

Report from CBS Lead Centres for GCOS – JMA

1 GSN station performance in JMA’s area of responsibility

JMA runs the CBS Lead Centre for GCOS in East Asia and Southeast Asia with an area of responsibility encompassing Brunei, Cambodia, China, Japan, Lao PDR, Malaysia, Mongolia, Myanmar, the Philippines, the Republic of Korea, Singapore, Thailand, and Vietnam.

Table 1 highlights the performance of GSN stations in JMA’s area of responsibility in 2021.

Table 1 GSN station performance for 2021

Country	Number of stations	Ratio of received CLIMAT reports	Ratio of CLIMAT reports without format errors	Ratio of valid (non-suspect) monthly mean temperature through QC
China	32	1.0	1.0	1.0
Japan	13	1.0	1.0	1.0
Malaysia	6	1.0	0.0	1.0
Mongolia	10	1.0	1.0	1.0
Myanmar	3	1.0	0.0	0.5
Philippines	6	0.8	0.8	0.6
Republic of Korea	3	1.0	1.0	1.0
Thailand	6	1.0	1.0	1.0
Vietnam	1	0.9	0.3	0.8

JMA received CLIMAT reports from most stations (ratios: 0.8 to 1.0 for 2021). However, reports from Malaysia, Myanmar and Vietnam included frequent format errors (2021 ratio of correct CLIMAT reports for Malaysia and Myanmar: 0.0; for Vietnam: 0.3) as detailed below.

- Malaysia: Group 8 in Section 1 of reports was two digits long.
- Myanmar: Group 3 in Section 1 of reports was a digit short.
- Vietnam: Group 6 in Section 1 of reports was a digit short/long.

JMA also identified the following errors through quality control testing:

- Malaysia: Group 4 in Section 1 of reports included monthly highest/lowest temperatures rather than monthly mean daily maximum/minimum temperatures.
- Mongolia: Group 6 in Section 1 of reports occasionally included precipitation values 10 times greater than expected from SYNOP report.

JMA monitoring of performance and CLIMAT report quality for Regional Basic Climate Network (RBCN) data revealed errors similar to those found for GSN stations.

2 Activities of JMA in its capacity as the CBS Lead Centre for GCOS in 2021

2.1 Activities for improved CLIMAT report availability

High quality was generally seen in CLIMAT reports from Members in JMA's area of responsibility. Monthly mean temperatures and monthly total precipitation amounts derived from CLIMAT reports are available on JMA's website (ClimatView)¹.

2.2 Training

Selected NMHS staff are invited to JMA's Group Training Course for Reinforcement of Meteorological Services (*) annually. The 11 attendees on the 2021 course learned about CLIMAT reports and the activities of the CBS Lead Centre for GCOS online.

* The course is organized by the Japan International Cooperation Agency (JICA) and JMA.

3 2021 BUFR CLIMAT reports

Transition from TAC to BUFR format for CLIMAT reports remains ongoing worldwide. The results of JMA's analysis regarding the current BUFR CLIMAT situation for its own area of responsibility is summarized below.

3.1 2021 BUFR CLIMAT availability

Figure 1 shows percentages of CLIMAT reports in BUFR format per station for 2021 as per the GSN Monitoring Centre website². Details for JMA's area of responsibility are given in Table 2.

Most CLIMAT reports in JMA's area of responsibility were transmitted in dual BUFR/TAC format, with provision rates varying by country. A high percentage of BUFR CLIMAT reports are received from China, Japan, the Philippines, the Republic of Korea, Singapore and Thailand, while less than half are received from Myanmar and Vietnam. No BUFR CLIMAT reports were received from Brunei, Cambodia, Lao PDR, Malaysia or Mongolia in 2021.

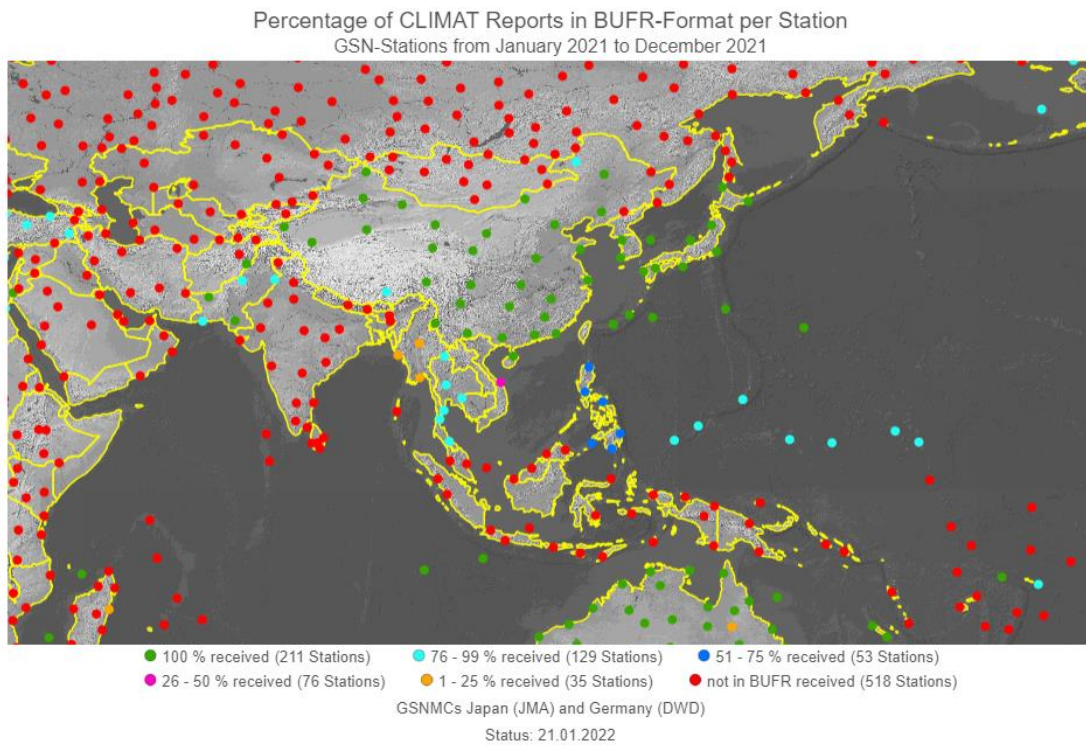
¹ <https://www.data.jma.go.jp/tcc/tcc/products/climate/climatview/frame.php>

² GSNMC - Global Climate Observing System Surface Network Monitoring Centre

<https://www.dwd.de/DWD->

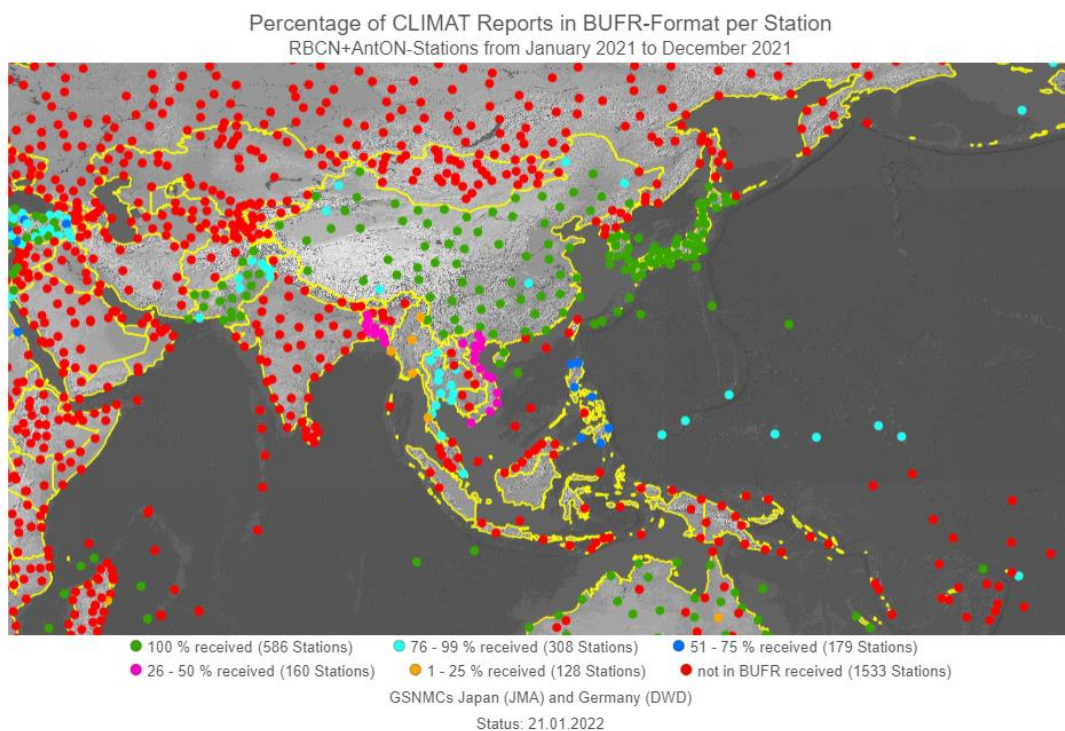
<https://www.dwd.de/DWD->
GCOS/EN/nationalcontributions/servicesforgcos/centresforqualityassurance/gsmnc/gsmnc_monitoring_produkte/gsmnc_monitoring_produkte_node.html

(a)



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(b)



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Figure 1 Percentage of CLIMAT reports in BUFR format for (a) GSN stations and (b) RBCN stations in 2021

Map based on CLIMAT reports received by DWD and JMA

Table 2 Summary of 2021 CLIMAT report formats in JMA’s area of responsibility

Country	Format	Remarks on BUFR CLIMAT in comparison with TAC CLIMAT
Brunei	TAC	—
Cambodia	—	No CLIMAT reports in 2021
China	BUFR	— (BUFR only)
Japan	TAC & BUFR	Generally OK
Lao PDR	TAC	—
Malaysia	TAC	—
Mongolia	TAC	—
Myanmar	TAC & BUFR	Transmission of BUFR CLIMAT report only in November 2021
Philippines	TAC & BUFR	Quality issues
Republic of Korea	TAC & BUFR	Generally OK
Singapore	TAC & BUFR	Generally OK
Thailand	TAC & BUFR	Generally OK
Vietnam	TAC & BUFR	Quality issues

To assess BUFR CLIMAT report quality, BUFR and TAC CLIMAT reports received by JMA were compared. It should be noted that the results outlined below are preliminary, and discrepancies may be attributable to errors on JMA’s part.

Comparison showed that BUFR CLIMAT reports in JMA’s area of responsibility were generally appropriate. However, closer analysis revealed differences as described below. Examples of BUFR-TAC differences are shown in Table 3.

- Philippines
 - Different values between BUFR CLIMAT and TAC reports
 - ✧ Monthly mean air pressure at sea level at station 98755 in June
 - ✧ Mean monthly temperature at station 98644 in July and November (Table 3 (1))
 - Values in TAC reports missing in BUFR CLIMAT reports
 - ✧ Mean daily minimum temperature at station 98755 in June
 - ✧ Mean daily partial vapor pressure at station 98644 in November (Table 3 (1))
- Vietnam
 - Different values between BUFR CLIMAT and TAC reports
 - ✧ Sunshine duration at station 48845 in January
 - ✧ Precipitation and associated quintile at station 48914 in January
 - ✧ Mean daily minimum temperature at station 48917 in January
 - ✧ Mean daily minimum temperature at station 48848 in May
 - ✧ Precipitation, associated quintile, and number of days with

- precipitation exceeding 1.0 mm at station 48914 in May and September
 - ✧ Precipitation at station 48914 in August and November
 - ✧ Precipitation at station 48848 in September
 - ✧ Number of days with precipitation exceeding 1.0 mm at station 48852 in September
 - ✧ Mean daily maximum and minimum temperature at station 48826 in October
 - ✧ Mean monthly temperature at station 48848 in October
 - ✧ Mean monthly air pressure at station level at station 48808 in November
- Values in TAC reports missing in BUFR CLIMAT reports
 - ✧ Monthly mean air pressure at sea level at station 48877 in January
 - ✧ Precipitation and number of days with precipitation exceeding 1.0 mm at station 48917 in May and November
 - ✧ Monthly mean air pressure at sea level at station at 48808 in November
- Values in BUFR CLIMAT reports missing in TAC reports
 - ✧ Sunshine duration at station 48806 in January
 - ✧ Quintile associated with precipitation and number of days with precipitation exceeding 1.0 mm at station 48848 in January (Table 3 (2)) and May
 - ✧ Mean daily minimum temperature at station 48806 in August
 - ✧ Mean daily minimum temperature and sunshine duration at station 48830 in August
 - ✧ Quintile associated with precipitation and number of days with precipitation exceeding 1.0 mm at station 48870 in August
 - ✧ Sunshine duration at station 48917 in August
 - ✧ Quintile associated with precipitation at station 48848 and 48852 in September
 - ✧ Sunshine duration at station 48870 in September
 - ✧ Sunshine duration at station 48848 in October
 - ✧ Sunshine duration at station 48830 in November
- Plus-minus errors
 - ✧ Mean daily minimum temperature at station 48848 in January (Table 3 (2)).

Table 3 BUFR/TAC CLIMAT report comparison

The table shows BUFR and TAC CLIMAT report data in parallel for comparison, with differences highlighted in green.

(1) Philippines CLIMAT report for November 2021

Partial vapor pressure was recorded in TAC CLIMAT report but was missing in BUFR report. Monthly mean temperature differed between BUFR and TAC CLIMAT reports. Comparison to normal values suggests that those in BUFR report were erroneous.

station ID	station name	country name	Pressure		SLP		Tmean		Tmax		Tmin		Vapour Pressure		Precip		Quin		Prec Day		Sun duration		Sun ratio	
			TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR
98644	TAGBILARAN	PHILIPPINES	53	53	82	82	280	1660	315	315	245	245	317	///	121	121	2	2	14	14	///	///	///	///

(2) Vietnam CLIMAT report for January 2021

The minimum temperature was 18.1°C in TAC CLIMAT report and -18.1°C in BUFR report. Comparison to normal values suggests that those in BUFR report were erroneous.

station ID	station name	country name	Pressure		SLP		Tmean		Tmax		Tmin		Vapour Pressure		Precip		Quin		Prec Day		Sun duration		Sun ratio	
			TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR	TAC	BUFR
48848	DONG HOI	VIETNAM	179	179	187	187	200	200	229	229	181	1181	169	169	37	37	/	4	//	8	66	66	65	65