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OBSERVATION REPORT

**NCMRWF
MONTHLY DATA
MONITORING REPORT**

March 2024

* Permission to quote from this report should be obtained from Head, NCMRWF.

**National Centre for Medium Range Weather Forecasting
Ministry of Earth Sciences, Government of India
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1. INTRODUCTION

As a monthly publication, the NCMRWF Data Monitoring Report presents a general view of the data availability for the whole month. Data produced by the Global Observation System, transmitted through the Global Telecommunication System (GTS) are received by the India Meteorological Department (IMD) at New Delhi is relayed to the NCMRWF data processing system. This report consists of the results of monitoring of all the data received at NCMRWF within the global data assimilation cycle cut-off period (~4 hours). Besides quantity monitoring, the report also presents results of quality monitoring for the Indian sub-continent (blocks 42 and 43) RSRW Data.

Objective monitoring of the quality of the data (for blocks 42 and 43 only) is undertaken by NCMRWF as a monthly activity. Tables are prepared following the Commission for Basic System (CBS) recommended format so that the monitoring results can be readily compared with those from other meteorological centers. This is an important task, because frequent comparisons of this kind are absolutely necessary for the improvement of the quality of the Tropical data.

Following the established procedure at other major weather forecasting centers, the first guesses produced by the Global Data Assimilation System (GDAS) (NGFS) have been used in determining data quality. This approach assumes a very accurate first guess, which is not necessarily valid in data sparse regions like the tropics and also due to the model systematic errors. As a result the quality monitoring of tropical data is a difficult task and any judgement has to be arrived carefully.

Comments and Suggestions are welcome and should be send to:
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2. NCMRWF MONITORING STATISTICS

Availability (global) and data quality (for WMO blocks 42 and 43 only) are presented in figures and tables, of which only a brief descriptions are given below.

Data Availability (Monthly average of Global Observations)

Figures 1.1 - 1.7 are global charts for all seven types of observations, received at NCMRWF. Each number is the average for 24 hours, over all observations of the particular type received in a 5-degree box.

Figure	Observation Type	Parameter	Level/Layer
1.1	SYNOP/SHIP	MSL Pressure	Surface
1.2	TEMP	Geo-potential	500 hPa
1.3	TEMP/PILOT	Wind	300 hPa
1.4	AIRCRAFT	Wind	300 to 150 hPa
1.5	Satellite Sounding	Radiance	All
1.6	Atmospheric Motion Vector Wind		400-150 hPa 1000-700 hPa
1.7	BUOY	MSL Pressure	Surface

The monthly mean observed satellite wind (low (700 - 1000 hPa) and (high (150 - 400)) and the wind bias (observation - first guess) are shown in figures 2.1, 2.2, 2.3 and 2.4.

Data Availability (Number of Daily Reports)

Figures 3.1 - 3.7 are bar diagrams for all seven types of observations received at NCMRWF. Each figure represents number of observations of the particular type for each of the month.

Figure	Observation Type
3.1	SYNOP
3.2	TEMP
3.3	PILOT
3.4	AIRCRAFT
3.5	Satellite Radiance
3.6	AMV Wind
3.7	BUOY

3. EXPLANATORY NOTE ON TABLES AND FIGURES

General

The material presented in this report is based on the data received by the IMD and relayed to NCMRWF. Analysis is performed for all the four synoptic hours (0000, 0006, 0012 and 0018 z) and, therefore the assimilation cycle of NGFS is run four times to produce the first-guess (six hour forecast) for the analysis step.

Data Availability

The average number of reports of each type received per day in a 5-degree square box and rounded off to the nearest integer is indicated for the whole globe (Figures 1.1 - 1.7). Four such numbers are actually displayed inside a 10-degree box for convenience. The integer 0 means that the average number of observations in the smaller box was less than 0.5. If no observations was received at all in the smaller box, then no number is printed for that smaller box.

Bar diagrams for the number of daily reports of a particular type received at NCMRWF are shown in Figures 3.1 to 3.7. This is important in monitoring the steadiness of the reception rate. It can be seen that on some days the number of reports received fall off drastically. In most of the cases they are traced to computer problems at the data reception centre.

Monitoring of Global Radiosonde Reports (Land) is based on the results of quality control steps within NGFS data assimilation cycle.

Table 1 presents the total number of land radiosonde reports received for the month (0000 and 0012 z) (WMO blocks 42 and 43), the number of hydrostatic errors detected in these reports by the CQC and the percent of corrections performed that are confident corrections.

Indian Data Frequency

Table 2 shows the number of times an upper air station within WMO blocks 42 or 43 reported in this month. The lists of stations are in accordance with the latest WMO directory. The numbers for 0000, 0006, 0012, and 0018 z are listed in separate columns. All stations that are expected to report are listed including those stations, which never report even once during the whole month. It is seen that there are variations in reporting frequencies.

Indian Data Quality

Tables 3-10 represent the results of quality monitoring statistics carried out at NCMRWF for the upper air stations under the WMO blocks 42 and 43 only. The conventional procedure is followed, which is that of first computing the normalized magnitude of the observation minus first guess interpolated to the observation point (the residual) and then comparing this value against a preset limit as well as checking the consistency of this value against similar values in the neighbourhood. The rationale of this approach is based on the work of A. Hollingsworth et al., Monthly Weather Review, Vol.114, No.5, May 1986, where the authors demonstrated the ability of modern data assimilation system to monitor the quality of an observational network. However, in the tropics these results have to be accepted with caution for two reasons:

- (1) As mentioned before, the above procedure assumed high quality first guess which is not guaranteed in data sparse area like the tropics.
- (2) Since small scale features like convection play a dominant role in the tropical atmosphere, sometimes there might be mismatch between this scale and that of the first guess which is determined by the forecast model.

Tables 3a and 3b present the number of observations received (count), rejection by the analysis (in percentage), standard deviation, total bias and root mean square error for the 100 hPa geopotential heights for 0000 and 0012 z respectively in units of meter. Tables 4a and 4b are the similar tables for 500 hPa geopotential heights. Tables 5a and 5b present similar results for 100 hPa dry temperatures and tables 6a and 6b present similar results for 500 hPa dry temperatures in units of kelvin. Tables 7a and 7b show similar results for 100 hPa zonal winds, and tables 8a and 8b similar results for 500 hPa zonal winds in units of m/s. Tables 9a and 9b show similar results for 100 hPa meridional winds and tables 10a 10b present similar results for 500 hPa meridional winds in units of m/s.

42809	CALCUTTA/DMDM	31 31	1 25	31 31	0 27
42867	NAGPUR SONEGN	31 31	1 30	26 26	0 30
42874	RAIPUR	30 27	0 0	31 31	0 0
42886	JHARSUGUDA	30 30	1 1	30 31	0 30
42895	BALASORE	1 30	1 1	0 27	0 30
42909	VERAVAL	1 30	1 1	0 27	0 30
42971	BHUBANESWAR	31 31	1 27	0 27	0 30
43003	BOMBAY/SANTCR	31 30	1 31	31 31	0 29
43014	AURNGABAD/AER	30 30	0 30	0 0	0 0
43041	JAGDALPUR	31 29	1 30	31 31	0 27
43049	GOPALPUR	22 22	1 1	0 27	0 29
43063	POONA	29 29	0 0	31 31	0 0
43110	RATNAGIRI	0 0	0 0	0 1	0 0
43128	HYDERABAD AER	31 31	31 31	31 31	31 31
43150	VISHAKHAPATNM	29 30	3 27	0 9	15 16
43185	MACHILIPATNAM	31 31	1 30	31 30	0 29
43192	GOA/PANJIM	0 0	0 0	0 0	0 0
43194	GOA/DABOLIM	0 0	0 0	0 0	0 0
43201	GADAG	28 28	1 1	29 29	29 29
43237	ANANTAPUR	0 0	0 0	0 0	0 0
43279	MADRAS/MINAMB	19 19	1 26	16 18	0 26
43284	MANG/BAJPE	0 0	0 0	0 0	0 0
43285	MANG/PANAMBUR	18 31	1 1	0 0	0 26
43295	BANGALORE	27 23	6 9	7 30	8 8
43311	AMINI DIVI	18 19	0 0	20 20	0 0
43333	PORT BLAIR	22 28	0 13	22 29	0 0
43344	TIRUCHIRAPLLI	0 0	0 0	0 0	0 0
43346	KARAIKAL	28 30	24 31	27 27	0 27
43353	COCHIN/WILING	30 30	0 0	25 25	0 0
43368	CAR NICOBAR	0 0	0 0	0 0	0 0
43369	MINICOY	31 31	1 10	29 29	0 8
43371	TRIVANDRUM	1 19	1 22	0 24	0 15
43373	TRIVANDRUM/TH	0 0	0 0	0 0	0 0

TABLE 3a: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
100 hPa GEOPOTENTIAL HEIGHT INCREMENTS - 01032024 to 31032024 (00Z)
UNIT IS GEOPOTENTIAL METERS

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	18	72	911.2	-610.5	1096.8
42101	8	25	108.8	-72.2	130.6
42111	25	0	22.4	-0.6	22.4
42182	30	0	13.6	-4.6	14.3
42314	21	4	46.0	49.8	67.8
42339	30	3	18.2	19.7	26.8
42348	26	7	56.7	45.8	72.9
42361	30	3	31.8	3.7	32.0
42369	16	0	16.8	-3.4	17.1
42379	1	100	0.0	-16.0	16.0
42399	26	0	950.6	-176.4	966.8
42410	19	10	96.2	68.7	118.2
42492	27	3	14.7	-0.5	14.8
42634	23	4	183.6	36.5	187.2
42647	30	6	20.3	-5.5	21.0
42667	10	0	14.0	8.4	16.4
42675	1	100	0.0	-16.0	16.0
42701	28	7	84.9	2.4	84.9
42724	29	0	26.4	21.1	33.8
42809	30	0	15.8	-10.4	18.9
42867	31	3	10.8	3.1	11.2
42874	26	3	66.3	37.7	76.3
42886	27	0	171.2	46.6	177.4
42971	30	3	13.6	14.0	19.5
43003	29	6	149.1	-23.0	150.9
43014	30	3	113.7	-20.6	115.5
43041	29	6	35.0	36.3	50.4
43049	22	4	18.5	21.3	28.2
43063	28	17	116.6	-67.9	134.9
43128	25	4	31.3	25.9	40.6
43150	29	0	12.2	2.1	12.4
43185	29	3	12.9	0.4	12.9
43279	19	5	18.6	18.6	26.3
43285	29	0	15.1	13.4	20.2
43295	17	17	318.5	149.6	351.9
43333	21	0	8.7	2.9	9.2
43346	21	4	16.4	21.3	26.9
43353	30	0	11.5	20.8	23.8
43369	1	100	0.0	-16.0	16.0
43371	1	100	0.0	-16.0	16.0

TABLE 3b: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
100 hPa GEOPOTENTIAL HEIGHT INCREMENTS - 01032024 to 31032024 (12Z)
UNIT IS GEOPOTENTIAL METERS

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	25	0	14.9	50.4	52.6
42056	29	0	24.0	58.6	63.3
42182	30	0	25.7	43.1	50.1
42339	31	3	27.7	88.9	93.1
42348	29	10	195.7	77.6	210.5
42361	21	0	21.8	42.5	47.7
42410	22	0	28.2	66.1	71.9
42647	30	0	35.0	41.8	54.5
42809	31	0	19.3	-1.4	19.3
42867	26	0	14.0	46.5	48.6
42874	24	4	122.2	42.7	129.4
42886	30	0	132.6	61.3	146.1
43003	28	3	42.5	38.8	57.5
43041	28	3	22.8	70.5	74.1
43063	30	0	32.8	48.6	58.6
43128	29	24	63.3	94.2	113.5
43185	29	3	231.8	92.8	249.7
43279	17	0	20.6	55.2	58.9
43333	22	0	12.1	1.5	12.2
43346	15	6	34.6	72.1	80.0
43353	25	0	18.2	63.7	66.3

TABLE 4a: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
500 hPa GEOPOTENTIAL HEIGHT INCREMENTS - 01032024 to 31032024 (00Z)
UNIT IS GEOPOTENTIAL METERS

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	21	57	289.7	-177.5	339.8
42056	1	0	0.0	-0.6	0.6
42101	16	0	47.1	-16.2	49.8
42111	25	0	8.2	-11.0	13.7
42182	30	0	7.3	-6.1	9.5
42314	24	0	11.0	0.0	11.0
42339	31	0	18.3	19.1	26.4
42348	30	3	65.1	55.9	85.8
42361	31	0	8.4	-2.8	8.8
42369	19	0	6.9	-8.2	10.8
42399	28	0	16.5	-0.1	16.5
42410	30	13	39.4	29.4	49.2
42492	29	0	9.4	1.0	9.5
42623	22	22	177.4	85.6	197.0
42634	26	0	9.3	-3.9	10.1
42647	30	0	8.8	0.9	8.9
42667	13	7	34.4	23.4	41.6
42675	1	0	0.0	-8.0	8.0
42701	28	3	97.8	-2.7	97.8
42724	29	3	25.0	13.8	28.6
42809	31	0	7.5	-4.0	8.5
42867	31	0	8.2	8.3	11.7
42874	29	0	18.2	20.8	27.6
42886	29	0	8.5	3.8	9.3
42971	30	0	9.0	20.3	22.2
43003	30	0	8.1	0.7	8.2
43014	30	3	36.7	-5.1	37.0
43041	29	3	40.2	33.7	52.5
43049	21	0	18.3	21.5	28.3
43063	30	20	39.2	-21.4	44.7
43128	30	6	28.8	15.8	32.8
43150	29	0	6.1	8.9	10.8
43185	30	3	9.7	-0.5	9.8
43279	18	0	5.4	13.2	14.3
43285	29	0	16.0	19.5	25.2
43295	18	16	202.3	108.2	229.4
43333	21	0	4.9	1.5	5.1
43346	20	0	14.9	15.4	21.4
43353	30	0	5.6	21.7	22.4
43369	15	20	92.8	62.1	111.6

TABLE 4b: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
500 hPa GEOPOTENTIAL HEIGHT INCREMENTS - 01032024 to 31032024 (12Z)
UNIT IS GEOPOTENTIAL METERS

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	26	0	5.5	28.9	29.4
42056	29	0	23.0	27.0	35.5
42182	31	0	11.2	6.7	13.0
42339	31	3	24.1	46.1	52.0
42348	30	13	18.3	65.7	68.2
42361	21	0	6.0	4.4	7.5
42410	28	3	24.8	44.5	51.0
42647	31	3	18.3	7.8	19.9
42809	31	0	8.7	0.6	8.8
42867	26	0	8.3	18.3	20.1
42874	27	3	27.2	40.2	48.5
42886	30	0	8.6	9.3	12.7
43003	29	0	10.2	5.9	11.8
43041	31	0	27.6	48.3	55.6
43063	30	0	10.6	11.5	15.7
43128	30	23	81.5	66.8	105.4
43185	31	0	11.1	13.1	17.2
43279	18	0	6.8	18.6	19.8
43333	22	0	4.9	4.5	6.6
43346	17	5	26.6	37.4	45.9
43353	25	0	6.7	33.2	33.8

TABLE 5a: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
100 hPa DRY TEMPERATURE INCREMENTS - 01032024 to 31032024 (00Z)
UNIT IS DEGREE KELVIN

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	19	68	12.0	2.4	12.2
42056	1	0	0.0	83.0	83.0
42101	8	25	0.9	-1.1	1.4
42111	25	0	3.1	0.8	3.2
42182	30	0	1.3	-0.8	1.5
42314	21	4	2.2	1.6	2.8
42339	30	0	23.2	4.5	23.6
42348	26	3	16.3	2.9	16.5
42361	30	0	5.1	0.2	5.1
42369	15	0	1.8	-0.1	1.8
42399	26	0	12.7	3.0	13.1
42410	20	10	15.4	4.1	15.9
42492	27	3	1.8	0.4	1.9
42634	23	4	10.3	2.1	10.5
42647	30	3	7.4	0.9	7.4
42667	11	9	1.4	-0.4	1.4
42701	26	7	1.6	0.5	1.7
42724	29	0	1.5	0.6	1.6
42809	31	0	6.1	1.7	6.3
42867	31	0	11.0	2.1	11.2
42874	27	3	11.8	2.5	12.0
42886	28	0	9.1	3.2	9.7
42971	29	0	1.5	-1.0	1.8
43003	29	3	14.9	2.1	15.0
43014	30	3	1.2	-0.5	1.3
43041	29	3	17.7	3.6	18.1
43049	21	0	1.2	0.3	1.2
43063	29	17	7.2	0.9	7.2
43128	26	3	25.7	5.6	26.3
43150	29	0	1.1	-0.6	1.3
43185	29	0	10.7	1.6	10.8
43279	18	0	1.3	-0.8	1.5
43285	30	0	0.9	-0.5	1.1
43295	17	17	12.7	3.0	13.0
43333	21	0	1.0	-0.8	1.3
43346	20	0	1.1	-0.3	1.1
43353	30	0	1.0	-0.3	1.0

TABLE 5b: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
100 hPa DRY TEMPERATURE INCREMENTS - 01032024 to 31032024 (12Z)
UNIT IS DEGREE KELVIN

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	25	0	1.4	0.3	1.4
42056	29	0	0.9	0.9	1.3
42182	30	0	1.2	0.8	1.4
42339	31	3	1.3	0.9	1.6
42348	29	10	14.9	3.8	15.4
42361	21	0	0.9	0.9	1.3
42410	22	0	1.4	0.5	1.5
42647	30	0	1.3	0.5	1.4
42809	31	0	1.0	0.2	1.0
42867	26	0	1.2	0.7	1.5
42874	24	4	16.7	4.1	17.2
42886	30	3	5.0	1.2	5.1
43003	28	3	1.3	0.9	1.6
43041	28	3	1.0	0.7	1.2
43063	30	0	0.9	1.4	1.7
43128	29	24	1.1	0.9	1.4
43185	29	3	11.6	3.3	12.0
43279	17	0	1.5	0.2	1.6
43333	22	0	1.3	-0.0	1.3
43346	15	6	2.1	0.9	2.3
43353	25	0	1.3	0.9	1.5

TABLE 6a: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
500 hPa DRY TEMPERATURE INCREMENTS - 01032024 to 31032024 (00Z)
UNIT IS DEGREE KELVIN

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	21	57	19.2	-10.2	21.7
42056	1	0	0.0	25.0	25.0
42101	16	0	0.8	0.0	0.8
42111	25	0	0.6	-0.1	0.6
42182	31	0	2.9	0.5	3.0
42314	24	0	1.5	0.3	1.5
42339	31	0	4.9	0.4	4.9
42348	30	3	11.4	1.1	11.4
42361	31	0	0.7	-0.3	0.8
42369	19	0	0.8	-0.3	0.9
42399	28	0	1.2	0.1	1.2
42410	30	13	10.6	2.0	10.8
42492	29	0	0.8	0.1	0.8
42623	22	22	10.0	2.1	10.2
42634	26	0	0.9	-0.3	0.9
42647	30	0	3.0	0.3	3.0
42667	13	7	0.7	0.1	0.7
42675	1	0	0.0	0.5	0.5
42701	28	3	0.9	-0.1	0.9
42724	29	0	0.9	-0.2	0.9
42809	31	0	2.6	-0.3	2.6
42867	31	0	5.1	0.6	5.1
42874	29	0	6.6	0.6	6.6
42886	29	0	2.2	-0.1	2.2
42971	30	0	0.8	-0.5	0.9
43003	30	0	2.1	-0.3	2.2
43014	30	3	2.4	-0.8	2.5
43041	29	3	15.2	2.5	15.4
43049	21	0	0.8	-0.6	1.0
43063	30	20	3.0	-1.4	3.3
43128	30	3	19.6	3.3	19.9
43150	29	0	0.8	-0.3	0.9
43185	30	3	2.8	0.1	2.8
43279	18	0	0.7	-0.5	0.8
43285	28	0	0.5	-0.5	0.7
43295	18	16	1.4	-1.1	1.8
43333	21	0	0.4	-0.4	0.6
43346	20	0	0.5	-0.2	0.5
43353	30	0	0.7	-0.3	0.8
43369	15	20	4.1	0.9	4.2

TABLE 6b: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
500 hPa DRY TEMPERATURE INCREMENTS - 01032024 to 31032024 (12Z)
UNIT IS DEGREE KELVIN

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	26	0	1.0	-0.6	1.2
42056	29	0	0.7	-0.2	0.7
42182	31	0	0.7	0.2	0.7
42339	31	3	0.7	-0.0	0.7
42348	30	13	0.7	0.1	0.7
42361	21	0	0.6	-0.3	0.6
42410	28	3	0.9	-0.1	0.9
42647	31	3	0.8	0.1	0.8
42809	31	0	0.9	-0.5	1.0
42867	26	0	0.8	0.1	0.8
42874	27	0	0.8	0.4	0.9
42886	30	0	0.8	0.2	0.8
43003	29	0	0.7	0.0	0.7
43041	31	0	0.8	0.1	0.8
43063	30	0	1.0	-0.4	1.0
43128	30	23	1.4	-0.4	1.5
43185	31	0	0.7	0.2	0.7
43279	18	0	0.6	0.1	0.6
43333	22	0	0.7	-0.4	0.8
43346	17	0	0.8	0.1	0.8
43353	25	0	0.5	0.1	0.5

TABLE 7a: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
100 hPa ZONAL WIND INCREMENTS - 01032024 to 31032024 (00Z)
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	19	0	11.8	-9.7	15.3
42056	1	0	0.0	-0.1	0.1
42101	8	0	2.9	1.6	3.2
42111	25	0	4.4	-0.1	4.4
42182	30	0	4.7	0.7	4.7
42314	21	0	3.8	-0.9	3.9
42339	30	0	4.9	-1.5	5.1
42348	26	0	4.6	-0.8	4.7
42361	30	0	3.7	0.6	3.7
42369	15	0	4.0	0.2	4.0
42399	26	0	4.9	1.1	5.0
42410	20	0	3.4	0.6	3.4
42492	27	0	3.8	-0.9	3.9
42634	23	0	2.9	-0.3	2.9
42647	30	0	2.9	0.4	3.0
42667	11	0	2.7	-7.1	7.6
42701	25	4	5.2	0.2	5.2
42724	29	0	3.4	0.8	3.5
42809	31	3	2.7	0.1	2.7
42867	31	0	2.7	0.7	2.8
42874	27	0	3.4	0.1	3.4
42886	28	0	5.5	1.4	5.7
42971	29	3	3.4	-0.8	3.4
43003	29	0	3.1	0.2	3.1
43014	30	0	3.6	0.8	3.7
43041	29	3	2.7	0.1	2.7
43049	21	0	2.4	0.8	2.5
43063	29	0	3.8	-0.6	3.9
43128	25	4	3.0	0.0	3.0
43150	29	0	3.0	1.1	3.2
43185	29	0	3.0	0.1	3.0
43279	18	0	2.8	-1.1	3.0
43285	30	0	3.1	-0.5	3.1
43295	17	0	2.3	-0.7	2.4
43333	21	0	2.1	0.3	2.1
43346	20	0	3.4	-1.1	3.5
43353	30	0	3.5	-2.7	4.5

TABLE 7b: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
100 hPa ZONAL WIND INCREMENTS - 01032024 to 31032024 (12Z)
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	25	0	3.5	-1.6	3.9
42056	29	0	3.1	0.5	3.2
42182	30	0	4.8	0.4	4.8
42339	31	0	4.8	-0.2	4.8
42348	29	0	4.5	0.6	4.5
42361	21	0	2.9	-0.6	2.9
42410	22	0	3.2	0.4	3.2
42647	30	0	4.4	-0.4	4.4
42809	31	0	3.4	-0.3	3.4
42867	26	0	3.7	-0.1	3.7
42874	24	0	3.4	0.3	3.5
42886	30	0	3.0	1.6	3.4
43003	28	0	3.1	-1.0	3.2
43041	28	0	3.5	0.9	3.7
43063	30	0	3.3	-0.4	3.3
43128	29	0	3.5	0.2	3.5
43185	29	0	3.6	-0.2	3.6
43279	17	0	2.8	0.1	2.8
43333	22	0	2.4	-0.3	2.4
43346	15	0	2.6	-0.4	2.6
43353	25	0	4.1	-3.6	5.5

TABLE 8a: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
500 hPa ZONAL WIND INCREMENTS - 01032024 to 31032024 (00Z)
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	21	0	8.1	4.4	9.2
42056	1	0	0.0	-0.5	0.5
42101	16	0	3.4	0.1	3.4
42111	25	0	2.0	-0.3	2.0
42182	31	0	3.3	1.6	3.7
42314	24	0	5.3	1.1	5.4
42339	31	0	3.4	-0.2	3.4
42348	30	0	2.5	1.1	2.7
42361	31	0	2.5	0.6	2.6
42369	19	0	2.5	0.1	2.5
42399	28	0	3.6	0.1	3.6
42410	30	0	3.2	0.7	3.3
42492	29	0	2.3	1.0	2.5
42623	22	0	2.3	1.1	2.5
42634	26	0	2.1	0.8	2.3
42647	30	0	2.9	1.1	3.1
42667	13	0	2.4	-7.0	7.4
42675	1	0	0.0	4.2	4.2
42701	28	3	3.6	0.7	3.6
42724	29	0	3.1	1.9	3.7
42809	31	0	3.2	1.8	3.7
42867	31	0	2.4	1.1	2.6
42874	29	0	2.1	0.7	2.2
42886	29	0	3.0	0.1	3.0
42971	30	0	2.6	0.5	2.7
43003	30	0	2.2	0.7	2.3
43014	30	0	2.7	1.5	3.1
43041	29	0	1.9	0.9	2.1
43049	21	0	1.7	1.3	2.1
43063	30	0	1.9	1.3	2.3
43128	30	3	2.1	1.0	2.4
43150	29	0	1.9	0.9	2.1
43185	30	0	1.9	0.7	2.0
43279	18	0	2.2	1.2	2.5
43285	29	0	1.2	0.2	1.2
43295	18	0	1.6	0.1	1.6
43333	21	0	2.3	0.2	2.3
43346	20	0	1.8	0.8	1.9
43353	30	0	1.7	1.5	2.2
43369	15	0	2.0	0.7	2.1

TABLE 8b: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
500 hPa ZONAL WIND INCREMENTS - 01032024 to 31032024 (12Z)
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	26	0	4.8	-1.9	5.2
42056	29	0	4.1	0.9	4.2
42182	31	0	2.5	1.0	2.7
42339	31	0	2.5	0.2	2.5
42348	30	0	2.7	0.8	2.8
42361	21	0	2.7	1.3	3.0
42410	28	0	3.7	1.2	3.9
42647	31	0	3.3	1.5	3.7
42809	31	0	2.4	2.1	3.2
42867	26	0	2.1	0.8	2.3
42874	27	0	2.2	0.2	2.3
42886	30	0	1.9	1.1	2.2
43003	29	0	2.8	2.2	3.6
43041	31	0	2.2	0.5	2.3
43063	30	0	1.9	0.8	2.1
43128	30	0	1.9	0.2	1.9
43185	31	0	1.7	0.4	1.7
43279	18	0	1.9	1.6	2.5
43333	22	0	1.8	0.3	1.8
43346	17	5	1.6	-0.2	1.6
43353	25	0	2.5	1.8	3.1

TABLE 9a: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
100 hPa MERIDIONAL WIND INCREMENTS - 01032024 to 31032024 (00Z)
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	19	0	10.3	-3.5	10.9
42056	1	0	0.0	-2.9	2.9
42101	8	0	2.4	5.9	6.4
42111	25	0	7.0	-0.0	7.0
42182	30	0	5.1	0.9	5.2
42314	21	0	3.4	-2.5	4.2
42339	30	0	4.4	1.0	4.5
42348	26	0	5.4	0.5	5.4
42361	30	0	3.5	1.5	3.8
42369	15	0	4.8	0.5	4.8
42399	26	0	4.9	-0.2	4.9
42410	20	0	4.1	-0.9	4.2
42492	27	0	4.1	-2.1	4.6
42634	23	0	5.6	1.3	5.8
42647	30	0	4.9	2.2	5.3
42667	11	0	4.0	-9.4	10.2
42701	25	4	3.3	3.4	4.7
42724	29	0	5.1	-1.5	5.4
42809	31	3	4.1	-0.5	4.1
42867	31	0	4.5	0.1	4.5
42874	27	0	4.5	0.3	4.5
42886	28	0	4.0	0.4	4.0
42971	29	3	3.5	1.3	3.7
43003	29	0	4.0	0.2	4.0
43014	30	0	4.5	1.1	4.6
43041	29	3	4.6	-0.4	4.6
43049	21	0	3.8	0.8	3.9
43063	29	0	3.8	-0.1	3.8
43128	25	0	3.6	0.1	3.6
43150	29	0	4.3	-0.3	4.4
43185	29	0	3.8	1.2	3.9
43279	18	0	3.6	-0.6	3.6
43285	30	0	3.2	0.8	3.3
43295	17	0	3.3	-0.4	3.3
43333	21	0	3.2	-0.5	3.2
43346	20	0	2.5	0.0	2.5
43353	30	0	2.1	0.1	2.1

TABLE 9b: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
100 hPa MERIDIONAL WIND INCREMENTS - 01032024 to 31032024 (12Z)
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	25	0	3.8	-0.2	3.8
42056	29	0	4.6	0.1	4.6
42182	30	0	3.9	0.3	3.9
42339	31	0	4.0	0.8	4.0
42348	29	0	4.0	0.6	4.1
42361	21	0	3.8	-0.9	3.9
42410	22	0	5.4	1.7	5.7
42647	30	0	4.2	0.3	4.2
42809	31	0	2.7	-1.2	3.0
42867	26	0	4.9	-0.3	4.9
42874	24	0	3.8	0.0	3.8
42886	30	0	3.4	1.4	3.7
43003	28	0	4.3	0.7	4.3
43041	28	0	4.1	-1.4	4.4
43063	30	0	5.2	0.6	5.2
43128	29	0	4.6	0.2	4.6
43185	29	0	3.8	0.3	3.8
43279	17	0	2.7	0.4	2.7
43333	22	0	2.9	-1.9	3.4
43346	15	0	3.4	0.2	3.4
43353	25	0	2.1	0.3	2.1

TABLE 10a: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
500 hPa MERIDIONAL WIND INCREMENTS - 01032024 to 31032024 (00Z)
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	21	0	3.9	0.5	3.9
42056	1	0	0.0	2.0	2.0
42101	16	0	2.5	0.6	2.5
42111	25	0	2.3	-0.0	2.3
42182	31	0	2.1	-0.3	2.1
42314	24	0	3.7	-0.7	3.8
42339	31	0	2.5	1.7	3.0
42348	30	0	2.6	0.6	2.7
42361	31	0	2.2	-0.6	2.3
42369	19	0	2.6	-0.9	2.7
42399	28	0	2.7	0.8	2.8
42410	30	0	2.8	-0.4	2.8
42492	29	0	2.4	-0.0	2.4
42623	22	0	2.4	0.1	2.4
42634	26	0	3.1	-0.6	3.1
42647	30	0	2.4	-0.0	2.4
42667	13	0	3.4	-6.3	7.1
42675	1	0	0.0	-6.0	6.0
42701	28	3	2.8	0.5	2.9
42724	29	0	2.6	0.2	2.6
42809	31	0	2.7	0.5	2.8
42867	31	0	2.7	0.5	2.8
42874	29	0	2.9	0.1	2.9
42886	29	0	3.2	0.8	3.3
42971	30	0	3.3	0.3	3.3
43003	30	0	2.9	-0.5	2.9
43014	30	0	2.2	-0.5	2.2
43041	29	0	3.6	-0.8	3.7
43049	21	0	2.3	0.2	2.3
43063	30	0	2.6	-0.6	2.7
43128	30	0	2.2	-0.7	2.3
43150	29	0	2.7	0.1	2.7
43185	30	0	2.3	-0.0	2.3
43279	18	0	2.7	-1.2	3.0
43285	29	0	2.6	-0.4	2.6
43295	18	0	2.5	-0.4	2.5
43333	21	0	1.5	-0.8	1.7
43346	20	0	1.8	-0.4	1.8
43353	30	0	1.5	0.2	1.5
43369	15	0	1.5	-0.2	1.5

TABLE 10b: NCMRWF RADIOSONDE MONITORING STATISTICS
FOR WMO BLOCK 42 AND 43 STATIONS ONLY
500 hPa MERIDIONAL WIND INCREMENTS - 01032024 to 31032024 (12Z)
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	26	0	3.8	0.8	3.9
42056	29	0	2.3	0.1	2.3
42182	31	0	2.7	-0.5	2.7
42339	31	0	2.5	-0.3	2.5
42348	30	0	1.9	-0.1	1.9
42361	21	0	2.6	0.3	2.6
42410	28	0	2.8	0.5	2.8
42647	31	0	2.0	0.0	2.0
42809	31	0	2.0	0.5	2.0
42867	26	0	3.2	0.2	3.2
42874	27	0	2.1	1.0	2.3
42886	30	0	2.4	0.3	2.5
43003	29	0	1.9	-1.3	2.4
43041	31	0	2.9	0.0	2.9
43063	30	0	2.1	-1.6	2.7
43128	30	0	2.3	-0.4	2.4
43185	31	0	2.3	0.3	2.3
43279	18	0	2.4	-1.1	2.7
43333	22	0	1.2	-0.6	1.4
43346	17	5	2.1	-0.7	2.2
43353	25	0	1.7	0.8	1.8

NCMRWF Monitoring Statistics 01 03 24 TO 31 03 24

Availability - SYNOP/SHIP PRESSURE

Average number of observations in 24 hours - 112864

LAND - WMO REGION I: 6458 II:15411 III: 2282 IV: 6112 V:14971 VI:44405 VII: 866

OCEAN - N. Atlantic: 9888 S. Atlantic: 1371 Indian: 2817 Pacific: 7217

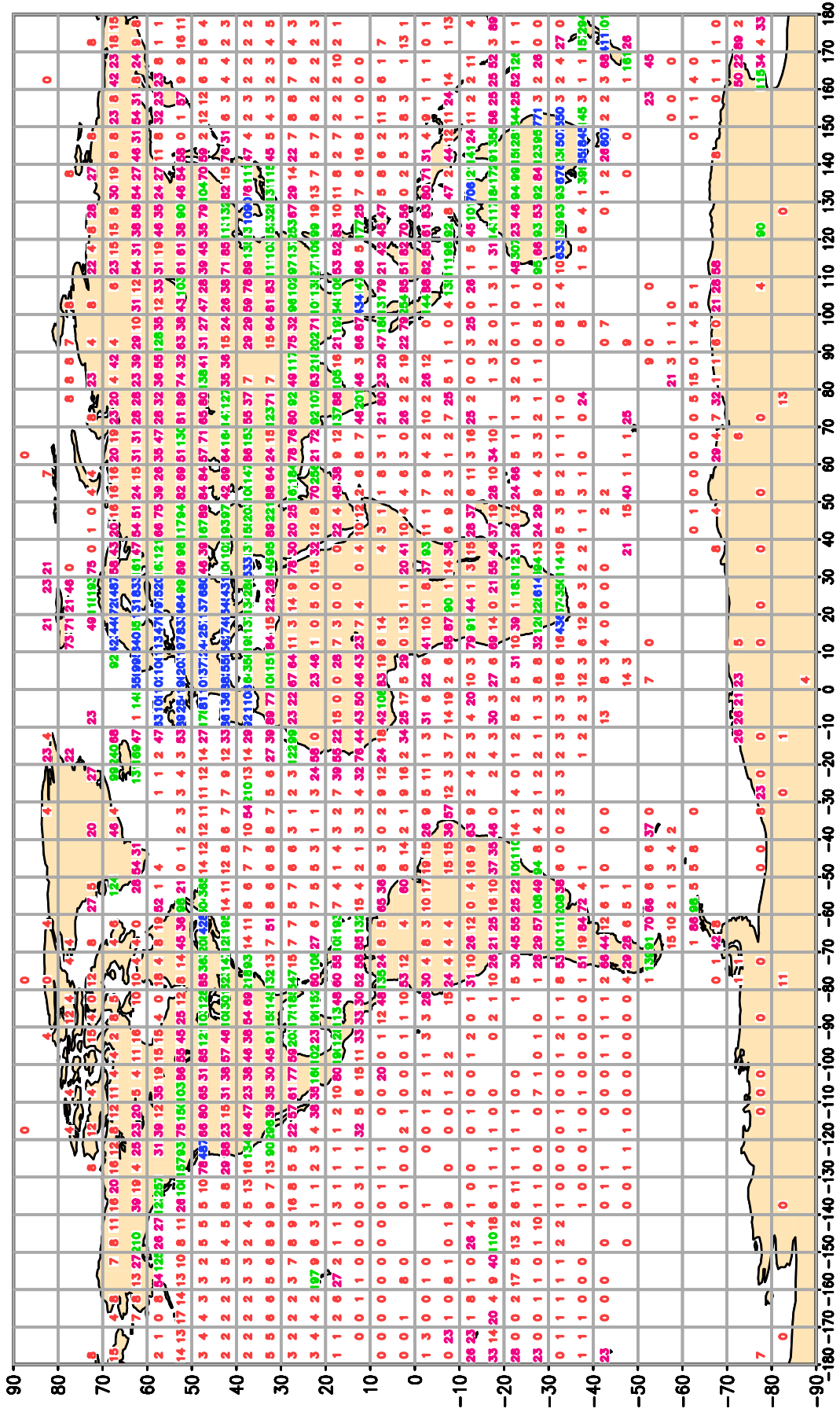


Fig 1.1

NCMRWF Monitoring Statistics 01 03 24 TO 31 03 24

Availability - TEMP 500 hPa geopotential

Average number of observations in 24 hours - 1205

LAND - WMO REGION I: 32 II: 463 III: 71 IV: 240 V: 135 VI: 190 VII: 13

OCEAN - N. Atlantic: 0 S. Atlantic: 0 Indian: 0 Pacific: 0

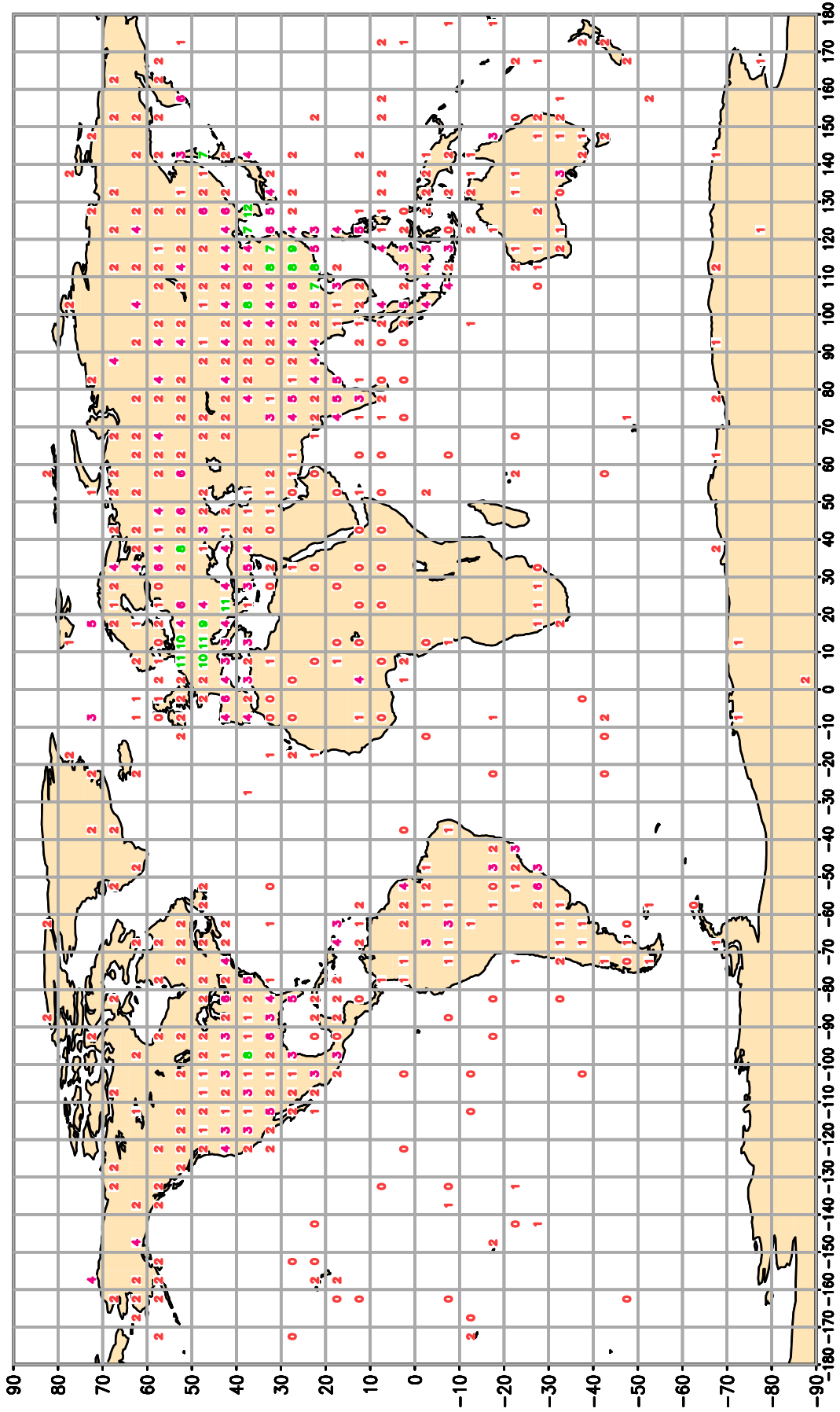


Fig 1.2

NCMRWF Monitoring Statistics 01 03 24 TO 31 03 24

Availability – TEMP/PILOT 300 hPa wind

Average number of observations in 24 hours – 1485

LAND – WMO REGION I: 52 II: 525 III: 87 IV: 339 V: 226 VI: 192 VII: 14

OCEAN – N. Atlantic: 0 S. Atlantic: 0 Indian: 0 Pacific: 0

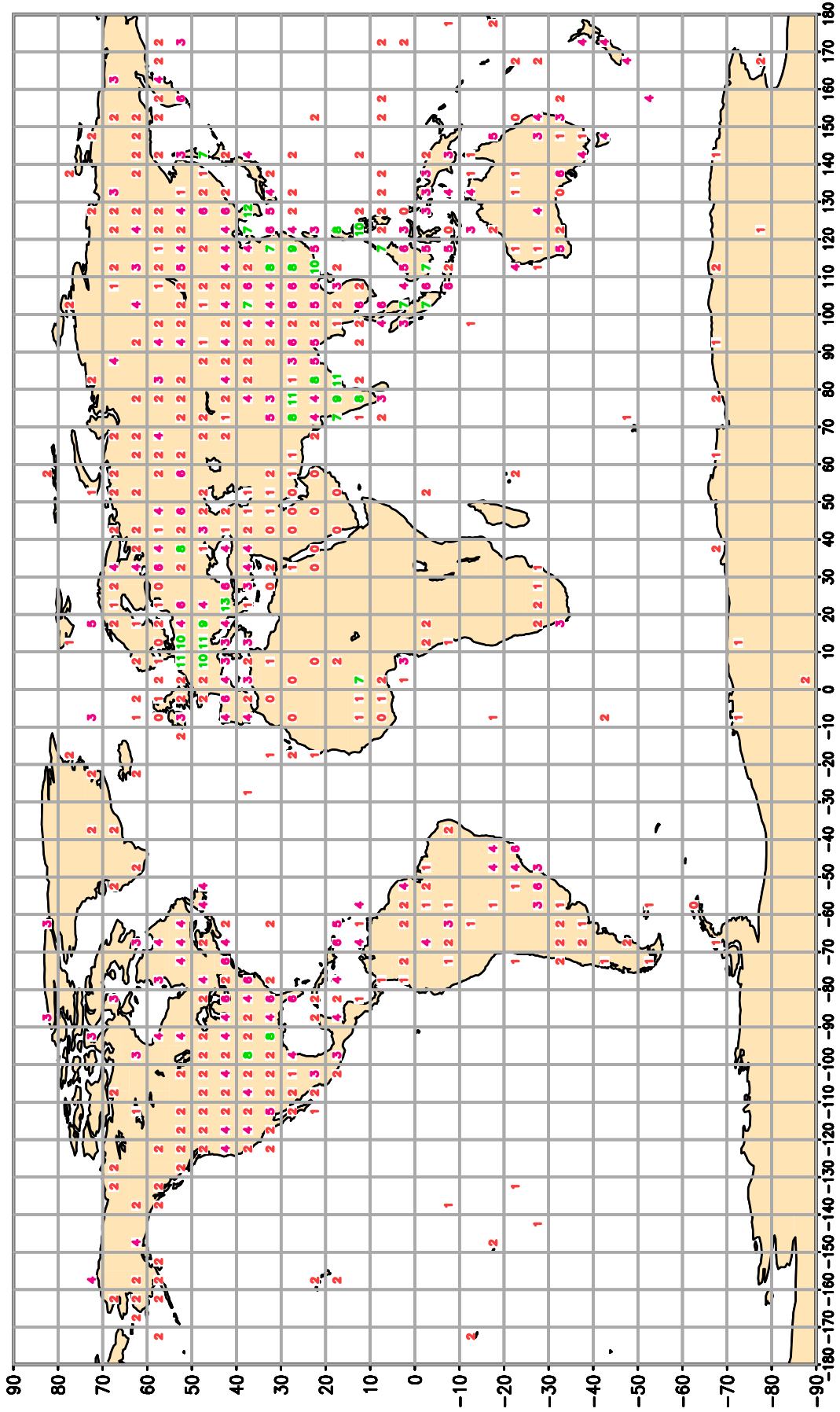


Fig 1.3

NCMRWF Monitoring Statistics 01 03 24 TO 31 03 24

Availability – AIRCRAFT winds 300–150 hPa

Average number of observations in 24 hours – 179404

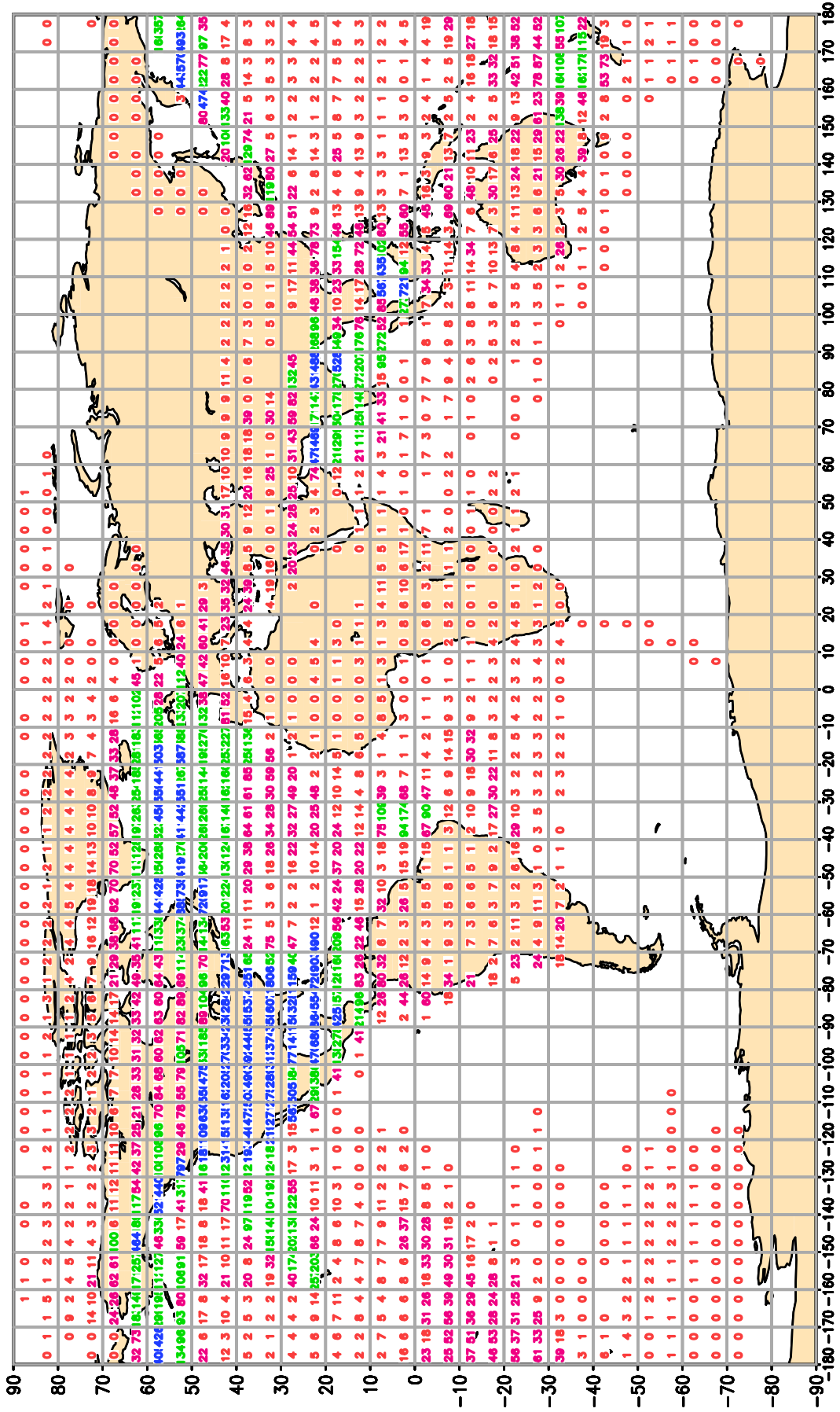


Fig 1.4

NCMRWF Monitoring Statistics 01 03 24 TO 31 03 24

Availability - NOAA 18 ATOVS : AMSU-A

Average number of observations in 24 hours - 197427

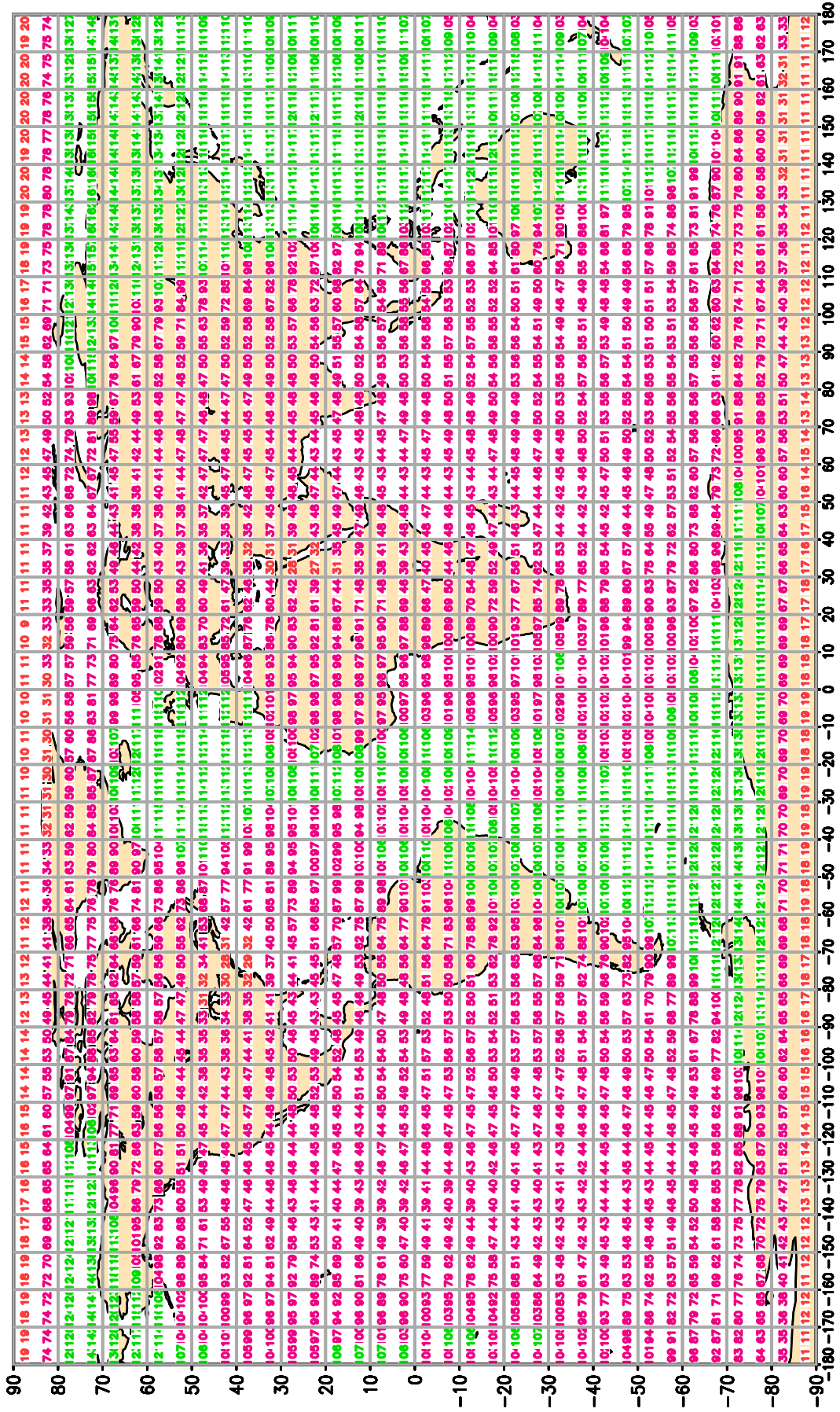


Fig 1.5

NCMRWF Monitoring Statistics 01 03 24 TO 31 03 24

Availability – AMV winds 400–150 hPa

Average number of observations in 24 hours – 536734

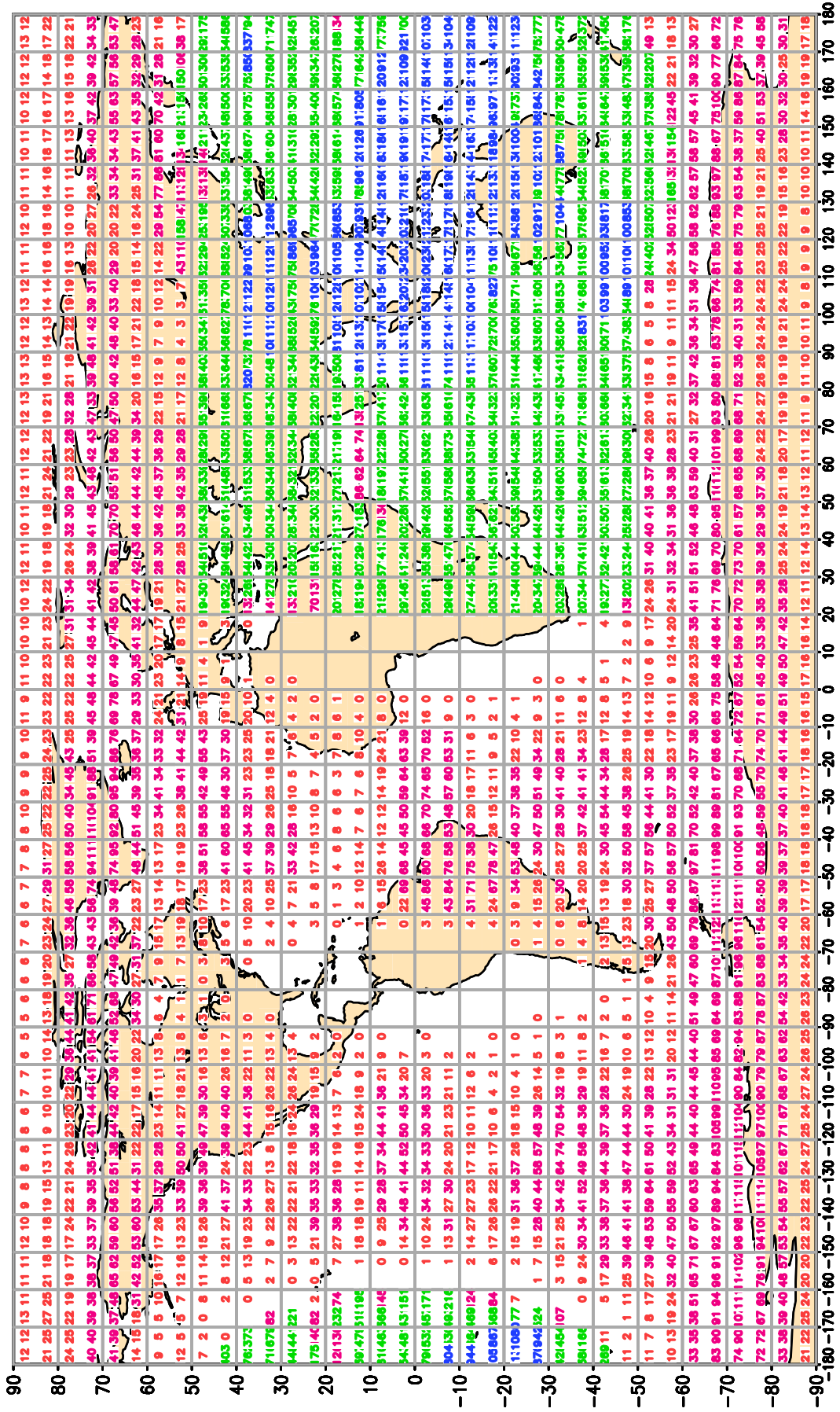


Fig 1.6(a)

NCMRWF Monitoring Statistics 01 03 24 TO 31 03 24

Availability – AMV winds 1000–700 hPa

Average number of observations in 24 hours – 396289

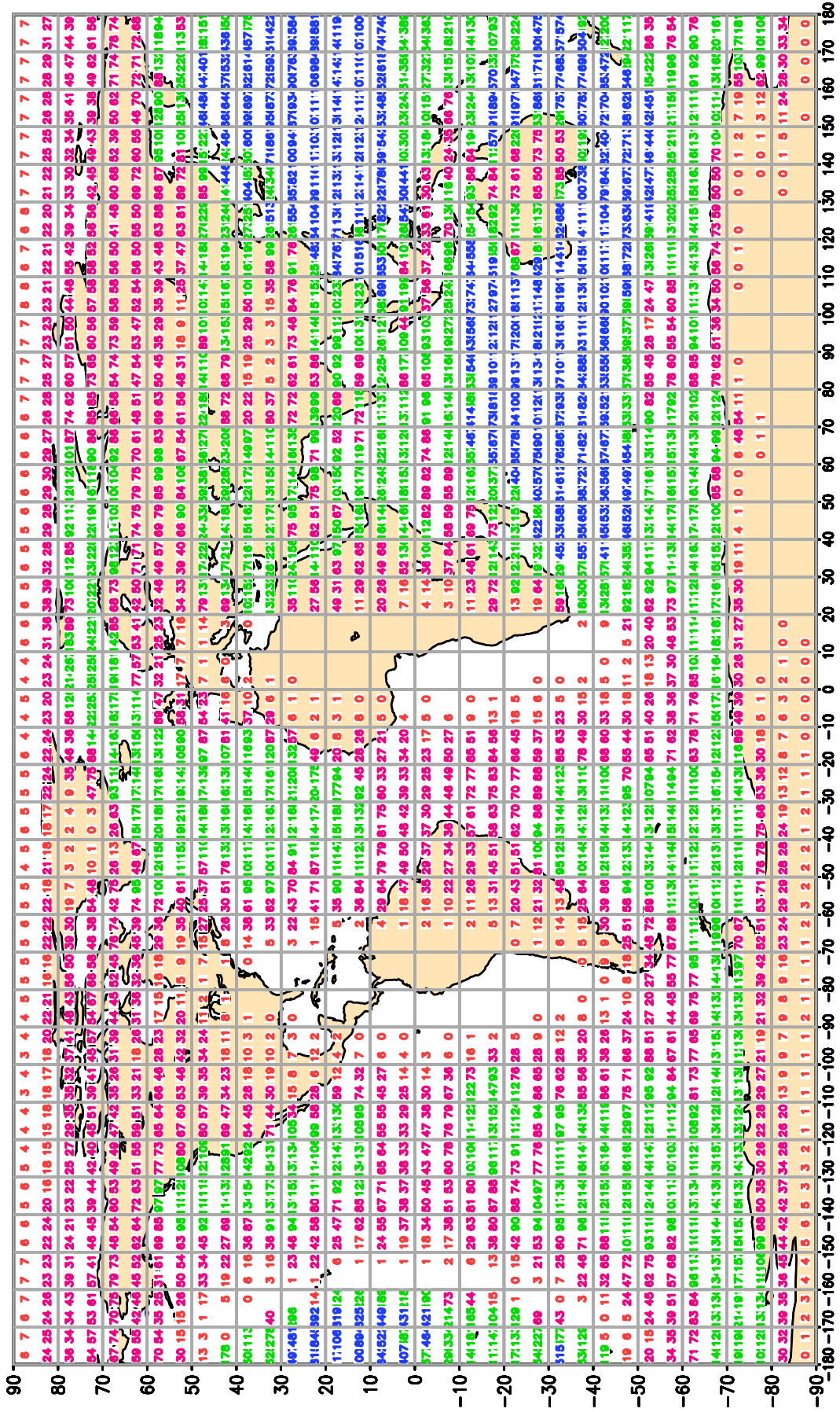


Fig 1.6(b)

NCMRWF Monitoring Statistics: March 2024

AMV WINDS: 700 - 1000 hPa

Mean Observed Wind

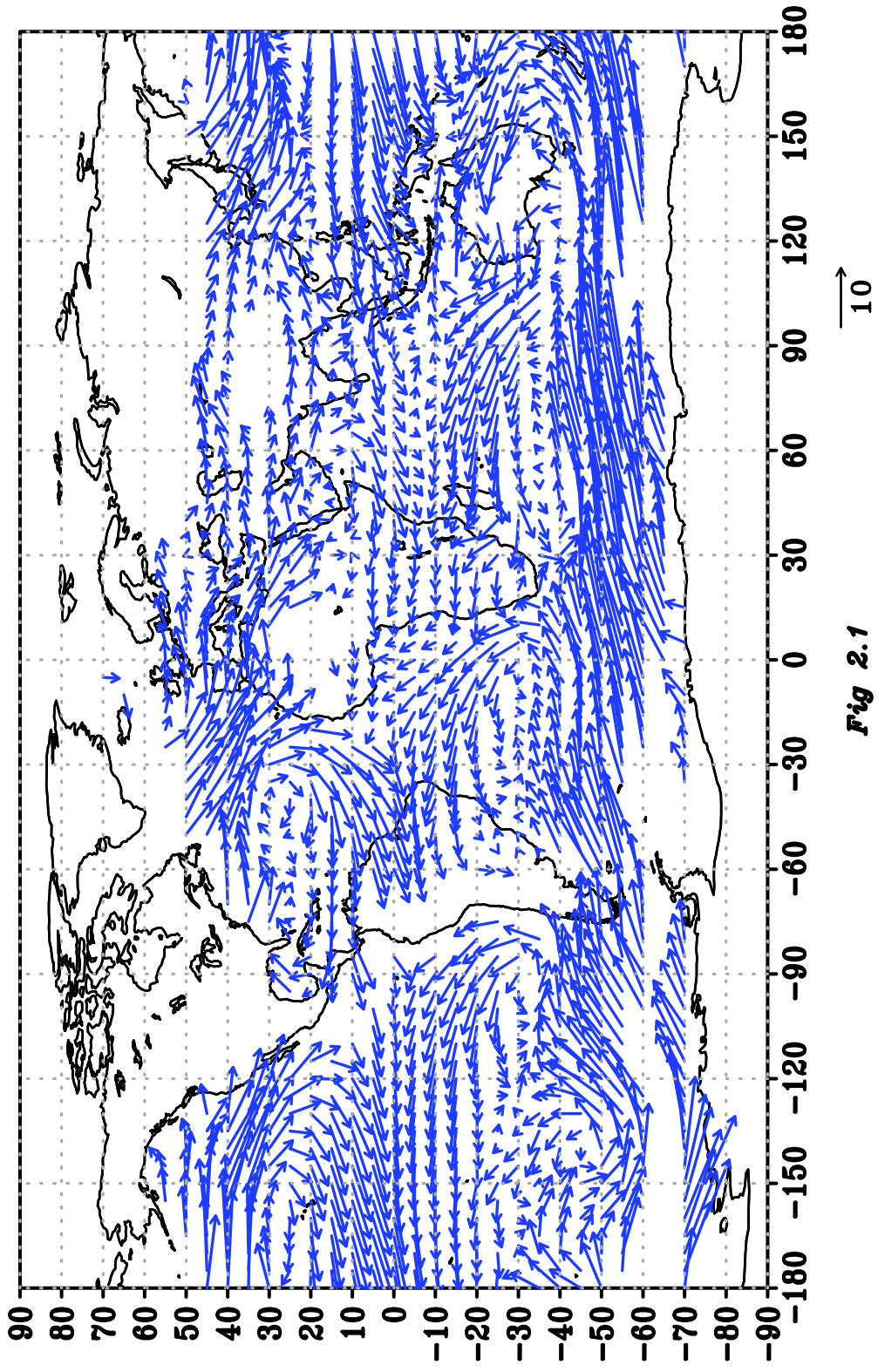


Fig 2.1

NCMRWF Monitoring Statistics: March 2024

AMV WINDS: 700 - 1000 hPa

WIND BIAS: Observation - First Guess

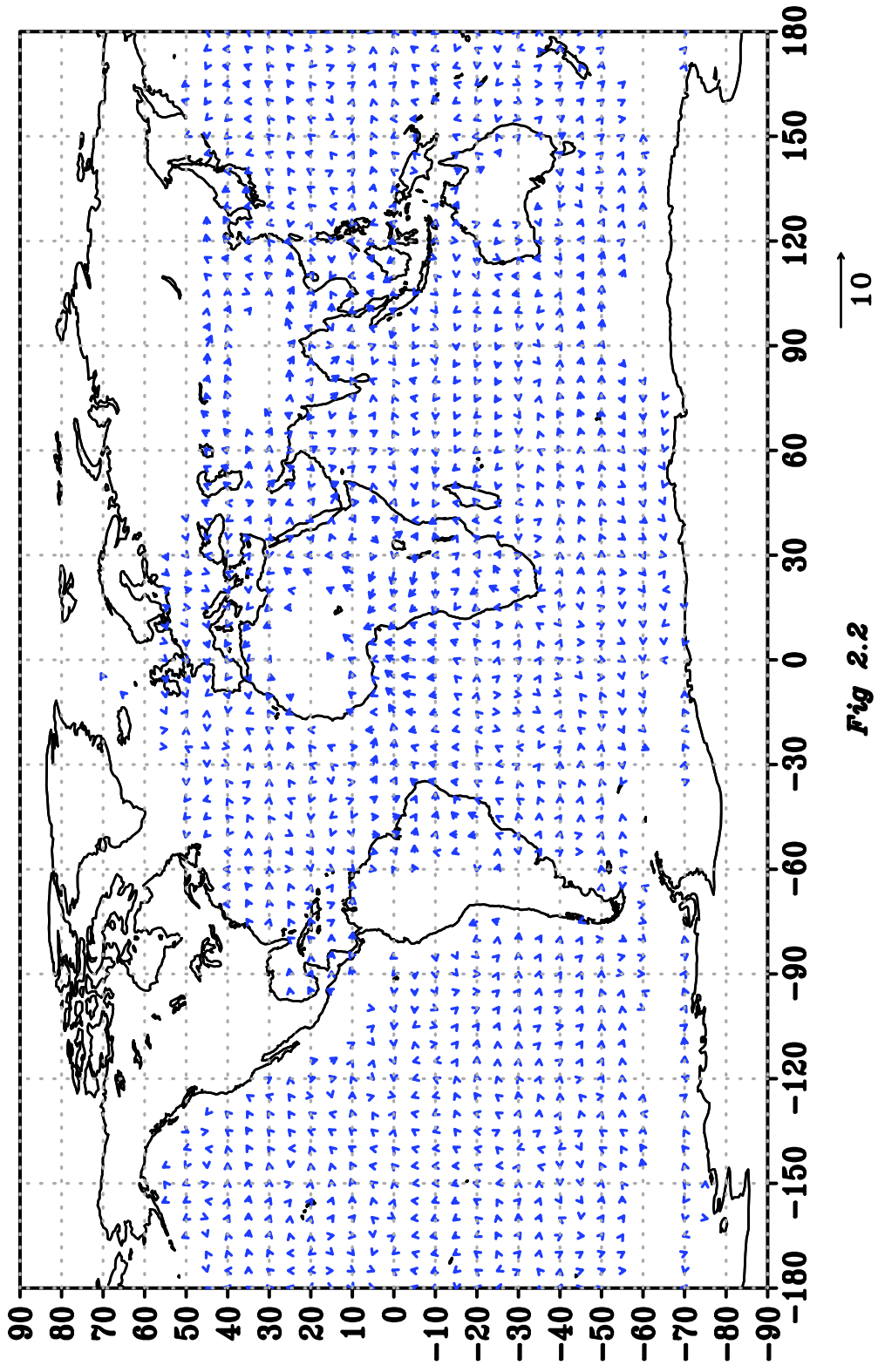


Fig 2.2

NCMRWF Monitoring Statistics: March 2024

AMV WINDS: 150 - 400 hPa

Mean Observed Wind

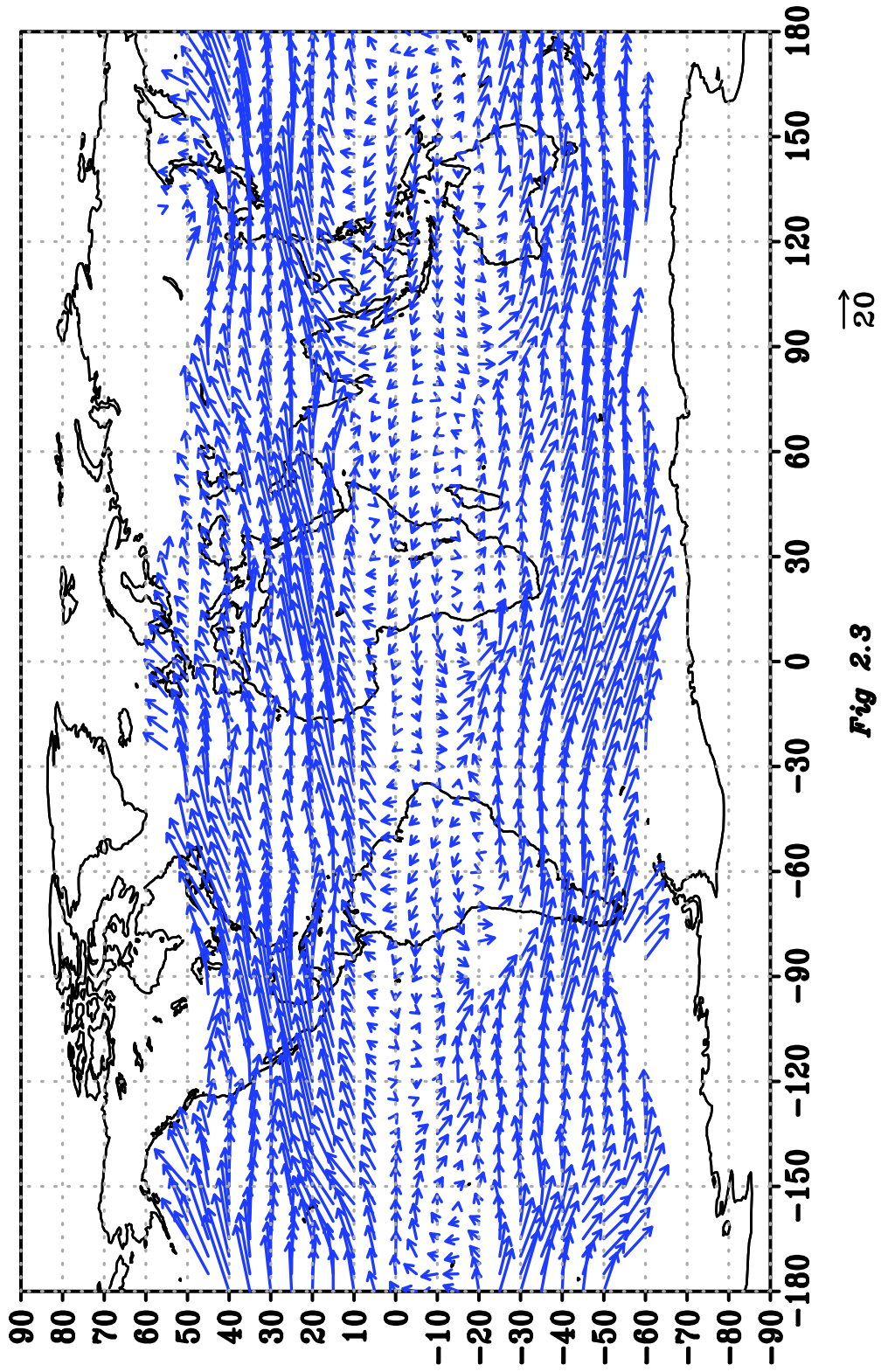


Fig 2.3

NCMRWF Monitoring Statistics: March 2024

AMV WINDS: 150 - 400 hPa

WIND BIAS: Observation - First Guess

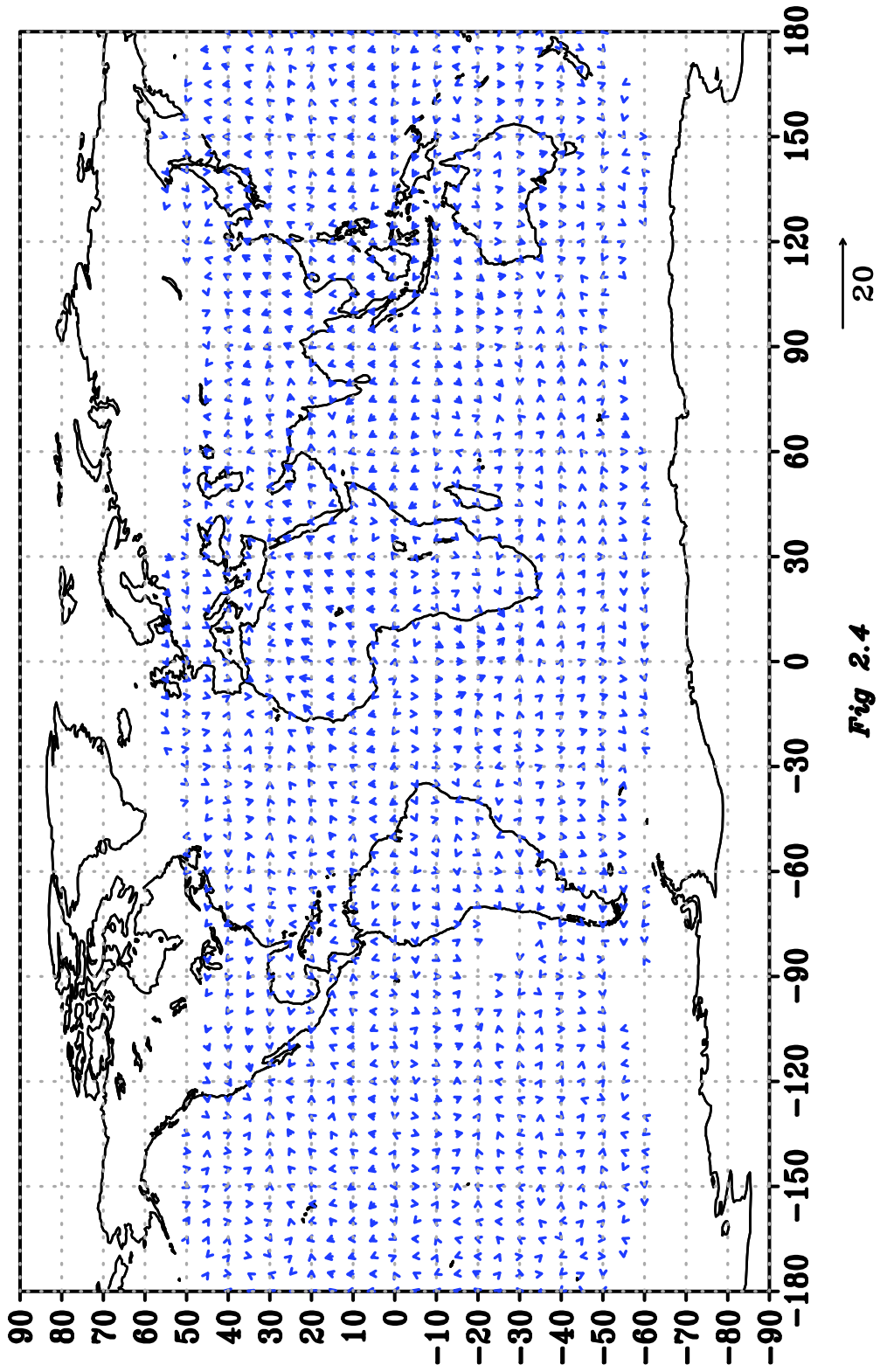


Fig 2.4

Monthly DWR data monitoring at NCMRWF for March 2024(%)

