



***NMRF/OR/07/2024***



सत्यमेव जयते

***OBSERVATION REPORT***

**NCMRWF  
MONTHLY DATA  
MONITORING REPORT**

**July 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 30	0 24	31 31	0 23
42867	NAGPUR SONEGN	14 14	0 30	9 9	0 31
42874	RAIPUR	31 31	0 0	28 27	0 0
42886	JHARSUGUDA	29 31	0 0	31 30	0 25
42895	BALASORE	0 29	0 0	0 31	0 29
42909	VERAVAL	0 22	0 0	0 31	0 26
42971	BHUBANESWAR	31 31	0 22	0 31	0 29
43003	BOMBAY/SANTCR	31 31	0 29	31 31	0 29
43014	AURNGABAD/AER	31 31	0 29	0 0	0 31
43041	JAGDALPUR	13 12	0 30	0 0	0 27
43049	GOPALPUR	0 30	0 0	0 31	0 29
43063	POONA	31 29	0 0	30 30	0 0
43110	RATNAGIRI	0 0	0 0	0 0	0 0
43128	HYDERABAD AER	29 30	0 0	29 28	0 0
43150	VISHAKHAPATNM	7 10	18 26	0 1	23 23
43185	MACHILIPATNAM	30 31	0 26	31 31	0 28
43192	GOA/PANJIM	0 17	0 0	0 19	0 0
43194	GOA/DABOLIM	0 0	0 0	0 0	0 0
43201	GADAG	30 31	0 0	30 31	28 29
43237	ANANTAPUR	0 0	0 0	0 0	0 0
43279	MADRAS/MINAMB	29 31	0 25	31 29	0 23
43284	MANG/BAJPE	0 0	0 0	0 0	0 0
43285	MANG/PANAMBUR	3 31	0 12	0 26	0 18
43295	BANGALORE	22 26	2 6	21 30	5 6
43311	AMINI DIVI	12 22	0 0	17 27	0 0
43333	PORT BLAIR	30 30	19 28	8 31	18 31
43344	TIRUCHIRAPLLI	0 0	0 0	0 0	0 0
43346	KARAIKAL	5 5	0 29	0 0	0 29
43353	COCHIN/WILING	31 31	0 0	28 27	0 0
43368	CAR NICOBAR	0 0	0 0	0 0	0 0
43369	MINICOY	31 31	0 0	31 31	0 0
43371	TRIVANDRUM	26 31	0 4	28 31	0 8
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 - 01072024 to 31072024 (00Z )  
UNIT IS GEOPOTENTIAL METERS

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	15	6	170.0	-14.6	170.7
42079	11	36	638.2	0.5	638.2
42111	17	5	471.0	152.9	495.2
42182	28	0	22.7	7.3	23.8
42314	21	0	108.2	31.0	112.5
42339	27	0	18.1	33.9	38.4
42348	27	0	18.4	52.9	56.0
42399	21	9	494.3	-60.2	498.0
42410	28	7	65.1	95.9	115.9
42492	27	7	42.0	13.3	44.0
42623	17	17	203.3	33.1	205.9
42634	26	3	62.6	2.3	62.6
42647	25	0	25.2	15.4	29.5
42675	23	4	214.4	89.0	232.2
42701	12	0	16.6	-11.3	20.1
42724	25	0	22.4	70.2	73.7
42809	28	0	23.4	39.8	46.2
42867	13	0	10.9	33.5	35.2
42874	24	8	348.2	-19.3	348.8
42886	21	19	620.2	-137.9	635.3
42971	24	0	22.8	27.0	35.4
43003	22	13	181.1	64.7	192.3
43014	30	0	26.7	1.0	26.7
43041	10	0	106.5	5.9	106.7
43063	24	4	77.6	69.8	104.4
43128	18	0	24.5	24.7	34.8
43150	3	0	6.6	24.7	25.5
43185	26	0	20.4	38.3	43.4
43279	17	5	555.3	-83.3	561.5
43285	4	0	8.3	6.2	10.4
43295	16	0	11.5	24.4	27.0
43333	10	0	15.8	8.3	17.9
43346	4	0	21.3	14.8	25.9
43353	23	0	24.3	32.2	40.3
43369	9	11	36.7	81.8	89.7

TABLE 3b: NCMRWF RADIOSONDE MONITORING STATISTICS  
FOR WMO BLOCK 42 AND 43 STATIONS ONLY  
100 hPa GEOPOTENTIAL HEIGHT INCREMENTS - 01072024 to 31072024 (12Z )  
UNIT IS GEOPOTENTIAL METERS

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	21	0	19.1	69.0	71.5
42056	15	26	1583.8	-497.7	1660.1
42079	23	4	595.7	-56.7	598.4
42111	10	0	28.5	74.1	79.4
42182	31	0	20.1	40.4	45.1
42314	19	5	56.5	48.4	74.3
42339	28	3	91.9	100.7	136.3
42348	23	17	34.5	110.4	115.7
42410	28	0	20.1	68.2	71.1
42647	24	4	56.0	66.4	86.9
42724	26	0	20.1	88.6	90.8
42809	27	7	54.2	64.0	83.9
42867	9	0	19.9	97.4	99.5
42874	14	7	93.3	101.8	138.1
42886	29	3	53.3	60.2	80.4
43003	24	4	1025.3	-95.2	1029.8
43063	25	24	50.1	98.2	110.3
43128	15	6	36.6	88.6	95.9
43185	29	6	437.9	-7.3	437.9
43279	27	11	76.0	96.6	122.9
43295	3	0	28.2	75.7	80.8
43353	23	0	11.8	64.0	65.1
43369	7	28	51.1	157.3	165.4

TABLE 4a: NCMRWF RADIOSONDE MONITORING STATISTICS  
FOR WMO BLOCK 42 AND 43 STATIONS ONLY  
500 hPa GEOPOTENTIAL HEIGHT INCREMENTS - 01072024 to 31072024 (00Z )  
UNIT IS GEOPOTENTIAL METERS

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	24	8	90.2	-0.1	90.2
42079	18	0	9.3	-4.4	10.3
42111	18	0	9.9	-6.7	12.0
42182	28	0	5.3	-5.0	7.3
42314	27	0	72.1	-24.9	76.3
42339	28	0	20.2	23.0	30.6
42348	28	0	18.4	59.6	62.4
42399	24	0	11.8	12.7	17.3
42410	30	0	7.3	10.1	12.4
42492	28	3	13.2	7.5	15.2
42623	30	0	6.4	19.1	20.1
42634	27	3	80.3	-11.8	81.2
42647	27	0	7.2	-1.6	7.3
42675	27	0	8.5	7.6	11.4
42701	14	7	30.3	-15.1	33.8
42724	29	0	12.7	10.4	16.5
42809	28	0	7.8	0.5	7.8
42867	13	0	5.4	15.5	16.4
42874	30	0	585.9	119.2	597.9
42886	24	0	8.5	5.9	10.3
42971	27	0	14.1	13.4	19.4
43003	26	7	76.2	15.0	77.7
43014	30	0	7.2	0.7	7.2
43041	12	0	9.6	22.7	24.6
43063	28	0	9.1	-0.3	9.1
43128	27	0	9.2	-7.0	11.6
43150	6	0	7.5	1.5	7.7
43185	28	0	8.1	3.5	8.8
43279	28	3	509.4	-86.1	516.7
43285	6	0	5.6	3.3	6.5
43295	16	0	8.5	7.9	11.6
43333	13	0	8.8	-1.3	8.9
43346	4	0	24.6	10.0	26.6
43353	29	0	20.0	1.1	20.0
43369	29	3	898.1	-153.7	911.2

TABLE 4b: NCMRWF RADIOSONDE MONITORING STATISTICS  
FOR WMO BLOCK 42 AND 43 STATIONS ONLY  
500 hPa GEOPOTENTIAL HEIGHT INCREMENTS - 01072024 to 31072024 (12Z )  
UNIT IS GEOPOTENTIAL METERS

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	30	0	161.0	-2.0	161.0
42056	23	17	566.2	-142.2	583.8
42079	25	0	6.0	8.4	10.3
42111	10	0	10.2	-3.7	10.9
42182	31	0	7.0	2.3	7.4
42314	31	6	27.6	-27.8	39.2
42339	29	6	27.7	42.9	51.1
42348	27	25	29.5	72.5	78.3
42410	28	0	5.8	10.2	11.8
42647	24	4	16.6	8.0	18.4
42724	30	0	9.1	13.8	16.5
42809	29	0	8.8	2.3	9.1
42867	9	0	5.6	20.1	20.9
42874	21	4	99.5	41.3	107.7
42886	29	0	8.0	4.3	9.1
43003	27	3	10.9	6.7	12.8
43063	26	3	8.8	1.9	9.0
43128	23	0	9.9	0.1	9.9
43185	29	0	501.1	-89.2	508.9
43279	29	6	16.7	23.0	28.5
43295	3	0	7.0	10.3	12.5
43353	27	0	20.8	0.9	20.9
43369	29	0	7.1	17.9	19.2

TABLE 5a: NCMRWF RADIOSONDE MONITORING STATISTICS  
FOR WMO BLOCK 42 AND 43 STATIONS ONLY  
100 hPa DRY TEMPERATURE INCREMENTS - 01072024 to 31072024 (00Z )  
UNIT IS DEGREE KELVIN

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	15	6	1.8	0.9	2.0
42079	11	36	18.6	10.2	21.2
42111	17	5	3.4	0.6	3.5
42182	28	0	1.3	-0.5	1.4
42314	21	0	0.9	-0.2	0.9
42339	27	0	1.1	-0.3	1.1
42348	27	0	1.3	-0.6	1.4
42399	21	9	19.1	5.8	19.9
42410	28	7	2.3	1.7	2.9
42492	27	7	0.9	0.1	0.9
42623	17	17	28.3	11.7	30.6
42634	26	3	1.5	0.6	1.6
42647	25	0	1.8	0.2	1.8
42675	23	4	1.4	0.6	1.5
42701	12	0	1.0	-0.7	1.2
42724	25	0	1.5	2.1	2.5
42809	28	0	1.3	1.1	1.7
42867	13	0	0.9	0.4	1.0
42874	24	8	18.0	4.6	18.6
42886	21	19	25.8	10.9	28.0
42971	23	0	1.2	-0.4	1.2
43003	22	18	19.6	5.3	20.3
43014	30	0	16.4	2.8	16.6
43041	10	0	27.2	10.1	29.0
43063	24	4	3.0	1.4	3.4
43128	18	0	1.3	0.9	1.5
43150	4	0	1.0	0.5	1.2
43185	26	0	1.3	0.1	1.3
43279	17	5	2.5	0.4	2.6
43285	4	0	0.3	-0.3	0.4
43295	16	0	1.1	-0.3	1.1
43333	10	0	1.4	0.1	1.4
43346	4	0	1.8	0.1	1.8
43353	23	0	1.8	-1.5	2.4
43369	9	11	4.7	1.2	4.8

TABLE 5b: NCMRWF RADIOSONDE MONITORING STATISTICS  
FOR WMO BLOCK 42 AND 43 STATIONS ONLY  
100 hPa DRY TEMPERATURE INCREMENTS - 01072024 to 31072024 (12Z )  
UNIT IS DEGREE KELVIN

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	21	0	1.1	1.0	1.4
42056	15	26	4.7	3.5	5.9
42079	23	4	5.1	2.5	5.7
42111	10	0	1.7	2.0	2.6
42182	31	0	1.0	0.5	1.2
42314	19	5	2.2	0.6	2.3
42339	28	3	7.2	1.8	7.4
42348	23	17	1.0	0.9	1.3
42410	28	0	1.1	1.4	1.8
42647	24	4	1.9	1.2	2.2
42724	26	0	1.5	2.5	2.9
42809	27	7	3.3	2.0	3.9
42867	9	0	0.6	2.2	2.3
42874	14	7	3.0	1.6	3.4
42886	29	6	4.5	1.6	4.8
43003	24	4	15.3	6.1	16.5
43063	25	24	2.1	2.4	3.1
43128	15	6	2.7	2.3	3.5
43185	29	6	3.4	2.4	4.1
43279	27	11	1.5	1.0	1.8
43295	3	0	2.0	0.3	2.0
43353	23	0	1.6	-0.6	1.7
43369	7	28	2.7	2.1	3.4

TABLE 6a: NCMRWF RADIOSONDE MONITORING STATISTICS  
FOR WMO BLOCK 42 AND 43 STATIONS ONLY  
500 hPa DRY TEMPERATURE INCREMENTS - 01072024 to 31072024 (00Z )  
UNIT IS DEGREE KELVIN

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	24	8	4.5	-2.7	5.3
42079	18	0	1.0	-0.9	1.4
42111	18	0	1.0	-1.0	1.4
42182	28	0	1.5	-1.2	1.9
42314	27	0	4.4	-2.1	4.9
42339	28	0	0.7	-0.8	1.1
42348	28	0	0.8	-1.2	1.5
42399	24	0	0.7	-1.0	1.2
42410	30	0	0.5	-0.9	1.0
42492	28	3	0.9	-0.8	1.2
42623	30	0	1.0	-0.7	1.2
42634	27	3	1.8	-0.5	1.9
42647	27	0	0.9	-1.1	1.4
42675	27	0	1.0	-0.9	1.3
42701	14	7	0.5	-0.5	0.7
42724	29	0	1.0	-0.9	1.4
42809	28	0	0.9	-0.8	1.2
42867	13	0	0.7	-0.9	1.1
42874	30	0	3.8	-1.6	4.2
42886	24	0	1.0	-0.4	1.1
42971	27	0	0.7	-1.1	1.3
43003	25	4	1.0	-0.9	1.3
43014	30	0	0.5	-1.0	1.2
43041	12	0	0.5	-0.7	0.8
43063	28	0	0.7	-0.8	1.1
43128	27	0	0.7	-0.8	1.1
43150	6	0	0.7	-0.5	0.9
43185	28	0	0.8	-0.6	0.9
43279	28	3	2.8	0.3	2.8
43285	6	0	0.5	-1.0	1.1
43295	16	0	0.8	-0.3	0.9
43333	13	0	0.5	-0.9	1.0
43346	4	0	0.7	-0.2	0.7
43353	29	0	0.8	0.1	0.8
43369	29	3	0.6	-0.0	0.6



TABLE 6b: NCMRWF RADIOSONDE MONITORING STATISTICS  
FOR WMO BLOCK 42 AND 43 STATIONS ONLY  
500 hPa DRY TEMPERATURE INCREMENTS - 01072024 to 31072024 (12Z )  
UNIT IS DEGREE KELVIN

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	30	0	0.9	-1.3	1.5
42056	23	17	3.8	-1.0	3.9
42079	25	0	0.8	0.0	0.8
42111	10	0	1.3	-0.4	1.3
42182	31	0	0.9	-0.4	0.9
42314	31	3	1.2	-0.9	1.5
42339	29	3	1.3	-0.6	1.4
42348	27	25	1.0	-0.7	1.2
42410	28	0	0.6	-0.3	0.7
42647	24	4	1.2	-0.1	1.2
42724	30	0	0.9	-0.3	1.0
42809	29	0	0.8	-0.4	0.9
42867	9	0	0.8	0.4	0.9
42874	21	4	1.0	-0.4	1.1
42886	29	0	0.9	-0.5	1.0
43003	27	3	2.0	-0.1	2.0
43063	26	3	0.7	-0.5	0.9
43128	23	0	1.0	0.0	1.0
43185	28	0	2.8	0.3	2.8
43279	29	6	0.9	-0.3	1.0
43295	3	0	0.7	-0.3	0.7
43353	27	0	0.5	-0.1	0.6
43369	29	0	0.6	0.1	0.6

TABLE 7a: NCMRWF RADIOSONDE MONITORING STATISTICS  
FOR WMO BLOCK 42 AND 43 STATIONS ONLY  
100 hPa ZONAL WIND INCREMENTS - 01072024 to 31072024 (00Z )  
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	15	0	2.7	0.6	2.8
42079	11	0	10.3	3.9	11.0
42111	17	0	31.9	6.8	32.7
42182	28	0	2.3	-0.9	2.5
42314	21	0	2.9	-0.5	2.9
42339	27	0	2.8	-1.7	3.3
42348	27	0	3.6	-1.6	3.9
42399	21	0	2.8	-0.6	2.9
42410	28	0	2.1	-1.2	2.4
42492	27	0	2.9	-1.2	3.1
42623	17	0	3.0	-1.6	3.5
42634	26	0	4.5	-1.9	4.8
42647	25	0	3.9	-0.6	3.9
42675	23	0	2.7	0.2	2.7
42701	12	0	2.0	0.6	2.1
42724	25	0	3.9	-0.9	4.0
42809	28	0	1.9	-1.1	2.2
42867	13	0	3.0	-1.8	3.5
42874	24	0	3.2	-2.4	3.9
42886	21	0	3.5	0.9	3.6
42971	24	0	2.7	1.8	3.3
43003	22	0	3.2	-1.2	3.5
43014	30	0	2.8	-1.3	3.1
43041	10	0	1.8	-0.5	1.9
43063	24	0	3.0	0.2	3.0
43128	18	0	3.1	-1.7	3.5
43150	4	0	1.0	-0.3	1.1
43185	26	0	2.1	-0.8	2.3
43279	17	0	3.5	1.6	3.9
43285	4	0	2.9	-6.9	7.5
43295	16	0	2.1	-0.8	2.2
43333	10	0	4.7	-1.8	5.0
43346	4	0	4.1	-2.5	4.8
43353	22	0	9.3	3.6	10.0
43369	9	0	4.4	-0.4	4.4

TABLE 7b: NCMRWF RADIOSONDE MONITORING STATISTICS  
FOR WMO BLOCK 42 AND 43 STATIONS ONLY  
100 hPa ZONAL WIND INCREMENTS - 01072024 to 31072024 (12Z )  
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	21	0	4.9	-2.3	5.4
42056	15	0	4.3	-0.7	4.4
42079	23	0	4.1	0.2	4.1
42111	10	0	1.8	0.2	1.8
42182	31	0	3.7	0.4	3.7
42314	19	0	2.2	0.0	2.2
42339	28	0	3.6	-0.3	3.6
42348	23	0	3.1	-0.4	3.2
42410	28	0	2.5	-1.2	2.8
42647	24	0	2.7	-0.2	2.7
42724	26	0	2.4	0.2	2.4
42809	27	0	2.9	0.5	3.0
42867	9	0	1.1	-2.1	2.3
42874	14	0	1.7	-1.2	2.1
42886	29	0	2.9	-0.4	2.9
43003	24	0	3.7	-0.3	3.7
43063	25	0	4.0	-0.7	4.0
43128	15	0	3.7	0.1	3.7
43185	29	0	5.1	-0.3	5.2
43279	27	0	5.0	-1.8	5.3
43295	3	0	1.1	-0.4	1.2
43353	23	0	8.6	2.0	8.8
43369	7	0	5.2	0.2	5.3

TABLE 8a: NCMRWF RADIOSONDE MONITORING STATISTICS  
FOR WMO BLOCK 42 AND 43 STATIONS ONLY  
500 hPa ZONAL WIND INCREMENTS - 01072024 to 31072024 (00Z )  
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	24	0	6.3	0.2	6.3
42079	18	0	7.0	-1.9	7.3
42111	18	0	2.8	-0.5	2.8
42182	28	0	2.8	-0.1	2.8
42314	27	0	3.2	-0.1	3.2
42339	28	0	2.3	0.1	2.3
42348	28	0	2.9	0.2	2.9
42399	24	0	3.7	-1.3	3.9
42410	30	0	2.0	-0.5	2.1
42492	28	0	2.4	-1.6	2.8
42623	30	0	2.5	0.3	2.6
42634	27	0	3.2	0.7	3.3
42647	27	0	2.4	-0.1	2.4
42675	27	0	2.0	-0.6	2.1
42701	14	0	1.9	-0.2	1.9
42724	29	0	3.1	0.1	3.1
42809	28	0	2.8	-1.1	3.0
42867	13	0	3.0	0.1	3.0
42874	30	0	2.7	-0.4	2.8
42886	24	0	2.8	0.3	2.9
42971	27	0	2.8	0.3	2.9
43003	26	0	3.2	0.8	3.3
43014	30	0	3.4	1.4	3.7
43041	12	0	2.7	0.4	2.8
43063	28	0	3.4	1.5	3.7
43128	27	0	2.9	1.7	3.4
43150	6	0	3.6	1.5	3.9
43185	28	0	4.4	0.1	4.4
43279	28	0	3.2	1.8	3.6
43285	6	0	3.4	-0.9	3.5
43295	16	0	2.9	1.1	3.1
43333	13	0	2.7	1.3	3.0
43346	4	0	1.0	2.2	2.4
43353	29	0	3.4	-0.5	3.4
43369	29	0	2.7	0.5	2.7

TABLE 8b: NCMRWF RADIOSONDE MONITORING STATISTICS  
FOR WMO BLOCK 42 AND 43 STATIONS ONLY  
500 hPa ZONAL WIND INCREMENTS - 01072024 to 31072024 (12Z )  
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	30	0	3.2	-1.9	3.8
42056	23	0	4.0	1.3	4.2
42079	25	0	3.0	0.9	3.1
42111	10	0	3.3	1.2	3.5
42182	31	0	2.3	0.1	2.3
42314	31	0	2.4	-0.5	2.5
42339	29	0	2.8	1.3	3.1
42348	27	0	2.5	0.8	2.6
42410	28	0	2.6	-1.0	2.7
42647	24	0	2.2	1.8	2.9
42724	30	0	1.6	0.1	1.6
42809	29	0	2.4	-1.2	2.6
42867	9	0	1.8	0.2	1.8
42874	21	0	3.4	0.0	3.4
42886	29	0	2.5	-0.6	2.6
43003	27	0	4.1	0.9	4.2
43063	26	0	3.3	0.5	3.3
43128	23	0	3.3	2.0	3.8
43185	29	0	4.0	2.1	4.6
43279	29	0	3.1	1.5	3.5
43295	3	0	2.1	-0.2	2.1
43353	27	0	2.6	0.4	2.6
43369	29	0	2.9	0.3	2.9

TABLE 9a: NCMRWF RADIOSONDE MONITORING STATISTICS  
FOR WMO BLOCK 42 AND 43 STATIONS ONLY  
100 hPa MERIDIONAL WIND INCREMENTS - 01072024 to 31072024 (00Z )  
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	15	0	3.2	-0.9	3.4
42079	11	0	19.0	7.9	20.5
42111	17	0	22.0	6.1	22.8
42182	28	0	3.5	-0.5	3.5
42314	21	0	4.0	0.2	4.0
42339	27	0	3.2	-0.3	3.3
42348	27	0	3.9	-0.5	3.9
42399	21	0	3.0	0.4	3.1
42410	28	0	2.7	0.7	2.8
42492	27	0	4.9	-0.6	4.9
42623	17	0	2.2	-1.1	2.5
42634	26	0	2.9	0.0	2.9
42647	25	0	4.2	-1.4	4.4
42675	23	0	3.1	-0.6	3.2
42701	12	0	1.9	-1.3	2.3
42724	25	0	5.1	0.8	5.1
42809	28	0	3.2	0.2	3.2
42867	13	0	4.0	1.1	4.2
42874	24	0	4.1	0.2	4.1
42886	21	0	3.4	-0.1	3.4
42971	24	0	3.8	-1.5	4.1
43003	22	0	4.0	0.3	4.0
43014	30	0	3.1	0.4	3.2
43041	10	0	2.3	-0.8	2.4
43063	24	0	4.3	0.5	4.3
43128	18	0	2.3	-1.1	2.5
43150	4	0	2.4	-0.1	2.4
43185	26	0	3.4	-0.9	3.5
43279	17	0	5.3	-0.5	5.3
43285	4	0	5.4	3.4	6.4
43295	16	0	3.0	-0.3	3.0
43333	10	0	5.2	-2.8	5.9
43346	4	0	3.1	-1.0	3.2
43353	22	0	2.9	1.4	3.2
43369	9	0	3.9	2.7	4.7

TABLE 9b: NCMRWF RADIOSONDE MONITORING STATISTICS  
FOR WMO BLOCK 42 AND 43 STATIONS ONLY  
100 hPa MERIDIONAL WIND INCREMENTS - 01072024 to 31072024 (12Z )  
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	21	0	4.7	0.7	4.7
42056	15	0	6.6	2.8	7.2
42079	23	0	4.3	0.7	4.4
42111	10	0	2.6	-0.3	2.6
42182	31	0	3.0	2.4	3.8
42314	19	0	3.5	-0.1	3.5
42339	28	0	3.6	0.7	3.7
42348	23	0	3.5	0.5	3.5
42410	28	0	3.0	-0.6	3.1
42647	24	0	4.0	-1.3	4.2
42724	26	0	2.8	-0.8	2.9
42809	27	0	3.5	0.2	3.5
42867	9	0	5.0	-0.8	5.1
42874	14	0	3.3	-1.7	3.7
42886	29	0	3.4	-2.4	4.1
43003	24	0	3.9	-1.3	4.1
43063	25	0	3.4	-0.0	3.4
43128	15	0	2.8	-0.3	2.9
43185	29	0	3.9	-0.1	3.9
43279	27	0	3.7	1.8	4.1
43295	3	0	1.7	-1.2	2.1
43353	23	0	3.9	2.2	4.5
43369	7	0	3.7	1.4	4.0

TABLE 10a: NCMRWF RADIOSONDE MONITORING STATISTICS  
FOR WMO BLOCK 42 AND 43 STATIONS ONLY  
500 hPa MERIDIONAL WIND INCREMENTS - 01072024 to 31072024 (00Z )  
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	24	0	3.3	-0.0	3.3
42079	18	0	3.4	0.3	3.4
42111	18	0	2.8	2.0	3.5
42182	28	0	2.4	1.8	3.0
42314	27	0	1.9	-0.5	2.0
42339	28	0	1.8	-0.5	1.8
42348	28	0	2.1	1.0	2.3
42399	24	0	3.6	-0.0	3.6
42410	30	0	2.5	-0.9	2.7
42492	28	0	2.6	-0.2	2.6
42623	30	0	2.1	-0.2	2.2
42634	27	0	3.9	-1.0	4.1
42647	27	0	3.6	-1.2	3.8
42675	27	0	1.6	0.6	1.7
42701	14	0	1.8	0.1	1.8
42724	29	0	2.7	-0.5	2.8
42809	28	0	2.9	-1.3	3.2
42867	13	0	2.0	0.2	2.0
42874	30	0	1.7	0.6	1.8
42886	24	0	1.9	0.9	2.1
42971	27	0	2.6	-0.4	2.6
43003	26	0	3.0	-0.5	3.0
43014	30	0	3.2	-0.9	3.3
43041	12	0	2.5	1.0	2.7
43063	28	0	2.7	0.5	2.7
43128	27	0	2.2	0.4	2.2
43150	6	0	2.6	1.2	2.8
43185	28	0	3.5	-0.7	3.6
43279	28	0	2.6	0.4	2.6
43285	6	0	3.9	0.2	3.9
43295	16	0	2.0	1.6	2.6
43333	13	0	2.8	-0.4	2.8
43346	4	0	0.9	-0.6	1.1
43353	29	0	2.7	1.2	3.0
43369	29	0	2.5	-0.3	2.5



TABLE 10b: NCMRWF RADIOSONDE MONITORING STATISTICS  
FOR WMO BLOCK 42 AND 43 STATIONS ONLY  
500 hPa MERIDIONAL WIND INCREMENTS - 01072024 to 31072024 (12Z )  
UNIT IS METER/SEC

STNID	COUNT	%REJC	SD	BIAS	RMS
42027	30	0	3.6	-0.2	3.6
42056	23	0	1.8	1.0	2.1
42079	25	0	2.6	0.3	2.6
42111	10	0	2.7	1.5	3.1
42182	31	0	2.5	0.7	2.6
42314	31	0	2.0	-0.0	2.0
42339	29	0	2.2	0.6	2.3
42348	27	0	3.0	0.6	3.0
42410	28	0	1.8	0.5	1.9
42647	24	0	2.6	-0.2	2.6
42724	30	0	2.0	0.7	2.1
42809	29	0	2.7	-1.0	2.9
42867	9	0	2.4	-0.2	2.4
42874	21	0	2.8	-0.8	2.9
42886	29	0	2.8	-0.2	2.8
43003	27	0	2.7	-0.3	2.8
43063	26	0	2.0	0.7	2.1
43128	23	0	2.1	0.9	2.3
43185	29	0	2.8	-0.1	2.8
43279	29	0	2.1	0.4	2.1
43295	3	0	1.0	0.5	1.1
43353	27	0	2.6	0.0	2.6
43369	29	0	2.6	0.7	2.7

# NCMRWF Monitoring Statistics 01 07 24 TO 31 07 24

Availability - SYNOP/SHIP PRESSURE

Average number of observations in 24 hours - 115672

LAND - WMO REGION I: 6420 II:17409 III: 2269 IV: 6119 V:14899 VI:43373 VII: 646

OCEAN - N. Atlantic:11179 S. Atlantic: 720 Indian: 2770 Pacific: 8825

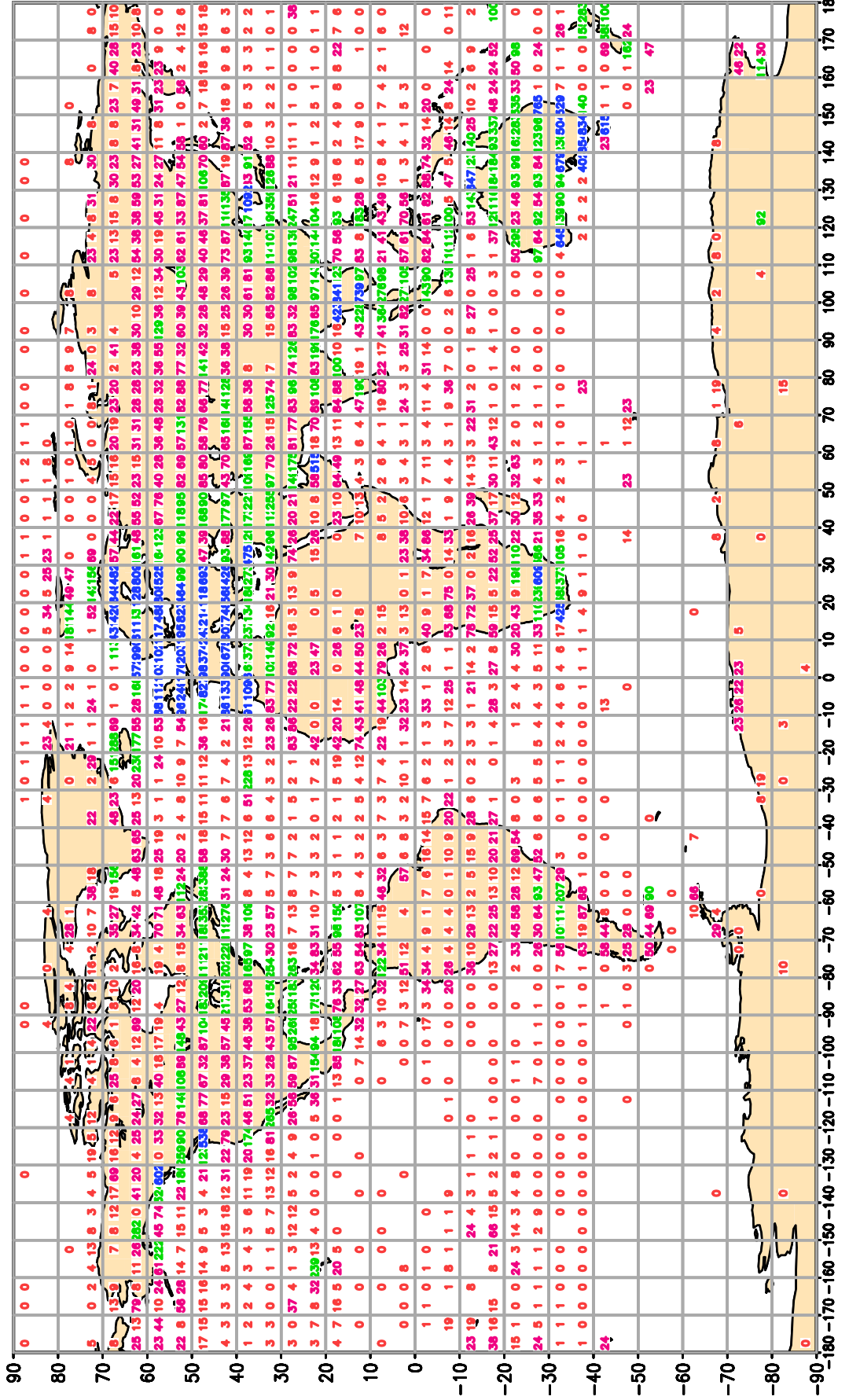


Fig 1.1

# NCMRWF Monitoring Statistics 01 07 24 TO 31 07 24

Availability - TEMP 500 hPa geopotential

Average number of observations in 24 hours - 1207

LAND - WMO REGION I: 34 II: 477 III: 70 IV: 231 V: 141 VI: 188 VII: 14

OCEAN - N. Atlantic: 1 S. Atlantic: 1 Indian: 1 Pacific: 1

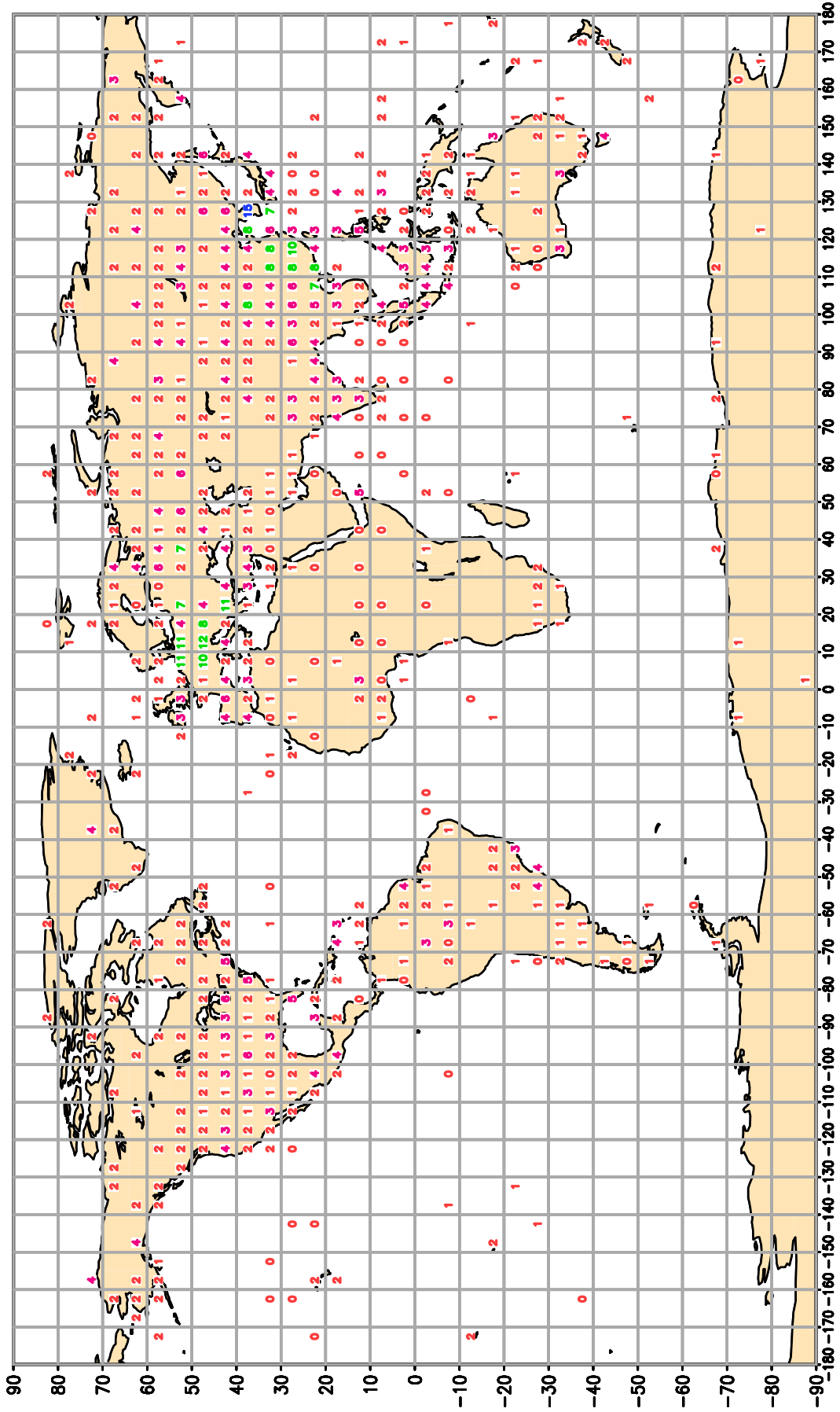


Fig 1.2

# NCMRWF Monitoring Statistics 01 07 24 TO 31 07 24

Availability – TEMP/PILOT 300 hPa wind

Average number of observations in 24 hours – 1514

LAND – WMO REGION I: 51 II: 541 III: 88 IV: 346 V: 242 VI: 188 VII: 14

OCEAN – N. Atlantic: 0 S. Atlantic: 0 Indian: 4 Pacific: 0

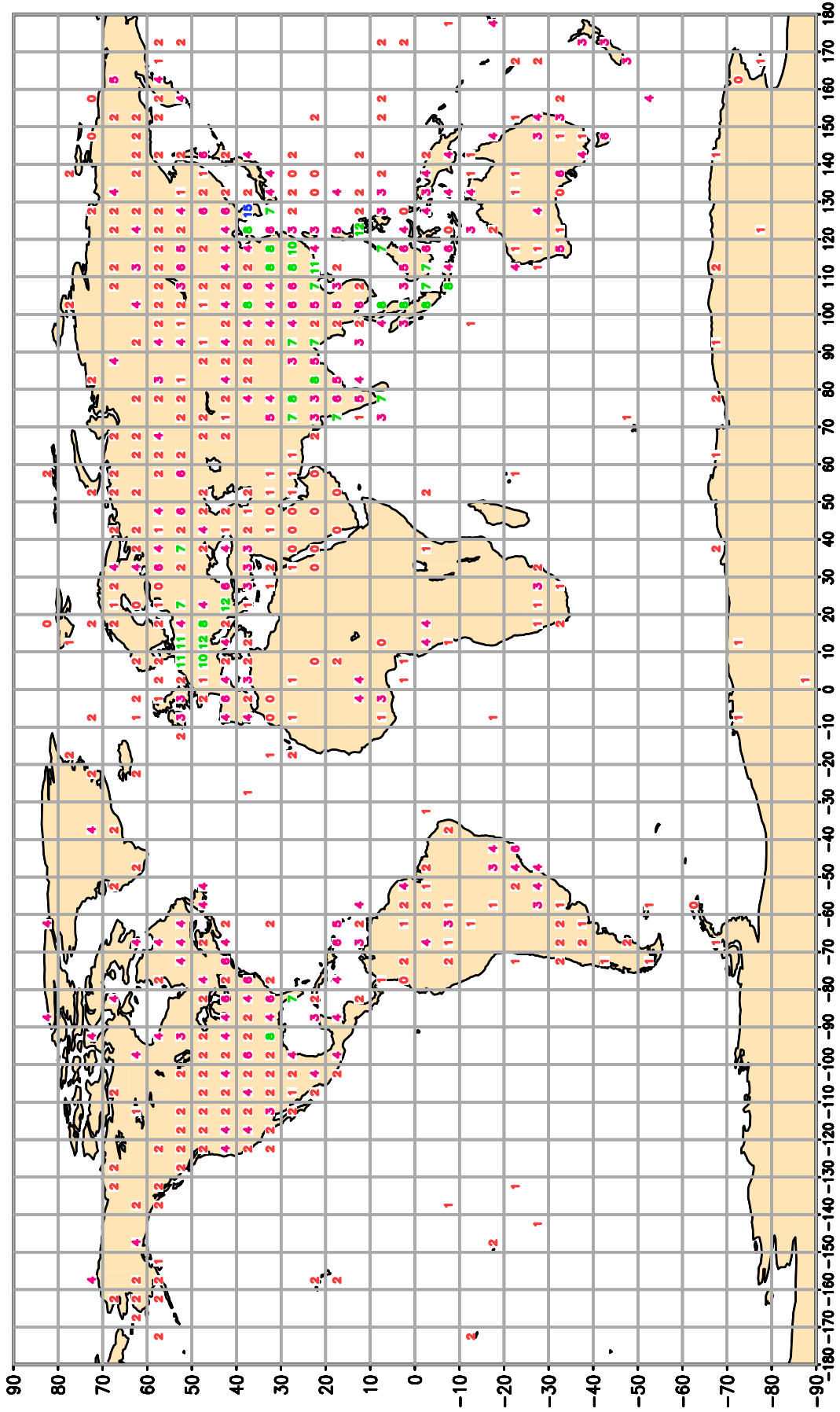
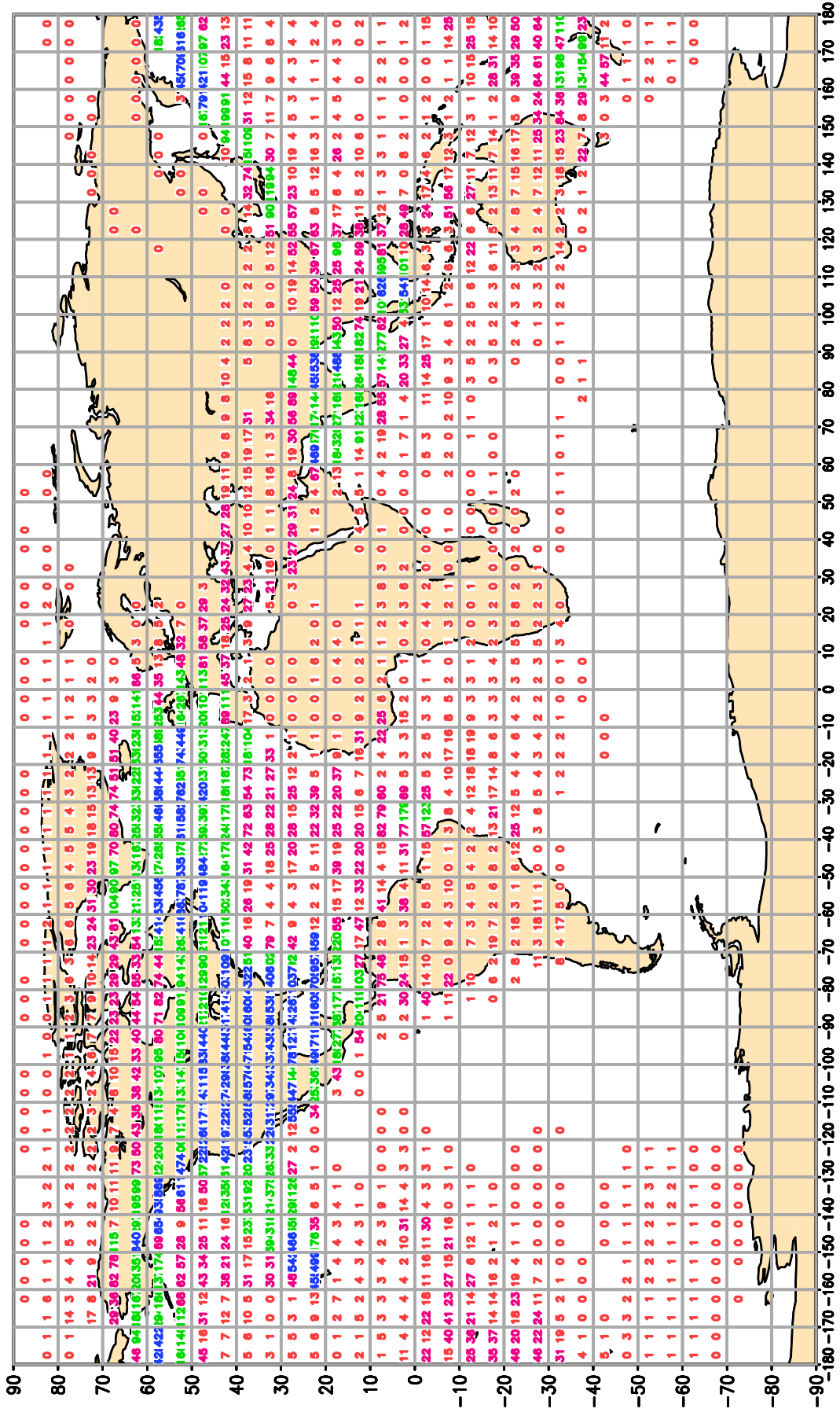


Fig 1.3

# NCMRWF Monitoring Statistics 01 07 24 TO 31 07 24

Availability – AIRCRAFT winds 300–150 hPa

Average number of observations in 24 hours – 214901



NCMRWF Monitoring Statistics 01 07 24 TO 31 07 24  
 Availability - NOAA 18 ATOVS : AMSU-A  
 Average number of observations in 24 hours - 219885

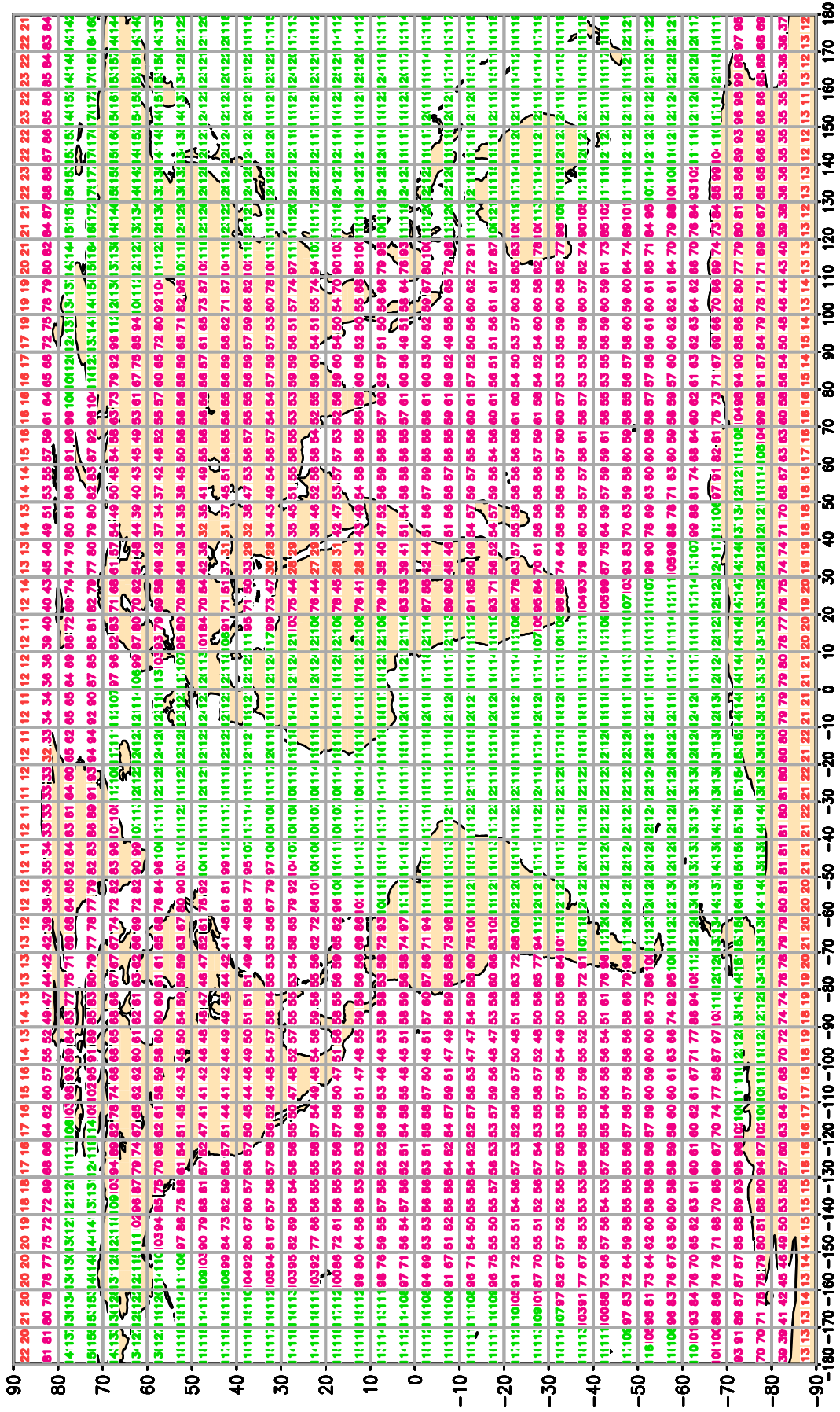


Fig 1.5

# NCMRWF Monitoring Statistics 01 07 24 TO 31 07 24

Availability – AMV winds 400–150 hPa

Average number of observations in 24 hours – 501937

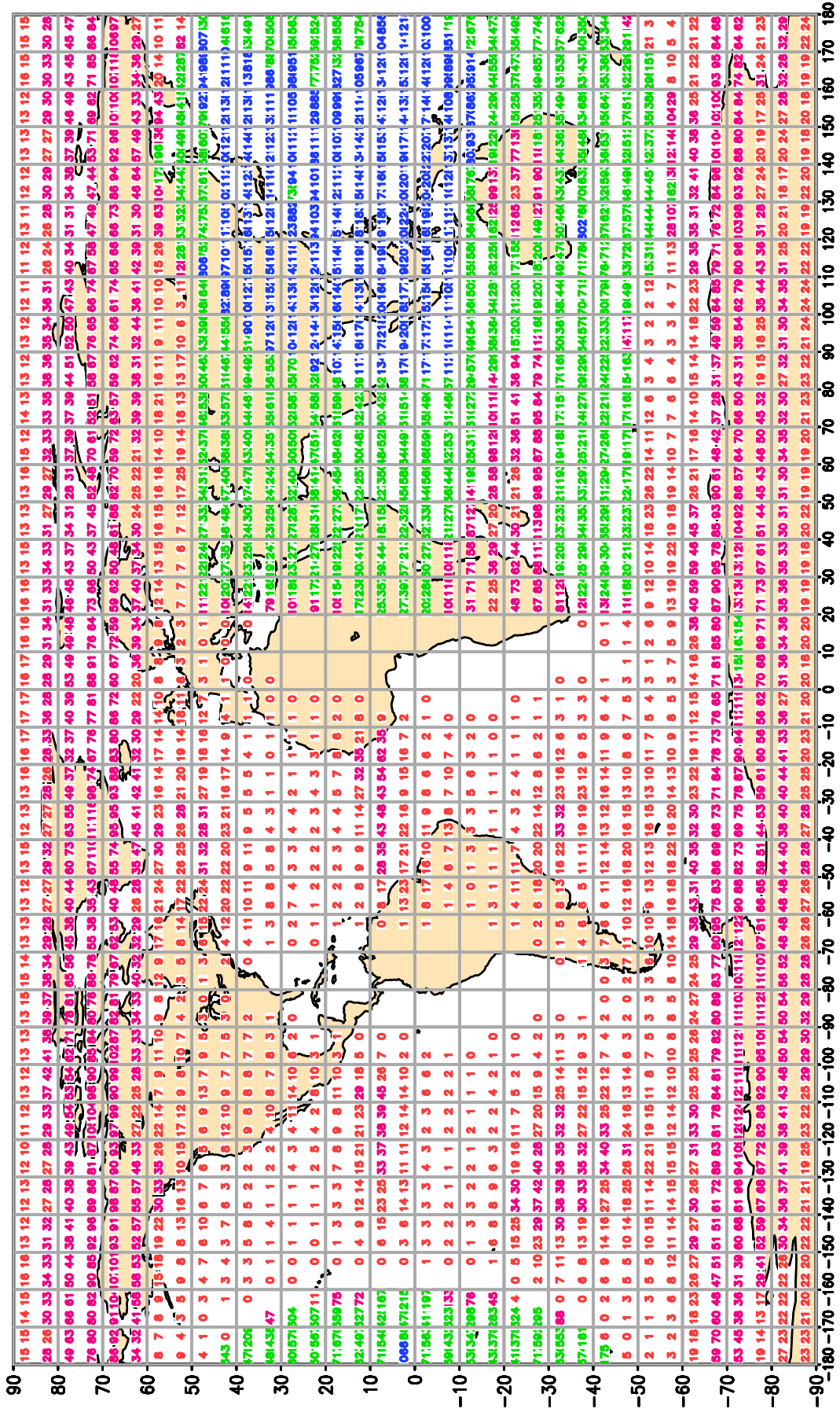


Fig 1.6(a)

# NCMRWF Monitoring Statistics 01 07 24 TO 31 07 24

Availability – AMV winds 1000–700 hPa

Average number of observations in 24 hours – 283616

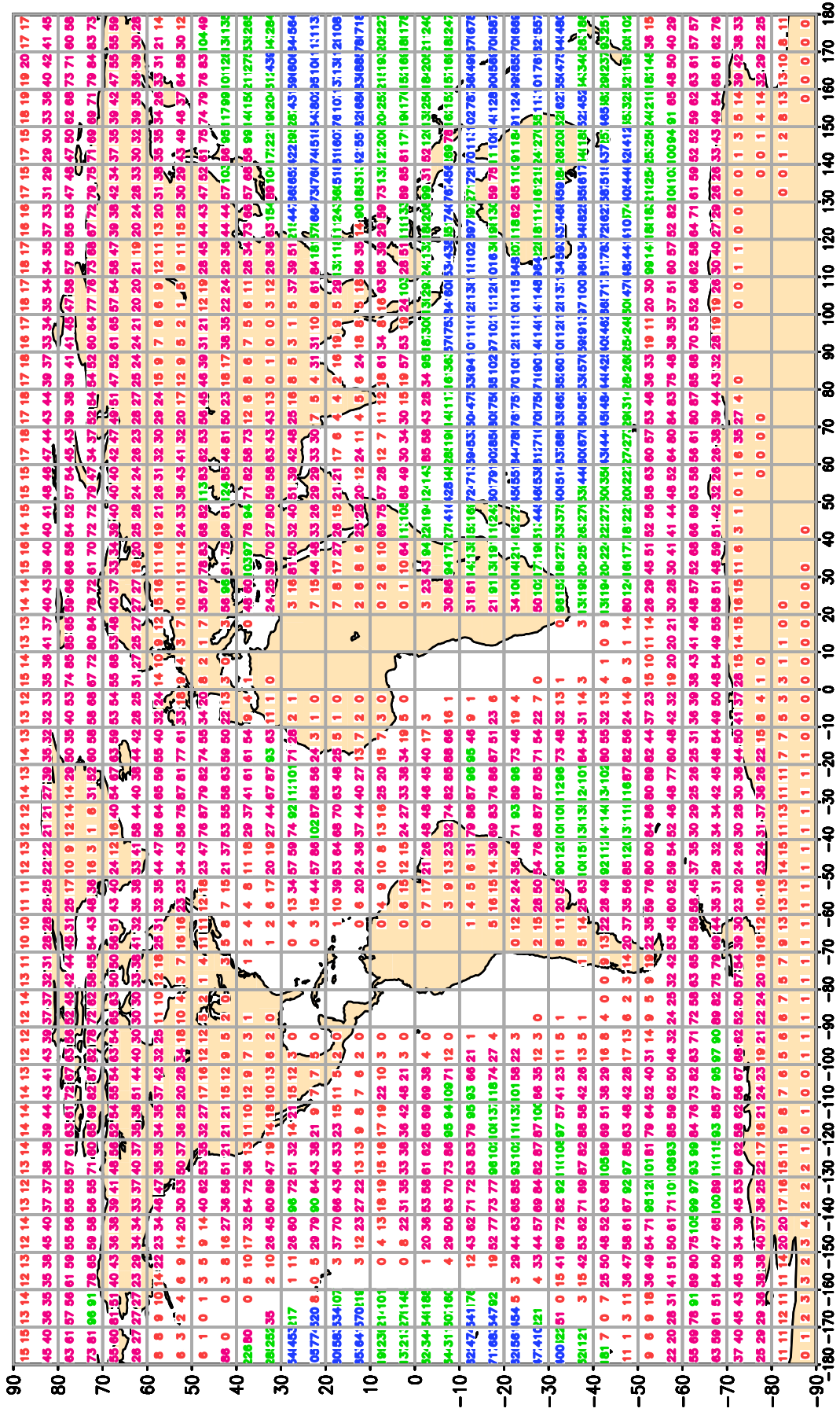


Fig 1.6(b)



# NCMRWF Monitoring Statistics 01 07 24 TO 31 07 24

Availability - BUOY PRESSURE

Average number of observations in 24 hours - 40867

OCEAN - N. Atlantic: 8586 S. Atlantic: 2459 Indian: 4102 Pacific:25098

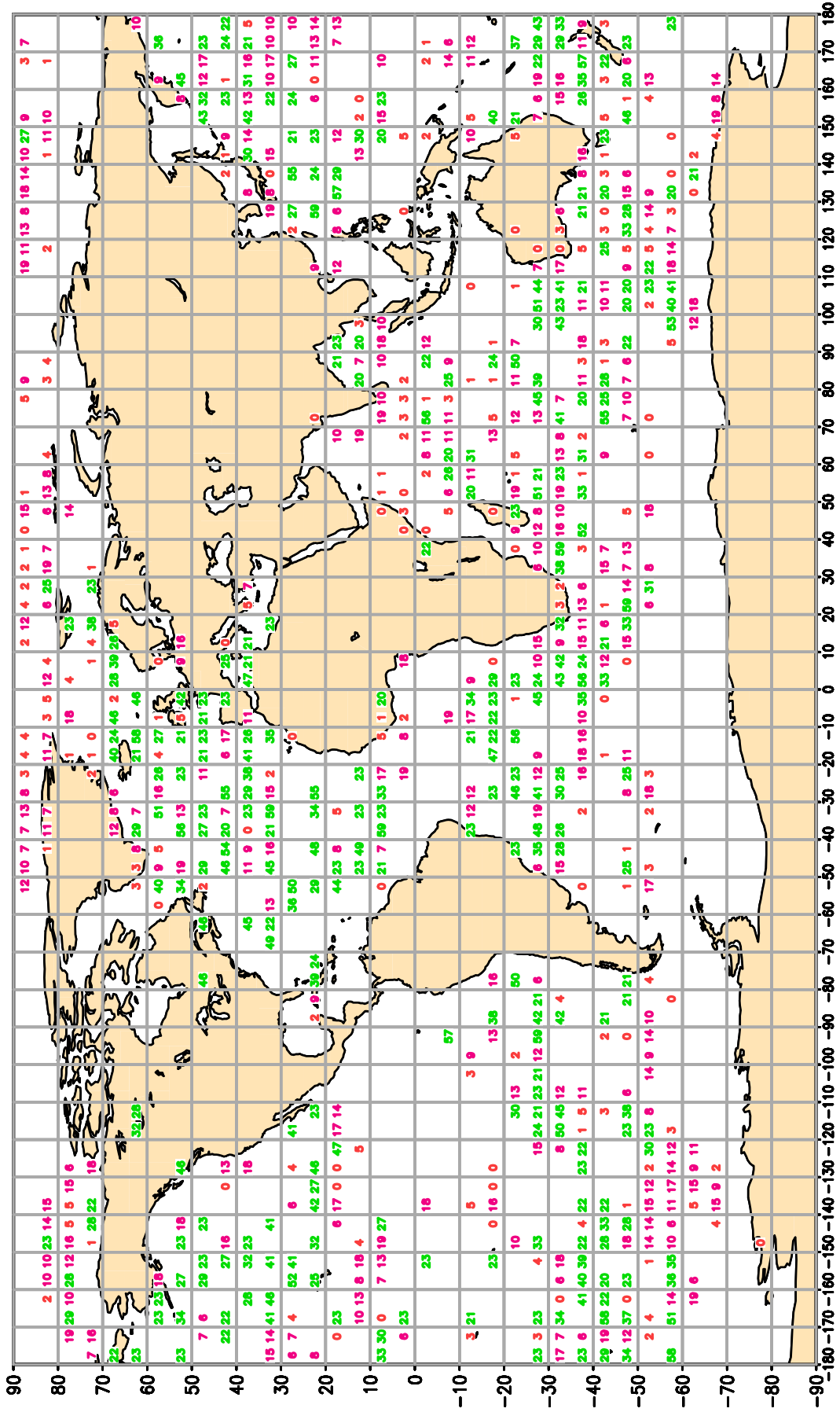


Fig 1.7

# NCMRWF Monitoring Statistics: July 2024

## AMV WINDS: 700 - 1000 hPa

### Mean Observed Wind

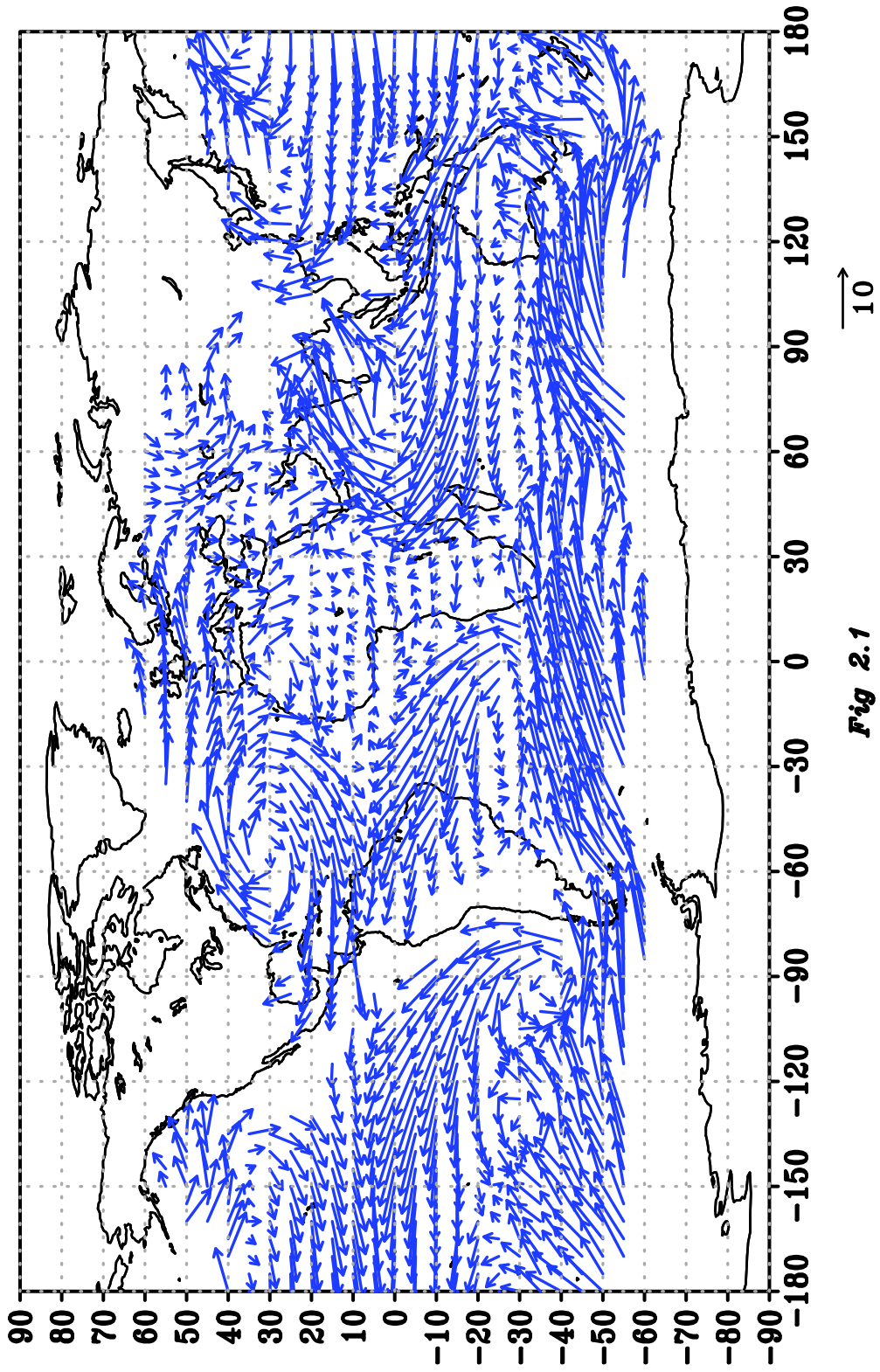


Fig 2.1

# NCMRWF Monitoring Statistics: July 2024

AMV WINDS: 700 - 1000 hPa

WIND BIAS: Observation - First Guess

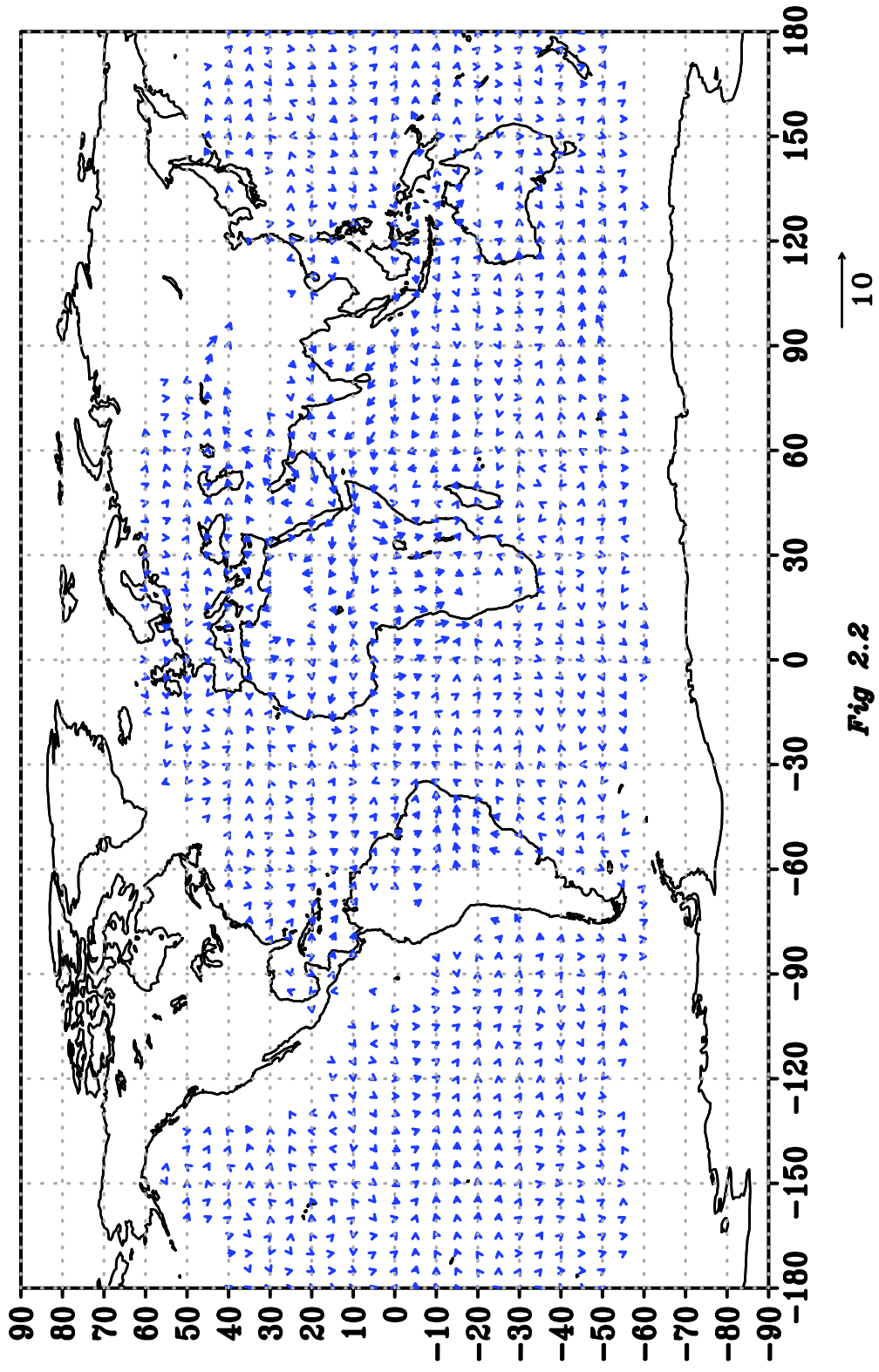


Fig 2.2

# NCMRWF Monitoring Statistics: July 2024

## AMV WINDS: 150 - 400 hPa

### Mean Observed Wind

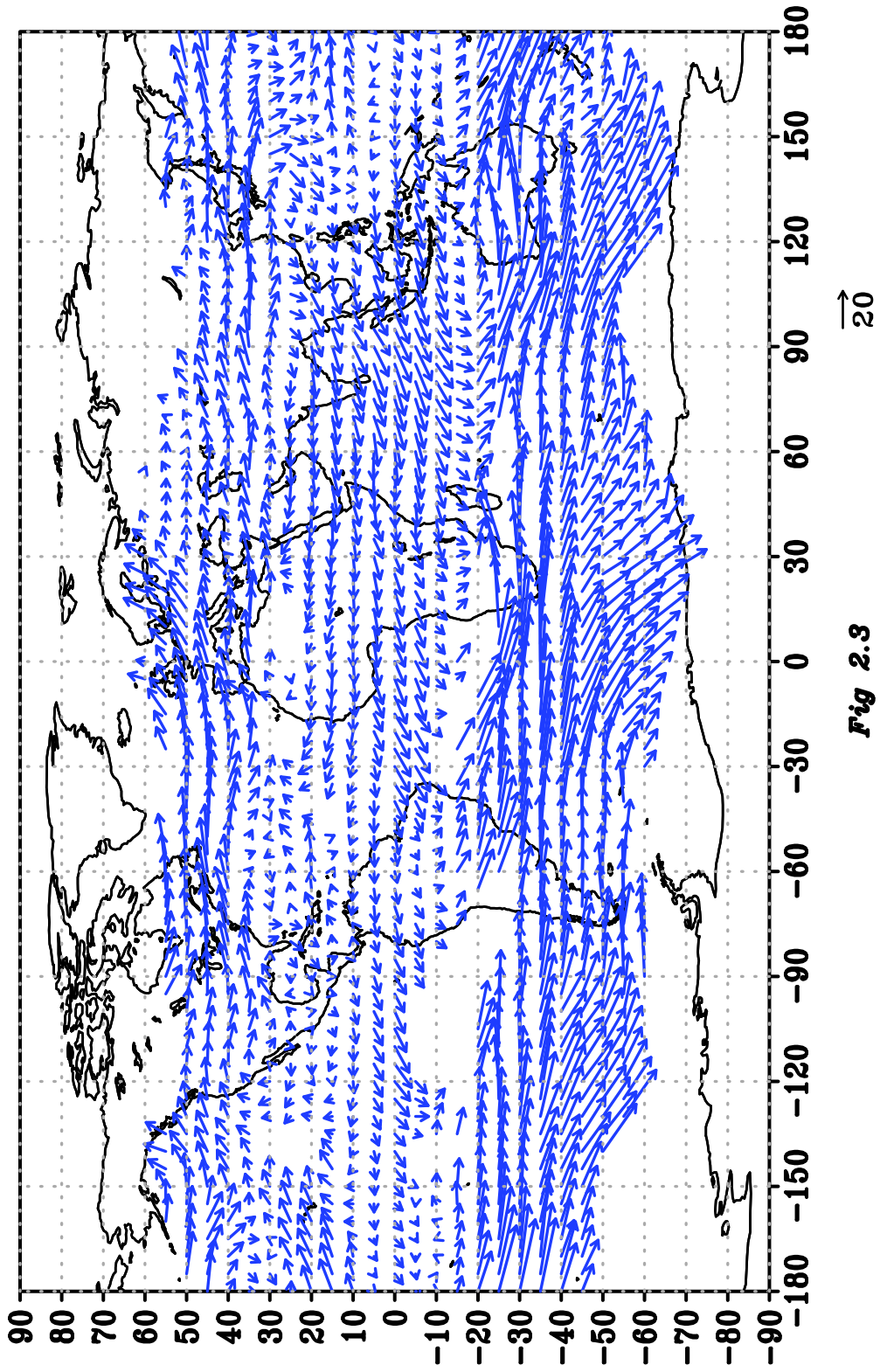


Fig 2.3

# NCMRWF Monitoring Statistics: July 2024

AMV WINDS: 150 - 400 hPa

WIND BIAS: Observation - First Guess

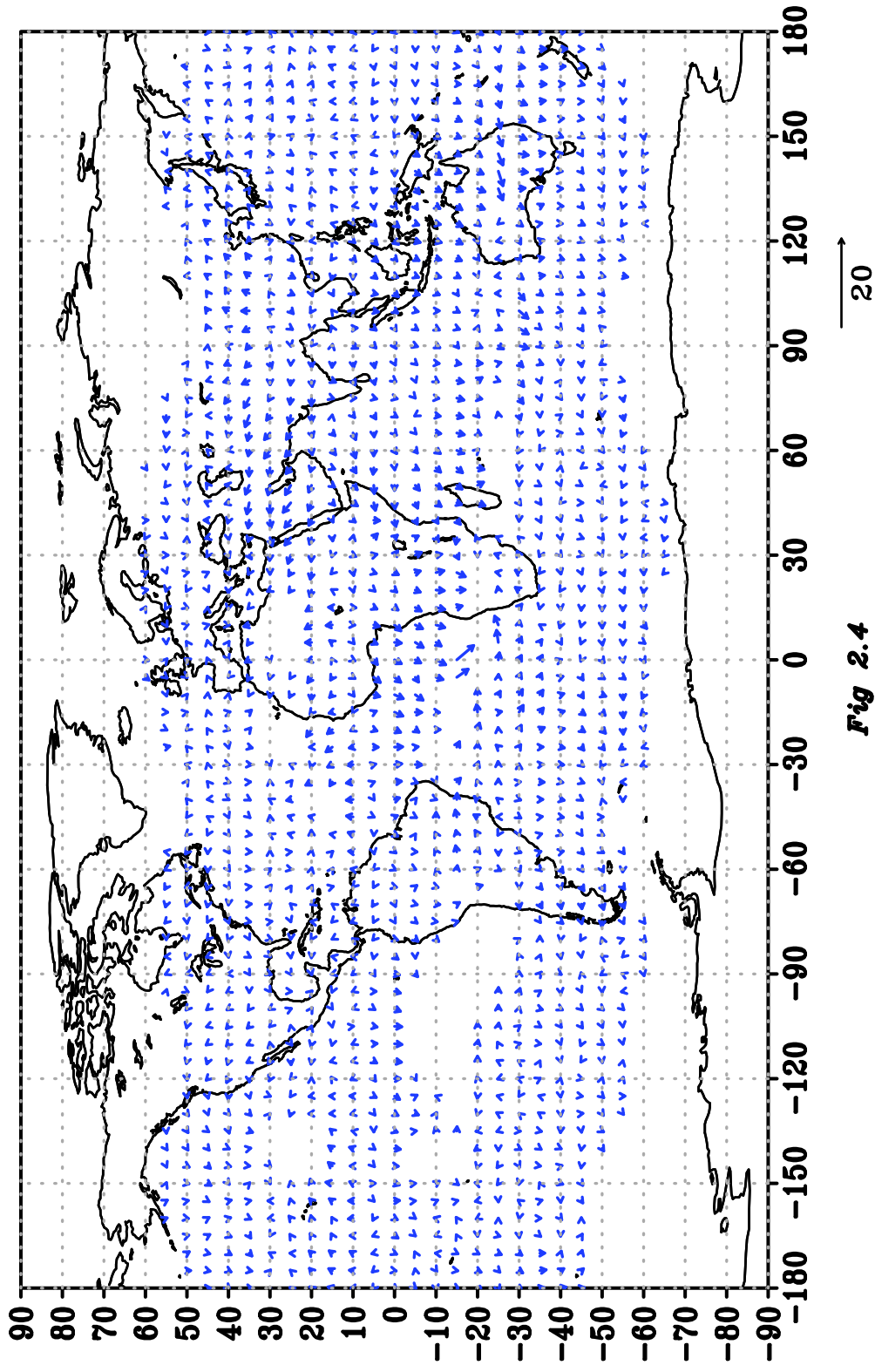


Fig 2.4

