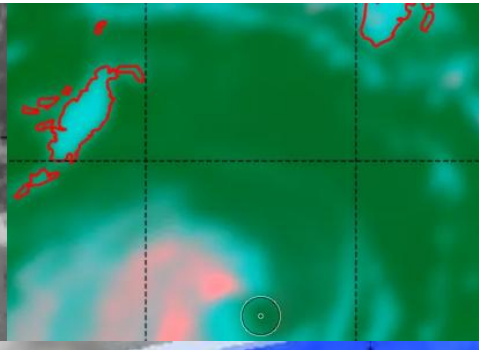
AMSR2 18/0449UTC 37GHz



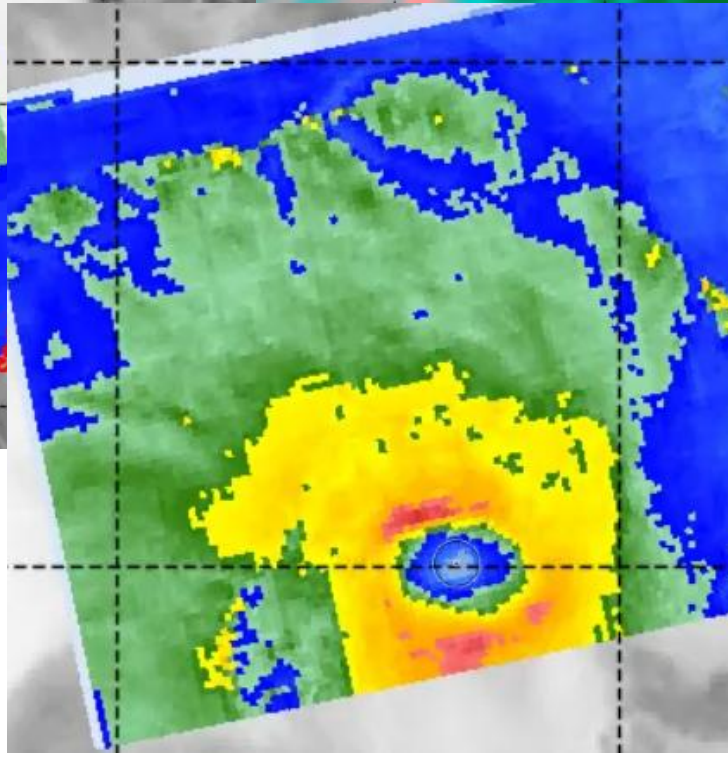
ASCAT-C 1228UTC



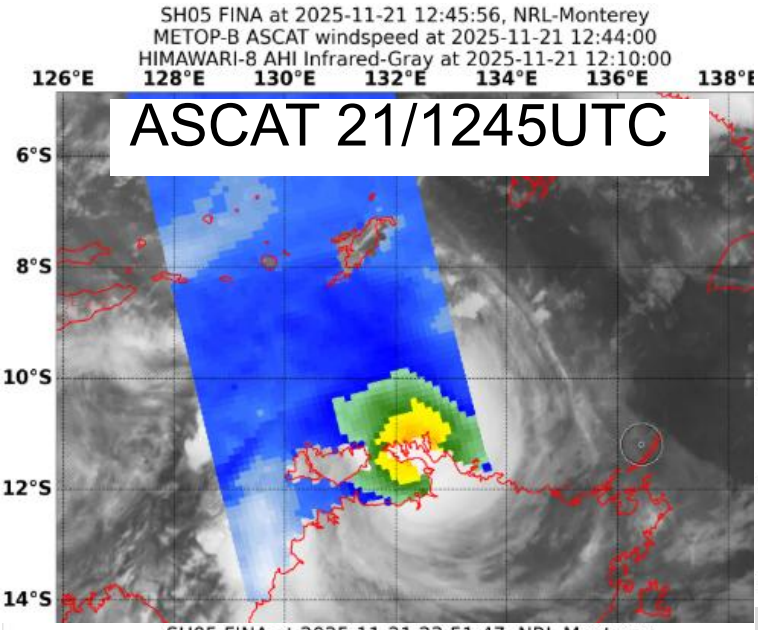
AMSR2 1602UTC

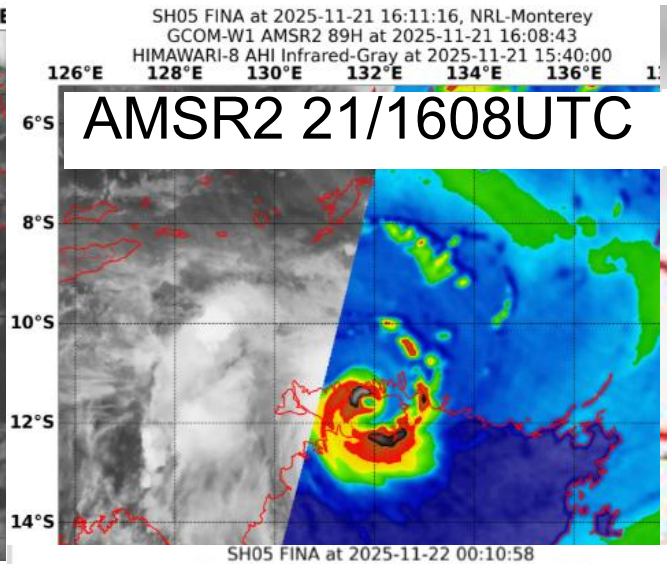


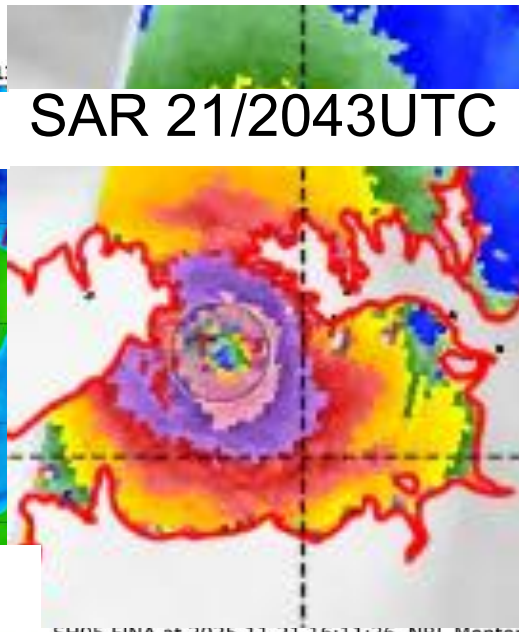
SAR 0929UTC

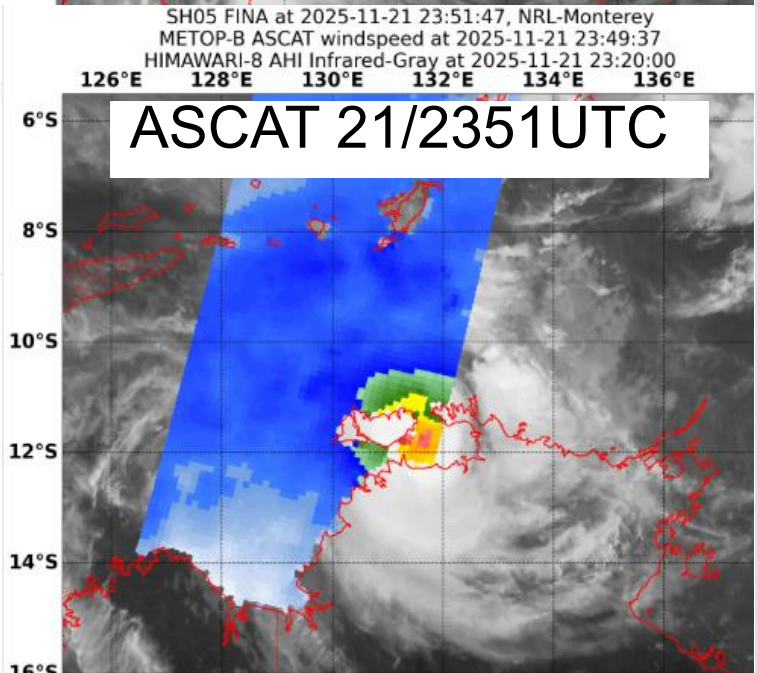


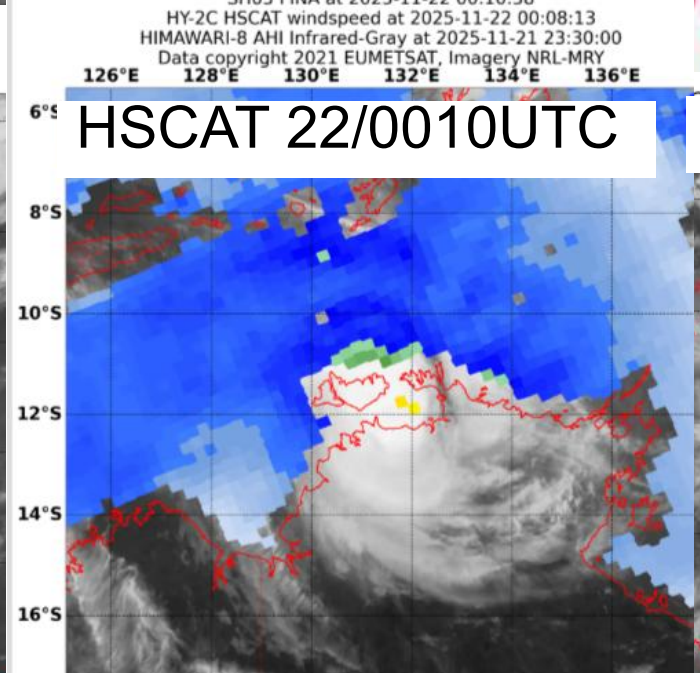
Fina 21 Nov Intensification in Van Dieman Gulf

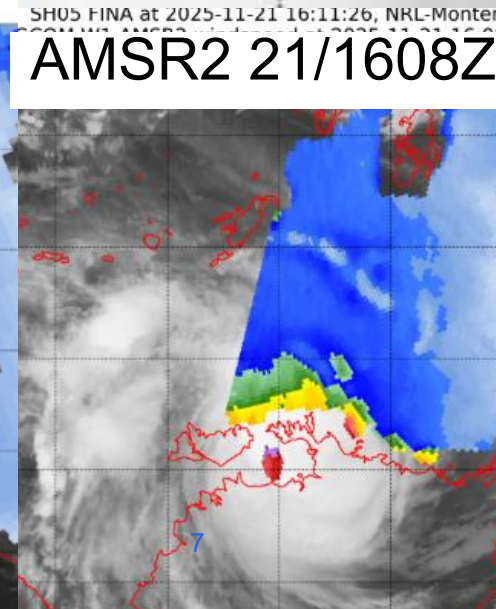






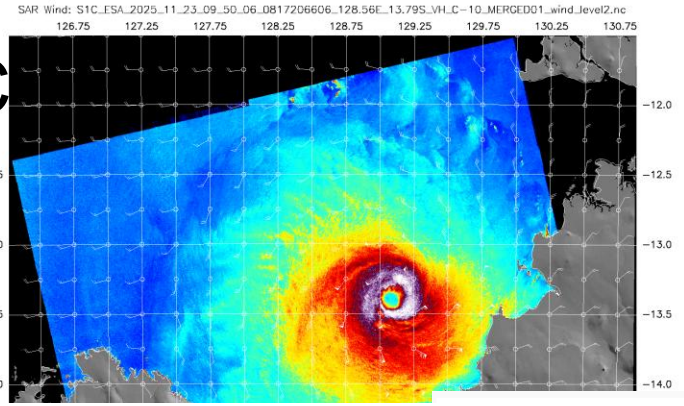




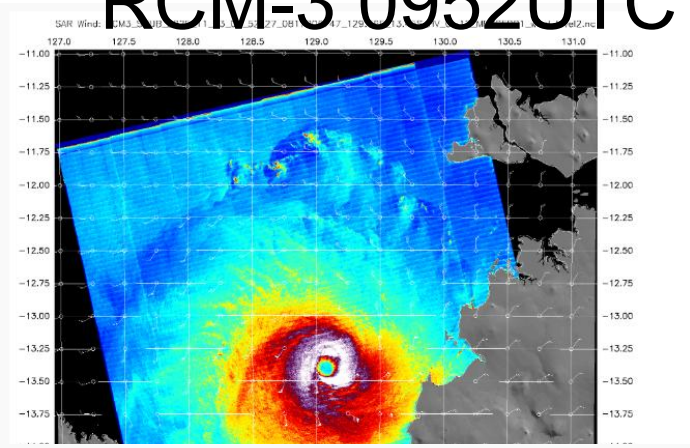


Fina 23 Nov
Coincident SAR 23 Nov 10Z

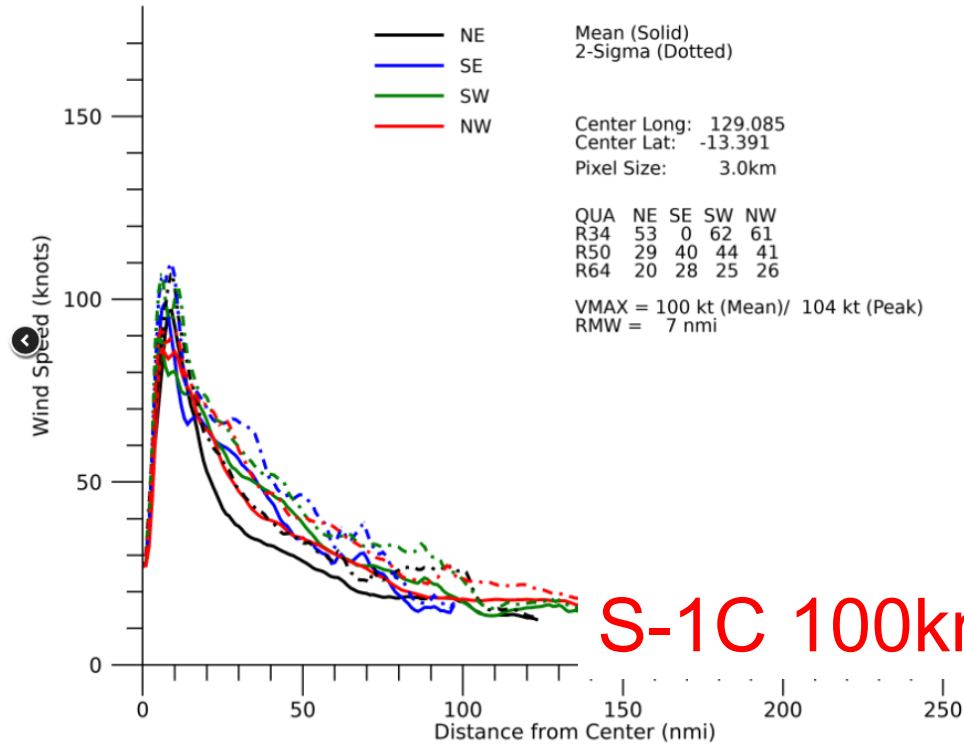
S-1C 0950UTC



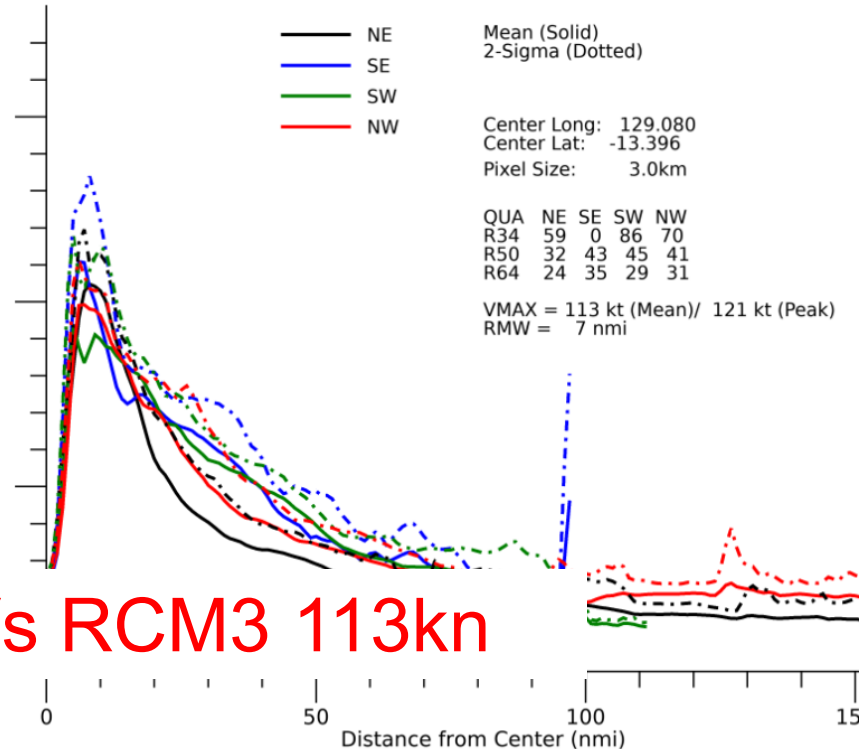
RCM-3 0952UTC



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

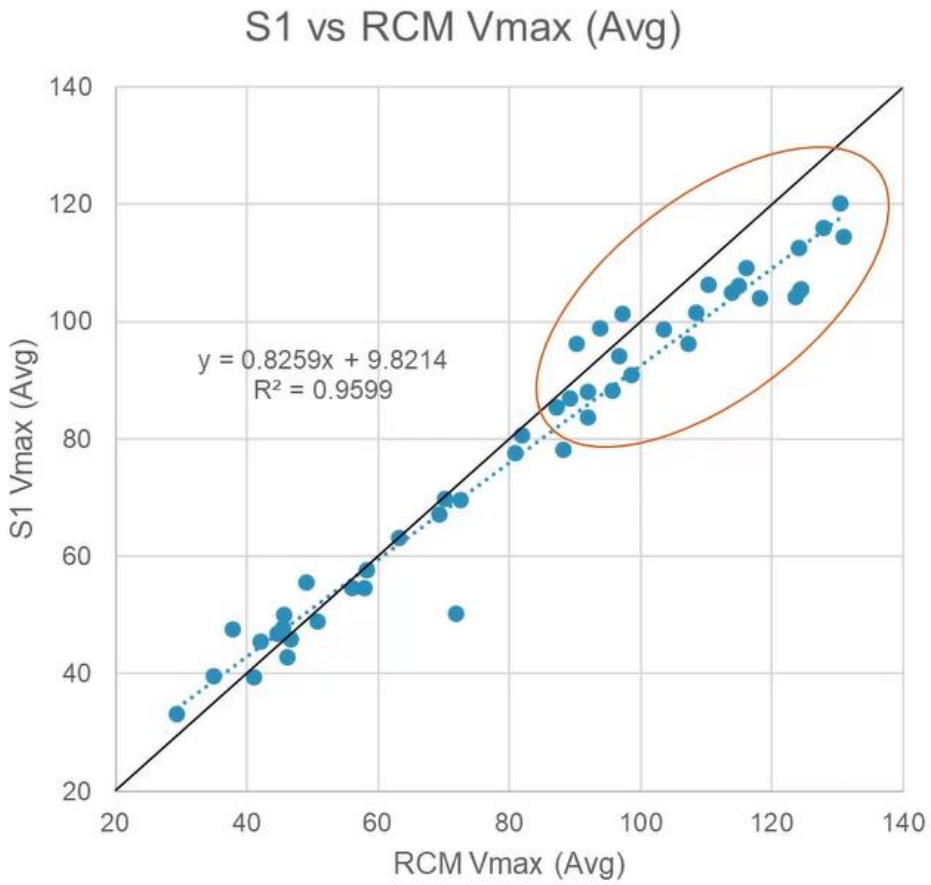


S-1C 100kn Vs RCM3 113kn

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

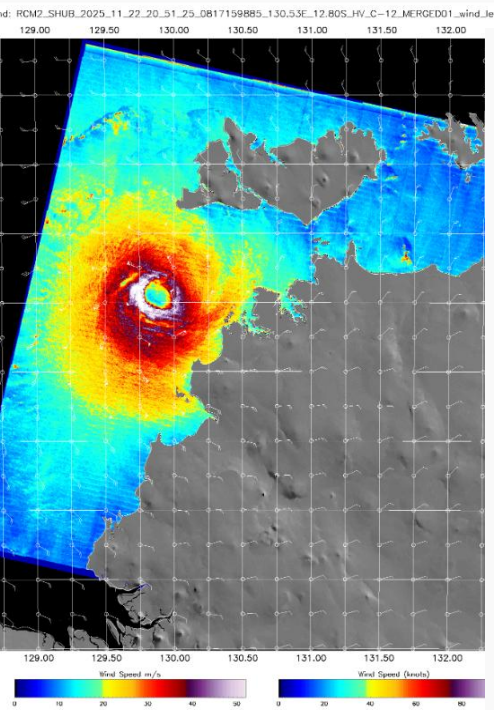
OFFICIAL

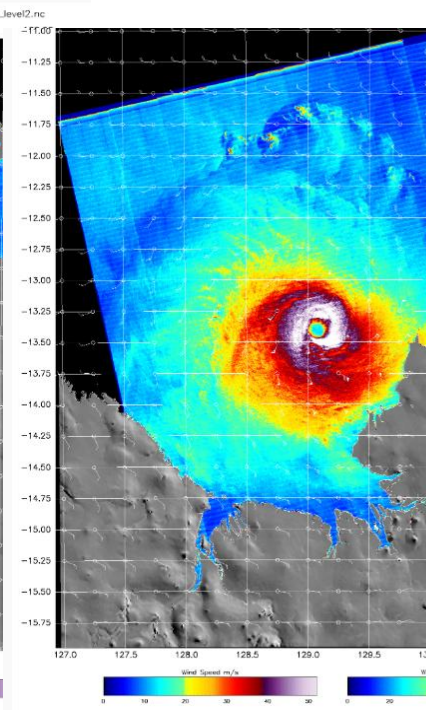
RCM-2 22/2051Z

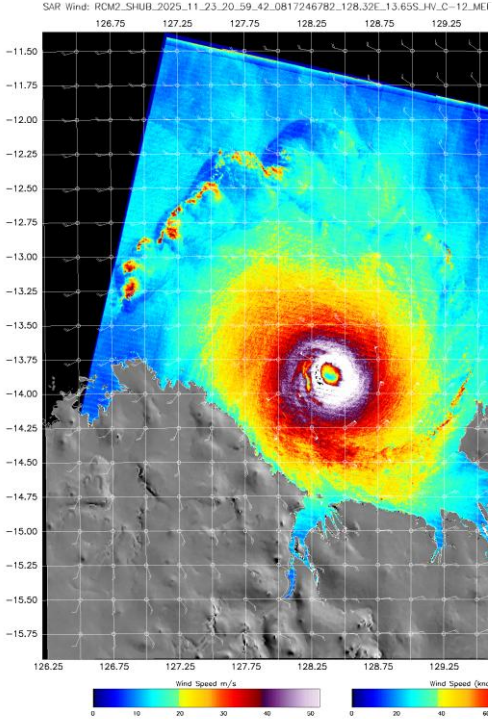
RCM-3 23/1059Z

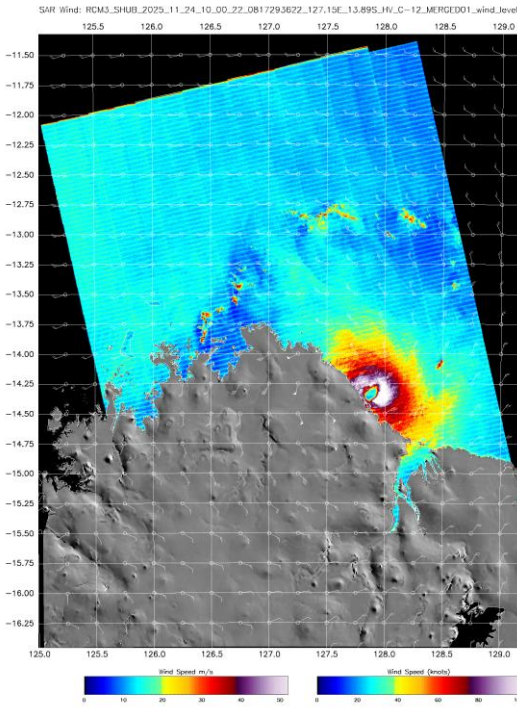
RCM-2 23/2059Z

RCM-3 24/1000Z









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

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RADARSAT is an official mark of the Canadian Space Agency
Processed at NOAA/NESDIS/STAR/SOCD 2025 Nov 24 00:04:36 UTC

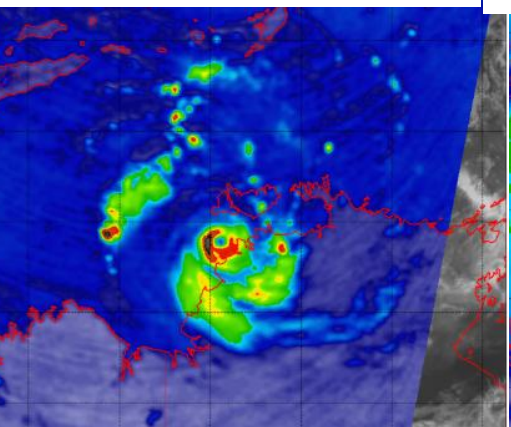
SH05 FINA at 2025-11-24 08:00:00, NRL-Monterey
F18 SSMIS 91H at 2025-11-24 07:58:00
HIMAWARI-8 AHI Infrared-Gray at 2025-11-24 08:00:00

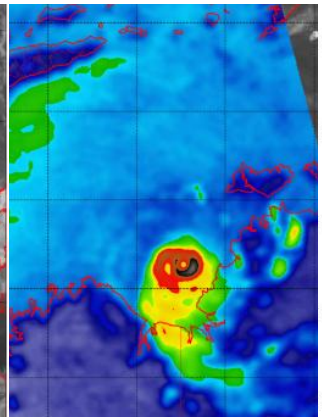
AMSR2 22/1652Z

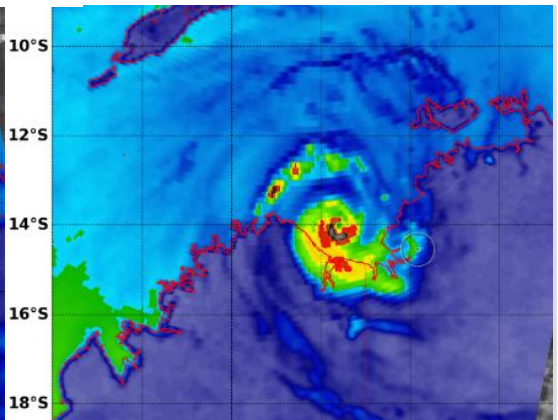
SSMIS 23/1035Z

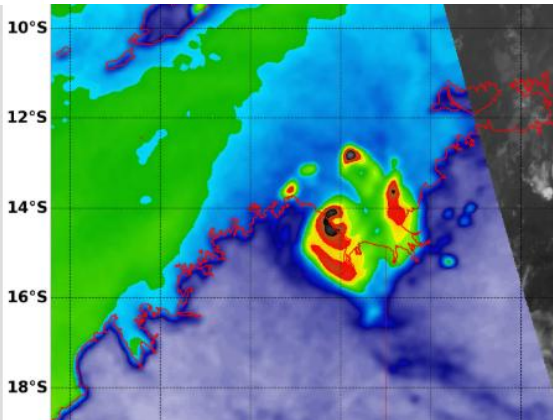
WSFM 23/2128Z

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

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/ (no archive)

Questions?