# WMO DBNet: Recent Updates and Future Plans

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# WMO DBNet Concept

1. Global availability (since 2004) of low-latency LEO infrared and microwave sounder data received by a global network of Direct Broadcast ground stations.
2. Consistency with global data by using common processing software (i.e. AAPP, CSPP SDR, FY3PP), standardized BUFR coding, and file naming.
3. Routine monitoring to ensure compatibility with global data.
4. Dissemination by the WMO Information System (primarily GTS today, transitioning to WIS 2.0).
5. Coordination by WMO Space Programme.
6. Participation by EUMETSAT, NOAA, Metro France, IMD, BoM, JMA, KMA, NIWA, INPE, SMN, HKO, ECCC (40 ground station sites).

# DBNet Services

Microwave sounders:

- AMSU-A, MHS (Metop-B, Metop-C, NOAA-18, NOAA-19)
- ATMS (SNPP, NOAA-20, NOAA-21)
- MWTS, MWHS (FY-3D, FY-3E)

Infrared sounders:

- IASI (Metop-B, Metop-C)
- CrIS (NOAA-20, NOAA-21)

# DBNet Data Flow

Direct Broadcast Reception

Central processing

Common software:
AAPP
CSPP SDR
FY3PP

Local processing

GTS / WIS 2.0

EUMETCAST

NMHS NWP users

WMO Space Programme

# DBNet Monitoring

- DBNet microwave sounder and infrared sounder data are continuously monitored by EUMETSAT's NWP-SAF.
- DBNet BUFR data received via GTS are compared to global BUFR data received from EUMETSAT, NOAA, and CMA.
- Automated statistics, plots, and reports are prepared for every DBNet dataset.
- Automated alerts are sent to DBNet station operators if anomalies are found in their data.
- All DBNet stations are monitored for "aliveness" for each satellite and sensor they support. Automated alerts are generated if expected datasets are missing for > 3 days.

# DBNet Data Monitoring Website

## Local and Global ATMS data intercomparison

Statistics reported for each station overpass (represented by a row in the table) pertain to the differences between local and global brightness temperatures (BTs), timestamps and field of view (FOV) coordinates for the selection of channels listed in the adjacent table.

| Channel Number | 1 | 8 | 16 | 22 |
|---|---|---|---|---|
| Channel Wavenumber | 0.794 | 1.833 | 2.942 | 6.148 |

Brightness temperature difference (BTD) plots present the differences between the local and global BTs (screened for invalid BTDs). Navigational difference plots depict the regional navigated fields of view, superimposed upon the global (screened for invalid coordinates).

The plots for each overpass are available by clicking on the corresponding "Overpass Time" entry in the table. Alternatively, view daily plots for each station (from the last week), here.

### Explanation of table statistics and data displayed in plots.

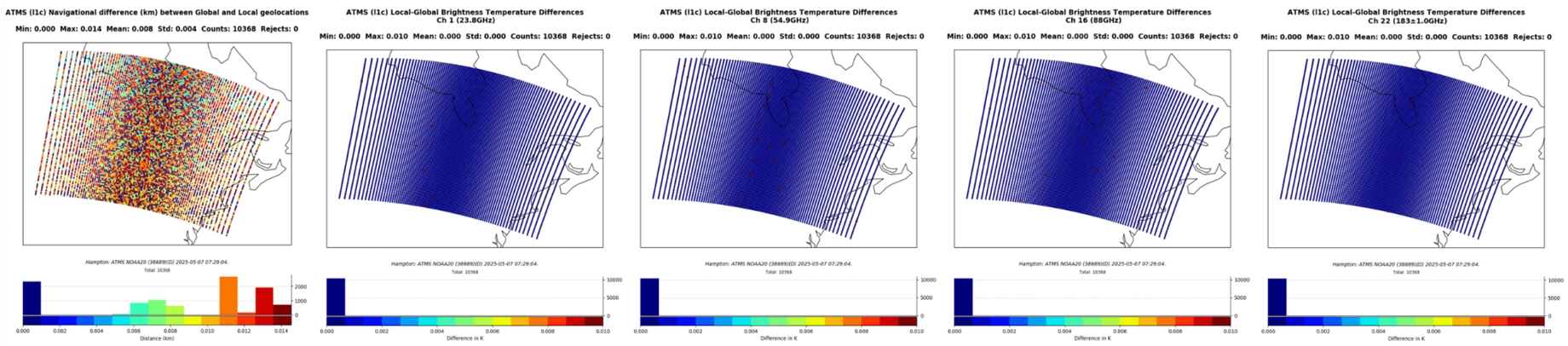
- Click here for the differences between data displayed in the plots and used to calculate the statistics.
- Click here for information on how the different statistical measures are defined and calculated.
- Click here to see the thresholds used to generate warnings for overpasses.

### How to use the table

Sort fields by clicking on the desired column heading; filter using the "search" bar.
Plots associated with each overpass can be viewed by clicking on the "Overpass Time" entries; clicking on each plot will enlarge the image.
Above the plots, there is a link to a text table of BT and BTD statistics for ALL channels for each overpass.
Overpasses which have not met the local-global data consistency thresholds have the relevant statistic highlighted in red.
Use the dropdown menu on the far right to selectively view these overpasses.

Currently, the 'All Channel BT difference Statistics' table and the plots presented are for the overpass corresponding to file: **atms_noaa20_20250507_072900_38689_SSEC_ham_176_28.l1c.h5**.

All Channel BT difference Statistics



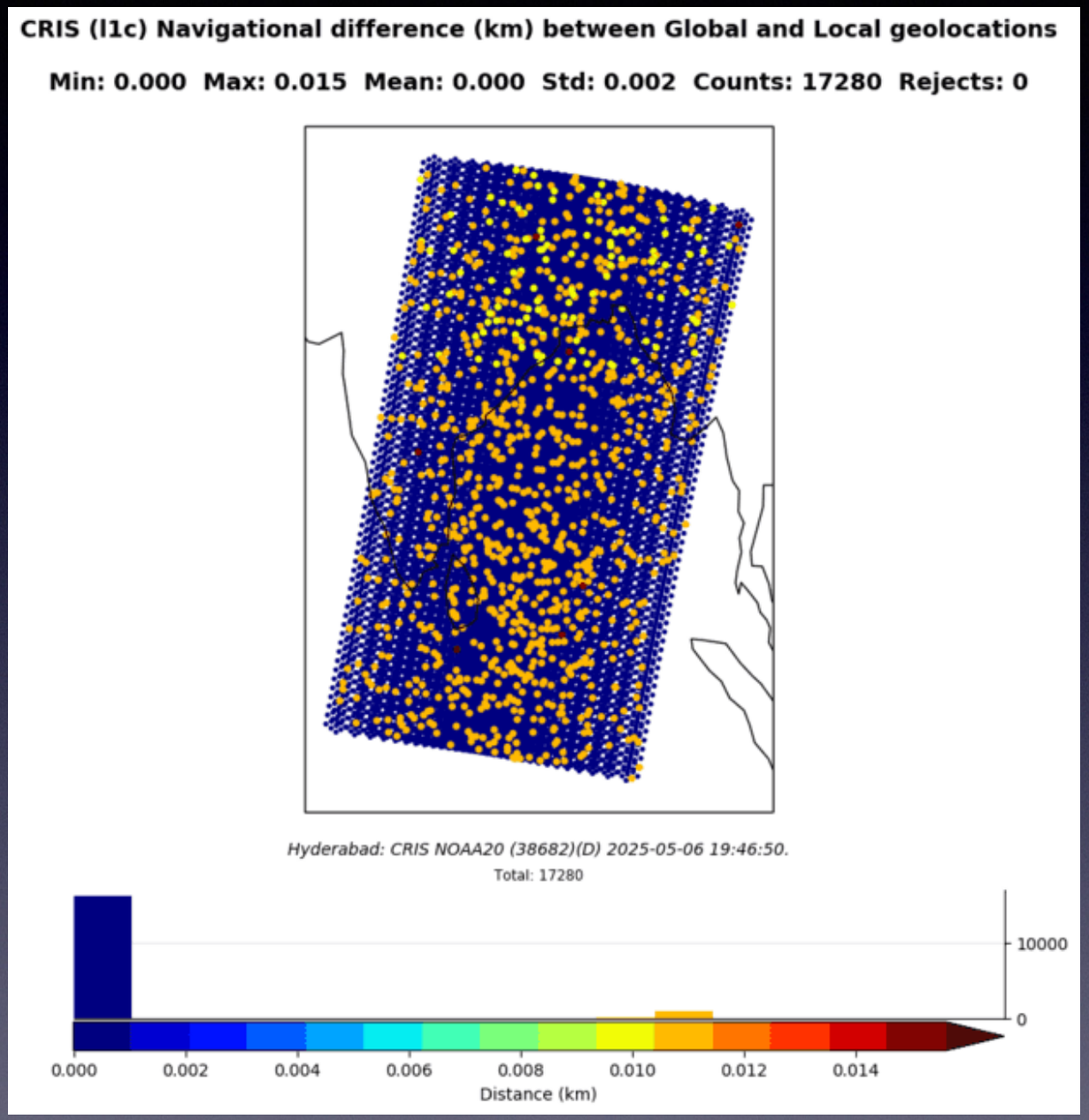

Show 10 entries | Satellite | Station | Day | View overpasses with warnings: All Overpasses | Search:

| Satellite | Station | Day | Overpass Time | Percentage of valid local BTs | Percentage of valid global BTs | No. of Local scanlines | No. of Common scanlines | Mean Timestamp Difference/s | Mean Navigational Difference/m | Percentage of valid BTDs | Mean BTD | Min BTD | Max BTD | STD of BTD | No. of spurious local timestamps | No. of spurious global timestamps | No. of spurious local coordinates | No. of spurious global coordinates | No. of common spurious coordinates |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| noaa20 | ham | Wednesday | 2025-05-07 07:29:04.351 | 100<br>100<br>100 | 100<br>100<br>100 | 108 | 108 | 0.000778 | 8 | 100<br>100<br>100 | 6.76e-06<br>1.64e-05<br>1.25e- | 0<br>0<br>0 | 0.01<br>0.01<br>0.01 | 0.00026<br>0.000405<br>0.000354 | 0 | 0 | 0 | 0 | 0 |

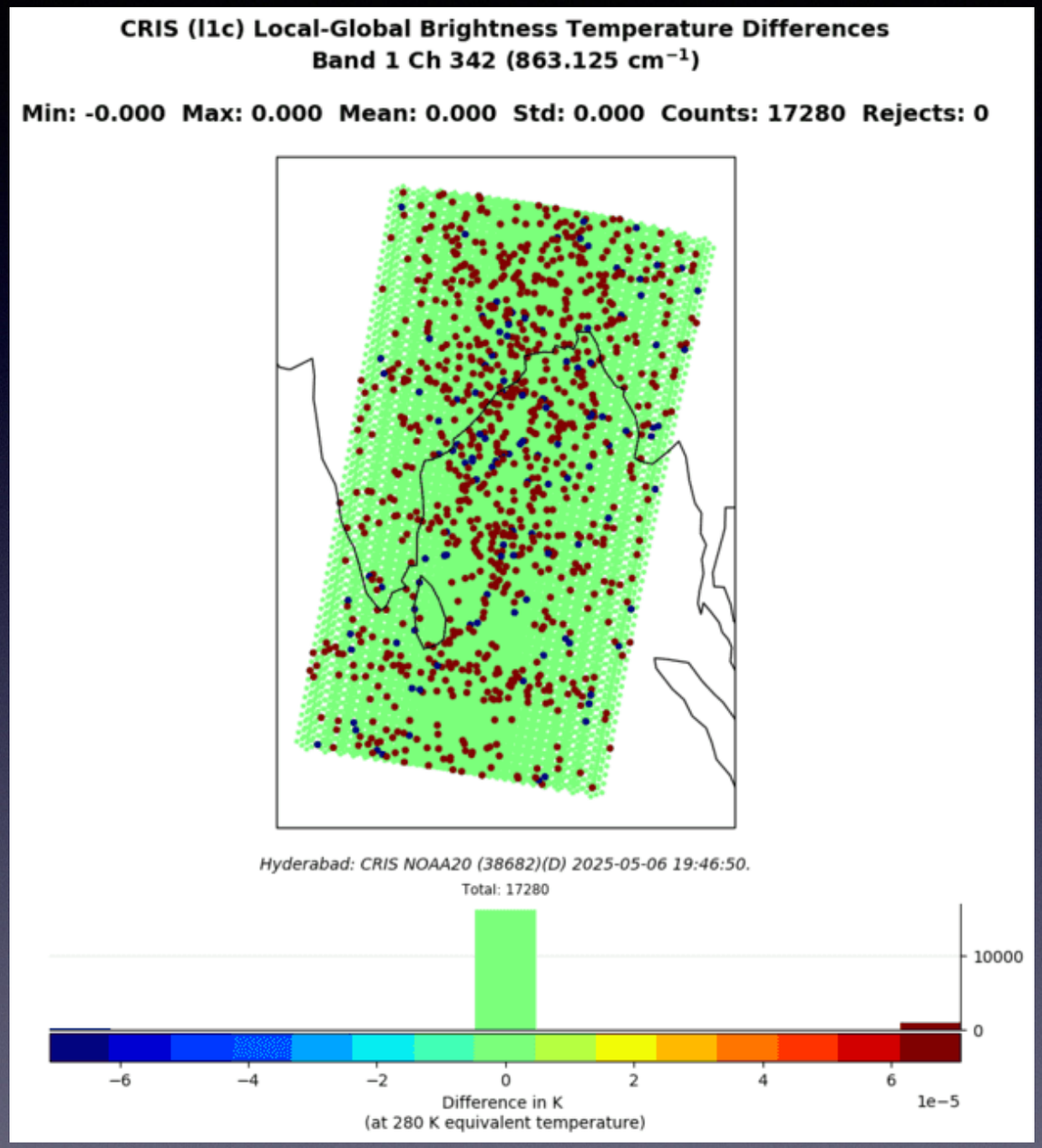
EUMETSAT NWP-SAF

# DBNet Data Monitoring: CrIS

NOAA-20 CrIS received and processed at Hyderabad, India




CrIS geolocation differences < 15 meters



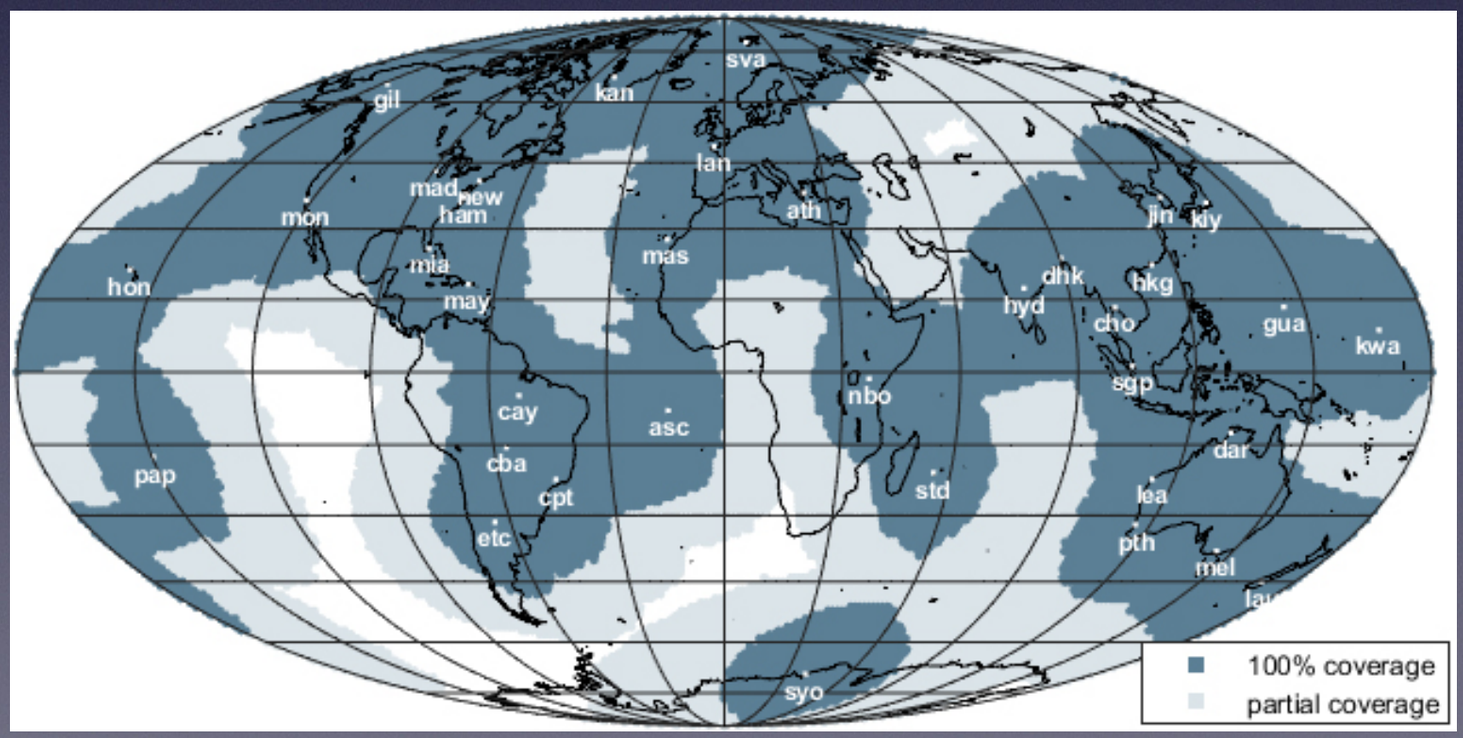

EUMETSAT NWP-SAF

CrIS brightness temperature differences < 0.0001 K

# DBNet Coverage: AMSU-A and ATMS

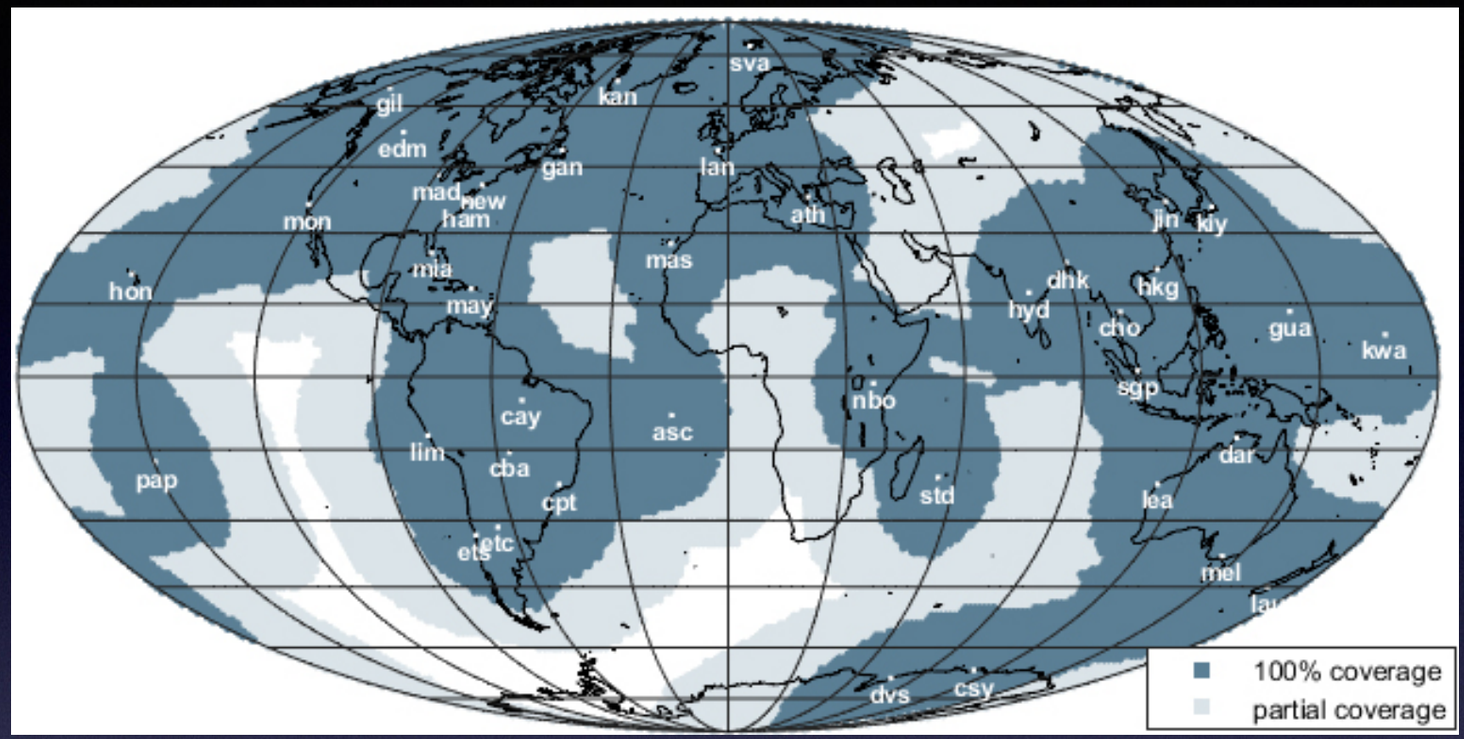
AMSU-A
MHS


ATMS

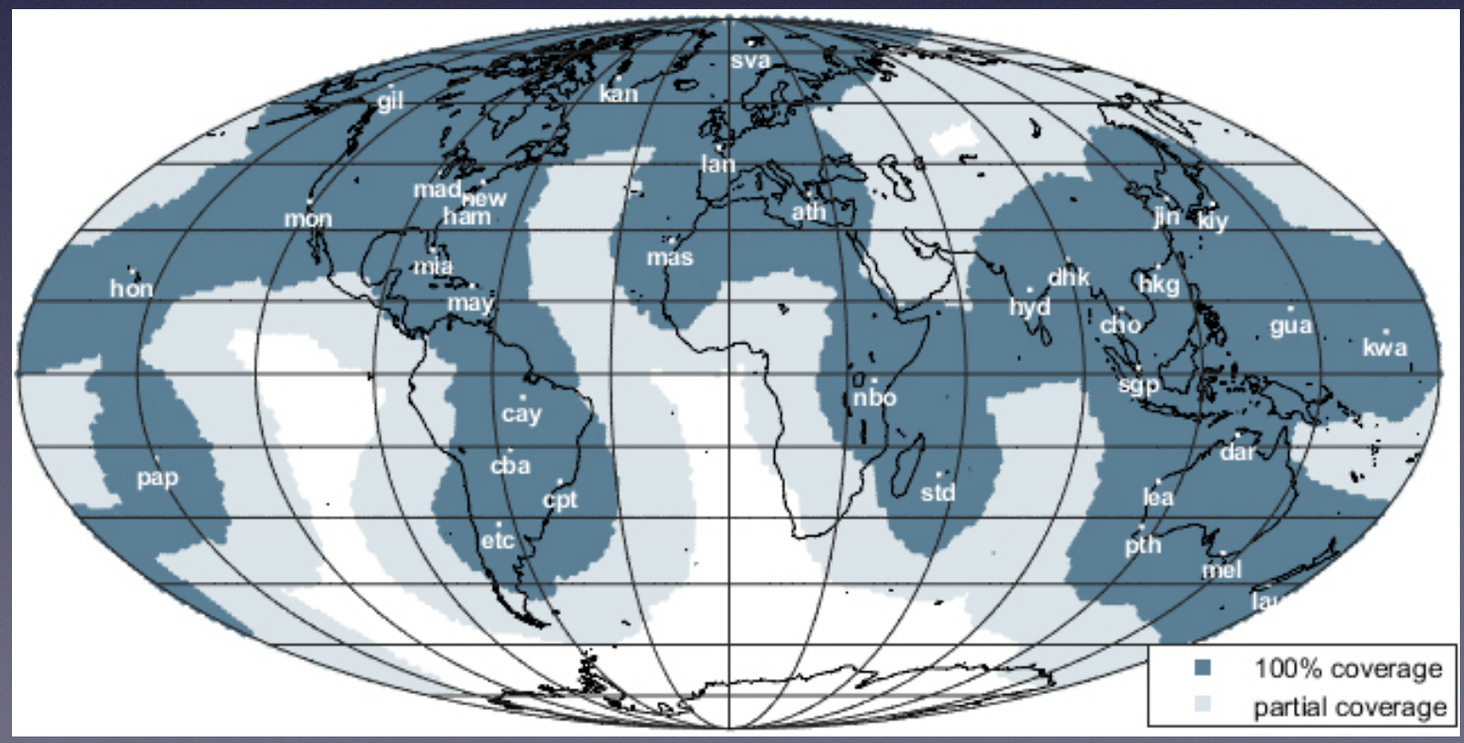


# DBNet Coverage: IASI and CrIS

IASI




CrIS



# DBNet Data Dissemination

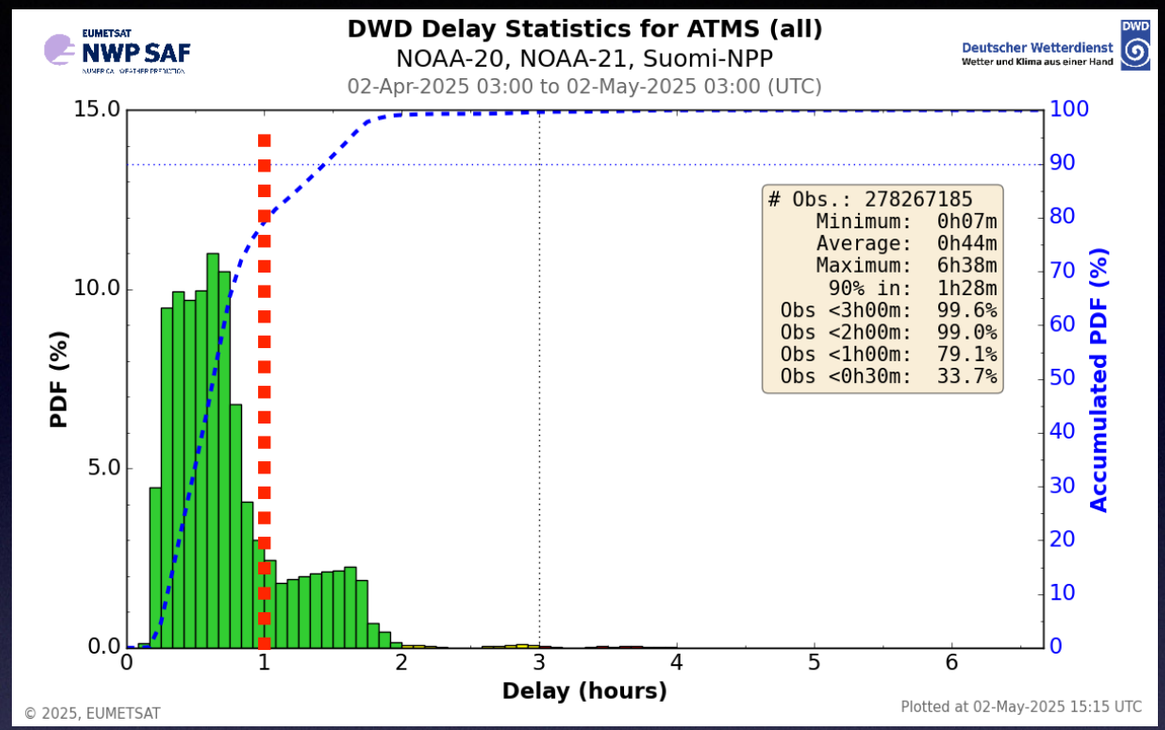
- DBNet data dissemination to National Meteorological Hydrological Service (NMHS) agencies has been via GTS since project start in 2004.
- EUMETSAT also disseminates DBNet data over Europe via EUMETCAST rebroadcast service.
- GTS is transitioning to WIS 2.0 (GTS will be decommissioned in 2033).
- DBNet transition to WIS 2.0 is underway.
- Several DBNet providers are already disseminating data on WIS 2.0 (along with GTS).

# DBNet Data Latency

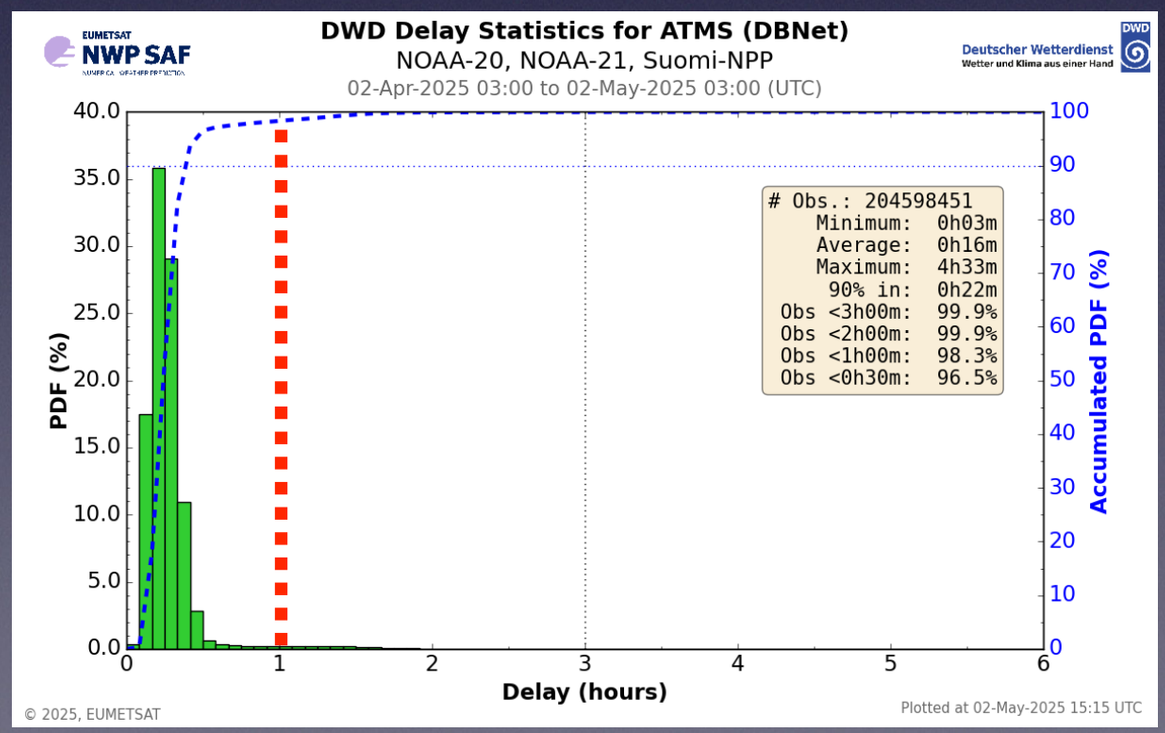
- DBNet goal established in 2015 is to provide data on the GTS within 20 minutes of observation.
- Direct broadcast is the only way to achieve this goal.
- Latency is measured from time of observation on spacecraft to time data available on GTS.
- Timeliness is monitored by EUMETSAT's NWP-SAF.

# DBNet Data Latency: ATMS

Global latency:
79% < 1 hr
33% < 30 min
Average 44 min

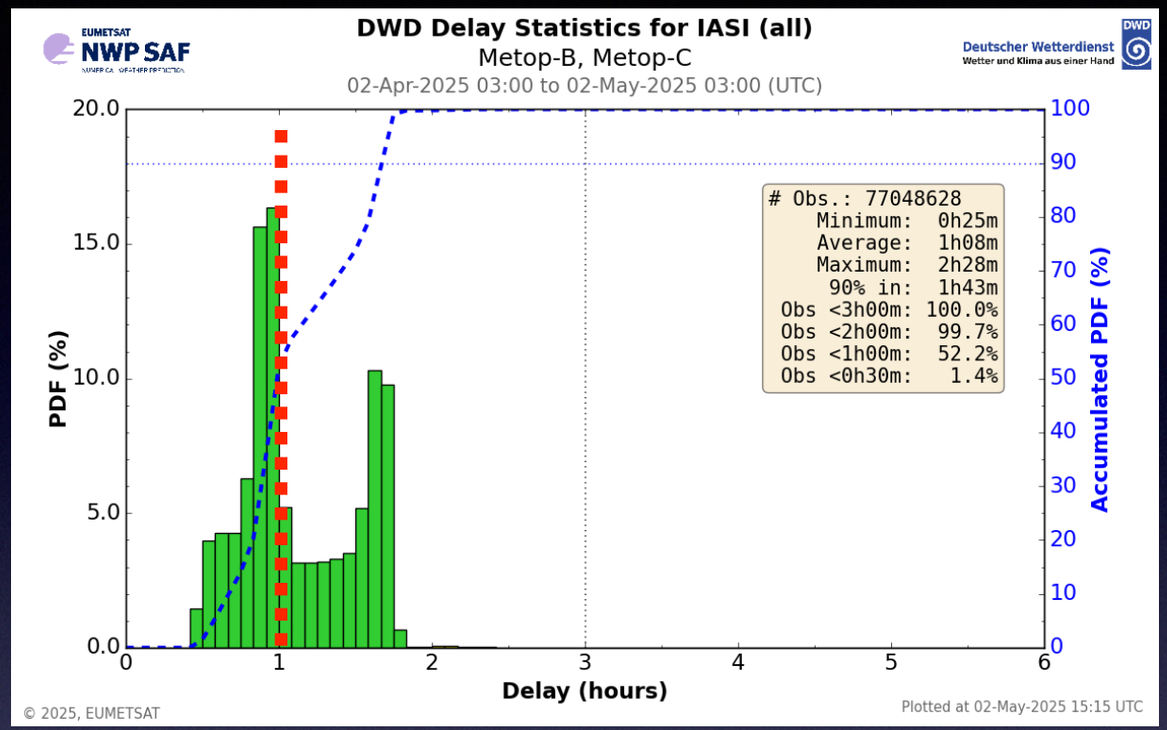



DBNet latency:
98% < 1 hr
96% < 30 min
Average 16 min

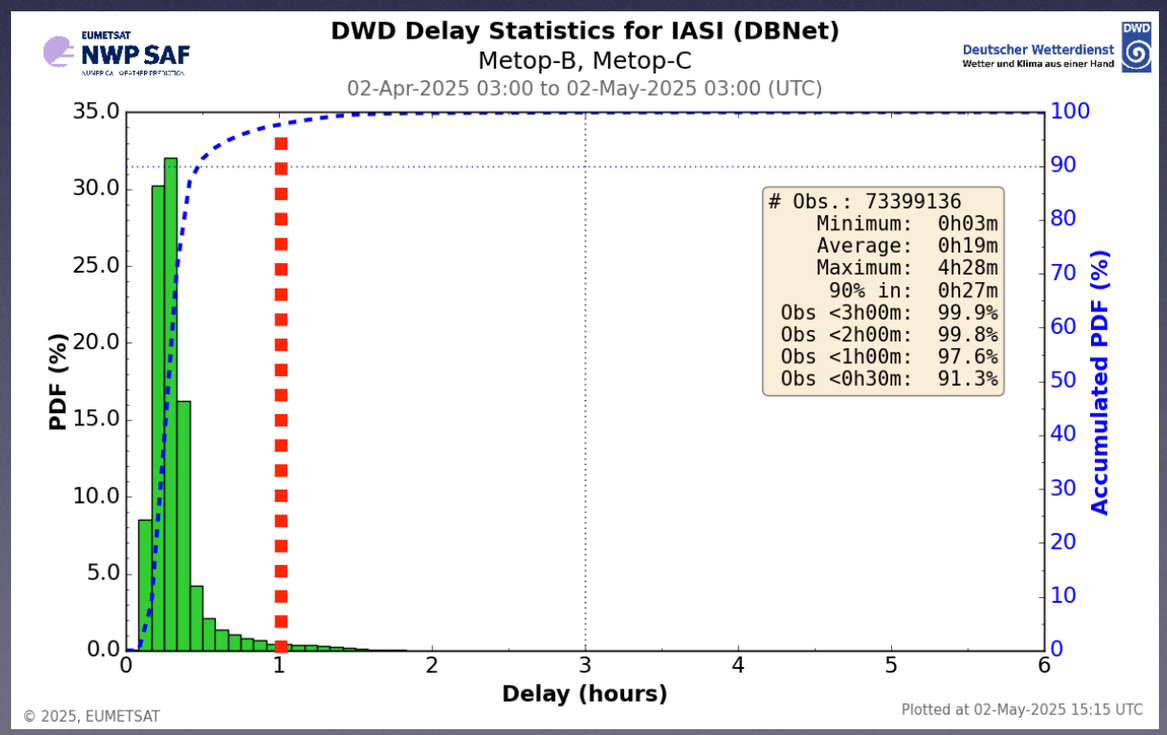


# DBNet Data Latency: IASI

Global latency:
52% < 1 hr
1% < 30 min
Average 68 min




DBNet latency:
97% < 1 hr
91% < 30 min
Average 19 min



# DBNet Upcoming Challenges

1. Decommissioning of NOAA-18/19

   NOAA products will end on June 26.

2. Arrival of Metop-SGA1

   New hardware and software will be required at many DBNet stations.

3. Continuing adoption of NOAA-21, FY-3E, FY-3F

   Many stations still need hardware and/or software updates.

4. Transition from GTS to WIS 2.0….

# 4. Transition from GTS to WIS 2.0

- GTS will be decommissioned by 2033; no new datasets can be added.
- All DBNet station operators are working on GTS to WIS 2.0 transition; to be completed by 2030.
- CIMSS/SSEC is disseminating full channel sets of CrIS and IASI DBNet data routinely via WIS 2.0.
- Meteo France has begun disseminating DBNet data via WIS 2.0.
- WIS 2.0 provides much more flexibility in what can be disseminated (no constraints on size, format, naming, content).

# Summary

- DBNet continues to provide low-latency microwave and infrared sounder data over every continent.
- DBNet data quality is assured via automated monitoring.
- Latency of < 30 minutes is routine.
- DBNet continues to support new satellites and sensors and to expand geographic coverage.
- DBNet will transition from GTS to WIS 2.0 by 2030.