ECMWF Global Data Monitoring Report

December 2017

European Centre for Medium-Range Weather Forecasts
Europäisches Zentrum für mittelfristige Wettervorhersage
Centre européen pour les prévisions météorologiques à moyen terme

Contents

Summary of Revisions (in reverse order)

Revision 28 (June 15) – Monitoring of SYNOP and SYNOP-SHIPs now includes BUFR encoded observations for those which were assimilated as well as for those without TAC counterpart.

Revision 27 (Feb 15) – Selection criteria for SHIPs are modified as per SOT-7/Doc.9.1.1.
Different criteria applied to Manual and Automatic SHIPs.

Revision 26 (Dec 14) – Coverage chart for ATOVS AMSU-A for Noaa_16 removed

Revision 25 (Mar 13) – Monitoring of Radiosondes and ASAPs now includes BUFR encoded observations for those which were assimilated as well as for those without TAC counterpart.
Tables 24 and 25 are also added to show the identifiers of these BUFR observations separately.

Revision 24 (Aug 06) – North Atlantic Monitoring statistics replaced by EUCOS Area Monitoring Statistics (tables 13 to 23).
Airep tables removed from this section.

Revision 23 (Dec 00) – Coverage charts for Noaa_14 MSU replaced by ATOVS AMSU-A for Noaa_16.

Revision 22 (Aug 99) – Coverage charts for TOVS thickness 300-100 hPa replaced by (A)TOVS AMSU-A and MSU (Noaa_15 and Noaa_14).

Revision 21 (May 99) – Monitoring statistics ceased for Noaa_11 as satellite is no more available.

Revision 20 (Sep 98) – Changes to tables and annex to remove all mention about data usage. Two more levels (50 and 850 hPa) added to the COSNA statistics for Sondes.

Revision 19 (Jul 98) – From June 29th, 1998 ECMWF model assimilates temperature data instead of geopotential from radiosondes. As a consequence the number of used geopotential data drops to zero in tables 7, 10, 13 and 15.

Revision 18 (Apr 98) – Changes to tables and annex to introduce the usage of accepted numbers and observations instead of precentage of rejection.

1 Introduction

The ECMWF global data monitoring report is a monthly publication intended to give an overview of the availability and quality of observations from the Global Observing System within the World Weather Watch of the World Meteorological Organisation. It should be recognised that the statistics given in this report refer to data as received at ECMWF in time for the appropriate analysis. The annex of the report gives further explanations of the methods applied to compile the statistics and on the reference used to establish the quality of observations.

The information presented on data quality is based on differences between observations and the values of the most recent ECMWF forecast ("first guess") of the same parameter. Depending on the time of the observation, the forecast range is between 9 and 15 hours. It should be recognised that although the quality of the first-guess is of a generally high standard this is only true to a limited extent in certain areas, such as the tropics and data-sparse areas of both northern and southern hemispheres. The data quality results should therefore be used with care when assessing the absolute quality of a particular observing platform. Other indicators such as long-term trends of station performance, particularly in comparison with nearby stations, can be more useful in this respect.

The global monitoring results presented in this report are meant to serve a wider meteorological community as well as to support special WMO programmes such as TOGA and EUCOS. The contents of the report may therefore be adapted for special requirements as necessary.

As recommended at the ninth session of the Commission for Basic Systems at Geneva 1988, lead centres have been appointed for each main type of observation which should liaise with the participating centres and co-ordinate all the results, inform the WMO Secretariat immediately of obvious problems, and produce every six months a consolidated list of observations of that particular type believed to be of low quality. The presently nominated centres are: RSMC Exeter for marine surface observations; RSMC ECMWF for radiosonde and pilot observations; WMC Washington for aircraft and satellite observations.

ECMWF produces this monthly report as part of its routine monitoring activity in order to facilitate the exchange of monitoring information. Tables are presented according to the CBS recommended standards for the exchange of monitoring results. Copies of the report will be provided to major GDPS centres participating in data monitoring activities as initiated and recommended at the ninth session of the Commission for Basic Systems in Geneva 1988, and to the WMO Secretariat and the International TOGA office in Geneva.

Any comments on the contents and the format of the report are welcome and should be addressed to:

ECMWF
Attn. Head of Evaluation Section
Shinfield Park
Reading, Berkshire, RG2 9AX
United Kingdom

2 Data summary - History of events

2.1 Radiosondes

The following is a list of land-based stations showing a change in reporting frequency (of 500 hPa geopotential) of at least 10 observations compared with the average over the previous 3 months. The number of reports received at ECMWF for the current and previous month is shown in addition to the observation time.

Ident	Time	Nov	Dec	Ident	Time	Nov	Dec
23205	(00)	27	12	02527	(00)	16	30
23205	(12)	27	12	03238	(00)	4	31
32618	(00)	28	11	08001	(00)	0	31
32618	(12)	27	8	27594	(00)	0	18
60760	(00)	14	0	27594	(12)	0	21
64400	(00)	28	7	32150	(12)	17	28
64400	(12)	30	5	40373	(12)	13	27
65578	(00)	16	0	40811	(00)	15	30
65578	(12)	20	0	60155	(00)	2	18
68538	(00)	36	0	68538	(12)	0	40
70361	(00)	36	15	71082	(00)	6	31
74006	(00)	11	0	72393	(00)	34	45
76595	(00)	22	10	72694	(00)	30	43
78897	(00)	14	0	72694	(12)	30	43
80001	(00)	29	13	72768	(12)	30	41
80001	(12)	28	12	74004	(00)	14	35
82917	(00)	15	0	76526	(12)	0	22
82917	(12)	14	0	78384	(00)	7	26
83899	(00)	20	0	78384	(12)	8	31
83899	(12)	29	3	78807	(00)	17	28
85442	(12)	60	45	83362	(00)	5	27
85799	(12)	57	43	83971	(00)	0	14
85934	(12)	54	42	89022	(12)	0	21
96996	(00)	30	7	89625	(12)	20	31

2.2 Drifting Buoys

Surface pressure observations from **1493** drifting buoys were received during the month.

3 Global monitoring statistics

The following figures and tables provide information on both the availability and quality of various data types as received at ECMWF during the month. A brief description of each figure/table is given below. For a full explanation please refer to the Annex.

3.1 Data Availability

Figures 1-9 are global charts for each data type showing the average number of observations received in 24 hours in 5 degree boxes. The average daily number of observations (global) is also displayed with a breakdown, where appropriate, for each WMO region (figures 1, 3 and 4) and Ocean (figures 1-4).

Fig	Observation Type	Parameter	Level/Layer
1	SYNOP/SHIP	MSL Pressure	Surface
2	DRIFTER	MSL Pressure	Surface
3	TEMP	Geopotential	500 hPa
4	TEMP/PILOT	Wind	300 hPa
5	AIRCRAFT (AIREP/AMDAR etc.)	Wind	300-150 hPa
6	SATOB	Wind	400-150 hPa
7	SATOB	Wind	1000-700 hPa
9	TOVS (120 km) - NOAA14	Thickness	300-100 hPa

(Figure 1 includes data from fixed marine platforms e.g. moored buoys.)

3.2 Data Quality

Tables 1-8 contain lists of suspect stations in the format according to Recommendation 3 CBS-Ext(85).

Tab	Observation Type	Parameter	Level/Layer
1	SHIP	MSL Pressure	Surface
2	SHIP	Wind Speed	Surface
3	SHIP	Wind Direction	Surface
4	DRIFTER	MSL Pressure	Surface
5	DRIFTER	Wind Speed	Surface
6	DRIFTER	Wind Direction	Surface
7	TEMP	Geopotential	1000- 30 hPa
8	TEMP/PILOT	Wind	1000-100 hPa
9	TEMP/PILOT	Wind Direction	500-150 hPa

(SHIP tables include data from fixed marine platforms e.g. moored buoys.)

Figures 10-13 show the locations of suspect stations given in tables 7 and 8.

Fig	Observation Type	Parameter	Observation Time
10	TEMP	Geopotential	00 UTC
11	TEMP	Geopotential	12 UTC
12	TEMP/PILOT	Wind	00 UTC
13	TEMP/PILOT	Wind	12 UTC

Tables 10 and 11 provide quality statistics for all TEMPSHIPS and PILOTSHIPS received during the month.

Tab	Parameter	Observation Time
10	Geopotential	00 and 12 UTC
11	Wind	00 and 12 UTC

Figures 14–18 show global charts of SATOB and aircraft wind statistics in the form of wind vectors averaged over 5 degree boxes.

Fig	Parameter	Level/Layer
14	SATOB - Mean observed wind	1000-700 hPa
15	SATOB - Mean observed wind	400-150 hPa
16	SATOB - Mean observed minus first-guess wind	1000-700 hPa
17	SATOB - Mean observed minus first-guess wind	400-150 hPa
18	AIRCRAFT WIND - Mean observed minus first-guess	300-150 hPa

Table 12 provides quality statistics of aircraft wind observations stratified by airline carrier.

3.2.1 Figure 1 - Availability - SYNOP PRESSURE

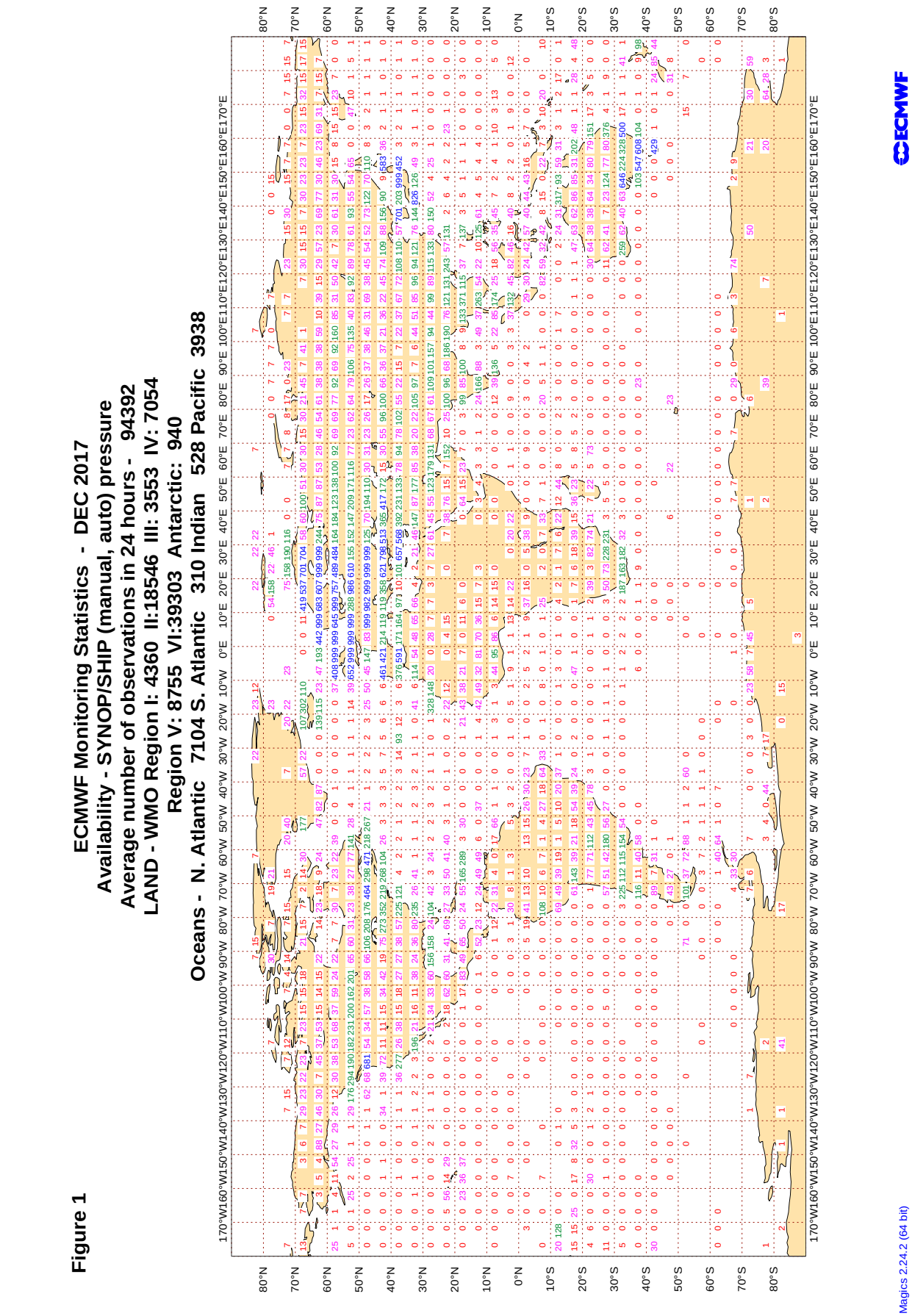


Figure 1

3.2.2 Figure 2 - Availability - DRIFTER PRESSURE

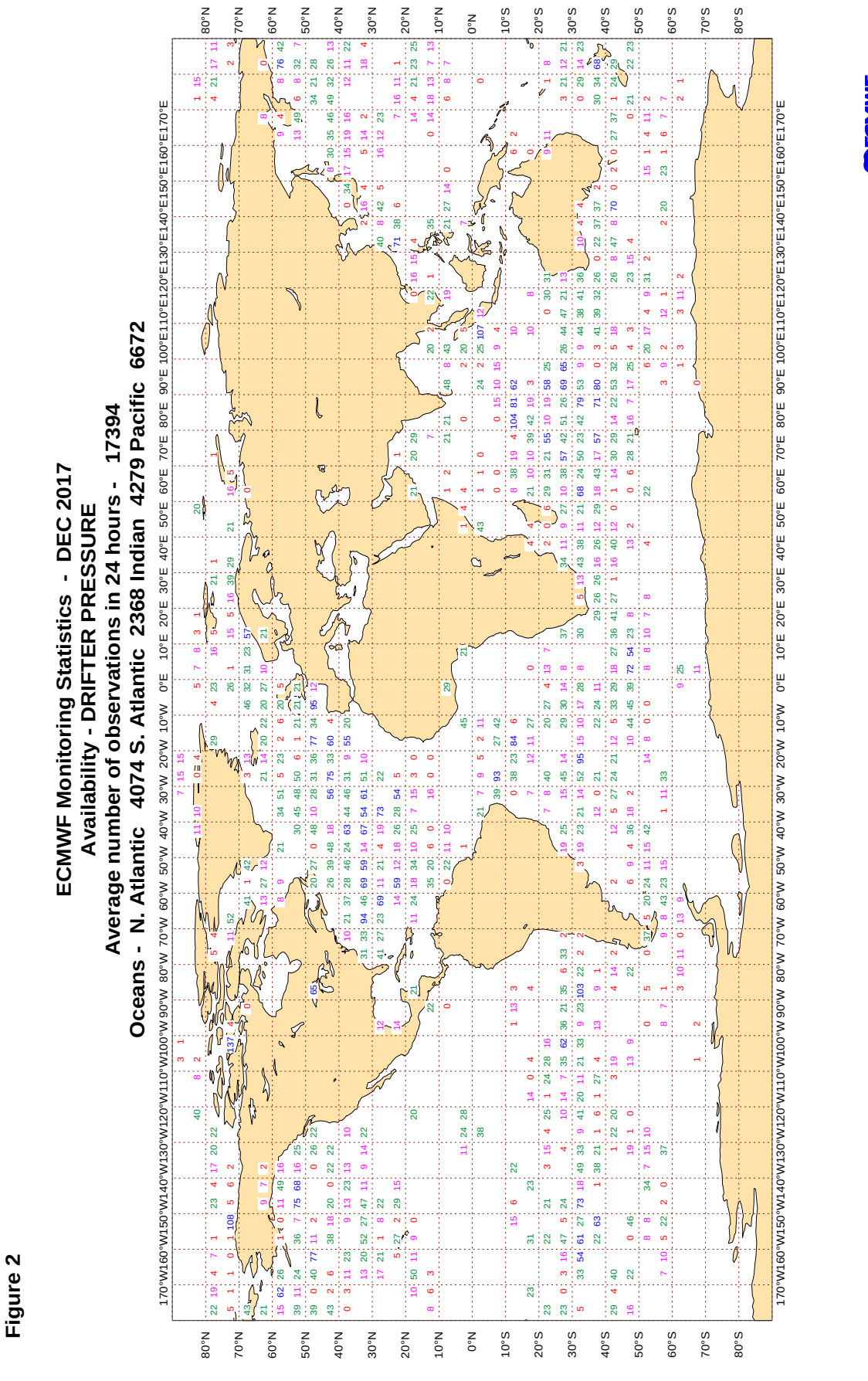


Figure 2

3.2.3 Figure 3 - Availability - TEMP 500 hPa geopotential

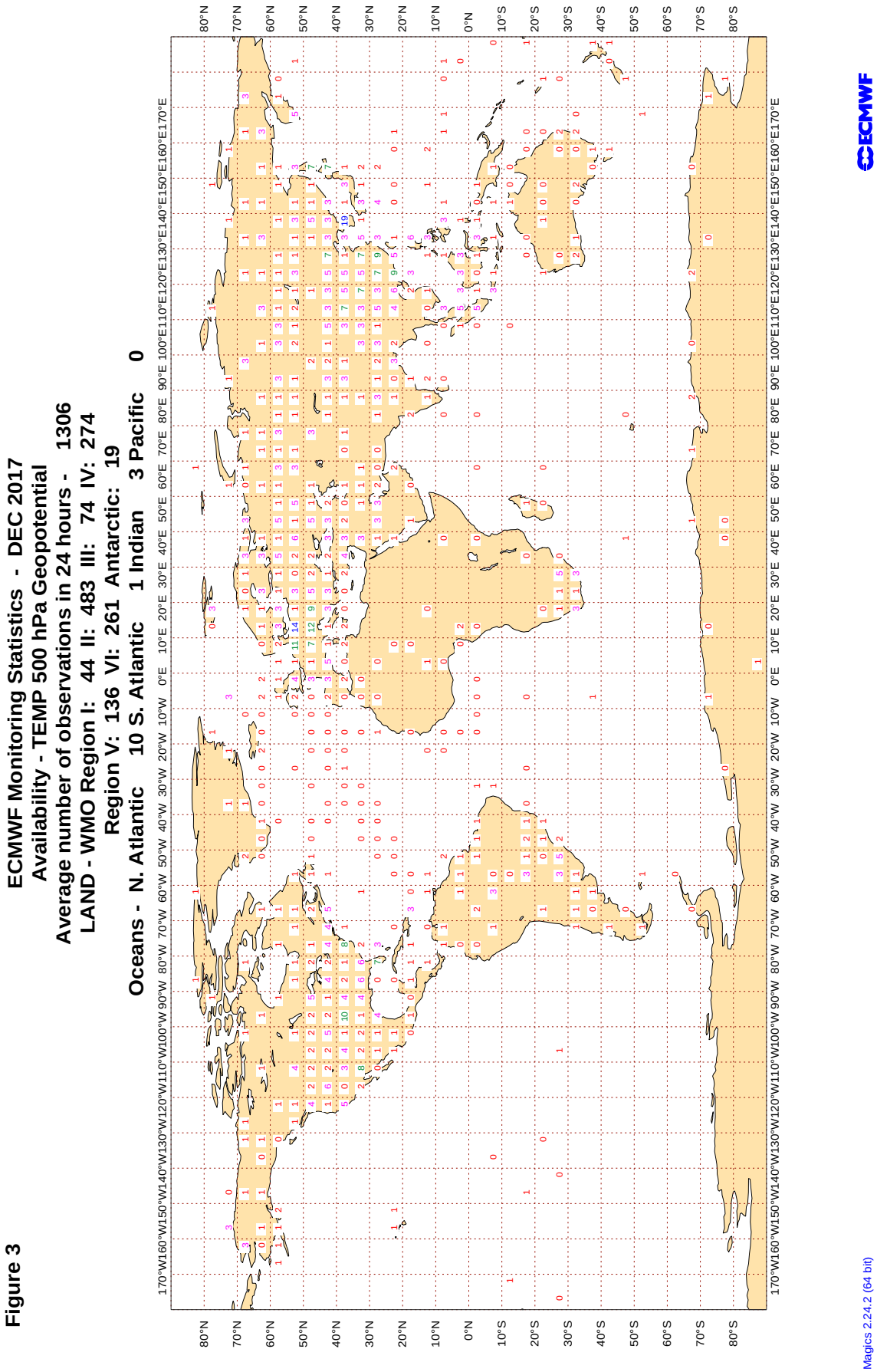


Figure 3

3.2.4 Figure 4 - Availability - TEMP/PILOT 300 hPa wind

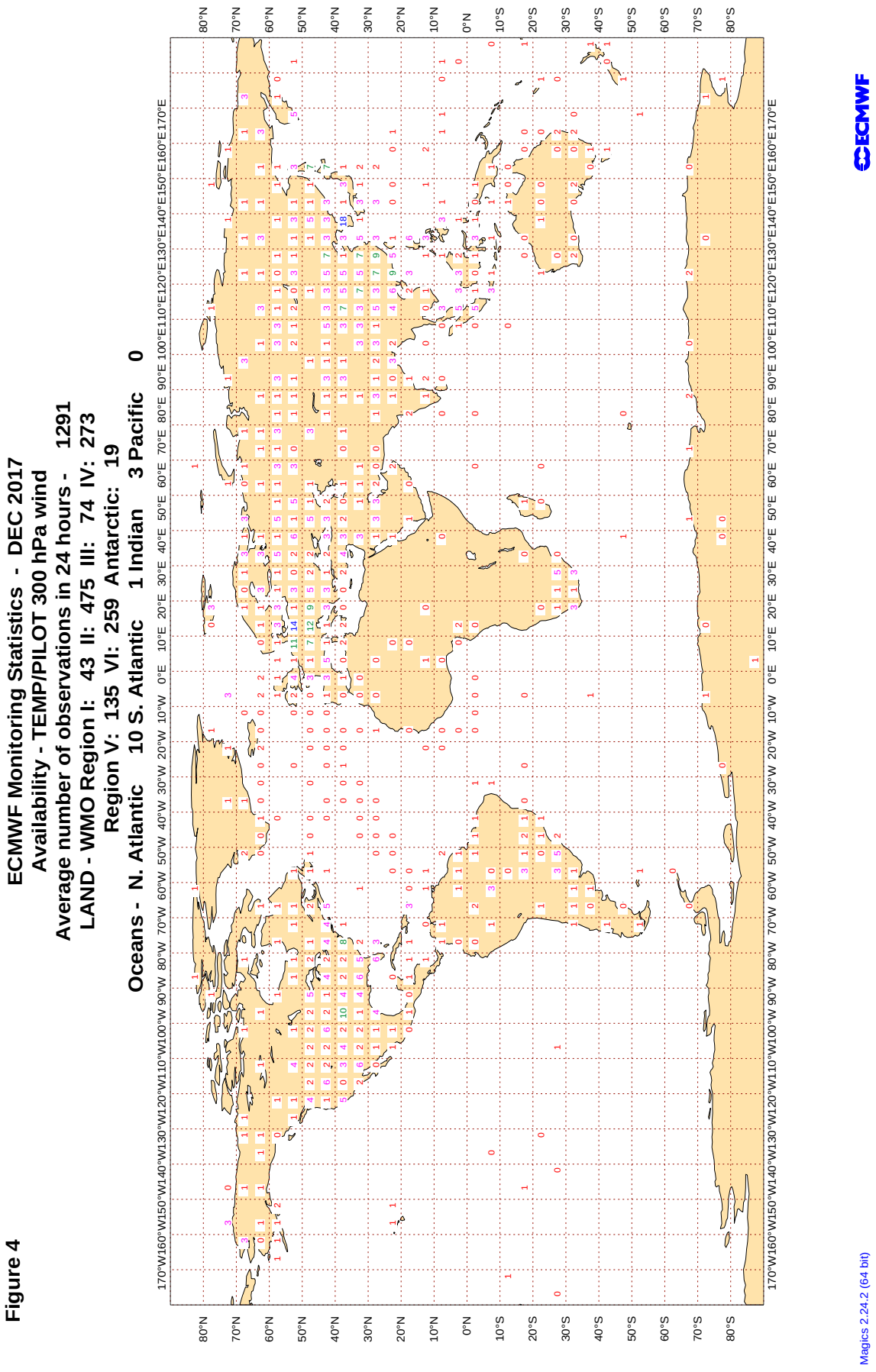


Figure 4

3.2.5 Figure 5 - Availability - AIRCRAFT winds 300-150 hPa

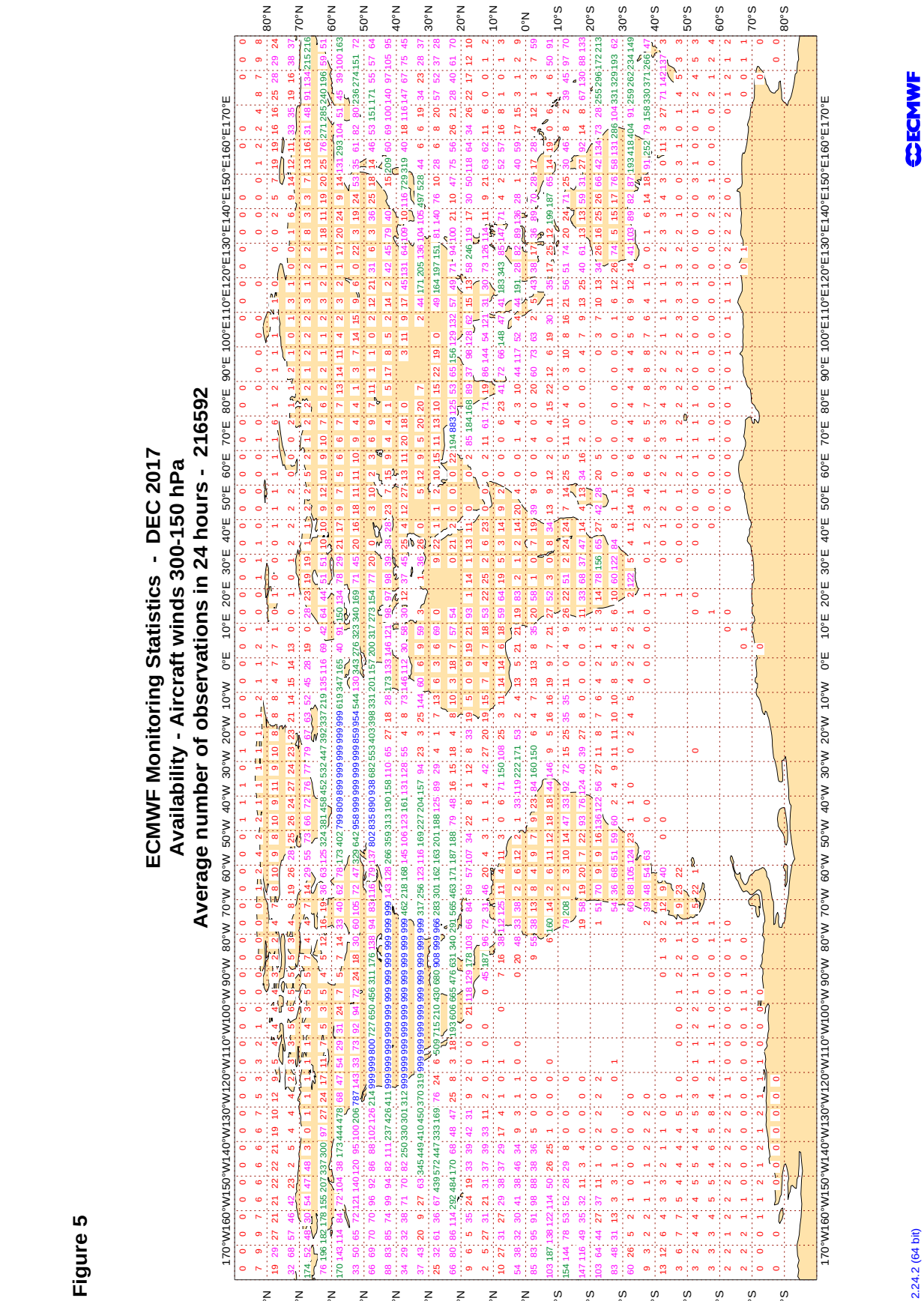
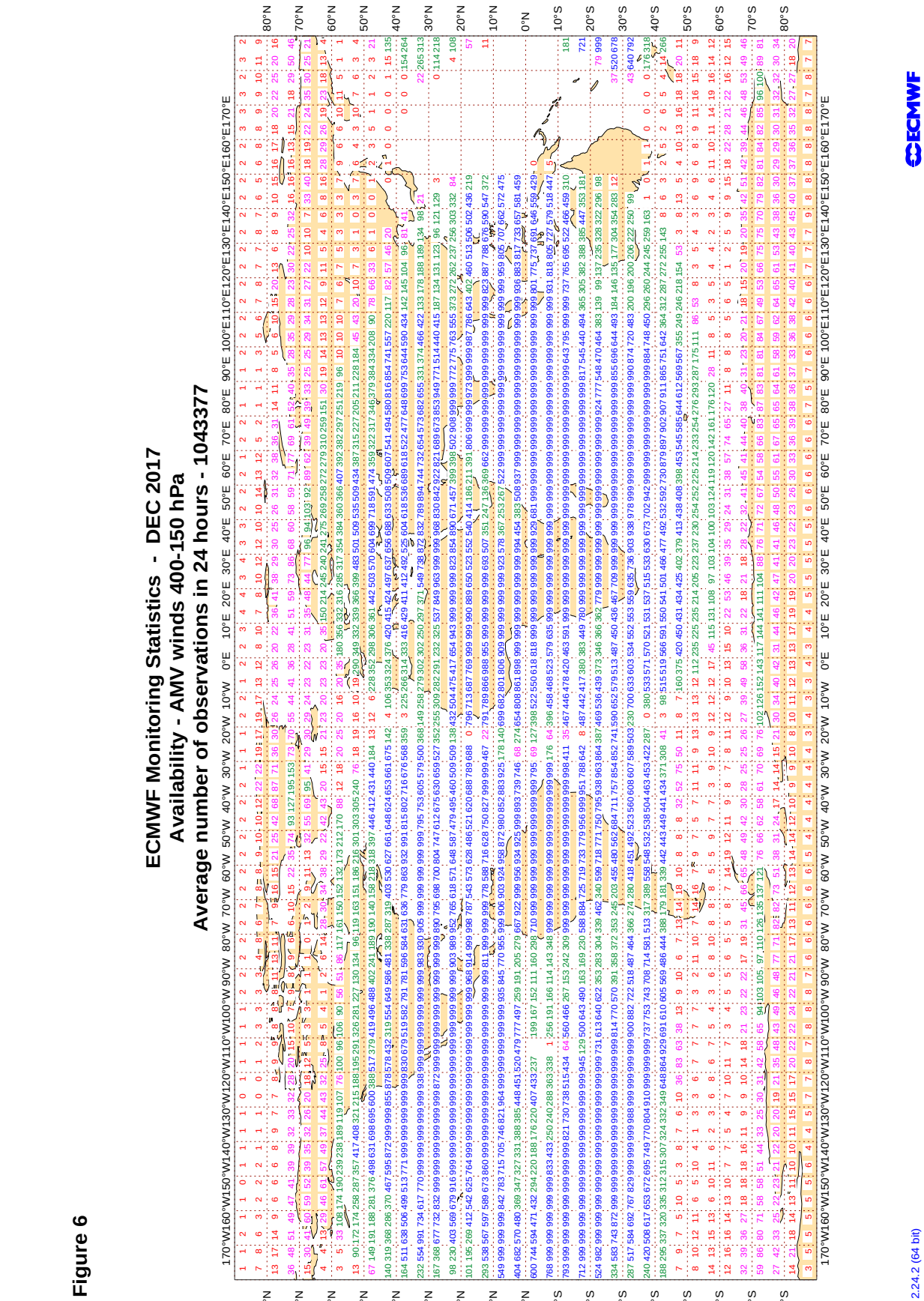


Figure 5

3.2.6 Figure 6 - Availability - SATOB winds 400-150 hPa

Figure 6



3.2.7 Figure 7 - Availability - SATOB winds 1000-700 hPa

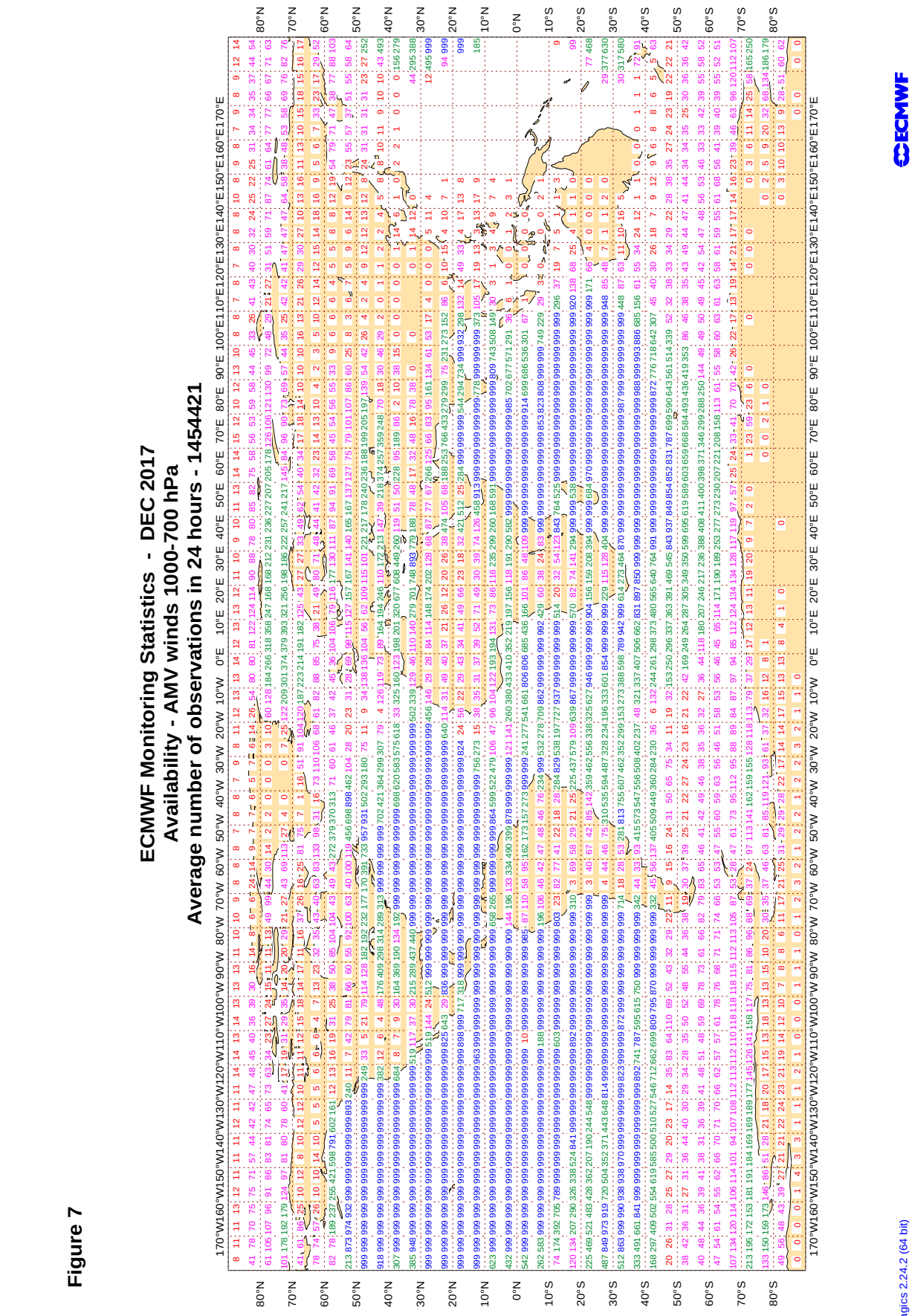
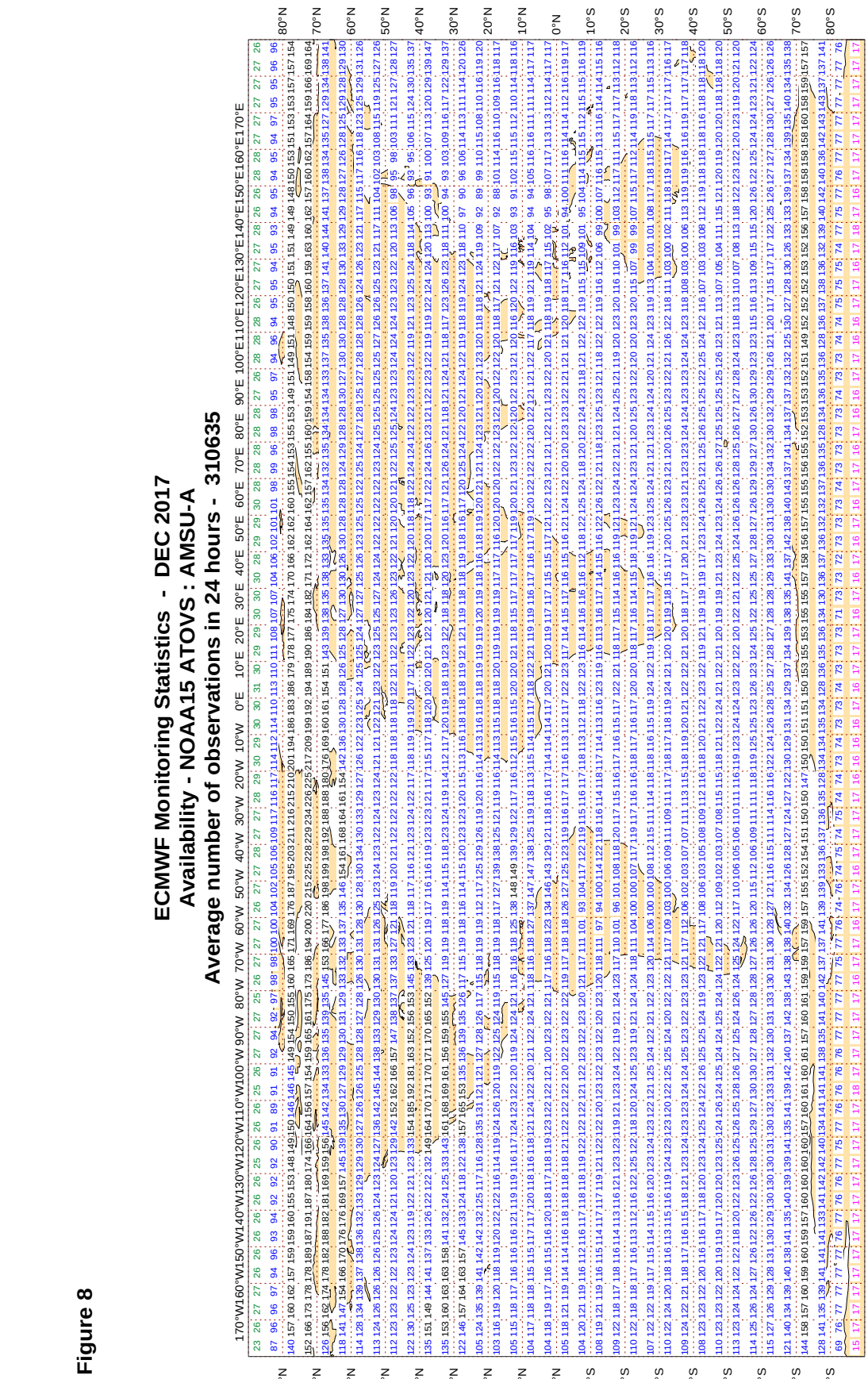


Figure 7

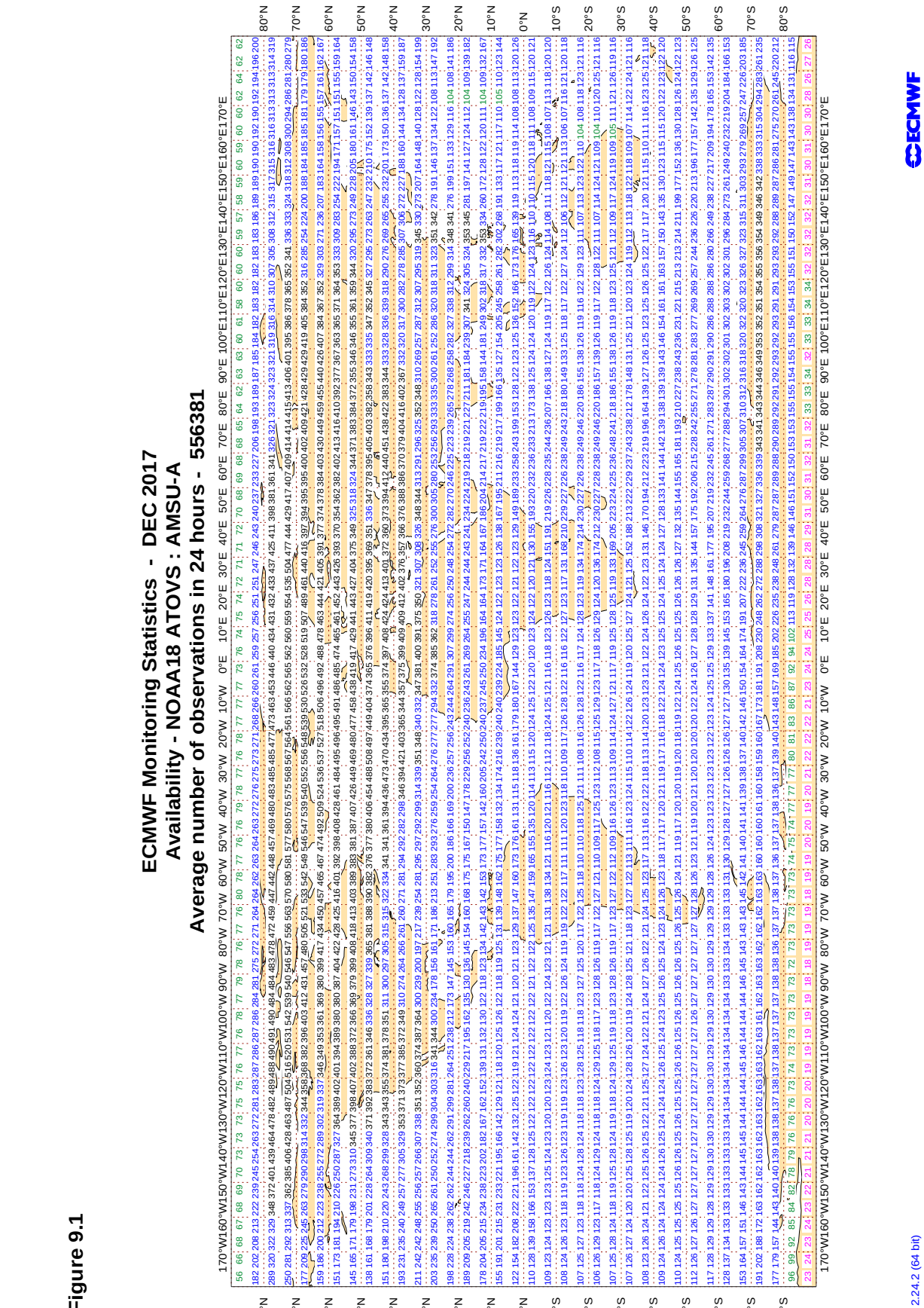
3.2.8 Figure 8 - Availability - NOAA15 ATOVS : AMSU-A

Figure 8



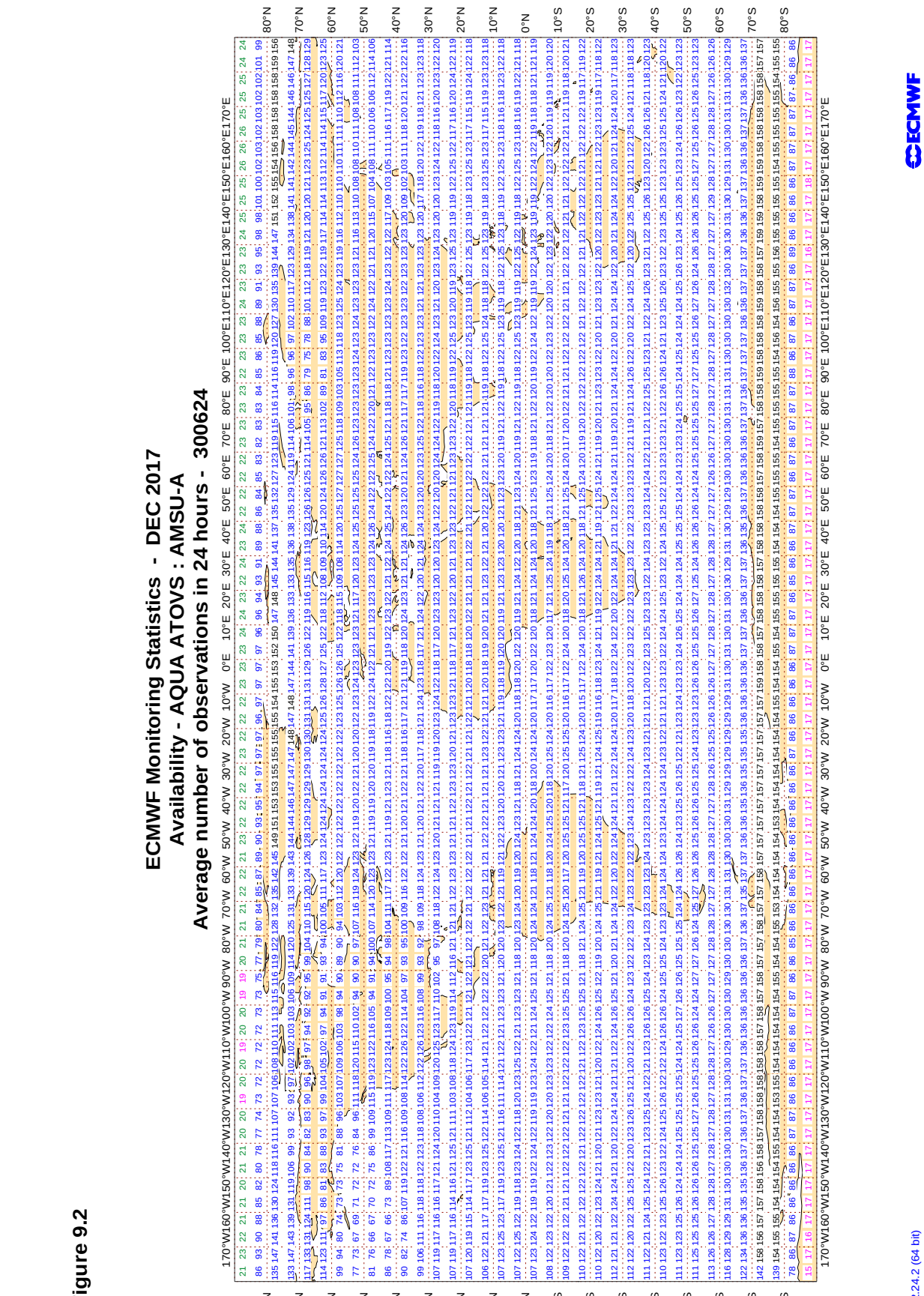
3.2.9 Figure 9.1 - Availability - NOAA18 ATOVS : AMSU-A

Figure 9.1



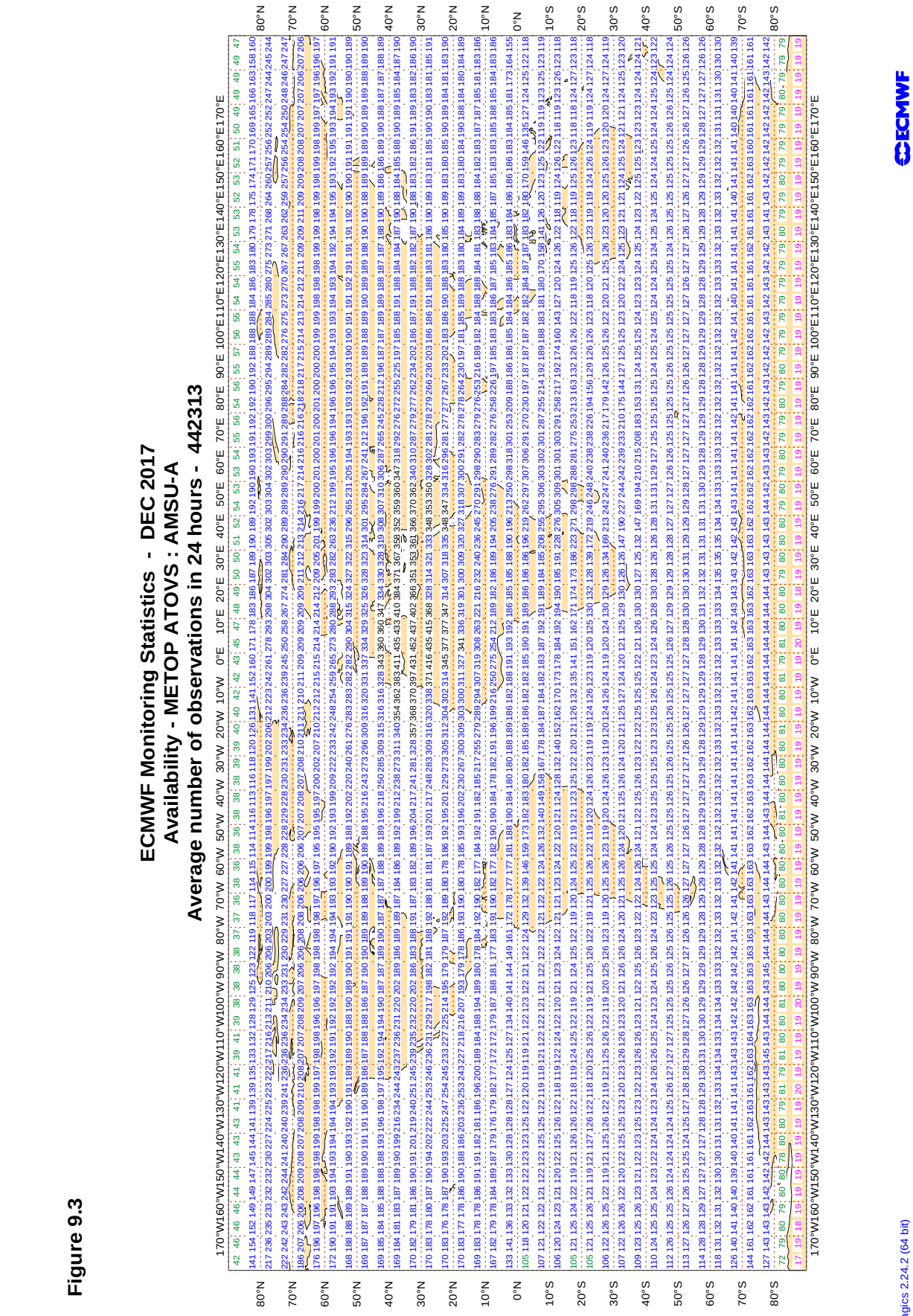
3.2.10 Figure 9.2 - Availability - AQUA ATOVS : AMSU-A

Figure 9.2



3.2.11 Figure 9.3 - Availability - METOP ATOVS : AMSU-A

Figure 9.3



3.2.12 Table 1 - Suspect ships and fixed marine platforms: Surface pressure - (hPa)

```
          LIST OF SUSPECT STATIONS        : SHIPS + FIXED MARINE PLATFORMS
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : SURFACE PRESSURE (HPA)
                    AREA                  : GLOBAL
                    PERIOD                : DEC 2017
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


SELECTION CRITERIA: NO. OF OBS.           >= 15(50), AND,
Manual (Automatic)  ABSOLUTE BIAS         >= 3(2) HPA, OR,
                    STANDARD DEVIATION    >= 5(4) HPA, OR,
                    % GROSS ERROR         >= 25(15)
                    (GROSS ERROR LIMIT = 15 HPA)

TIME = 99 => AVERAGE OF 00, 06, 12 AND 18 UTC OBSERVATIONS
```

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	SD	BIAS	RMS
2IYM9	99	P	SUR	23	0	0.4	3.1	3.1
3FFA5	99	P	SUR	27	0	2.2	3.6	4.2
3FFH9	99	P	SUR	19	0	0.6	-5.6	5.6
3FPB5	99	P	SUR	24	0	2.2	3.8	4.4
41037	99	P	SUR	118	41	0.4	-0.4	0.6
5BZE2	99	P	SUR	60	0	0.8	3.3	3.4
9HA4638	99	P	SUR	29	2	0.7	13.3	13.3
9HJD9	99	P	SUR	27	0	1.6	-3.4	3.7
9V2907	99	P	SUR	16	0	1.5	6.1	6.2
9V9793	99	P	SUR	25	0	1.5	4.0	4.2
9V9832	99	P	SUR	24	0	0.6	-4.2	4.2
AUYJ	99	P	SUR	63	0	3.3	5.2	6.1
AUYN	99	P	SUR	45	1	0.8	7.5	7.5
AUYO	99	P	SUR	21	0	4.0	-4.2	5.7
BKIC	99	P	SUR	78	0	2.4	3.6	4.3
BNSK	99	P	SUR	23	23	0.0	0.0	0.0
C6AV5	99	P	SUR	28	0	0.8	-3.5	3.6
C6BR3	99	P	SUR	82	2	2.4	12.3	12.5
C6ZJ5	99	P	SUR	17	0	1.2	-4.0	4.2
D5HF3	99	P	SUR	27	0	1.2	8.5	8.6
ELPX7	99	P	SUR	19	0	0.6	3.1	3.2
OZ2049	99	P	SUR	25	0	0.6	-5.3	5.3
OZWA2	99	P	SUR	30	0	1.7	-3.4	3.8
SDIA	99	P	SUR	95	25	2.4	-0.7	2.5
UBAU	99	P	SUR	52	0	1.8	-3.5	3.9
UBRI5	99	P	SUR	23	2	4.3	-3.1	5.3
UBSH5	99	P	SUR	21	0	0.5	-3.0	3.0
UFJN	99	P	SUR	52	0	1.5	-4.4	4.7
UFMK	99	P	SUR	16	2	4.7	-5.7	7.4
UGZM	99	P	SUR	20	0	0.9	-3.2	3.3
V7SY6	99	P	SUR	15	0	1.1	-8.2	8.3
V7ZZ5	99	P	SUR	60	0	1.8	4.9	5.2

LIST OF SUSPECT STATIONS : SHIPS + FIXED MARINE PLATFORMS
MONITORING CENTRE : ECMWF
ELEMENT MONITORED : SURFACE PRESSURE (HPA)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	SD	BIAS	RMS
VRCU7	99	P	SUR	20	0	2.5	4.4	5.1
VRGV9	99	P	SUR	70	0	2.4	3.6	4.3
VRID2	99	P	SUR	75	0	1.3	3.8	4.0
VRJF2	99	P	SUR	22	0	2.0	-3.7	4.2
VRLK7	99	P	SUR	16	0	0.7	3.9	3.9
VRNM9	99	P	SUR	20	2	1.1	3.5	3.7
VTFG	99	P	SUR	101	5	0.5	14.2	14.2
VTXB	99	P	SUR	118	4	6.7	-6.7	9.5
WAIU	99	P	SUR	26	0	1.5	-4.9	5.1
WCAJ	99	P	SUR	22	0	0.6	5.4	5.5
WCX8884	99	P	SUR	23	0	2.7	5.0	5.7
WDC6925	99	P	SUR	27	0	1.1	3.3	3.5
WDG8555	99	P	SUR	54	0	0.8	5.7	5.8
WDI6469	99	P	SUR	25	0	5.6	-3.5	6.6
WDJ2573	99	P	SUR	48	0	2.3	-3.0	3.8
WLPI	99	P	SUR	15	0	0.9	-3.2	3.4
WTDH	99	P	SUR	52	0	0.7	-4.5	4.5

3.2.13 Table 2 - Suspect ships and fixed marine platforms: Wind speed (m/s)

```
          LIST OF SUSPECT STATIONS        : SHIPS + FIXED MARINE PLATFORMS
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND SPEED (M/S)
                    AREA                  : GLOBAL
                    PERIOD                : DEC 2017
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


SELECTION CRITERIA: NO. OF OBS.           >= 15(50), AND,
Manual (Automatic)  ABSOLUTE BIAS         >= 4(4) M/S, OR,
                    % GROSS ERROR         >= 25(15)
                    (GROSS ERROR LIMIT FOR VECTOR WIND = 25 M/S)


TIME = 99 => AVERAGE OF 00, 06, 12 AND 18 UTC OBSERVATIONS
```

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
46183	99	SPEED	SUR	43	0	0	3.7	-7.5	8.4

3.2.14 Table 3 - Suspect ships and fixed marine platforms: Wind direction (DEGREES)

```
          LIST OF SUSPECT STATIONS        : SHIPS + FIXED MARINE PLATFORMS
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND DIRECTION (DEGREES)
                    AREA                  : GLOBAL
                    PERIOD                : DEC 2017
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


SELECTION CRITERIA: NO. OF OBS.           >= 15(50) (WIND SPEEDS > 3M/S), AND ,
Manual (Automatic)  ABSOLUTE BIAS         >= 30(25) DEGREES, OR,
                    STANDARD DEVIATION    >= 70(50) DEGREES
                    (GROSS ERROR LIMIT FOR VECTOR WIND = 25 M/S)


TIME = 99 => AVERAGE OF 00, 06, 12 AND 18 UTC OBSERVATIONS
```

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
34002	99	DIRN	SUR	245	74	0	148.6	84.3	170.8
42360	99	DIRN	SUR	108	0	0	98.5	27.1	102.1
42361	99	DIRN	SUR	106	0	0	12.7	32.6	35.0
42365	99	DIRN	SUR	54	0	0	22.5	-31.7	38.9
44037	99	DIRN	SUR	110	0	0	17.0	31.1	35.4
46120	99	DIRN	SUR	84	0	0	86.2	-46.5	97.9
46207	99	DIRN	SUR	110	0	0	15.2	43.8	46.4

3.2.15 Table 4 - Suspect drifters: Surface pressure (HPA)

```
          LIST OF SUSPECT STATIONS         : DRIFTER
                    MONITORING CENTRE      : ECMWF
                    ELEMENT MONITORED      : SURFACE PRESSURE (HPA)
                    AREA                   : GLOBAL
                    PERIOD                 : DEC 2017
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


SELECTION CRITERIA: NO. OF OBS.            >= 20, AND,
                    ABSOLUTE BIAS          >= 4 HPA, OR,
                    STANDARD DEVIATION     >= 6 HPA, OR,
                    % GROSS ERROR          >= 25
                    (GROSS ERROR LIMIT = 15 HPA)

TIME = 99 => AVERAGE OF ALL OBSERVATIONS
```

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
1501517	99	P	SUR	-37	-12	730	0	0.6	-5.4	5.5
2101577	99	P	SUR	23	126	1225	0	2.0	5.9	6.2
2200185	99	P	SUR	37	125	734	164	7.0	-2.8	7.6
2301708	99	P	SUR	6	80	641	46	3.6	-7.0	7.9
3301537	99	P	SUR	-51	-57	231	0	2.2	4.5	5.0
41037	99	P	SUR	34	-77	683	237	0.5	-0.4	0.6
4401629	99	P	SUR	47	-36	48	20	0.7	1.2	1.4
4500509	99	P	SUR	45	-88	1349	1349	0.0	0.0	0.0
45509	99	P	SUR	45	-88	1421	1421	0.0	0.0	0.0
4600726	99	P	SUR	56	175	410	232	4.6	-6.2	7.7
4601623	99	P	SUR	76	172	70	63	0.5	-11.6	11.6
46726	99	P	SUR	56	175	431	254	4.5	-6.2	7.7
4700552	99	P	SUR	68	-63	605	605	0.0	0.0	0.0
4701659	99	P	SUR	71	-104	362	362	0.0	0.0	0.0
4701674	99	P	SUR	71	-67	686	0	0.5	-6.2	6.2
47552	99	P	SUR	68	-63	728	728	0.0	0.0	0.0
4800631	99	P	SUR	82	4	519	359	6.9	-5.4	8.8
4800790	99	P	SUR	80	168	505	505	0.0	0.0	0.0
4801609	99	P	SUR	71	-140	389	300	0.4	-0.4	0.5
4801622	99	P	SUR	77	-176	574	234	8.3	-5.8	10.1
4801626	99	P	SUR	78	-173	460	460	0.0	0.0	0.0
4801711	99	P	SUR	78	175	695	0	2.7	-4.9	5.6
4802502	99	P	SUR	85	-105	574	291	7.8	5.4	9.5
48790	99	P	SUR	80	168	692	692	0.0	0.0	0.0
5201578	99	P	SUR	9	132	667	1	4.4	4.0	6.0
5301603	99	P	SUR	12	94	729	729	0.0	0.0	0.0
5500632	99	P	SUR	-21	150	650	0	4.3	-4.3	6.1
5500937	99	P	SUR	-37	169	142	141	0.0	-0.1	0.1
55632	99	P	SUR	-21	150	650	0	4.3	-4.3	6.1
55937	99	P	SUR	-37	169	142	141	0.0	-0.1	0.1
5600942	99	P	SUR	-28	82	682	118	4.1	-5.9	7.2
5600946	99	P	SUR	-31	89	679	602	1.1	0.0	1.1

```
          LIST OF SUSPECT STATIONS        : DRIFTER
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : SURFACE PRESSURE (HPA)
                    (CONTINUED)
```

WMO IDENT	OBS TIME	ELM	ME LAT	N LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	
5601611	99	P	SUR	-18	97	688	0	0.5	6.9	6.9
56942	99	P	SUR	-28	82	724	122	4.0	-5.9	7.2
56946	99	P	SUR	-31	89	727	649	1.1	0.0	1.1
6301550	99	P	SUR	76	59	46	0	5.0	6.5	8.2

3.2.16 Table 5 - Suspect drifters: Wind speed (m/s)

```
          LIST OF SUSPECT STATIONS        : DRIFTER
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND SPEED (M/S)
                    AREA                  : GLOBAL
                    PERIOD                : DEC 2017
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


SELECTION CRITERIA: NO. OF OBS.           >= 20, AND,
                    ABSOLUTE BIAS         >= 5 M/S, OR,
                    % GROSS ERROR         >= 25
                    (GROSS ERROR LIMIT FOR VECTOR WIND = 25 M/S)


TIME = 99 => AVERAGE OF ALL OBSERVATIONS
```

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
46183	99	SPEED	SUR	54	-131	255	0	0	3.7	-7.6	8.5
5200309	99	SPEED	SUR	5	-180	66	0	0	1.4	-5.9	6.0
52309	99	SPEED	SUR	5	-180	66	0	0	1.5	-6.1	6.3

3.2.17 Table 6 - Suspect drifters: Wind direction (degrees)

```
          LIST OF SUSPECT STATIONS         : DRIFTER
                    MONITORING CENTRE      : ECMWF
                    ELEMENT MONITORED      : WIND DIRECTION (DEGREES)
                    PERIOD                 : DEC 2017
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


SELECTION CRITERIA: NO. OF OBS.            >= 20 (WIND SPEEDS > 3M/S), AND ,
                    ABSOLUTE BIAS          >= 20 DEGREES, OR,
                    STANDARD DEVIATION     >= 60 DEGREES
                    (GROSS ERROR LIMIT FOR VECTOR WIND = 25 M/S)


TIME = 99 => AVERAGE OF ALL OBSERVATIONS
```

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
23092	99	DIRN	SUR	17	89	125	0	90	37.6	-73.1	82.2
23093	99	DIRN	SUR	16	88	166	0	2	18.1	26.5	32.1
23454	99	DIRN	SUR	10	73	103	0	0	27.5	21.9	35.1
3100229	99	DIRN	SUR	-3	-38	64	0	0	8.0	-22.4	23.8
3100231	99	DIRN	SUR	-27	-47	174	0	33	36.5	62.9	72.8
3100262	99	DIRN	SUR	-23	-43	30	0	0	35.9	-21.9	42.0
3100374	99	DIRN	SUR	-25	-45	414	0	0	18.2	-23.5	29.8
31229	99	DIRN	SUR	-3	-38	64	0	0	8.4	-22.4	23.9
31231	99	DIRN	SUR	-27	-47	160	0	36	35.7	61.8	71.4
31262	99	DIRN	SUR	-23	-43	28	0	0	38.0	-27.9	47.2
31374	99	DIRN	SUR	-25	-45	380	0	0	17.7	-24.7	30.4
34002	99	DIRN	SUR	-55	-90	2104	722	100	0.0	-98.0	98.0
42044	99	DIRN	SUR	26	-97	220	0	5	25.3	-29.3	38.7
42045	99	DIRN	SUR	26	-97	723	0	0	24.8	-28.7	37.9
42085	99	DIRN	SUR	18	-67	671	0	0	14.7	24.3	28.4
42361	99	DIRN	SUR	28	-93	632	0	1	14.6	29.8	33.2
42365	99	DIRN	SUR	28	-89	263	0	2	17.3	-30.2	34.8
44037	99	DIRN	SUR	44	-68	658	0	0	14.1	30.7	33.8
44058	99	DIRN	SUR	38	-76	748	0	0	17.6	-29.2	34.1
46120	99	DIRN	SUR	48	-122	326	0	27	50.5	-43.4	66.6
46207	99	DIRN	SUR	51	-130	667	0	1	14.7	43.8	46.2
6101003	99	DIRN	SUR	40	25	173	0	8	31.9	36.1	48.1

3.2.18 Table 7 - Suspect radiosondes: Geopotential height (metres)

```
          LIST OF SUSPECT STATIONS        : RADIOSONDES
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
                    AREA                  : GLOBAL
                    PERIOD                : DEC 2017
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


SELECTION CRITERIA: AT LEAST 3 LEVELS WITH
                    10 OBS AND 100 M WEIGHTED RMS


ONLY THE WORST LEVEL IS SHOWN (WITH UNWEIGHTED RMS)
```

WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
04360	12	Z	1000	66	-38	16	0	5.6	39.5	39.9
04360	00	Z	1000	66	-38	16	0	9.8	39.1	40.3
21946	00	Z	50	71	148	18	1	71.9	-198.8	211.4
21946	12	Z	50	71	148	15	0	71.5	-208.6	220.5
24125	12	Z	70	69	112	14	2	73.6	-223.5	235.3
24125	00	Z	70	69	112	16	1	84.9	-202.4	219.5
24343	00	Z	70	67	123	21	0	59.3	-109.7	124.7
24641	12	Z	50	64	122	19	0	52.6	-164.8	173.0
24641	00	Z	50	64	122	19	0	83.6	-172.3	191.5
24726	00	Z	50	63	114	20	1	75.9	-164.0	180.7
24726	12	Z	50	63	114	21	1	77.5	-131.8	152.9
25123	12	Z	70	69	161	10	0	46.2	-132.8	140.6
27707	00	Z	50	54	35	25	0	66.2	-205.2	215.6
27707	12	Z	30	54	35	28	0	88.6	-205.4	223.7
28225	12	Z	50	58	56	15	0	114.9	-210.8	240.1
28225	00	Z	50	58	56	18	0	93.3	-131.8	161.5
31004	00	Z	30	59	125	19	0	115.6	-187.2	220.0
31004	12	Z	70	59	125	23	0	106.5	-144.6	179.6
31088	12	Z	30	59	143	21	0	112.2	-151.0	188.1
31873	12	Z	50	46	134	29	0	47.5	-142.7	150.4
31873	00	Z	150	46	134	31	0	25.1	-85.6	89.2
34300	00	Z	50	50	36	18	0	52.8	-134.4	144.4
34858	12	Z	50	46	43	28	0	98.7	-150.2	179.7
34858	00	Z	30	46	43	18	0	89.5	-275.2	289.4
42165	00	Z	400	28	73	16	1	60.5	-28.8	67.0
47122	00	Z	1000	37	127	31	0	9.7	-46.6	47.6
47122	12	Z	1000	37	127	31	0	3.0	-45.4	45.5
83566	00	Z	1000	-20	-44	29	0	16.1	-48.6	51.2

LIST OF SUSPECT STATIONS (CONTINUED)

WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
96147	12	Z	925	4	108	26	1	12.3	40.8	42.6
96147	00	Z	850	4	108	27	2	14.7	52.9	54.9
98223	00	Z	30	18	121	26	0	58.8	243.3	250.3

3.2.19 Table 8 - Suspect radiosondes: Wind (m/s)

```
          LIST OF SUSPECT STATIONS        : RADIOSONDES
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND (M/S)
                    AREA                  : GLOBAL
                    PERIOD                : DEC 2017
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD

SELECTION CRITERIA: AT LEAST 10 OBS AND 15 M/S RMS VECTOR WIND

STANDARD LEVEL (1000-100 HPA) WITH HIGHEST RMS IS SHOWN
```

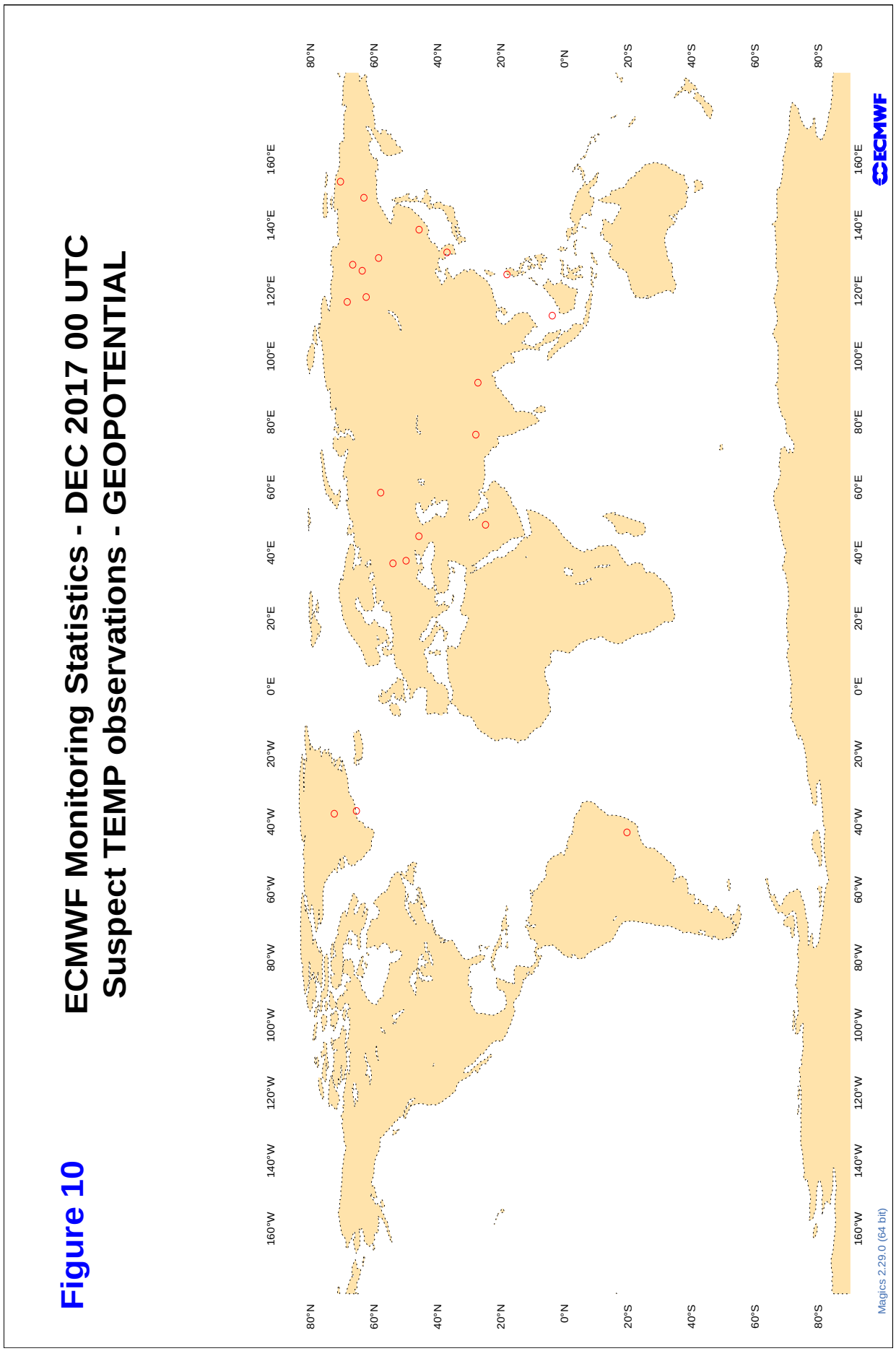
WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	UBIAS	VBIAS	RMS
42182	00	V	150	29	77	21	0	-9.8	-4.3	16.3
42182	12	V	150	29	77	30	0	-12.8	-6.5	19.7
42423	00	V	150	26	90	11	0	-10.2	-1.7	15.7

3.2.20 Table 9 - Suspect radiosondes: Wind direction (degrees)

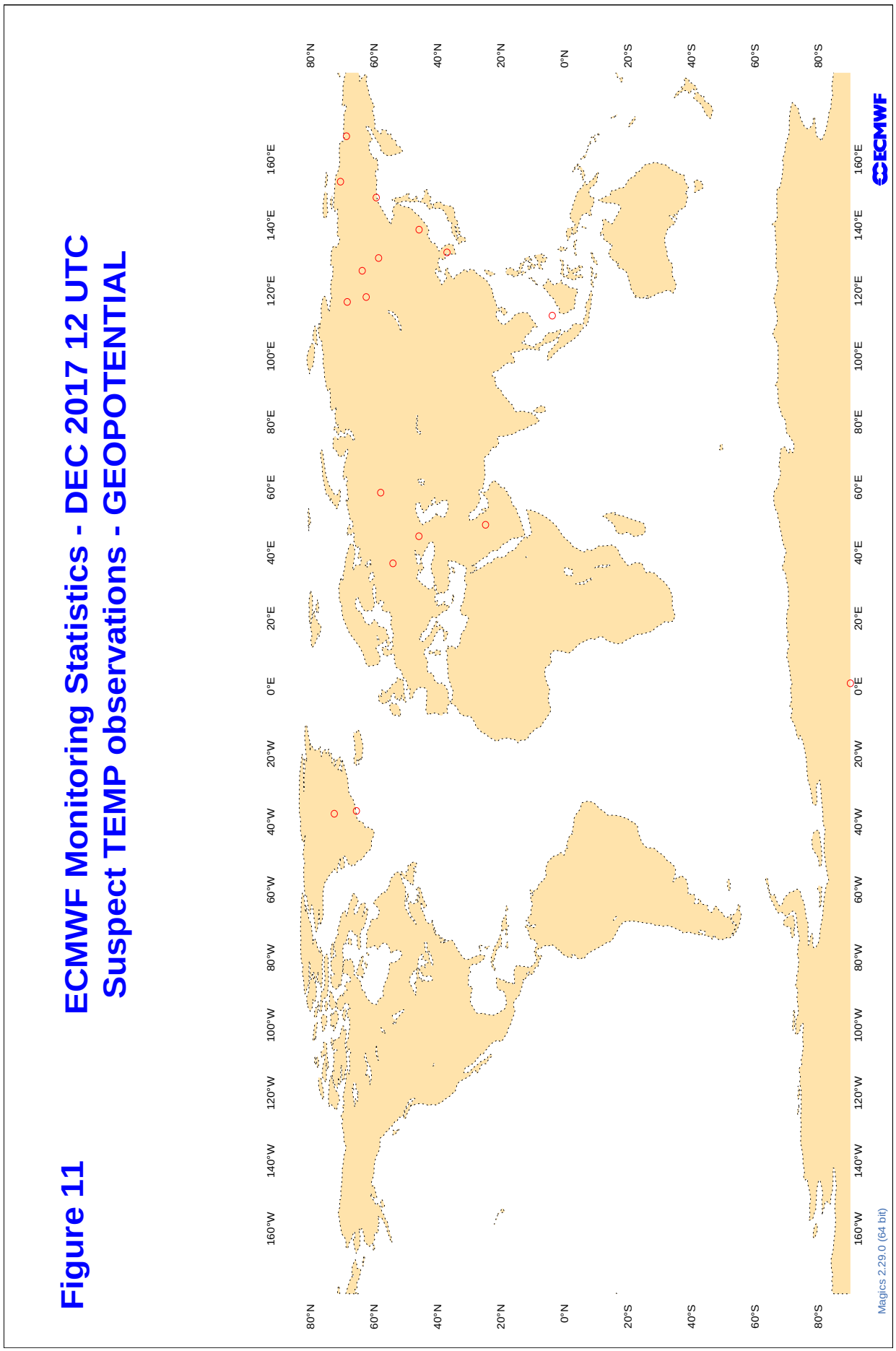
```
          LIST OF SUSPECT STATIONS        : RADIOSONDES
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND DIRECTION (DEGREES)
                    AREA                  : GLOBAL
                    PERIOD                : DEC 2017
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


SELECTION CRITERIA: OBSERVED/FORECAST WIND SPEEDS >= 5 M/S
                    NO. OF OBSERVATIONS   >= 5, AND,
                    ABSOLUTE BIAS         >= 10 DEGREES, WITH
                    STANDARD DEVIATION    <  30 DEGREES, AND,
                    VERTICAL SPREAD       < 10 DEGREES
                    (AVERAGE BETWEEN 500 AND 150 HPA)
```

WMO IDENT	OBS TIME	ELM	LAT	LONG	NUM OBS	BIAS	MAX SPREAD	SD
57972	00	DD	26	113	28	10.1	0.7	3.9

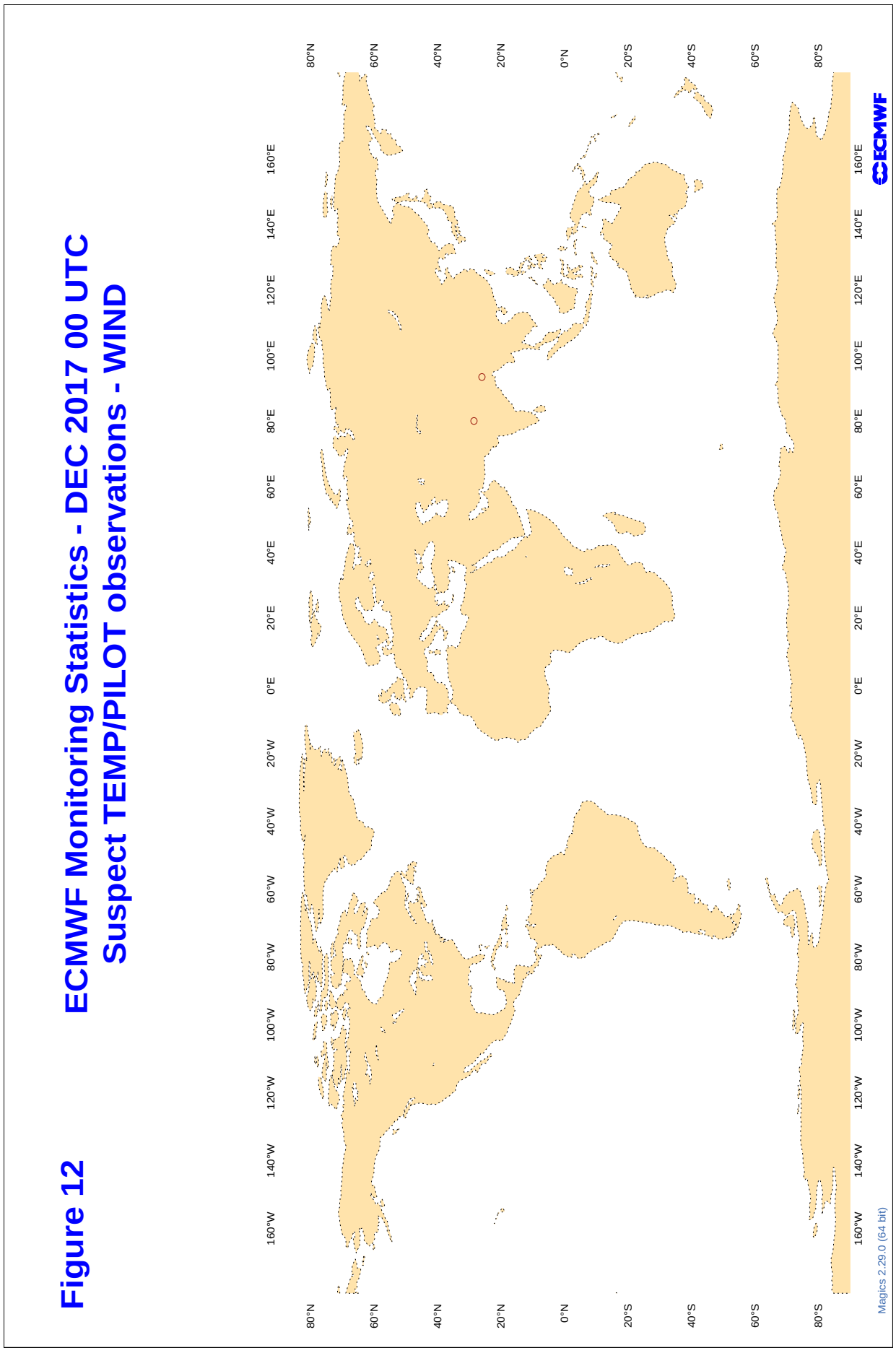
3.2.21 Figure 10 - Suspect TEMP observations - geopotential : 00 UTC



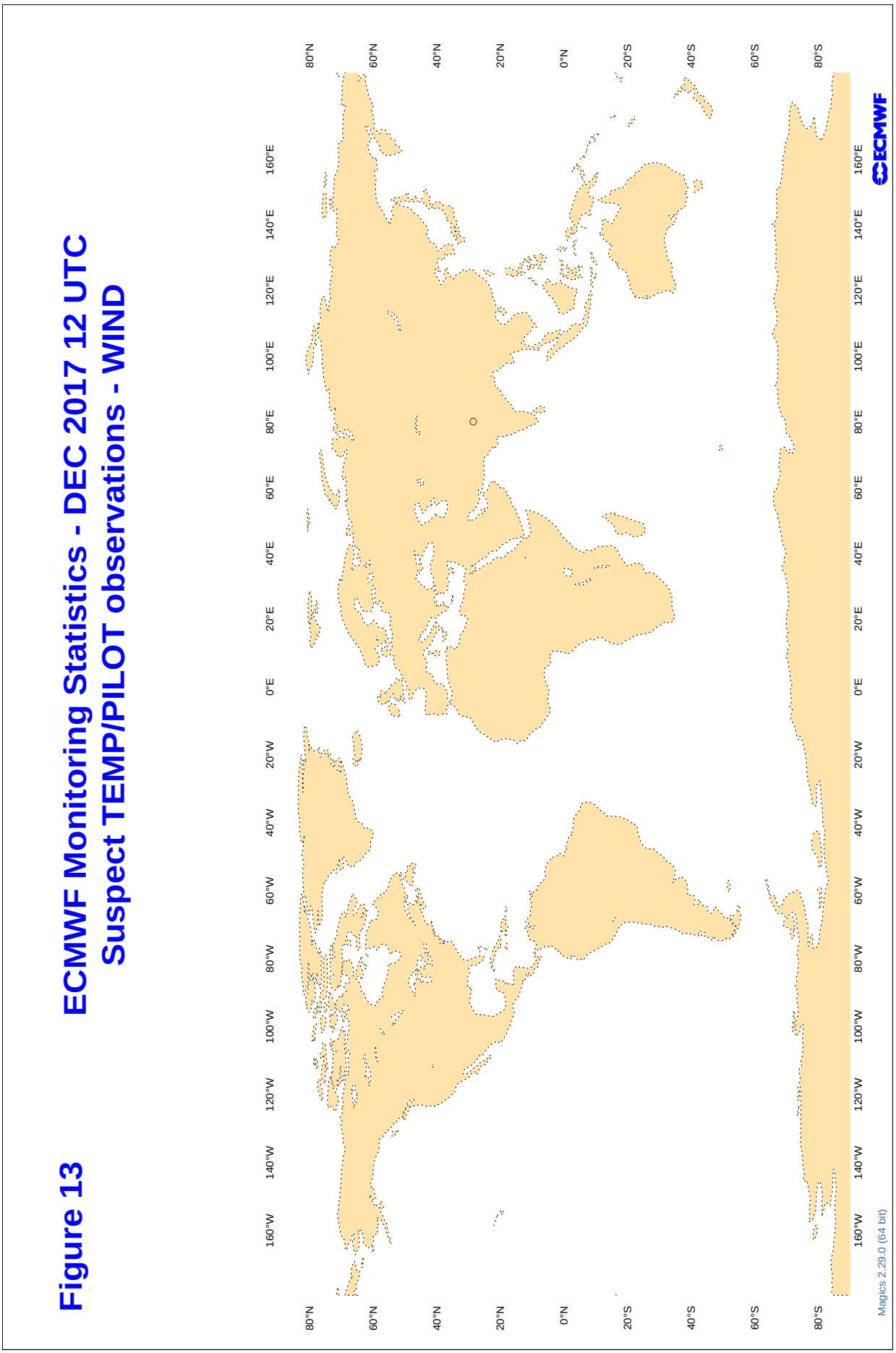
3.2.22 Figure 11 - Suspect TEMP observations - geopotential : 12 UTC



3.2.23 Figure 12 - Suspect TEMP/PILOT observations - wind : 00 UTC



3.2.24 Figure 13 - Suspect TEMP/PILOT observations - wind : 12 UTC



3.2.25 Table 10 - Radiosonde monitoring statistics (SHIPs): Geopotential height (metres)

```
RADIOSONDE MONITORING STATISTICS (SHIPS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
         LEVEL                 : 100 HPA
         AREA                  : GLOBAL
         PERIOD                : DEC 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
5QPW8X	00	Z	100	16	18.1	15.3
5QPW8X	12	Z	100	12	19.0	16.6
7JUNA4	00	Z	100	2	21.4	-21.3
7JUNA4	12	Z	100	6	33.8	19.9
ASDE09	12	Z	100	3	22.8	21.2
ASDE9	12	Z	100	2	20.2	19.6
ASDK01	00	Z	100	4	2.6	1.9
ASDK01	12	Z	100	9	6.7	3.2
ASDK03	12	Z	100	2	23.6	23.5
ASDK03	00	Z	100	3	13.6	13.1
ASDK1	00	Z	100	4	5.2	0.0
ASDK1	12	Z	100	9	7.9	-1.7
ASDK3	00	Z	100	2	13.4	12.7
ASDK3	12	Z	100	2	18.7	18.7
ASFR1	00	Z	100	12	17.1	13.4
ASFR1	12	Z	100	11	20.0	17.0
ASFR2	00	Z	100	8	23.6	22.1
ASFR2	12	Z	100	13	35.2	34.3
ASFR3	00	Z	100	13	23.1	20.8
ASFR3	12	Z	100	12	20.0	17.4
ASFR4	12	Z	100	12	26.2	25.2
ASFR4	00	Z	100	17	25.3	24.8
DBLK	12	Z	100	1	4.3	4.3
FPUW5G	12	Z	100	29	16.0	14.2
FPUWN	12	Z	100	24	11.9	8.6
JGQH	00	Z	100	3	11.2	11.2
JGQH	12	Z	100	0	0.0	0.0
JNKN7J	00	Z	100	2	31.1	31.0
JNKN7J	12	Z	100	2	50.4	49.8
JNSR	12	Z	100	47	13.0	11.9
JNSR	00	Z	100	67	13.6	10.5
JSNJ	12	Z	100	2	0.0	0.0
KMPLHP	12	Z	100	0	0.0	0.0
LRYQE3	00	Z	100	7	7.9	2.9
LRYQE3	12	Z	100	7	54.5	46.8
VKB4L5	00	Z	100	5	34.8	31.0
VKB4L5	12	Z	100	6	41.1	40.8
VKB4Q	12	Z	100	1	39.2	39.2
XQFJRG	00	Z	100	5	7.4	-3.5

RADIOSONDE MONITORING STATISTICS (SHIPS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
XQFJRG	12	Z	100	3	16.1	14.1
XQFJX	00	Z	100	4	6.0	-5.6
XQFJX	12	Z	100	2	10.9	5.1
YLV96W	00	Z	100	2	17.8	17.8
YLV96W	12	Z	100	3	12.3	3.5
ZVQEM	12	Z	100	7	10.7	-8.4
ZVQEQC	12	Z	100	9	12.6	-9.6

3.2.26 Table 11 - Radiosonde monitoring statistics (SHIPs): Wind (m/s)

```
RADIOSONDE MONITORING STATISTICS (SHIPS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : WIND (M/S)
         LEVEL                 : 100 HPA
         AREA                  : GLOBAL
         PERIOD                : DEC 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
5QPW8X	00	V	100	11	3.2	0.5	0.3
5QPW8X	12	V	100	9	4.0	-1.6	0.9
7JUNA4	00	V	100	1	3.0	2.7	1.2
7JUNA4	12	V	100	3	2.5	2.0	-0.4
ASDE09	12	V	100	3	3.5	0.1	-0.1
ASDE9	12	V	100	2	3.5	-1.6	-3.1
ASDK01	00	V	100	4	5.0	2.5	-0.5
ASDK01	12	V	100	9	4.0	-0.1	-1.4
ASDK03	12	V	100	2	3.0	-1.0	0.3
ASDK03	00	V	100	2	1.1	-1.1	-0.2
ASDK1	00	V	100	4	4.3	2.1	-0.1
ASDK1	12	V	100	9	4.3	0.3	-1.5
ASDK3	00	V	100	2	1.5	-1.2	-0.5
ASDK3	12	V	100	2	3.7	-1.7	-1.1
ASFR1	00	V	100	11	3.7	0.2	-0.9
ASFR1	12	V	100	9	2.6	-0.9	0.8
ASFR2	00	V	100	8	3.5	0.1	0.0
ASFR2	12	V	100	12	3.5	-0.4	-0.6
ASFR3	00	V	100	12	3.8	1.7	0.1
ASFR3	12	V	100	10	3.9	1.5	0.6
ASFR4	12	V	100	11	4.1	-1.0	1.5
ASFR4	00	V	100	13	3.4	-0.4	0.0
DBLK	12	V	100	0	0.0	0.0	0.0
FPUW5G	12	V	100	24	5.9	-0.5	-1.2
FPUWN	12	V	100	24	5.9	-0.6	-1.2
JGQH	00	V	100	1	2.9	-1.5	2.5
JGQH	12	V	100	0	0.0	0.0	0.0
JNKN7J	00	V	100	2	4.3	0.7	0.5
JNKN7J	12	V	100	2	5.8	4.8	-0.3
JNSR	12	V	100	17	4.0	-1.1	1.7
JNSR	00	V	100	23	4.4	0.9	0.8
JSNJ	12	V	100	2	4.3	-2.9	2.0
KMPLHP	12	V	100	0	0.0	0.0	0.0
LRYQE3	00	V	100	6	3.1	-0.7	-2.3
LRYQE3	12	V	100	6	2.8	0.2	0.0
VKB4L5	00	V	100	5	4.6	0.8	-0.3
VKB4L5	12	V	100	4	5.2	1.9	2.3
VKB4Q	12	V	100	0	0.0	0.0	0.0
XQFJRG	00	V	100	5	3.1	-1.4	-0.8

RADIOSONDE MONITORING STATISTICS (SHIPS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
XQFJRG	12	V	100	3	4.2	1.7	1.1
XQFJX	00	V	100	4	3.9	-0.2	0.0
XQFJX	12	V	100	2	4.2	0.4	-0.1
YLV96W	00	V	100	2	5.2	-3.8	0.7
YLV96W	12	V	100	3	5.1	-3.9	-1.1
ZVQEM	12	V	100	7	5.3	2.0	0.2
ZVQEQC	12	V	100	7	4.2	1.6	-0.2

3.2.27 Figure 14 - SATOB Winds: 700-1000hPa

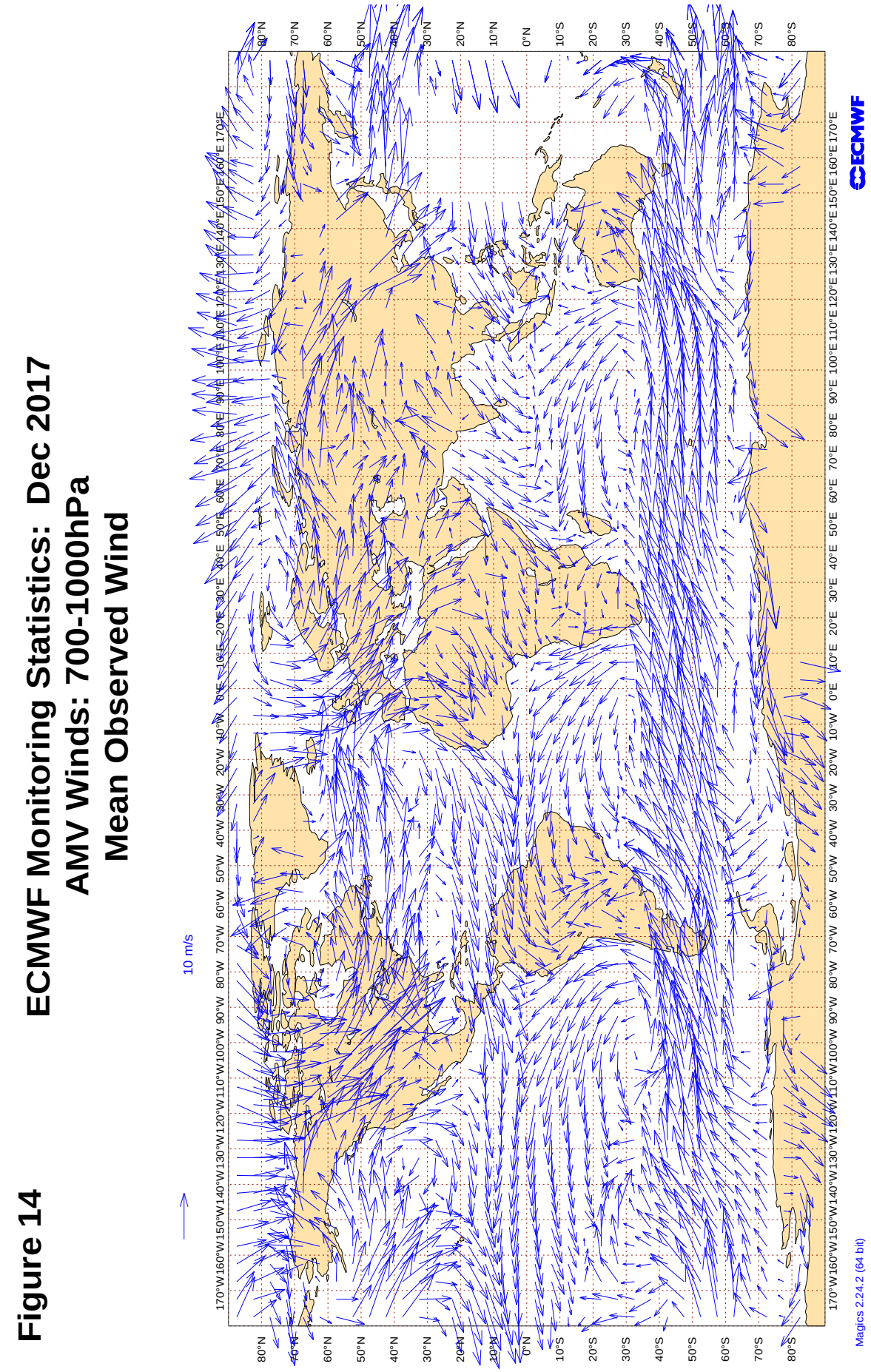


Figure 14

3.2.28 Figure 15 - SATOB Winds: 150- 400hPa

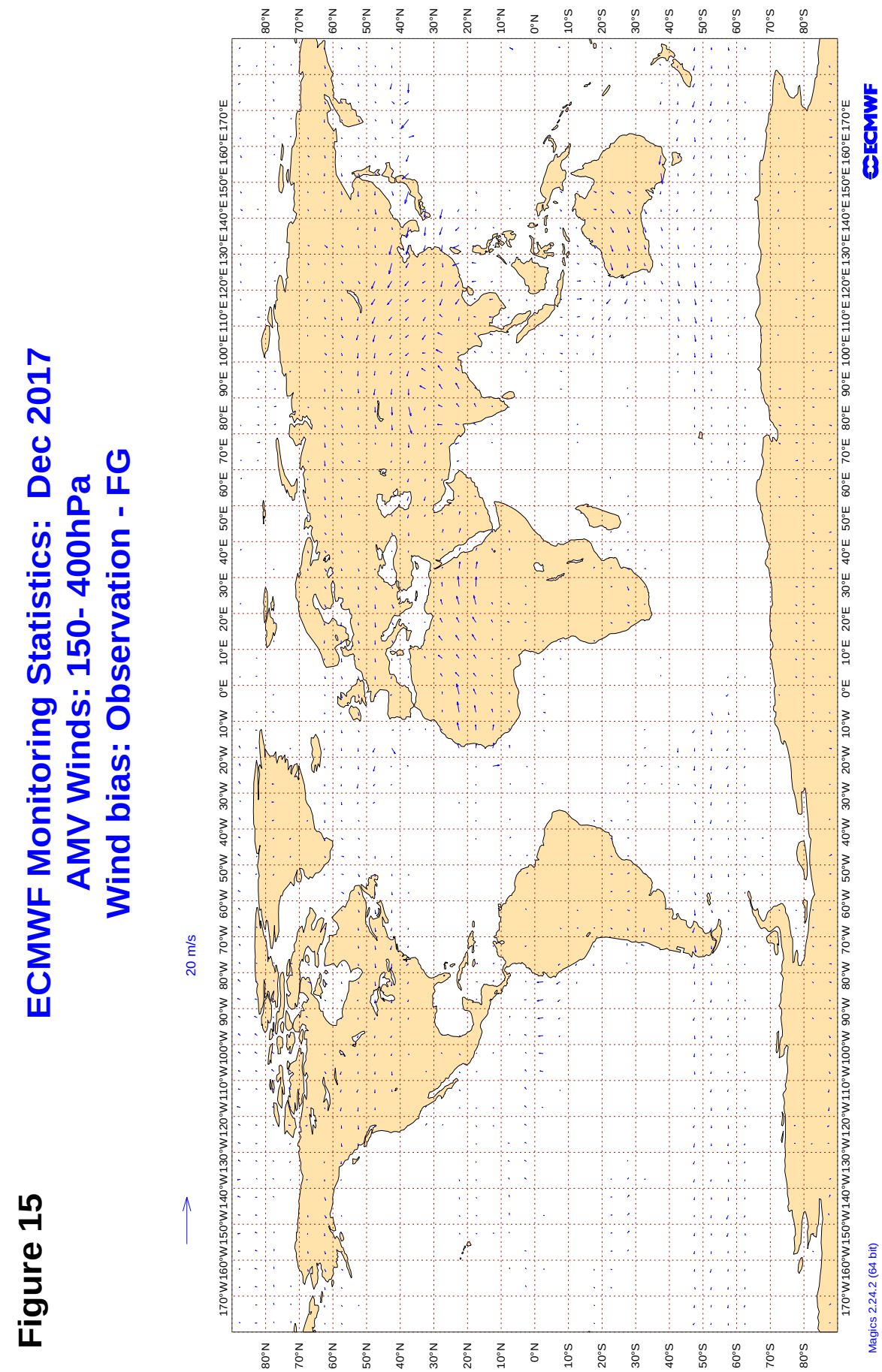


Figure 15

3.2.29 Figure 16 - SATOB Winds: 700-1000hPa

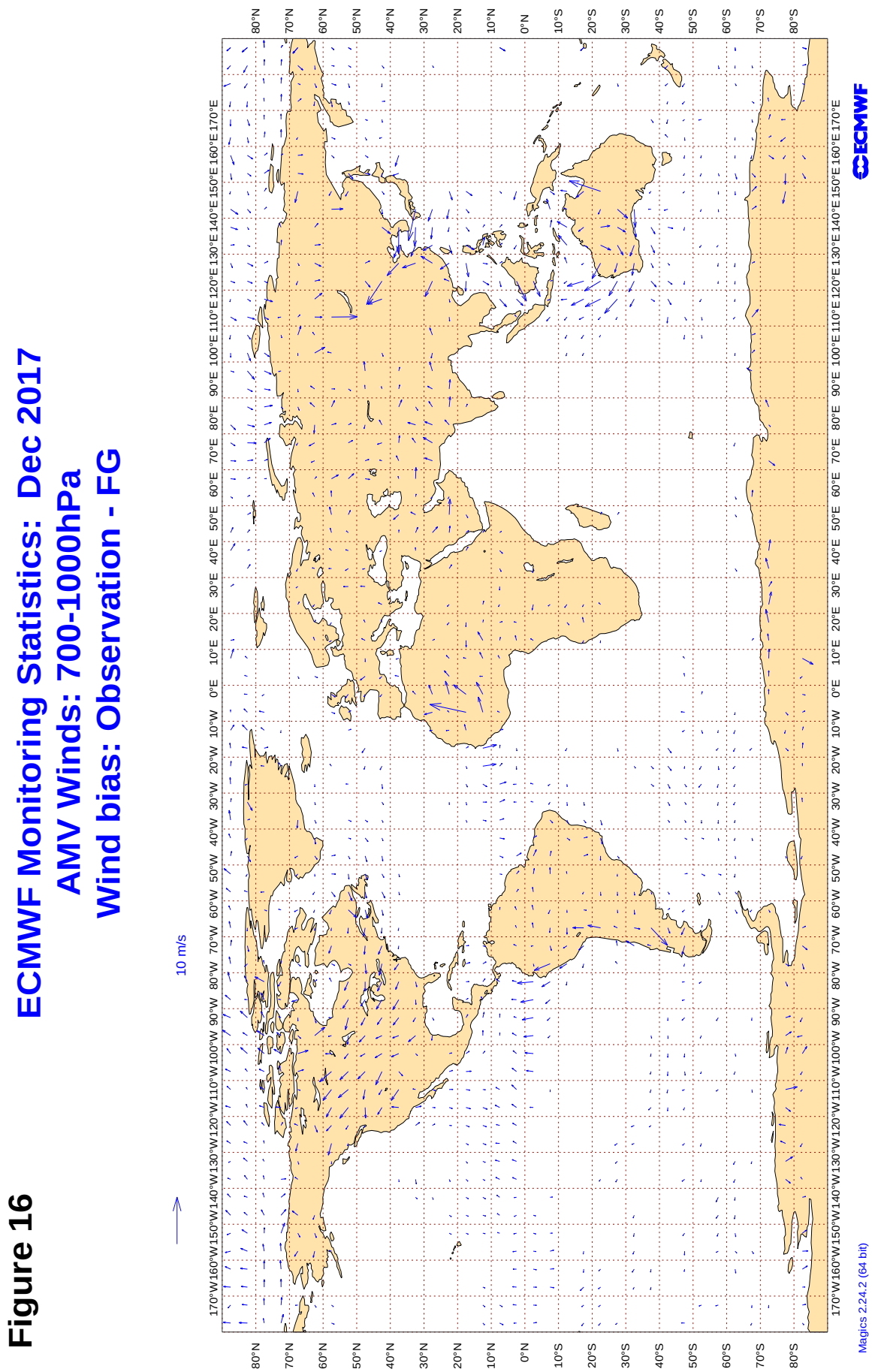


Figure 16

3.2.30 Figure 17 - SATOB Winds: 150- 400hPa

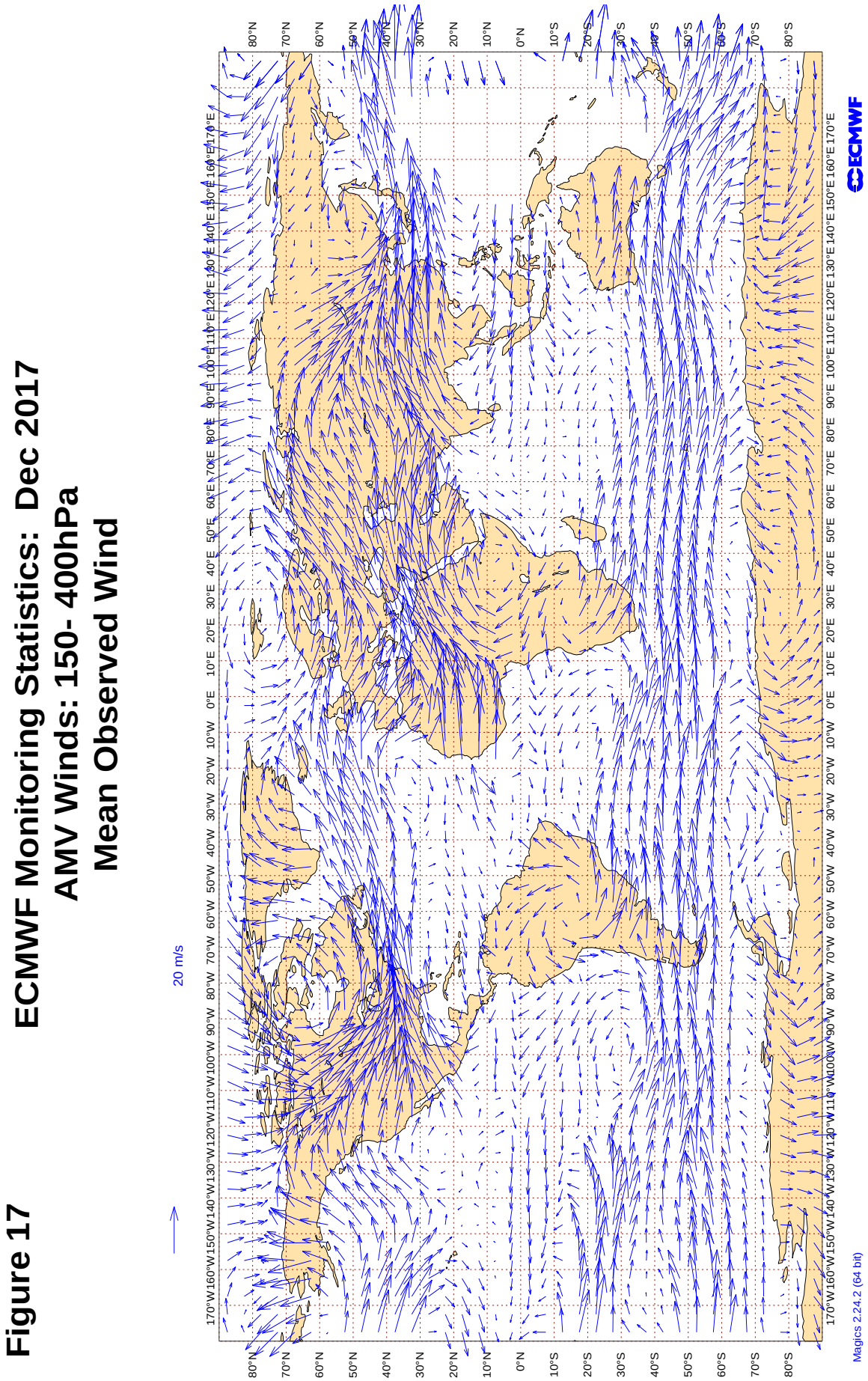


Figure 17

3.2.31 Figure 18 - AIRCRAFT Winds: 150- 300hPa

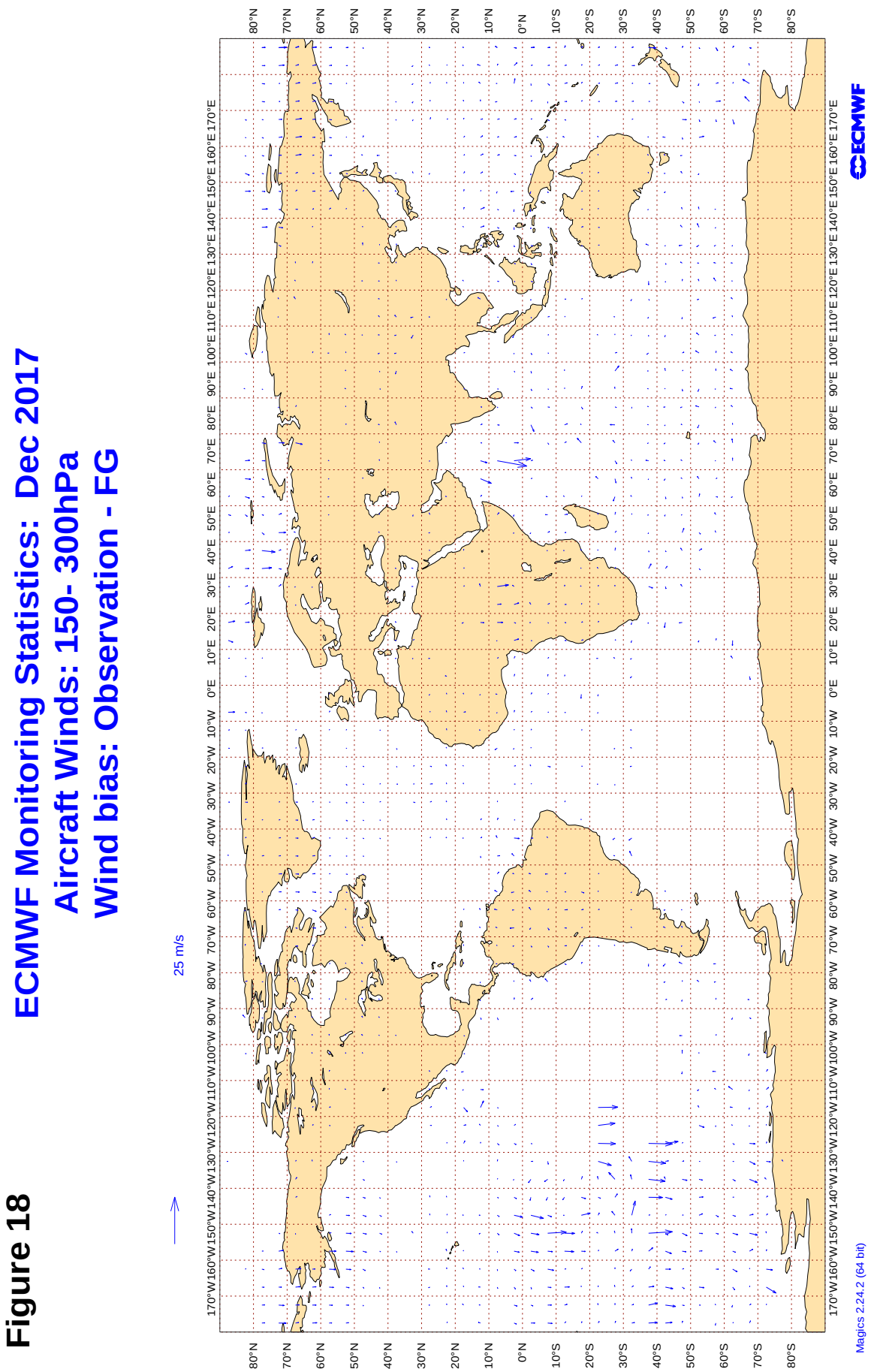


Figure 18

3.2.32 Table 12 - Airep Monitoring Statistics For Airline Carriers (Global)

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
MONITORING CENTRE : ECMWF
ELEMENT MONITORED : VECTOR WIND (M/S)
AREA : GLOBAL
PERIOD : DEC 2017
STANDARD OF COMPARISON: FIRST-GUESS FIELD

SELECTION CRITERIA: NO. OF OBS. >= 20

TIME = 99 => AVERAGE OF ALL OBSERVATIONS
GROSS ERROR LIMIT ON VECTOR WIND = 40 M/S

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
AAB	99	V	300-150	27	0	0	4.2	-0.3
AAL	99	V	300-150	46635	3	0	6.7	0.2
AAR	99	V	300-150	264	0	0	4.5	-1.8
ABD	99	V	300-150	1018	0	0	5.2	-0.7
ABW	99	V	300-150	1034	0	0	4.0	-0.7
ACA	99	V	300-150	26110	9	0	7.6	0.2
ACI	99	V	300-150	2709	0	0	4.3	0.8
AEA	99	V	300-150	1022	3	0	5.6	0.4
AFL	99	V	300-150	2455	0	0	3.4	0.6
AFR	99	V	300-150	28098	2	0	4.8	0.3
AHY	99	V	300-150	274	18	0	8.6	-0.4
AIB	99	V	300-150	39	0	0	3.5	-0.1
AIC	99	V	300-150	1784	8	0	5.7	0.2
ALK	99	V	300-150	679	0	0	3.8	0.7
AMX	99	V	300-150	3285	22	0	10.3	0.1
ANZ	99	V	300-150	24412	3	0	8.1	0.7
AOJ	99	V	300-150	56	13	0	4.5	0.0
ASA	99	V	300-150	856	1	0	5.6	0.5
ASL	99	V	300-150	666	0	0	4.0	-0.0
ASY	99	V	300-150	169	0	0	5.0	0.8
ATN	99	V	300-150	69	0	4	6.6	1.2
AUA	99	V	300-150	3473	0	0	4.5	-0.0
AUI	99	V	300-150	63	0	0	4.4	-0.8
AVA	99	V	300-150	354	7	0	7.3	0.4

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
AWC	99	V	300-150	60	0	0	3.2	-0.3
AXM	99	V	300-150	222	0	0	5.0	0.7
AZA	99	V	300-150	6068	0	0	4.2	0.2
AZG	99	V	300-150	279	0	0	3.0	0.1
BAH	99	V	300-150	21	0	0	4.6	-1.5
BAW	99	V	300-150	52685	4	0	5.5	0.1
BBA	99	V	300-150	38	0	0	3.8	-0.8
BBC	99	V	300-150	99	0	0	3.3	0.6
BEL	99	V	300-150	1763	0	0	3.7	0.1
BFD	99	V	300-150	22	0	0	2.8	-0.2
BLU	99	V	300-150	29	0	0	3.9	0.8
BMW	99	V	300-150	127	0	0	3.6	0.2
BOX	99	V	300-150	1723	0	0	3.6	0.1
BOX	99	V	300-150	26	0	0	4.4	-0.8
BPA	99	V	300-150	27	0	0	3.7	-0.5
BRJ	99	V	300-150	26	88	0	37.6	-1.5
BVR	99	V	300-150	82	10	1	4.3	0.7
CAF	99	V	300-150	40	0	0	4.0	-1.2
CAL	99	V	300-150	529	0	0	4.3	0.8
CAZ	99	V	300-150	154	0	0	4.8	-0.3
CCA	99	V	300-150	1750	6	0	8.1	0.6
CEB	99	V	300-150	113	0	0	3.6	-0.1
CES	99	V	300-150	1181	0	0	4.5	0.9
CFC	99	V	300-150	174	0	0	5.0	1.2
CFG	99	V	300-150	4168	0	0	4.4	-0.3
CHH	99	V	300-150	178	0	2	6.7	0.4
CJT	99	V	300-150	368	0	0	4.3	0.1
CKS	99	V	300-150	1559	0	0	4.0	-0.1
CLF	99	V	300-150	44	0	0	3.8	1.0
CLU	99	V	300-150	509	0	0	4.0	-0.2
CLX	99	V	300-150	3430	0	0	4.1	-0.5
CMB	99	V	300-150	242	0	1	4.5	-0.2
CNK	99	V	300-150	23	0	0	3.9	-0.6
CNV	99	V	300-150	185	0	0	3.6	0.1
CPA	99	V	300-150	1621	0	0	4.0	0.5
CPI	99	V	300-150	20	0	0	8.8	-5.8
CRK	99	V	300-150	1217	0	0	4.3	0.6
CRL	99	V	300-150	809	0	0	4.3	0.2
CRV	99	V	300-150	47	0	0	3.8	-0.7
CSC	99	V	300-150	165	0	0	3.8	0.6
CSN	99	V	300-150	1187	7	0	8.1	0.5
CTM	99	V	300-150	50	0	0	5.7	-0.2
CXA	99	V	300-150	21	14	0	15.3	-0.2

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
DAH	99	V	300-150	801	0	0	3.9	0.4
DAL	99	V	300-150	59122	0	0	4.0	0.0
DCS	99	V	300-150	42	0	0	6.0	1.1
DGX	99	V	300-150	64	0	0	3.2	0.3
DHK	99	V	300-150	1829	0	0	4.4	-0.1
DJT	99	V	300-150	1485	0	0	4.5	0.2
DLH	99	V	300-150	27324	0	0	3.8	0.1
DSO	99	V	300-150	101	0	0	3.5	-0.2
DUB	99	V	300-150	110	0	0	3.4	-0.0
EAU	99	V	300-150	45	0	0	4.3	0.5
EAV	99	V	300-150	20	75	0	26.9	-0.3
EDC	99	V	300-150	101	0	0	4.0	0.2
EDG	99	V	300-150	26	46	0	11.4	1.6
EDW	99	V	300-150	1079	0	0	4.0	0.3
EIN	99	V	300-150	14229	0	0	3.9	0.2
EJM	99	V	300-150	435	3	0	5.9	0.1
ELY	99	V	300-150	3032	7	0	6.1	-0.0
ETD	99	V	300-150	6555	4	0	5.2	0.1
ETH	99	V	300-150	3025	6	0	6.5	0.3
EVE	99	V	300-150	47	0	0	5.1	0.2
EWG	99	V	300-150	2420	0	0	4.4	0.4
EXS	99	V	300-150	77	0	0	3.1	0.3
FAM	99	V	300-150	41	0	0	3.8	0.6
FDX	99	V	300-150	5364	0	0	3.8	0.1
FIN	99	V	300-150	1241	0	0	3.3	0.3
FJI	99	V	300-150	5824	0	0	4.8	0.8
FLA	99	V	300-150	45	0	0	5.1	-1.5
FWI	99	V	300-150	1630	0	0	4.2	0.4
FYG	99	V	300-150	50	0	0	4.8	1.2
GAF	99	V	300-150	60	0	0	4.4	0.3
GAJ	99	V	300-150	20	35	0	30.1	-1.2
GCR	99	V	300-150	115	0	0	3.9	0.9
GEC	99	V	300-150	2431	0	0	3.7	0.3
GES	99	V	300-150	85	0	0	4.8	0.1
GFA	99	V	300-150	528	0	0	3.7	0.2
GIA	99	V	300-150	395	0	0	4.1	0.7
GLJ	99	V	300-150	61	0	0	3.5	-0.5
GLO	99	V	300-150	37	3	3	11.3	2.2
GMA	99	V	300-150	51	0	0	4.1	0.5
GOL	99	V	300-150	70	0	0	4.9	-0.0
GTI	99	V	300-150	2340	0	0	4.2	-0.3
HAL	99	V	300-150	3612	0	0	4.8	1.0
HFY	99	V	300-150	66	0	0	7.6	1.5

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
HRT	99	V	300-150	64	66	0	8.3	0.1
HWA	99	V	300-150	44	0	0	3.4	-0.2
HZM	99	V	300-150	56	0	0	3.7	0.1
HZS	99	V	300-150	91	0	0	3.8	-0.2
IBE	99	V	300-150	1888	0	0	4.2	0.1
IBK	99	V	300-150	259	0	2	3.7	-0.1
ICL	99	V	300-150	986	0	0	4.5	-0.2
ICV	99	V	300-150	263	0	0	4.1	-0.4
IFA	99	V	300-150	27	96	0	37.1	4.8
IJM	99	V	300-150	63	0	0	5.0	0.5
ISS	99	V	300-150	222	0	0	4.6	-0.4
JAF	99	V	300-150	1158	9	0	7.7	-0.0
JAI	99	V	300-150	1496	0	0	3.7	0.2
JAL	99	V	300-150	29	0	0	11.6	-0.8
JAS	99	V	300-150	80	0	0	3.2	-0.2
JBU	99	V	300-150	25	0	72	2.6	-0.2
JEF	99	V	300-150	51	0	0	4.8	1.2
JET	99	V	300-150	94	0	0	4.3	0.4
JJA	99	V	300-150	59	2	2	6.1	0.6
JME	99	V	300-150	168	0	0	4.2	0.5
JST	99	V	300-150	2478	2	0	9.7	0.7
KAC	99	V	300-150	1477	0	0	3.9	0.2
KAI	99	V	300-150	93	0	0	6.4	0.8
KAL	99	V	300-150	1848	0	0	4.2	0.5
KAY	99	V	300-150	47	0	0	3.5	0.2
KCE	99	V	300-150	36	0	0	4.9	1.0
KFE	99	V	300-150	22	0	0	4.8	-1.0
KLM	99	V	300-150	17801	2	0	4.9	-0.0
KQA	99	V	300-150	125	24	0	11.3	1.1
LAN	99	V	300-150	2253	20	0	11.6	0.2
LCO	99	V	300-150	89	0	0	4.3	0.4
LDM	99	V	300-150	42	0	0	6.0	-1.2
LEA	99	V	300-150	35	0	0	4.4	-0.2
LNI	99	V	300-150	180	0	0	3.5	0.4
LOT	99	V	300-150	2648	25	0	12.8	-0.2
LUC	99	V	300-150	87	0	0	5.2	0.8
LXA	99	V	300-150	34	0	0	4.3	0.0
LXJ	99	V	300-150	104	7	2	6.8	0.3
MAS	99	V	300-150	761	0	0	3.7	0.5
MAU	99	V	300-150	71	0	0	4.2	1.1
MLM	99	V	300-150	48	0	0	3.9	0.7
MMD	99	V	300-150	380	0	0	4.0	0.3
MNB	99	V	300-150	133	0	0	4.1	0.3

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
MPH	99	V	300-150	695	0	0	4.5	-1.0
MSR	99	V	300-150	1527	0	0	3.5	0.1
MXD	99	V	300-150	31	0	0	4.7	0.9
NAX	99	V	300-150	12991	22	0	10.5	-0.0
NCA	99	V	300-150	283	0	0	4.1	-1.1
NJE	99	V	300-150	348	0	0	3.9	0.1
NOS	99	V	300-150	507	0	0	5.9	-1.1
NWS	99	V	300-150	390	0	0	3.9	0.4
OAE	99	V	300-150	265	0	0	4.9	-0.1
OMA	99	V	300-150	456	10	0	4.6	0.6
PAC	99	V	300-150	221	0	0	4.0	0.2
PAL	99	V	300-150	856	0	0	4.0	0.3
PAT	99	V	300-150	75	0	0	4.2	0.1
PIA	99	V	300-150	201	0	0	3.9	-0.2
PIT	99	V	300-150	22	0	0	8.9	2.7
PLM	99	V	300-150	64	0	0	4.2	-1.4
PNC	99	V	300-150	38	0	0	3.4	0.6
PRD	99	V	300-150	39	0	0	5.3	0.6
PVJ	99	V	300-150	29	0	0	3.7	0.4
QAF	99	V	300-150	21	0	0	3.2	0.3
QFA	99	V	300-150	18871	0	0	5.4	0.7
QID	99	V	300-150	22	0	0	3.8	0.2
QQE	99	V	300-150	80	0	0	4.9	0.9
QTR	99	V	300-150	12372	1	0	4.2	0.1
RAM	99	V	300-150	573	24	0	9.1	0.5
RBA	99	V	300-150	138	25	0	5.2	0.4
RCH	99	V	300-150	4960	0	0	4.7	0.3
RDN	99	V	300-150	69	0	0	2.8	0.2
REN	99	V	300-150	22	0	0	2.5	1.0
RJA	99	V	300-150	1639	25	0	11.5	-0.1
RKS	99	V	300-150	23	0	0	4.3	1.4
ROU	99	V	300-150	1014	0	1	4.3	-0.1
RRR	99	V	300-150	78	0	0	3.7	0.0
RSY	99	V	300-150	321	0	0	3.9	0.2
SAM	99	V	300-150	85	0	0	3.8	1.5
SAS	99	V	300-150	4480	0	0	3.5	0.3
SDM	99	V	300-150	153	0	1	4.3	-0.5
SHE	99	V	300-150	53	0	0	4.8	-3.1
SIA	99	V	300-150	3187	0	0	3.9	0.2
SIO	99	V	300-150	104	0	0	3.5	-0.2
SLM	99	V	300-150	142	0	0	3.0	0.0
SOO	99	V	300-150	656	0	0	4.3	-0.1
SPA	99	V	300-150	38	0	0	3.5	-0.1

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
SQC	99	V	300-150	650	0	0	4.5	-1.0
SVA	99	V	300-150	5527	5	0	5.0	0.3
SVW	99	V	300-150	153	0	0	3.9	-0.3
SWR	99	V	300-150	11022	0	0	4.0	0.1
SXN	99	V	300-150	21	0	0	5.2	-0.3
TAM	99	V	300-150	255	0	0	2.8	0.2
TAP	99	V	300-150	1112	0	0	4.5	0.1
TAR	99	V	300-150	302	0	0	4.1	0.2
TAY	99	V	300-150	655	0	0	4.2	-0.0
TCX	99	V	300-150	2519	0	0	3.8	0.1
TFL	99	V	300-150	1966	11	0	8.0	0.1
TGW	99	V	300-150	81	23	0	3.4	-0.1
THA	99	V	300-150	424	13	0	13.6	0.1
THT	99	V	300-150	3397	0	0	4.7	0.9
THY	99	V	300-150	8487	0	0	3.8	0.1
TMN	99	V	300-150	62	0	35	4.4	1.7
TOM	99	V	300-150	4940	17	0	9.3	0.0
TOW	99	V	300-150	45	0	0	4.7	0.2
TRI	99	V	300-150	45	0	0	6.0	0.3
TRK	99	V	300-150	41	0	0	4.3	0.1
TSC	99	V	300-150	3806	0	0	4.0	-0.0
TVP	99	V	300-150	186	0	0	4.4	0.1
TWB	99	V	300-150	55	0	2	5.1	-0.0
TWY	99	V	300-150	142	17	0	9.3	-0.4
UAE	99	V	300-150	15561	0	0	4.0	0.2
UAL	99	V	300-150	68544	2	3	6.0	0.2
UPS	99	V	300-150	4633	0	0	4.3	0.2
UZB	99	V	300-150	66	18	2	12.6	0.2
VCN	99	V	300-150	20	0	0	3.7	-0.8
VIR	99	V	300-150	19393	3	0	5.4	0.0
VJT	99	V	300-150	811	52	0	14.9	0.3
VKG	99	V	300-150	581	0	0	3.8	-0.1
VMP	99	V	300-150	37	0	3	4.2	-0.9
VOZ	99	V	300-150	6699	0	0	4.4	0.7
WDY	99	V	300-150	37	0	0	4.0	0.9
WJA	99	V	300-150	3181	1	0	5.6	0.2
WOW	99	V	300-150	941	0	1	3.7	0.2
XAX	99	V	300-150	636	0	0	4.1	0.8
XLF	99	V	300-150	983	0	0	4.1	0.4

4 EUCOS Area Monitoring Statistics

The following tables provide information on the quality of upper-air data and surface DRIFTER data over the EUCOS area as received at ECMWF during the month.

Tables 13, 14 (50 hPa level), 15, 16 (100 hPa level) 17, 18 (500 hPa level) 19 and 20 (850 hPa level) provide quality statistics for all TEMPSHIPS and PILOTSHIPS received during the month in the area $10\,°$N - $90\,°$N, $70\,°$W - $40\,°$E and for TEMPS and PILOTS from selected land stations within the same area. The statistics are in the same form as tables 10 and 11.
Tables 21-23 provides quality statistics of pressure and wind for all DRIFTER reports received in the area $10\,°$N - $90\,°$N, $70\,°$W - $40\,°$E. The statistics are in the same form as tables 4-6.

4.1 Table 13 - Radiosonde Monitoring Statistics (EUCOS): 50 hPa Geopotential height (metres)

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
         LEVEL                 :  50 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : DEC 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	50	29	12.5	7.8
01001	00	Z	50	30	11.0	7.7
01028	00	Z	50	29	10.0	6.9
01028	12	Z	50	30	15.7	5.0
01400	12	Z	50	17	32.2	25.9
01400	00	Z	50	17	28.6	19.2
01415	12	Z	50	30	22.5	17.1
01415	00	Z	50	27	20.2	11.5
02365	12	Z	50	7	10.1	5.9
02365	00	Z	50	13	15.0	12.7
02591	12	Z	50	25	24.1	18.2
02591	00	Z	50	24	16.4	14.4
02836	00	Z	50	19	9.4	6.7
02836	12	Z	50	28	7.6	4.1
02963	12	Z	50	28	13.2	9.6
02963	00	Z	50	27	11.3	7.2
03005	12	Z	50	30	14.0	7.3
03005	00	Z	50	29	15.1	6.4
03238	00	Z	50	30	23.2	15.6
03238	12	Z	50	3	42.7	40.0
03808	00	Z	50	29	22.3	19.2
03808	12	Z	50	30	22.6	17.6
03918	12	Z	50	9	27.3	19.6
03918	00	Z	50	29	24.0	19.4
03953	12	Z	50	28	23.8	17.0
03953	00	Z	50	28	22.4	17.0
04018	00	Z	50	53	13.5	9.0
04018	12	Z	50	56	12.6	4.9
04220	00	Z	50	31	14.3	6.4
04220	12	Z	50	30	9.1	3.3
04270	00	Z	50	26	12.6	0.3
04270	12	Z	50	28	15.3	2.0
04320	12	Z	50	31	10.9	9.6
04320	00	Z	50	30	11.5	9.9
04339	12	Z	50	31	12.2	9.4
04339	00	Z	50	31	14.9	11.4
04360	12	Z	50	16	42.0	39.8
04360	00	Z	50	20	47.3	45.4
06011	12	Z	50	29	18.1	8.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	50	23	23.6	7.5
06260	12	Z	50	4	26.0	21.5
06260	00	Z	50	29	18.3	15.2
06610	00	Z	50	30	20.9	10.8
06610	12	Z	50	30	23.1	15.1
07110	12	Z	50	29	42.5	39.6
07110	00	Z	50	25	40.3	38.7
07510	00	Z	50	28	30.3	25.3
07510	12	Z	50	26	40.1	36.3
07645	00	Z	50	24	34.9	32.6
07645	12	Z	50	29	44.5	41.5
07761	00	Z	50	29	51.8	50.2
07761	12	Z	50	29	58.9	56.4
08001	00	Z	50	26	24.1	22.5
08001	12	Z	50	28	38.7	37.4
08221	12	Z	50	29	29.4	24.7
08221	00	Z	50	30	25.0	23.2
08302	00	Z	50	28	24.3	19.9
08302	12	Z	50	29	14.9	11.8
08508	12	Z	50	29	31.3	29.5
08522	12	Z	50	29	34.4	32.7
08579	12	Z	50	29	34.7	32.7
10035	12	Z	50	31	30.7	27.6
10035	00	Z	50	30	28.8	26.1
10393	12	Z	50	31	19.3	15.1
10393	00	Z	50	30	18.1	13.9
10410	12	Z	50	29	21.6	18.6
10410	00	Z	50	27	19.4	14.3
10739	12	Z	50	31	20.7	15.9
10739	00	Z	50	29	21.6	14.0
11035	12	Z	50	31	19.3	16.0
11035	00	Z	50	31	27.3	22.7
12982	12	Z	50	25	36.8	30.0
12982	00	Z	50	23	20.8	8.8
16080	00	Z	50	30	19.2	12.2
16080	12	Z	50	31	20.8	15.2
16245	12	Z	50	31	20.5	16.0
16245	00	Z	50	28	16.9	13.3
16320	12	Z	50	30	30.0	25.7
16320	00	Z	50	26	28.4	23.8
16429	00	Z	50	31	36.1	17.1
16429	12	Z	50	31	17.2	12.3
16622	00	Z	50	31	24.9	20.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16754	00	Z	50	26	25.4	19.8
17607	12	Z	50	31	29.1	27.4
26435	00	Z	50	15	15.4	5.5
5QPW8X	00	Z	50	11	27.8	21.6
5QPW8X	12	Z	50	9	18.9	14.7
60018	12	Z	50	31	20.7	19.3
60018	00	Z	50	28	19.4	18.5
7JUNA4	00	Z	50	0	0.0	0.0
7JUNA4	12	Z	50	2	53.1	40.3
ASDE09	12	Z	50	2	43.2	43.0
ASDE9	12	Z	50	2	44.6	44.6
ASDK01	00	Z	50	4	9.8	7.4
ASDK01	12	Z	50	7	4.2	0.6
ASDK03	12	Z	50	2	25.1	24.4
ASDK03	00	Z	50	2	23.1	22.9
ASDK1	00	Z	50	4	8.4	2.8
ASDK1	12	Z	50	7	7.0	-4.0
ASDK3	00	Z	50	2	17.0	17.0
ASDK3	12	Z	50	2	17.8	17.7
ASFR1	00	Z	50	10	28.1	24.7
ASFR1	12	Z	50	9	31.7	30.4
ASFR2	00	Z	50	7	42.6	39.7
ASFR2	12	Z	50	12	55.4	53.9
ASFR3	00	Z	50	12	38.2	36.6
ASFR3	12	Z	50	10	35.0	31.3
ASFR4	12	Z	50	12	43.9	42.8
ASFR4	00	Z	50	13	43.6	41.8
DBLK	12	Z	50	0	0.0	0.0
JNKN7J	00	Z	50	1	27.4	27.4
JNKN7J	12	Z	50	1	0.0	0.0
KMPLHP	12	Z	50	0	0.0	0.0
LRYQE3	00	Z	50	4	15.2	8.6
LRYQE3	12	Z	50	4	82.9	74.1
VKB4L5	00	Z	50	5	45.9	42.8
VKB4L5	12	Z	50	3	67.2	67.1
VKB4Q	12	Z	50	0	0.0	0.0
XQFJRG	00	Z	50	4	15.7	9.2
XQFJRG	12	Z	50	2	29.5	29.4
XQFJX	00	Z	50	4	9.6	2.0
XQFJX	12	Z	50	2	20.0	20.0
YLV96W	00	Z	50	0	0.0	0.0
YLV96W	12	Z	50	1	13.1	13.1
ZVQEM	12	Z	50	7	20.1	-0.8

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ZVQEQC	12	Z	50	7	19.2	-0.3

4.2 Table 14 - Radiosonde Monitoring Statistics (EUCOS):50 hPa Wind (m/s)

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : WIND (M/S)
         LEVEL                 :  50 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : DEC 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	50	29	3.2	0.5	0.1
01001	00	V	50	29	3.2	0.1	-0.6
01028	00	V	50	26	3.5	0.0	1.0
01028	12	V	50	27	2.7	-0.1	-0.3
01400	12	V	50	7	3.3	0.0	-0.5
01400	00	V	50	8	4.3	0.3	0.6
01415	12	V	50	30	7.4	-0.8	1.6
01415	00	V	50	24	5.9	0.5	0.8
02365	12	V	50	4	2.6	1.0	1.6
02365	00	V	50	8	4.3	-1.5	-1.9
02591	12	V	50	20	4.3	1.3	0.8
02591	00	V	50	21	4.5	1.4	-0.1
02836	00	V	50	17	3.0	0.6	0.2
02836	12	V	50	26	3.4	-0.3	0.2
02963	12	V	50	27	4.4	-0.4	-0.9
02963	00	V	50	24	4.4	0.1	0.4
03005	12	V	50	30	3.9	0.7	-0.5
03005	00	V	50	25	3.4	0.4	0.2
03238	00	V	50	23	4.2	-0.1	1.1
03238	12	V	50	3	5.5	4.2	1.0
03808	00	V	50	24	4.2	-0.7	1.0
03808	12	V	50	29	5.0	0.4	0.9
03918	12	V	50	9	4.3	-0.5	0.5
03918	00	V	50	28	4.3	0.9	1.5
03953	12	V	50	28	4.3	0.8	0.0
03953	00	V	50	28	3.8	0.7	-0.4
04018	00	V	50	26	3.7	0.2	-0.5
04018	12	V	50	28	4.3	-0.4	-0.6
04220	00	V	50	30	3.1	0.0	0.3
04220	12	V	50	29	2.8	-0.2	0.3
04270	00	V	50	25	3.1	-0.3	0.3
04270	12	V	50	28	3.9	-0.2	0.3
04320	12	V	50	31	3.2	0.1	-0.2
04320	00	V	50	29	3.0	-0.1	-0.6
04339	12	V	50	31	3.2	0.0	-0.3
04339	00	V	50	30	3.3	0.4	-0.5
04360	12	V	50	16	3.9	0.7	0.7
04360	00	V	50	19	2.9	-0.1	-0.6
06011	12	V	50	29	4.6	2.2	-0.5

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	50	22	4.0	1.2	0.4
06260	12	V	50	4	4.0	2.7	0.1
06260	00	V	50	26	3.7	0.9	-0.1
06610	00	V	50	29	5.9	0.0	0.4
06610	12	V	50	30	5.4	0.8	1.0
07110	12	V	50	27	3.9	1.0	0.6
07110	00	V	50	25	4.0	0.6	1.1
07510	00	V	50	26	5.0	0.7	1.2
07510	12	V	50	26	4.7	2.1	-0.3
07645	00	V	50	23	5.1	0.8	0.7
07645	12	V	50	29	6.7	1.5	0.8
07761	00	V	50	28	6.0	0.9	0.1
07761	12	V	50	28	4.7	2.0	1.0
08001	00	V	50	23	3.9	-0.1	0.7
08001	12	V	50	26	4.8	0.2	1.4
08221	12	V	50	28	5.0	1.3	0.0
08221	00	V	50	27	6.0	0.1	-0.3
08302	00	V	50	26	5.0	0.0	2.5
08302	12	V	50	29	6.4	0.7	1.9
08508	12	V	50	25	4.3	-0.4	-0.8
08522	12	V	50	28	4.5	0.6	1.5
08579	12	V	50	28	4.5	1.1	0.6
10035	12	V	50	31	4.6	1.0	0.6
10035	00	V	50	25	4.8	0.0	1.0
10393	12	V	50	31	4.3	0.9	-0.2
10393	00	V	50	26	4.5	-0.4	1.4
10410	12	V	50	28	3.7	0.4	0.9
10410	00	V	50	26	4.1	-0.3	0.8
10739	12	V	50	31	4.3	1.5	1.0
10739	00	V	50	26	4.8	1.7	1.4
11035	12	V	50	31	6.0	1.4	0.0
11035	00	V	50	29	4.3	0.8	0.6
12982	12	V	50	25	4.3	0.6	-0.6
12982	00	V	50	23	6.7	-0.3	0.4
16080	00	V	50	28	5.4	0.2	2.0
16080	12	V	50	31	6.4	1.1	1.0
16245	12	V	50	31	5.8	1.1	0.5
16245	00	V	50	28	5.1	1.1	-1.0
16320	12	V	50	30	4.9	1.2	-0.1
16320	00	V	50	26	5.4	1.1	0.2
16429	00	V	50	28	4.8	1.1	0.9
16429	12	V	50	30	4.5	0.9	0.6
16622	00	V	50	28	8.2	1.4	0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16754	00	V	50	21	4.8	1.2	0.0
17607	12	V	50	31	5.4	0.2	-1.5
26435	00	V	50	15	3.4	-0.3	-0.1
5QPW8X	00	V	50	11	2.2	0.1	-0.7
5QPW8X	12	V	50	9	3.6	0.2	-0.9
60018	12	V	50	30	5.1	1.8	0.5
60018	00	V	50	27	4.3	-0.5	1.0
7JUNA4	00	V	50	0	0.0	0.0	0.0
7JUNA4	12	V	50	2	4.0	-1.7	3.4
ASDE09	12	V	50	2	4.5	2.6	-1.1
ASDE9	12	V	50	2	3.2	1.6	-0.6
ASDK01	00	V	50	4	4.0	1.4	0.5
ASDK01	12	V	50	6	4.3	-0.2	-1.8
ASDK03	12	V	50	2	3.1	2.9	0.5
ASDK03	00	V	50	1	0.7	-0.7	0.1
ASDK1	00	V	50	4	3.9	1.3	-1.0
ASDK1	12	V	50	6	5.0	-0.2	-1.9
ASDK3	00	V	50	1	2.5	-0.5	-2.5
ASDK3	12	V	50	2	2.7	2.6	-0.2
ASFR1	00	V	50	10	2.8	1.1	-0.2
ASFR1	12	V	50	9	6.4	-2.1	0.2
ASFR2	00	V	50	7	4.0	0.3	2.1
ASFR2	12	V	50	12	3.7	0.8	0.3
ASFR3	00	V	50	12	3.2	1.5	1.1
ASFR3	12	V	50	10	2.8	-0.6	1.1
ASFR4	12	V	50	11	3.4	0.2	-0.2
ASFR4	00	V	50	12	3.5	1.4	-0.6
DBLK	12	V	50	0	0.0	0.0	0.0
JNKN7J	00	V	50	1	3.2	3.1	0.9
JNKN7J	12	V	50	1	0.6	0.4	-0.5
KMPLHP	12	V	50	0	0.0	0.0	0.0
LRYQE3	00	V	50	4	4.9	3.2	-0.5
LRYQE3	12	V	50	4	4.0	0.4	-2.5
VKB4L5	00	V	50	5	6.0	2.2	0.7
VKB4L5	12	V	50	0	0.0	0.0	0.0
VKB4Q	12	V	50	0	0.0	0.0	0.0
XQFJRG	00	V	50	4	3.6	-1.2	0.2
XQFJRG	12	V	50	2	4.0	0.1	3.3
XQFJX	00	V	50	4	3.9	-2.2	0.5
XQFJX	12	V	50	2	4.5	2.0	3.0
YLV96W	00	V	50	0	0.0	0.0	0.0
YLV96W	12	V	50	1	3.8	2.9	2.5
ZVQEM	12	V	50	6	8.4	1.2	0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ZVQEQC	12	V	50	6	7.3	-0.5	-1.1

4.3 Table 15 - Radiosonde Monitoring Statistics (EUCOS): 100 hPa Geopotential height (metres)

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
         LEVEL                 : 100 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : DEC 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	100	31	5.2	0.8
01001	00	Z	100	31	6.5	0.6
01028	00	Z	100	30	6.7	-4.0
01028	12	Z	100	30	16.1	-7.0
01400	12	Z	100	23	27.5	15.4
01400	00	Z	100	23	12.3	5.6
01415	12	Z	100	30	15.0	1.3
01415	00	Z	100	27	14.9	-3.8
02365	12	Z	100	21	9.7	3.1
02365	00	Z	100	22	5.8	0.8
02591	12	Z	100	29	10.5	5.3
02591	00	Z	100	28	7.8	5.7
02836	00	Z	100	23	4.2	-1.6
02836	12	Z	100	29	5.9	-3.4
02963	12	Z	100	30	10.6	-0.5
02963	00	Z	100	28	6.7	1.3
03005	12	Z	100	32	10.7	-4.5
03005	00	Z	100	32	10.4	-2.6
03238	00	Z	100	31	14.1	5.7
03238	12	Z	100	3	17.7	12.5
03808	00	Z	100	31	10.6	6.3
03808	12	Z	100	31	10.6	4.9
03918	12	Z	100	9	13.9	7.1
03918	00	Z	100	30	13.1	9.8
03953	12	Z	100	29	11.4	3.2
03953	00	Z	100	29	12.7	4.2
04018	00	Z	100	29	8.4	1.7
04018	12	Z	100	29	8.5	-2.2
04220	00	Z	100	31	8.9	0.2
04220	12	Z	100	30	4.2	-1.0
04270	00	Z	100	27	11.9	-5.0
04270	12	Z	100	28	16.9	-5.5
04320	12	Z	100	31	4.2	1.7
04320	00	Z	100	30	5.3	2.8
04339	12	Z	100	31	6.9	3.9
04339	00	Z	100	31	7.2	4.4
04360	12	Z	100	22	34.8	33.1
04360	00	Z	100	24	37.8	36.5
06011	12	Z	100	30	11.3	1.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	100	29	14.4	-2.4
06260	12	Z	100	4	15.5	9.9
06260	00	Z	100	30	6.3	2.8
06610	00	Z	100	31	17.9	4.0
06610	12	Z	100	31	9.4	0.8
07110	12	Z	100	32	21.3	18.9
07110	00	Z	100	29	20.5	19.1
07510	00	Z	100	30	15.6	10.3
07510	12	Z	100	28	17.3	14.6
07645	00	Z	100	28	16.7	13.9
07645	12	Z	100	31	25.3	21.7
07761	00	Z	100	31	35.1	31.8
07761	12	Z	100	31	42.5	40.6
08001	00	Z	100	30	12.9	11.0
08001	12	Z	100	31	20.6	19.3
08221	12	Z	100	31	12.9	10.2
08221	00	Z	100	32	14.1	12.2
08302	00	Z	100	28	7.4	2.4
08302	12	Z	100	29	8.7	4.4
08508	12	Z	100	31	17.4	15.5
08522	12	Z	100	31	23.4	20.9
08579	12	Z	100	30	20.3	19.1
10035	12	Z	100	31	19.0	16.2
10035	00	Z	100	33	16.8	15.8
10393	12	Z	100	31	8.2	2.7
10393	00	Z	100	33	8.1	1.5
10410	12	Z	100	29	8.6	4.6
10410	00	Z	100	31	8.3	1.5
10739	12	Z	100	31	9.7	2.7
10739	00	Z	100	33	10.0	2.6
11035	12	Z	100	31	13.2	9.6
11035	00	Z	100	31	14.3	7.1
12982	12	Z	100	26	21.0	12.7
12982	00	Z	100	24	19.7	-3.3
16080	00	Z	100	31	9.2	-0.3
16080	12	Z	100	31	11.1	1.9
16245	12	Z	100	31	8.4	2.2
16245	00	Z	100	29	9.3	0.1
16320	12	Z	100	30	18.4	14.0
16320	00	Z	100	28	15.7	13.3
16429	00	Z	100	31	10.3	4.3
16429	12	Z	100	31	7.8	4.4
16622	00	Z	100	31	14.6	8.9

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16754	00	Z	100	29	11.6	5.1
17607	12	Z	100	31	12.8	10.0
26435	00	Z	100	15	11.2	0.1
5QPW8X	00	Z	100	16	18.1	15.3
5QPW8X	12	Z	100	12	19.0	16.6
60018	12	Z	100	32	10.8	8.4
60018	00	Z	100	30	7.7	6.3
7JUNA4	00	Z	100	2	21.4	-21.3
7JUNA4	12	Z	100	6	33.8	19.9
ASDE09	12	Z	100	3	22.8	21.2
ASDE9	12	Z	100	2	20.2	19.6
ASDK01	00	Z	100	4	2.6	1.9
ASDK01	12	Z	100	9	6.7	3.2
ASDK03	12	Z	100	2	23.6	23.5
ASDK03	00	Z	100	3	13.6	13.1
ASDK1	00	Z	100	4	5.2	0.0
ASDK1	12	Z	100	9	7.9	-1.7
ASDK3	00	Z	100	2	13.4	12.7
ASDK3	12	Z	100	2	18.7	18.7
ASFR1	00	Z	100	12	17.1	13.4
ASFR1	12	Z	100	11	20.0	17.0
ASFR2	00	Z	100	8	23.6	22.1
ASFR2	12	Z	100	13	35.2	34.3
ASFR3	00	Z	100	13	23.1	20.8
ASFR3	12	Z	100	12	20.0	17.4
ASFR4	12	Z	100	12	26.2	25.2
ASFR4	00	Z	100	17	25.3	24.8
DBLK	12	Z	100	1	4.3	4.3
JNKN7J	00	Z	100	2	31.1	31.0
JNKN7J	12	Z	100	2	50.4	49.8
KMPLHP	12	Z	100	0	0.0	0.0
LRYQE3	00	Z	100	7	7.9	2.9
LRYQE3	12	Z	100	7	54.5	46.8
VKB4L5	00	Z	100	5	34.8	31.0
VKB4L5	12	Z	100	6	41.1	40.8
VKB4Q	12	Z	100	1	39.2	39.2
XQFJRG	00	Z	100	5	7.4	-3.5
XQFJRG	12	Z	100	3	16.1	14.1
XQFJX	00	Z	100	4	6.0	-5.6
XQFJX	12	Z	100	2	10.9	5.1
YLV96W	00	Z	100	2	17.8	17.8
YLV96W	12	Z	100	3	12.3	3.5
ZVQEM	12	Z	100	7	10.7	-8.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ZVQEQC	12	Z	100	9	12.6	-9.6

4.4 Table 16 - Radiosonde Monitoring Statistics (EUCOS): 100 hPa Wind (m/s)

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : WIND (M/S)
         LEVEL                 : 100 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : DEC 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	100	31	2.7	0.7	-0.2
01001	00	V	100	30	3.0	0.6	-0.5
01028	00	V	100	30	2.7	-0.2	-0.5
01028	12	V	100	30	2.6	1.0	-0.6
01400	12	V	100	15	3.0	1.2	0.8
01400	00	V	100	11	3.8	0.4	0.5
01415	12	V	100	30	4.9	0.5	-0.1
01415	00	V	100	25	4.5	0.6	0.1
02365	12	V	100	16	3.4	-0.5	0.2
02365	00	V	100	21	3.3	0.3	-0.6
02591	12	V	100	28	4.2	-0.2	0.2
02591	00	V	100	27	3.2	0.2	-0.5
02836	00	V	100	23	2.5	0.6	0.8
02836	12	V	100	29	3.5	0.8	0.5
02963	12	V	100	29	4.0	0.8	0.0
02963	00	V	100	27	3.3	0.3	-0.3
03005	12	V	100	30	3.5	0.0	-0.3
03005	00	V	100	29	2.8	0.4	-0.2
03238	00	V	100	30	3.9	-0.6	-0.3
03238	12	V	100	3	2.8	1.0	1.4
03808	00	V	100	29	4.5	0.1	0.6
03808	12	V	100	31	3.9	0.8	-0.5
03918	12	V	100	9	3.2	0.5	0.9
03918	00	V	100	29	3.7	0.5	0.2
03953	12	V	100	29	4.5	-0.9	0.4
03953	00	V	100	29	5.1	-0.9	0.9
04018	00	V	100	26	3.7	0.6	-0.4
04018	12	V	100	29	3.3	0.5	-0.2
04220	00	V	100	30	3.0	-0.3	0.6
04220	12	V	100	30	2.6	-0.4	0.1
04270	00	V	100	26	3.2	-0.1	-0.4
04270	12	V	100	28	4.7	0.6	0.4
04320	12	V	100	31	2.6	0.2	-0.4
04320	00	V	100	29	3.1	0.2	0.5
04339	12	V	100	31	3.1	0.7	-0.2
04339	00	V	100	30	2.9	-0.2	-0.6
04360	12	V	100	22	3.7	0.0	-0.4
04360	00	V	100	23	3.9	0.0	-0.1
06011	12	V	100	30	3.8	-0.4	-1.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	100	28	3.0	0.5	0.4
06260	12	V	100	4	3.7	-0.2	2.1
06260	00	V	100	27	3.2	-0.3	0.5
06610	00	V	100	30	6.2	1.1	1.6
06610	12	V	100	31	5.2	1.0	1.1
07110	12	V	100	30	3.6	1.0	-0.2
07110	00	V	100	28	4.0	-0.5	0.4
07510	00	V	100	29	4.2	0.7	0.4
07510	12	V	100	28	4.0	0.7	-0.4
07645	00	V	100	27	4.0	0.5	0.1
07645	12	V	100	31	5.1	-0.4	1.4
07761	00	V	100	30	4.7	0.2	-0.1
07761	12	V	100	31	6.0	0.4	0.9
08001	00	V	100	26	4.2	0.2	0.6
08001	12	V	100	30	3.9	0.5	1.0
08221	12	V	100	31	5.2	1.1	0.1
08221	00	V	100	28	5.0	0.1	-0.7
08302	00	V	100	27	4.9	1.8	0.5
08302	12	V	100	29	4.5	1.1	0.6
08508	12	V	100	27	5.5	-0.3	1.7
08522	12	V	100	31	4.4	-0.5	0.3
08579	12	V	100	30	5.2	0.5	1.5
10035	12	V	100	31	2.8	0.0	0.1
10035	00	V	100	28	2.8	-0.1	0.6
10393	12	V	100	31	3.1	0.4	0.1
10393	00	V	100	29	3.9	0.1	-0.5
10410	12	V	100	29	3.5	0.4	0.8
10410	00	V	100	28	4.2	-0.3	0.5
10739	12	V	100	31	4.4	0.9	1.1
10739	00	V	100	28	3.8	0.9	0.4
11035	12	V	100	31	4.0	0.9	0.6
11035	00	V	100	29	5.7	0.5	0.7
12982	12	V	100	26	4.3	0.8	0.8
12982	00	V	100	24	4.3	1.1	1.3
16080	00	V	100	30	5.4	0.8	0.0
16080	12	V	100	31	5.9	0.0	1.8
16245	12	V	100	31	4.9	1.2	0.8
16245	00	V	100	28	4.1	0.8	0.7
16320	12	V	100	30	5.2	1.5	0.0
16320	00	V	100	27	5.0	0.5	1.9
16429	00	V	100	29	5.1	-0.3	1.4
16429	12	V	100	31	6.1	-0.3	0.4
16622	00	V	100	30	5.2	0.8	0.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16754	00	V	100	26	3.7	0.8	-0.7
17607	12	V	100	31	5.1	1.5	-1.0
26435	00	V	100	15	3.8	-0.1	-0.8
5QPW8X	00	V	100	11	3.2	0.5	0.3
5QPW8X	12	V	100	9	4.0	-1.6	0.9
60018	12	V	100	30	4.4	0.4	1.0
60018	00	V	100	29	3.9	-0.1	1.1
7JUNA4	00	V	100	1	3.0	2.7	1.2
7JUNA4	12	V	100	3	2.5	2.0	-0.4
ASDE09	12	V	100	3	3.5	0.1	-0.1
ASDE9	12	V	100	2	3.5	-1.6	-3.1
ASDK01	00	V	100	4	5.0	2.5	-0.5
ASDK01	12	V	100	9	4.0	-0.1	-1.4
ASDK03	12	V	100	2	3.0	-1.0	0.3
ASDK03	00	V	100	2	1.1	-1.1	-0.2
ASDK1	00	V	100	4	4.3	2.1	-0.1
ASDK1	12	V	100	9	4.3	0.3	-1.5
ASDK3	00	V	100	2	1.5	-1.2	-0.5
ASDK3	12	V	100	2	3.7	-1.7	-1.1
ASFR1	00	V	100	11	3.7	0.2	-0.9
ASFR1	12	V	100	9	2.6	-0.9	0.8
ASFR2	00	V	100	8	3.5	0.1	0.0
ASFR2	12	V	100	12	3.5	-0.4	-0.6
ASFR3	00	V	100	12	3.8	1.7	0.1
ASFR3	12	V	100	10	3.9	1.5	0.6
ASFR4	12	V	100	11	4.1	-1.0	1.5
ASFR4	00	V	100	13	3.4	-0.4	0.0
DBLK	12	V	100	0	0.0	0.0	0.0
JNKN7J	00	V	100	2	4.3	0.7	0.5
JNKN7J	12	V	100	2	5.8	4.8	-0.3
KMPLHP	12	V	100	0	0.0	0.0	0.0
LRYQE3	00	V	100	6	3.1	-0.7	-2.3
LRYQE3	12	V	100	6	2.8	0.2	0.0
VKB4L5	00	V	100	5	4.6	0.8	-0.3
VKB4L5	12	V	100	4	5.2	1.9	2.3
VKB4Q	12	V	100	0	0.0	0.0	0.0
XQFJRG	00	V	100	5	3.1	-1.4	-0.8
XQFJRG	12	V	100	3	4.2	1.7	1.1
XQFJX	00	V	100	4	3.9	-0.2	0.0
XQFJX	12	V	100	2	4.2	0.4	-0.1
YLV96W	00	V	100	2	5.2	-3.8	0.7
YLV96W	12	V	100	3	5.1	-3.9	-1.1
ZVQEM	12	V	100	7	5.3	2.0	0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ZVQEQC	12	V	100	7	4.2	1.6	-0.2

4.5 Table 17 - Radiosonde Monitoring Statistics (EUCOS): 500 hPa Geopotential height (metres)

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
         LEVEL                 : 500 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : DEC 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	500	31	4.9	-0.8
01001	00	Z	500	31	3.3	0.4
01028	00	Z	500	31	5.2	-2.6
01028	12	Z	500	31	15.5	-6.7
01400	12	Z	500	26	13.1	8.7
01400	00	Z	500	27	9.7	7.2
01415	12	Z	500	30	6.4	4.3
01415	00	Z	500	27	7.0	5.2
02365	12	Z	500	26	6.0	4.4
02365	00	Z	500	26	5.4	4.4
02591	12	Z	500	29	8.1	6.9
02591	00	Z	500	28	8.4	7.9
02836	00	Z	500	27	3.6	0.9
02836	12	Z	500	30	3.5	0.3
02963	12	Z	500	30	4.1	2.2
02963	00	Z	500	28	3.6	1.6
03005	12	Z	500	32	14.4	-5.8
03005	00	Z	500	32	24.8	-5.2
03238	00	Z	500	31	5.5	3.3
03238	12	Z	500	3	6.7	3.6
03808	00	Z	500	32	5.6	4.1
03808	12	Z	500	31	6.0	3.5
03918	12	Z	500	9	9.9	8.1
03918	00	Z	500	30	11.4	10.5
03953	12	Z	500	32	10.1	3.7
03953	00	Z	500	31	7.2	0.1
04018	00	Z	500	29	3.8	1.6
04018	12	Z	500	31	3.6	0.4
04220	00	Z	500	31	6.6	3.5
04220	12	Z	500	30	3.5	1.7
04270	00	Z	500	30	10.4	-3.0
04270	12	Z	500	31	8.9	-2.6
04320	12	Z	500	31	3.3	1.3
04320	00	Z	500	30	4.1	2.7
04339	12	Z	500	31	5.0	3.4
04339	00	Z	500	31	6.5	3.1
04360	12	Z	500	27	37.1	36.8
04360	00	Z	500	28	40.1	39.9
06011	12	Z	500	31	7.0	1.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	500	31	7.8	0.9
06260	12	Z	500	4	2.8	1.4
06260	00	Z	500	30	4.8	2.3
06610	00	Z	500	31	4.9	2.5
06610	12	Z	500	31	4.4	-0.5
07110	12	Z	500	33	9.8	6.6
07110	00	Z	500	29	7.1	4.5
07510	00	Z	500	30	5.1	3.0
07510	12	Z	500	31	7.9	5.7
07645	00	Z	500	31	5.5	2.7
07645	12	Z	500	32	8.5	7.2
07761	00	Z	500	31	9.6	7.9
07761	12	Z	500	31	12.9	10.9
08001	00	Z	500	31	7.4	5.5
08001	12	Z	500	31	9.0	8.2
08221	12	Z	500	31	10.1	8.1
08221	00	Z	500	33	8.1	7.3
08302	00	Z	500	29	5.1	0.5
08302	12	Z	500	30	4.9	-0.4
08508	12	Z	500	31	9.5	7.8
08522	12	Z	500	31	11.7	9.6
08579	12	Z	500	31	9.6	8.7
10035	12	Z	500	32	15.0	14.2
10035	00	Z	500	34	14.8	14.4
10393	12	Z	500	31	3.1	-0.5
10393	00	Z	500	33	4.3	-1.1
10410	12	Z	500	30	4.4	-0.2
10410	00	Z	500	32	5.5	1.5
10739	12	Z	500	31	3.8	-0.3
10739	00	Z	500	33	4.4	-0.4
11035	12	Z	500	31	7.3	6.1
11035	00	Z	500	32	6.2	4.8
12982	12	Z	500	26	21.2	-0.5
12982	00	Z	500	26	22.2	-1.8
16080	00	Z	500	31	4.6	-2.6
16080	12	Z	500	31	4.0	-2.6
16245	12	Z	500	31	4.5	-1.3
16245	00	Z	500	30	4.5	-1.4
16320	12	Z	500	30	17.0	15.4
16320	00	Z	500	33	16.0	13.3
16429	00	Z	500	32	4.5	2.4
16429	12	Z	500	31	5.5	2.5
16622	00	Z	500	31	8.1	7.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16754	00	Z	500	30	7.5	0.7
17607	12	Z	500	31	7.4	6.6
26435	00	Z	500	15	4.3	0.1
5QPW8X	00	Z	500	16	22.7	21.7
5QPW8X	12	Z	500	12	23.0	22.1
60018	12	Z	500	33	5.9	4.2
60018	00	Z	500	30	4.9	3.7
7JUNA4	00	Z	500	2	22.8	-11.6
7JUNA4	12	Z	500	7	21.0	-0.6
ASDE09	12	Z	500	3	15.9	12.7
ASDE9	12	Z	500	2	14.4	14.3
ASDK01	00	Z	500	4	10.0	9.8
ASDK01	12	Z	500	9	11.1	9.9
ASDK03	12	Z	500	2	30.2	30.2
ASDK03	00	Z	500	4	26.6	26.6
ASDK1	00	Z	500	4	11.3	7.9
ASDK1	12	Z	500	9	14.3	6.2
ASDK3	00	Z	500	2	17.9	17.8
ASDK3	12	Z	500	2	26.9	26.8
ASFR1	00	Z	500	16	6.6	-2.0
ASFR1	12	Z	500	17	5.0	3.3
ASFR2	00	Z	500	13	17.6	16.9
ASFR2	12	Z	500	15	22.0	20.2
ASFR3	00	Z	500	14	8.6	5.6
ASFR3	12	Z	500	14	9.5	3.7
ASFR4	12	Z	500	13	7.7	6.0
ASFR4	00	Z	500	19	5.6	3.8
DBLK	12	Z	500	0	0.0	0.0
JNKN7J	00	Z	500	2	32.0	31.2
JNKN7J	12	Z	500	4	43.4	43.1
KMPLHP	12	Z	500	1	5.9	-5.9
LRYQE3	00	Z	500	8	3.6	2.0
LRYQE3	12	Z	500	9	7.6	3.9
VKB4L5	00	Z	500	6	30.8	27.8
VKB4L5	12	Z	500	6	34.7	34.2
VKB4Q	12	Z	500	1	34.4	34.4
XQFJRG	00	Z	500	5	7.0	-5.4
XQFJRG	12	Z	500	5	4.7	0.2
XQFJX	00	Z	500	4	10.0	-9.9
XQFJX	12	Z	500	3	12.5	-6.8
YLV96W	00	Z	500	2	13.2	7.8
YLV96W	12	Z	500	3	5.2	0.0
ZVQEM	12	Z	500	7	9.0	-5.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ZVQEQC	12	Z	500	12	4.7	-1.3

4.6 Table 18 - Radiosonde Monitoring Statistics (EUCOS): 500 hPa Wind (m/s)

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : WIND (M/S)
         LEVEL                 : 500 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : DEC 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	500	31	2.9	0.4	0.2
01001	00	V	500	30	2.9	-0.2	-0.1
01028	00	V	500	30	2.7	0.0	0.1
01028	12	V	500	31	3.2	0.2	-0.2
01400	12	V	500	26	3.0	-0.3	-0.3
01400	00	V	500	26	2.9	-0.6	0.9
01415	12	V	500	30	2.8	0.1	-0.1
01415	00	V	500	25	2.7	0.9	0.2
02365	12	V	500	26	2.9	0.8	-0.2
02365	00	V	500	26	3.0	0.0	-0.2
02591	12	V	500	29	2.5	-0.1	0.0
02591	00	V	500	27	3.4	-0.4	-0.7
02836	00	V	500	27	3.2	0.3	0.8
02836	12	V	500	30	2.9	0.0	-0.2
02963	12	V	500	29	3.0	0.6	0.5
02963	00	V	500	27	2.9	-0.5	0.1
03005	12	V	500	30	4.3	1.0	-0.2
03005	00	V	500	30	4.0	-0.1	0.5
03238	00	V	500	30	4.3	0.1	0.6
03238	12	V	500	3	2.9	-1.9	1.3
03808	00	V	500	30	3.8	0.3	-1.0
03808	12	V	500	31	3.5	0.0	-0.6
03918	12	V	500	9	3.3	1.4	-0.5
03918	00	V	500	29	3.4	0.0	0.0
03953	12	V	500	31	4.0	0.7	-0.9
03953	00	V	500	30	4.3	0.3	0.4
04018	00	V	500	27	3.0	0.5	0.7
04018	12	V	500	30	3.0	0.1	0.5
04220	00	V	500	30	3.1	0.0	-0.5
04220	12	V	500	30	2.6	0.2	0.1
04270	00	V	500	29	3.1	0.6	0.0
04270	12	V	500	31	5.3	-0.6	0.0
04320	12	V	500	31	2.7	0.3	-0.3
04320	00	V	500	29	2.8	-0.1	0.5
04339	12	V	500	31	2.7	-0.1	0.1
04339	00	V	500	30	3.2	0.5	0.4
04360	12	V	500	27	3.4	-0.5	-0.2
04360	00	V	500	27	3.5	0.2	0.5
06011	12	V	500	31	3.8	0.1	-1.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	500	30	3.7	0.7	-0.8
06260	12	V	500	4	1.9	-1.0	-0.3
06260	00	V	500	27	2.9	0.0	-0.3
06610	00	V	500	30	3.1	0.2	0.0
06610	12	V	500	31	4.1	0.1	-0.5
07110	12	V	500	31	4.4	0.2	-0.4
07110	00	V	500	28	2.8	-0.3	0.5
07510	00	V	500	29	3.2	0.9	-0.1
07510	12	V	500	31	3.2	-0.1	-0.6
07645	00	V	500	30	2.6	0.1	-0.4
07645	12	V	500	31	3.4	0.2	0.5
07761	00	V	500	30	3.3	0.7	0.2
07761	12	V	500	31	3.2	-0.5	0.2
08001	00	V	500	29	5.0	-0.4	0.1
08001	12	V	500	31	3.5	0.9	0.4
08221	12	V	500	31	3.1	0.9	-0.5
08221	00	V	500	30	3.6	0.1	-0.5
08302	00	V	500	28	3.1	0.5	-0.5
08302	12	V	500	30	3.5	0.4	0.1
08508	12	V	500	27	3.1	0.5	-0.1
08522	12	V	500	31	2.8	0.5	-0.3
08579	12	V	500	31	2.7	0.2	0.6
10035	12	V	500	31	3.0	-0.4	0.0
10035	00	V	500	30	2.9	-0.4	-0.3
10393	12	V	500	31	2.9	-0.3	-0.2
10393	00	V	500	30	3.3	0.0	-0.4
10410	12	V	500	30	2.9	0.6	0.2
10410	00	V	500	29	4.5	-0.1	-0.7
10739	12	V	500	31	3.8	0.9	-0.7
10739	00	V	500	30	3.5	0.3	-0.2
11035	12	V	500	31	4.5	1.3	-1.4
11035	00	V	500	30	3.7	-0.2	-0.2
12982	12	V	500	26	3.3	0.5	-0.2
12982	00	V	500	26	3.9	-0.2	0.0
16080	00	V	500	30	2.9	0.1	-0.7
16080	12	V	500	31	2.8	0.3	0.3
16245	12	V	500	31	3.0	-0.5	-0.6
16245	00	V	500	29	3.3	0.2	0.1
16320	12	V	500	30	3.3	0.4	0.3
16320	00	V	500	30	3.5	0.9	0.2
16429	00	V	500	30	3.5	0.7	0.4
16429	12	V	500	31	3.4	0.7	0.1
16622	00	V	500	30	3.2	0.9	0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16754	00	V	500	28	3.8	1.0	0.9
17607	12	V	500	31	3.0	0.7	0.4
26435	00	V	500	15	4.1	0.8	0.6
5QPW8X	00	V	500	11	3.5	0.3	-0.1
5QPW8X	12	V	500	9	3.2	0.4	-0.9
60018	12	V	500	30	3.4	0.3	0.2
60018	00	V	500	29	2.5	0.0	0.2
7JUNA4	00	V	500	2	5.9	2.3	-3.4
7JUNA4	12	V	500	5	3.0	-0.2	-1.3
ASDE09	12	V	500	3	2.6	1.6	-0.1
ASDE9	12	V	500	2	4.2	-3.5	1.6
ASDK01	00	V	500	4	2.2	0.7	0.5
ASDK01	12	V	500	9	4.0	0.8	1.3
ASDK03	12	V	500	2	1.6	-1.1	0.0
ASDK03	00	V	500	3	1.7	0.5	0.0
ASDK1	00	V	500	4	3.5	0.7	1.4
ASDK1	12	V	500	9	4.0	1.2	0.7
ASDK3	00	V	500	2	1.9	1.3	-1.0
ASDK3	12	V	500	2	1.4	-0.6	-1.3
ASFR1	00	V	500	14	2.6	0.4	0.6
ASFR1	12	V	500	16	3.6	0.3	-1.1
ASFR2	00	V	500	13	3.5	0.3	0.7
ASFR2	12	V	500	14	3.0	0.4	0.2
ASFR3	00	V	500	13	2.2	0.0	-0.4
ASFR3	12	V	500	12	2.9	0.0	0.5
ASFR4	12	V	500	12	3.1	1.0	0.1
ASFR4	00	V	500	15	2.4	-0.1	0.5
DBLK	12	V	500	0	0.0	0.0	0.0
JNKN7J	00	V	500	2	1.9	0.9	0.6
JNKN7J	12	V	500	4	3.5	-0.1	-0.3
KMPLHP	12	V	500	1	1.5	-0.4	-1.4
LRYQE3	00	V	500	7	3.8	-0.5	0.6
LRYQE3	12	V	500	8	2.9	-0.7	0.1
VKB4L5	00	V	500	6	3.1	0.6	-0.8
VKB4L5	12	V	500	5	3.4	0.4	-0.9
VKB4Q	12	V	500	1	1.5	-0.9	1.2
XQFJRG	00	V	500	5	2.2	0.1	-1.5
XQFJRG	12	V	500	4	3.4	0.3	0.3
XQFJX	00	V	500	4	4.1	-2.3	-1.7
XQFJX	12	V	500	3	6.5	4.5	2.4
YLV96W	00	V	500	2	2.2	-0.3	-1.3
YLV96W	12	V	500	3	2.4	0.7	-1.1
ZVQEM	12	V	500	7	3.8	-1.4	-1.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ZVQEQC	12	V	500	10	3.3	-0.1	-1.0

4.7 Table 19 - Radiosonde Monitoring Statistics (EUCOS): 850 hPa Geopotential height (metres)

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
         LEVEL                 : 850 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : DEC 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	850	31	3.7	-1.2
01001	00	Z	850	31	2.5	-0.9
01028	00	Z	850	31	3.9	-3.1
01028	12	Z	850	31	15.1	-6.1
01400	12	Z	850	26	8.1	5.3
01400	00	Z	850	27	7.8	6.2
01415	12	Z	850	30	4.0	3.2
01415	00	Z	850	27	5.4	4.5
02365	12	Z	850	26	6.4	6.0
02365	00	Z	850	26	6.0	5.3
02591	12	Z	850	30	8.2	7.7
02591	00	Z	850	28	7.9	7.4
02836	00	Z	850	27	2.8	1.7
02836	12	Z	850	30	3.2	2.6
02963	12	Z	850	30	2.9	2.0
02963	00	Z	850	28	3.1	2.6
03005	12	Z	850	33	3.8	-0.8
03005	00	Z	850	33	3.7	-1.3
03238	00	Z	850	31	4.4	2.8
03238	12	Z	850	3	4.3	3.2
03808	00	Z	850	32	4.2	1.9
03808	12	Z	850	31	3.5	1.6
03918	12	Z	850	9	9.4	9.1
03918	00	Z	850	30	9.8	9.2
03953	12	Z	850	32	6.6	4.4
03953	00	Z	850	31	5.0	2.5
04018	00	Z	850	29	2.3	-0.6
04018	12	Z	850	31	2.2	0.0
04220	00	Z	850	31	5.7	2.4
04220	12	Z	850	31	4.0	2.1
04270	00	Z	850	31	7.4	-1.1
04270	12	Z	850	31	5.2	-0.5
04320	12	Z	850	31	4.1	-0.8
04320	00	Z	850	30	4.2	0.3
04339	12	Z	850	31	4.9	3.3
04339	00	Z	850	31	5.2	1.1
04360	12	Z	850	30	40.3	40.1
04360	00	Z	850	30	39.2	38.5
06011	12	Z	850	31	3.9	2.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	850	31	4.3	3.1
06260	12	Z	850	4	3.2	1.4
06260	00	Z	850	30	3.3	2.1
06610	00	Z	850	31	4.4	3.3
06610	12	Z	850	31	3.4	2.3
07110	12	Z	850	33	4.5	3.2
07110	00	Z	850	29	3.1	1.0
07510	00	Z	850	30	3.8	3.3
07510	12	Z	850	31	6.1	5.4
07645	00	Z	850	31	4.7	2.2
07645	12	Z	850	32	4.9	4.0
07761	00	Z	850	31	4.6	2.8
07761	12	Z	850	31	5.6	4.1
08001	00	Z	850	31	4.2	3.0
08001	12	Z	850	32	4.4	1.9
08221	12	Z	850	31	4.4	3.7
08221	00	Z	850	33	5.4	5.0
08302	00	Z	850	29	3.2	-1.4
08302	12	Z	850	30	4.0	-3.4
08508	12	Z	850	31	5.0	3.4
08522	12	Z	850	31	4.9	4.2
08579	12	Z	850	31	4.4	3.4
10035	12	Z	850	32	14.3	13.9
10035	00	Z	850	34	14.5	14.4
10393	12	Z	850	31	3.4	-0.2
10393	00	Z	850	33	3.1	0.6
10410	12	Z	850	30	3.4	0.4
10410	00	Z	850	32	3.0	2.2
10739	12	Z	850	31	4.0	-0.6
10739	00	Z	850	33	3.1	1.1
11035	12	Z	850	31	8.7	7.6
11035	00	Z	850	32	8.9	8.3
12982	12	Z	850	26	5.0	4.1
12982	00	Z	850	26	4.0	2.9
16080	00	Z	850	31	3.6	-2.2
16080	12	Z	850	31	3.6	-2.0
16245	12	Z	850	31	3.7	-1.7
16245	00	Z	850	30	2.3	-0.4
16320	12	Z	850	30	18.0	16.1
16320	00	Z	850	33	16.2	14.8
16429	00	Z	850	32	3.2	1.2
16429	12	Z	850	31	4.1	2.1
16622	00	Z	850	31	8.4	7.7

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16754	00	Z	850	31	4.7	0.9
17607	12	Z	850	31	3.6	3.0
26435	00	Z	850	15	3.4	0.3
5QPW8X	00	Z	850	16	24.3	23.2
5QPW8X	12	Z	850	12	24.2	23.3
60018	12	Z	850	33	3.4	1.0
60018	00	Z	850	30	3.4	1.4
7JUNA4	00	Z	850	2	25.8	-15.6
7JUNA4	12	Z	850	8	20.4	-6.5
ASDE09	12	Z	850	3	12.8	10.4
ASDE9	12	Z	850	2	14.1	13.5
ASDK01	00	Z	850	4	8.3	6.0
ASDK01	12	Z	850	9	8.8	8.0
ASDK03	12	Z	850	4	27.5	27.4
ASDK03	00	Z	850	4	25.8	25.6
ASDK1	00	Z	850	4	6.7	3.9
ASDK1	12	Z	850	9	15.2	11.1
ASDK3	00	Z	850	2	24.3	24.2
ASDK3	12	Z	850	2	26.9	26.8
ASFR1	00	Z	850	17	6.1	-4.6
ASFR1	12	Z	850	17	4.1	-2.2
ASFR2	00	Z	850	13	13.6	13.0
ASFR2	12	Z	850	15	14.7	13.2
ASFR3	00	Z	850	14	3.8	2.3
ASFR3	12	Z	850	14	3.7	0.6
ASFR4	12	Z	850	14	3.6	-1.7
ASFR4	00	Z	850	19	4.6	-1.9
DBLK	12	Z	850	0	0.0	0.0
JNKN7J	00	Z	850	2	35.4	35.4
JNKN7J	12	Z	850	4	39.3	39.3
KMPLHP	12	Z	850	1	2.4	-2.4
LRYQE3	00	Z	850	8	2.6	-0.6
LRYQE3	12	Z	850	9	2.6	1.3
VKB4L5	00	Z	850	6	27.8	24.8
VKB4L5	12	Z	850	6	30.1	30.0
VKB4Q	12	Z	850	1	38.6	38.6
XQFJRG	00	Z	850	5	13.3	-13.1
XQFJRG	12	Z	850	5	7.4	-6.5
XQFJX	00	Z	850	4	9.5	-9.3
XQFJX	12	Z	850	3	7.9	-4.8
YLV96W	00	Z	850	2	7.6	5.4
YLV96W	12	Z	850	4	4.1	-0.7
ZVQEM	12	Z	850	7	4.1	-2.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ZVQEQC	12	Z	850	12	6.5	-4.5

4.8 Table 20 - Radiosonde Monitoring Statistics (EUCOS): 850 hPa Wind (m/s)

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : WIND (M/S)
         LEVEL                 : 850 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : DEC 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	850	31	3.5	0.3	0.1
01001	00	V	850	30	3.1	-0.2	1.1
01028	00	V	850	30	3.0	0.2	0.0
01028	12	V	850	31	2.5	-0.6	-0.4
01400	12	V	850	26	2.3	0.0	-0.2
01400	00	V	850	26	2.1	0.7	-0.7
01415	12	V	850	30	2.6	-0.4	0.2
01415	00	V	850	25	3.1	-0.6	0.3
02365	12	V	850	26	2.5	-0.3	-0.1
02365	00	V	850	26	2.3	-0.2	0.2
02591	12	V	850	29	2.6	0.2	-1.0
02591	00	V	850	27	2.6	0.0	-0.3
02836	00	V	850	27	2.2	0.1	0.1
02836	12	V	850	30	2.3	0.1	0.5
02963	12	V	850	29	2.1	-0.4	0.2
02963	00	V	850	27	2.6	-0.2	0.0
03005	12	V	850	30	3.5	-0.5	0.1
03005	00	V	850	30	2.7	-0.2	0.1
03238	00	V	850	30	2.3	-0.3	0.6
03238	12	V	850	3	3.2	1.7	1.5
03808	00	V	850	30	3.0	0.0	-0.7
03808	12	V	850	31	2.6	-0.3	-0.3
03918	12	V	850	9	3.0	0.3	-0.5
03918	00	V	850	29	2.7	-0.4	0.3
03953	12	V	850	31	3.2	-0.3	-0.4
03953	00	V	850	30	3.2	-0.1	0.2
04018	00	V	850	27	2.8	0.1	-0.1
04018	12	V	850	30	3.4	0.4	-0.1
04220	00	V	850	30	3.6	-0.3	0.4
04220	12	V	850	31	3.6	-0.2	0.5
04270	00	V	850	29	5.1	0.1	1.0
04270	12	V	850	31	5.1	0.0	0.8
04320	12	V	850	31	3.0	0.4	-0.4
04320	00	V	850	29	3.6	0.4	0.5
04339	12	V	850	31	3.3	0.0	0.5
04339	00	V	850	30	3.2	0.4	1.2
04360	12	V	850	27	5.9	1.0	0.0
04360	00	V	850	27	6.7	1.3	1.5
06011	12	V	850	31	3.8	0.5	-0.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	850	30	2.5	-0.6	0.0
06260	12	V	850	4	3.0	0.7	0.2
06260	00	V	850	27	2.3	0.0	0.2
06610	00	V	850	30	2.8	0.6	0.3
06610	12	V	850	31	3.3	0.6	-0.3
07110	12	V	850	31	3.1	0.0	-0.2
07110	00	V	850	28	2.7	-0.1	-0.6
07510	00	V	850	29	2.8	-0.5	-0.4
07510	12	V	850	31	3.3	-0.5	0.5
07645	00	V	850	30	3.3	-0.4	0.0
07645	12	V	850	31	4.2	-0.5	0.3
07761	00	V	850	30	4.4	0.2	-0.5
07761	12	V	850	31	4.5	-1.0	1.2
08001	00	V	850	29	2.4	0.3	-0.1
08001	12	V	850	31	2.7	0.8	0.2
08221	12	V	850	31	3.8	-0.4	0.1
08221	00	V	850	30	3.0	0.8	0.6
08302	00	V	850	28	2.7	0.5	-0.2
08302	12	V	850	30	3.7	0.2	0.5
08508	12	V	850	28	3.4	0.1	-0.3
08522	12	V	850	31	3.8	-1.2	0.4
08579	12	V	850	31	2.9	0.4	-0.5
10035	12	V	850	31	2.7	0.0	-0.4
10035	00	V	850	30	2.6	0.1	0.2
10393	12	V	850	31	2.1	-0.2	0.0
10393	00	V	850	30	2.9	0.2	-0.4
10410	12	V	850	30	2.7	-0.1	-0.9
10410	00	V	850	29	2.5	0.0	0.2
10739	12	V	850	31	4.2	0.8	-0.4
10739	00	V	850	30	2.8	0.6	-0.5
11035	12	V	850	31	3.8	0.0	-0.3
11035	00	V	850	30	3.9	0.6	-0.3
12982	12	V	850	26	3.2	0.2	0.2
12982	00	V	850	26	3.3	0.5	-0.9
16080	00	V	850	30	4.1	0.5	-1.0
16080	12	V	850	31	4.6	0.7	-0.3
16245	12	V	850	31	4.2	0.9	1.1
16245	00	V	850	29	4.0	0.9	0.4
16320	12	V	850	30	3.3	0.1	0.4
16320	00	V	850	30	4.7	0.4	-0.3
16429	00	V	850	30	3.1	-0.2	0.1
16429	12	V	850	31	2.8	-0.5	0.2
16622	00	V	850	30	3.2	-0.2	-0.9

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16754	00	V	850	29	4.0	0.5	-0.6
17607	12	V	850	31	3.5	1.0	0.3
26435	00	V	850	15	2.4	0.4	0.3
5QPW8X	00	V	850	11	4.0	1.0	-0.2
5QPW8X	12	V	850	9	3.5	0.0	-2.1
60018	12	V	850	30	3.7	1.3	0.1
60018	00	V	850	29	3.0	0.5	-0.3
7JUNA4	00	V	850	2	2.8	1.1	-1.0
7JUNA4	12	V	850	6	6.2	2.0	0.2
ASDE09	12	V	850	3	1.3	-0.6	-0.4
ASDE9	12	V	850	2	2.2	-1.9	0.1
ASDK01	00	V	850	4	1.7	0.8	0.2
ASDK01	12	V	850	9	5.0	1.6	-1.9
ASDK03	12	V	850	3	2.7	-1.4	1.0
ASDK03	00	V	850	3	3.3	0.9	-0.3
ASDK1	00	V	850	4	1.9	-0.7	-0.1
ASDK1	12	V	850	9	4.8	2.0	-2.1
ASDK3	00	V	850	2	2.7	2.0	-0.2
ASDK3	12	V	850	2	3.3	-3.1	0.6
ASFR1	00	V	850	15	2.5	0.1	-0.9
ASFR1	12	V	850	16	2.7	0.2	0.2
ASFR2	00	V	850	13	2.1	-0.4	0.1
ASFR2	12	V	850	14	4.2	-0.1	0.0
ASFR3	00	V	850	13	4.0	1.1	0.7
ASFR3	12	V	850	12	2.2	-0.2	0.8
ASFR4	12	V	850	13	2.6	1.0	-0.3
ASFR4	00	V	850	15	2.0	0.3	0.0
DBLK	12	V	850	0	0.0	0.0	0.0
JNKN7J	00	V	850	2	1.7	1.1	-0.6
JNKN7J	12	V	850	4	4.5	1.4	-1.5
KMPLHP	12	V	850	1	0.7	0.7	-0.2
LRYQE3	00	V	850	7	6.9	3.7	1.7
LRYQE3	12	V	850	8	12.1	8.1	3.2
VKB4L5	00	V	850	6	2.7	0.9	-1.0
VKB4L5	12	V	850	5	3.2	1.6	-0.4
VKB4Q	12	V	850	1	1.2	0.4	1.1
XQFJRG	00	V	850	5	2.6	0.9	0.0
XQFJRG	12	V	850	4	3.4	-1.6	1.4
XQFJX	00	V	850	4	4.3	-0.1	-2.2
XQFJX	12	V	850	3	4.9	-3.8	1.7
YLV96W	00	V	850	2	3.8	0.7	1.9
YLV96W	12	V	850	4	4.2	-0.5	-2.7
ZVQEM	12	V	850	7	2.8	-0.6	1.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ZVQEQC	12	V	850	10	3.1	-0.3	0.9

4.9 Table 21 - Drifter Monitoring Statistics (EUCOS): Surface pressure (hpa)

```
DRIFTER MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE      : ECMWF
         ELEMENT MONITORED      : SURFACE PRESSURE (HPA)
         AREA                   : 10N - 90N, 70W - 40E
         PERIOD                 : DEC 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD


TIME = 99 => AVERAGE OF ALL OBSERVATIONS
GROSS ERROR LIMIT = 15 HPA
```

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
012	99	P	SUR	77	30	4	0	2.0	2.6	3.3
03380	99	P	SUR	54	0	744	0	0.3	-0.2	0.4
1300001	99	P	SUR	11	-23	687	0	0.3	-0.1	0.3
1300008	99	P	SUR	15	-38	738	0	0.3	-0.2	0.4
1300130	99	P	SUR	28	-16	743	0	0.4	0.0	0.4
1300131	99	P	SUR	28	-17	744	0	0.4	0.1	0.4
1300869	99	P	SUR	25	-61	702	0	0.3	-0.1	0.3
1300872	99	P	SUR	35	-48	700	0	0.6	0.0	0.6
1301603	99	P	SUR	20	-30	701	0	0.3	0.0	0.3
1301604	99	P	SUR	14	-25	700	0	0.3	0.2	0.4
1301605	99	P	SUR	21	-34	700	0	0.3	-0.1	0.3
1301606	99	P	SUR	14	-31	698	0	0.3	0.2	0.4
13869	99	P	SUR	25	-61	702	0	0.3	-0.1	0.3
13872	99	P	SUR	35	-48	700	0	0.6	0.0	0.6
1501529	99	P	SUR	28	-28	732	0	0.3	0.3	0.4
1501531	99	P	SUR	20	-37	736	0	0.3	-0.0	0.3
1501534	99	P	SUR	23	-35	732	0	0.3	-0.3	0.5
1501607	99	P	SUR	11	-42	701	0	0.3	0.3	0.4
1501609	99	P	SUR	14	-56	701	0	0.3	0.8	0.9
3100735	99	P	SUR	19	-61	403	0	0.2	0.3	0.4
31735	99	P	SUR	19	-61	403	0	0.2	0.3	0.4
4100139	99	P	SUR	20	-38	744	0	0.3	-0.3	0.4
4100597	99	P	SUR	33	-42	700	0	0.5	0.2	0.5
4100729	99	P	SUR	35	-34	403	0	3.3	-1.0	3.4
4100730	99	P	SUR	37	-62	135	0	1.6	-0.4	1.6
4101529	99	P	SUR	35	-64	138	0	0.5	0.6	0.8
4101530	99	P	SUR	39	-38	31	0	0.4	0.0	0.4
4101538	99	P	SUR	36	-62	604	0	0.5	0.1	0.5
4101539	99	P	SUR	29	-68	631	0	0.4	0.4	0.5
4101554	99	P	SUR	31	-59	676	0	0.4	0.4	0.6
4101555	99	P	SUR	33	-66	419	0	0.3	0.0	0.3
4101556	99	P	SUR	39	-43	692	0	0.5	0.3	0.6
4101557	99	P	SUR	39	-51	687	0	0.5	0.1	0.5
4101558	99	P	SUR	44	-43	692	0	0.6	0.4	0.7
4101560	99	P	SUR	35	-53	661	0	0.5	0.4	0.7
4101561	99	P	SUR	32	-65	557	0	0.4	0.0	0.4

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4101562	99	P	SUR	37	-40	658	0	0.5	0.5	0.7
4101563	99	P	SUR	36	-67	69	0	0.5	0.4	0.6
4101564	99	P	SUR	34	-45	659	0	0.5	0.1	0.5
4101573	99	P	SUR	35	-66	133	0	0.5	0.0	0.5
4101574	99	P	SUR	36	-61	116	0	0.4	0.1	0.4
4101576	99	P	SUR	13	-50	691	0	0.3	0.5	0.6
4101577	99	P	SUR	20	-41	689	0	0.3	0.4	0.5
4101579	99	P	SUR	18	-43	688	0	3.8	2.5	4.6
4101580	99	P	SUR	15	-48	698	0	0.3	0.3	0.4
4101700	99	P	SUR	30	-31	701	0	0.3	0.3	0.5
4101702	99	P	SUR	31	-57	701	0	0.4	0.0	0.4
4101703	99	P	SUR	24	-59	701	0	0.3	0.5	0.6
4101704	99	P	SUR	18	-67	372	1	4.3	-1.2	4.5
4101705	99	P	SUR	33	-43	701	0	0.4	0.2	0.4
4101706	99	P	SUR	32	-44	699	0	0.4	-0.5	0.7
4101707	99	P	SUR	38	-34	700	0	0.4	-0.0	0.5
4101708	99	P	SUR	33	-31	698	0	0.5	0.0	0.5
4101709	99	P	SUR	40	-27	535	0	1.3	0.8	1.5
4101710	99	P	SUR	34	-54	699	0	0.5	-0.2	0.5
4101712	99	P	SUR	37	-57	674	0	0.5	-0.3	0.6
4101713	99	P	SUR	32	-56	700	0	0.4	-0.2	0.4
4101741	99	P	SUR	21	-60	701	0	0.3	0.5	0.5
4101742	99	P	SUR	22	-54	611	0	0.4	-0.1	0.5
4101743	99	P	SUR	22	-49	700	0	0.3	0.7	0.8
4101744	99	P	SUR	17	-59	700	0	0.3	-0.6	0.7
4101746	99	P	SUR	18	-59	700	0	0.3	-0.0	0.3
41040	99	P	SUR	15	-53	934	0	0.4	-0.4	0.6
41041	99	P	SUR	14	-46	1174	0	0.4	0.3	0.5
41043	99	P	SUR	21	-65	1197	0	0.4	-0.4	0.5
41044	99	P	SUR	22	-59	1225	0	0.4	0.1	0.4
41046	99	P	SUR	24	-68	1202	0	0.3	0.3	0.5
41048	99	P	SUR	32	-70	1227	0	0.5	-0.2	0.5
41049	99	P	SUR	28	-63	744	0	0.4	0.3	0.5
41052	99	P	SUR	18	-65	2026	0	0.4	-2.0	2.0
41053	99	P	SUR	19	-66	1942	0	0.4	-0.8	0.8
41056	99	P	SUR	18	-66	1571	0	0.4	-0.1	0.4
41597	99	P	SUR	33	-42	700	0	0.5	0.2	0.5
41729	99	P	SUR	35	-34	403	0	3.3	-1.0	3.4
41730	99	P	SUR	38	-62	135	0	1.6	-0.4	1.6
42059	99	P	SUR	15	-68	1196	0	0.4	-0.2	0.4
42085	99	P	SUR	18	-67	791	0	0.3	-0.9	1.0
44005	99	P	SUR	43	-69	110	0	0.6	-0.1	0.6
4400510	99	P	SUR	46	-10	1350	0	0.8	0.5	0.9

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4400513	99	P	SUR	54	-10	694	0	0.5	-0.4	0.7
4400517	99	P	SUR	25	-39	702	0	0.3	0.2	0.4
4400521	99	P	SUR	32	-40	721	0	0.4	-0.8	0.8
4400746	99	P	SUR	31	-29	699	0	0.3	0.3	0.4
4400765	99	P	SUR	64	10	691	0	0.7	-0.5	0.8
4400776	99	P	SUR	27	-53	703	0	0.3	0.4	0.5
4400777	99	P	SUR	32	-41	700	0	0.8	0.2	0.8
4400778	99	P	SUR	31	-30	702	0	0.3	0.3	0.5
44008	99	P	SUR	41	-69	744	0	0.6	-0.7	0.9
4400848	99	P	SUR	31	-66	102	0	0.3	0.1	0.3
4400857	99	P	SUR	31	-25	701	0	0.3	0.4	0.5
4400874	99	P	SUR	29	-39	701	0	0.4	0.3	0.5
4400887	99	P	SUR	34	-55	698	0	0.4	-0.3	0.5
4400891	99	P	SUR	34	-60	701	0	0.4	-1.2	1.3
44011	99	P	SUR	41	-67	743	0	0.6	-0.7	0.9
4401501	99	P	SUR	52	-4	688	0	0.8	-0.6	1.0
4401503	99	P	SUR	32	-69	703	0	0.4	-0.1	0.4
4401525	99	P	SUR	13	-60	591	0	0.3	0.0	0.3
4401527	99	P	SUR	25	-64	695	0	0.3	0.0	0.3
4401530	99	P	SUR	32	-53	435	0	0.4	-0.6	0.7
4401536	99	P	SUR	47	-32	707	0	0.6	0.4	0.8
4401537	99	P	SUR	36	-30	668	0	0.4	-0.7	0.8
4401538	99	P	SUR	40	-27	501	0	0.4	-1.8	1.9
4401539	99	P	SUR	35	-56	701	0	0.5	-0.2	0.5
4401540	99	P	SUR	33	-68	699	0	0.4	0.1	0.4
4401541	99	P	SUR	40	-51	700	0	0.5	0.0	0.5
4401543	99	P	SUR	27	-65	696	0	0.4	-0.1	0.4
4401544	99	P	SUR	38	-66	700	0	0.5	-0.8	1.0
4401546	99	P	SUR	45	-20	694	0	0.4	0.5	0.7
4401548	99	P	SUR	48	-7	697	0	0.6	-0.1	0.6
4401550	99	P	SUR	49	-29	701	0	0.5	-0.3	0.6
4401551	99	P	SUR	34	-40	691	0	0.4	0.3	0.5
4401552	99	P	SUR	41	-20	700	0	0.5	0.3	0.6
4401553	99	P	SUR	54	-39	698	0	0.5	0.3	0.6
4401554	99	P	SUR	55	-34	699	0	0.5	0.5	0.7
4401555	99	P	SUR	55	-22	701	0	0.6	-0.4	0.8
4401556	99	P	SUR	35	-36	700	0	0.5	0.2	0.5
4401557	99	P	SUR	39	-49	701	0	0.5	0.1	0.5
4401558	99	P	SUR	40	-47	700	0	0.7	0.2	0.7
4401559	99	P	SUR	44	-35	701	0	0.7	0.3	0.7
4401560	99	P	SUR	42	-25	701	0	0.6	0.3	0.7
4401561	99	P	SUR	44	-56	699	0	0.6	0.2	0.6
4401562	99	P	SUR	41	-31	700	0	0.6	-0.2	0.6

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4401563	99	P	SUR	30	-32	699	0	0.4	0.1	0.4
4401564	99	P	SUR	40	-34	700	0	0.7	0.7	1.0
4401565	99	P	SUR	47	-41	700	0	0.6	0.3	0.7
4401566	99	P	SUR	52	-43	700	0	0.5	0.6	0.8
4401601	99	P	SUR	55	-48	682	0	0.5	0.2	0.6
4401602	99	P	SUR	46	-58	675	0	0.6	0.6	0.8
4401603	99	P	SUR	53	-30	689	0	0.5	0.3	0.5
4401605	99	P	SUR	54	-38	687	0	0.5	-0.3	0.6
4401606	99	P	SUR	48	-14	685	0	0.9	0.2	0.9
4401609	99	P	SUR	40	-41	681	0	0.6	1.0	1.2
4401611	99	P	SUR	47	-52	678	0	0.6	0.4	0.8
4401613	99	P	SUR	47	-27	681	0	0.7	0.1	0.8
4401616	99	P	SUR	40	-35	683	0	0.5	-0.0	0.5
4401629	99	P	SUR	47	-36	48	20	0.7	1.2	1.4
4401631	99	P	SUR	50	-13	689	0	0.8	0.1	0.8
4401633	99	P	SUR	45	-25	685	24	1.2	-0.1	1.2
4401752	99	P	SUR	65	-25	538	0	0.5	0.5	0.7
4401755	99	P	SUR	63	-12	505	0	0.5	0.6	0.8
4401756	99	P	SUR	63	-53	664	0	2.4	1.2	2.7
4401757	99	P	SUR	68	-3	641	0	0.4	0.5	0.7
4401802	99	P	SUR	44	-57	682	0	0.7	0.4	0.8
44027	99	P	SUR	44	-67	929	0	0.7	-0.3	0.8
44032	99	P	SUR	44	-69	636	0	1.2	-1.0	1.6
44033	99	P	SUR	44	-69	719	0	0.5	-0.6	0.8
44034	99	P	SUR	44	-68	601	0	1.1	-0.6	1.3
44037	99	P	SUR	44	-68	701	0	1.2	-1.1	1.6
44137	99	P	SUR	42	-62	720	0	0.8	-0.3	0.8
44139	99	P	SUR	44	-57	347	0	0.6	0.0	0.6
44150	99	P	SUR	43	-64	723	0	0.6	-0.1	0.6
44510	99	P	SUR	46	-10	1348	0	0.8	0.5	0.9
44513	99	P	SUR	54	-10	694	0	0.5	-0.4	0.6
44517	99	P	SUR	25	-39	702	0	0.3	0.2	0.4
44521	99	P	SUR	32	-40	719	0	0.4	-0.8	0.8
44746	99	P	SUR	31	-29	699	0	0.3	0.3	0.4
44765	99	P	SUR	64	10	691	0	0.7	-0.5	0.8
44776	99	P	SUR	27	-53	703	0	0.3	0.4	0.5
44777	99	P	SUR	32	-41	700	0	0.8	0.2	0.8
44778	99	P	SUR	31	-31	702	0	0.3	0.3	0.5
44848	99	P	SUR	31	-66	102	0	0.3	0.1	0.3
44857	99	P	SUR	31	-25	701	0	0.3	0.4	0.5
44874	99	P	SUR	29	-39	701	0	0.4	0.3	0.5
44887	99	P	SUR	34	-55	698	0	0.4	-0.3	0.5
44891	99	P	SUR	34	-59	701	0	0.4	-1.2	1.3

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4700546	99	P	SUR	39	-27	671	0	0.7	0.8	1.0
4700552	99	P	SUR	68	-63	605	605	0.0	0.0	0.0
4700555	99	P	SUR	42	-17	688	0	1.3	0.6	1.5
4700560	99	P	SUR	65	12	690	0	0.4	0.1	0.4
4700562	99	P	SUR	60	-1	112	0	0.4	-0.1	0.4
4700568	99	P	SUR	46	-7	691	0	0.9	1.1	1.4
4700574	99	P	SUR	38	-19	686	0	0.6	0.5	0.8
4701661	99	P	SUR	84	-37	691	0	0.5	0.5	0.7
4701662	99	P	SUR	70	-67	659	0	0.4	-1.2	1.3
4701668	99	P	SUR	47	-55	676	0	0.6	0.5	0.8
4701669	99	P	SUR	44	-50	679	0	0.5	0.4	0.6
4701674	99	P	SUR	71	-67	686	0	0.5	-6.2	6.2
4701676	99	P	SUR	63	-64	605	43	2.8	1.1	3.0
4701677	99	P	SUR	55	-58	306	0	2.3	0.7	2.4
4701678	99	P	SUR	59	-63	65	2	5.1	1.0	5.2
47546	99	P	SUR	39	-27	704	0	0.7	0.7	1.0
47552	99	P	SUR	68	-63	728	728	0.0	0.0	0.0
47555	99	P	SUR	42	-17	732	0	1.4	0.6	1.5
47560	99	P	SUR	65	12	731	0	0.4	0.1	0.4
47562	99	P	SUR	60	-1	115	0	0.4	-0.2	0.4
47568	99	P	SUR	46	-7	733	0	0.9	1.1	1.4
47574	99	P	SUR	38	-19	729	0	0.6	0.5	0.8
4800510	99	P	SUR	85	-21	697	0	0.6	-0.1	0.6
4800600	99	P	SUR	57	-15	213	47	0.3	0.1	0.4
4800631	99	P	SUR	82	4	519	359	6.9	-5.4	8.8
4800770	99	P	SUR	79	-18	474	0	0.6	0.1	0.6
4802004	99	P	SUR	77	-13	677	0	0.5	-0.2	0.5
4802009	99	P	SUR	72	-20	688	0	0.5	0.3	0.6
48510	99	P	SUR	85	-21	729	0	0.6	-0.1	0.7
48600	99	P	SUR	57	-15	213	47	0.3	0.1	0.4
48770	99	P	SUR	79	-18	495	0	0.6	0.1	0.6
6100001	99	P	SUR	43	8	744	0	0.6	-0.1	0.6
6100002	99	P	SUR	42	5	743	0	0.5	0.1	0.5
61001	99	P	SUR	43	8	743	0	0.6	-0.1	0.6
6100197	99	P	SUR	40	4	744	0	0.5	-0.2	0.6
6100198	99	P	SUR	37	-2	744	0	0.5	-0.1	0.5
61002	99	P	SUR	42	5	743	0	0.5	0.1	0.5
6100280	99	P	SUR	41	1	744	0	0.5	-0.2	0.6
6100281	99	P	SUR	40	0	281	0	0.6	-0.3	0.7
6100417	99	P	SUR	38	0	744	0	0.5	-0.1	0.5
6100430	99	P	SUR	40	2	743	0	0.5	-0.4	0.6
6101001	99	P	SUR	38	24	245	0	0.6	0.4	0.8
6101003	99	P	SUR	40	25	244	0	0.5	0.2	0.5

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
6101007	99	P	SUR	36	25	246	0	0.6	2.6	2.7
6101008	99	P	SUR	37	22	165	0	0.5	0.0	0.5
6200024	99	P	SUR	44	-3	489	0	0.7	-0.3	0.7
6200025	99	P	SUR	44	-6	11	0	0.4	-0.6	0.7
6200082	99	P	SUR	44	-8	744	0	0.6	-0.3	0.6
6200083	99	P	SUR	43	-9	744	0	0.5	-0.3	0.5
6200084	99	P	SUR	42	-9	744	0	0.4	-0.2	0.5
6200085	99	P	SUR	36	-7	744	0	0.4	-0.1	0.4
6200091	99	P	SUR	53	-5	700	0	0.5	-0.2	0.5
6200092	99	P	SUR	51	-11	508	6	1.2	-0.3	1.2
6200093	99	P	SUR	55	-10	743	0	0.7	-0.5	0.8
6200094	99	P	SUR	52	-7	743	0	0.6	-0.2	0.6
62001	99	P	SUR	45	-5	722	0	0.8	-0.0	0.8
6200191	99	P	SUR	41	-10	397	0	0.4	-0.4	0.5
6200192	99	P	SUR	40	-10	396	0	0.3	-1.0	1.0
6200199	99	P	SUR	40	-9	396	0	0.3	0.1	0.3
6200200	99	P	SUR	36	-8	396	0	0.3	-0.1	0.3
6200513	99	P	SUR	61	-24	701	0	0.5	-0.2	0.6
6200554	99	P	SUR	37	-20	701	0	0.4	0.5	0.6
6200559	99	P	SUR	56	-6	658	0	0.8	0.3	0.8
6200940	99	P	SUR	27	-38	701	0	0.3	-0.1	0.4
6200941	99	P	SUR	26	-60	681	0	0.3	-0.4	0.5
6201030	99	P	SUR	44	-4	606	0	0.6	0.8	1.0
6201070	99	P	SUR	43	-9	681	0	0.7	-1.0	1.2
62023	99	P	SUR	51	-8	744	0	0.5	0.2	0.5
62027	99	P	SUR	49	-2	230	1	0.6	0.0	0.6
62029	99	P	SUR	49	-12	1433	2	0.6	-0.2	0.6
6203503	99	P	SUR	27	-37	698	0	0.3	-0.8	0.9
6203504	99	P	SUR	25	-43	698	0	0.3	0.1	0.4
6203510	99	P	SUR	17	-52	731	0	0.3	0.1	0.3
6203523	99	P	SUR	64	-12	695	0	0.6	-0.2	0.6
6203524	99	P	SUR	68	-56	680	0	1.6	0.5	1.6
6203526	99	P	SUR	66	1	683	0	0.5	0.5	0.7
6203528	99	P	SUR	37	-14	668	0	0.3	0.4	0.5
6203529	99	P	SUR	15	-35	670	0	0.3	0.1	0.3
6203600	99	P	SUR	48	-17	701	0	0.7	0.5	0.8
6203601	99	P	SUR	48	-19	700	0	0.5	0.2	0.6
6203602	99	P	SUR	61	-30	701	0	0.5	0.3	0.6
6203603	99	P	SUR	54	-37	700	0	0.5	0.0	0.5
6203604	99	P	SUR	50	-34	699	0	0.5	0.1	0.5
6203605	99	P	SUR	56	-36	701	0	0.6	0.1	0.6
6203606	99	P	SUR	47	-19	700	0	0.8	0.5	0.9
62050	99	P	SUR	50	-4	726	0	0.5	0.2	0.6

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62081	99	P	SUR	51	-13	709	0	0.6	-0.3	0.7
62095	99	P	SUR	53	-16	862	0	0.6	-0.2	0.6
62102	99	P	SUR	58	2	743	0	0.5	0.0	0.5
62103	99	P	SUR	50	-3	728	0	0.6	0.4	0.7
62104	99	P	SUR	57	1	744	0	0.5	-0.1	0.5
62105	99	P	SUR	55	-13	435	0	0.6	-0.5	0.8
62107	99	P	SUR	50	-6	1445	0	0.7	0.3	0.8
62111	99	P	SUR	58	0	744	0	0.5	1.3	1.4
62112	99	P	SUR	58	0	744	0	0.4	0.2	0.5
62113	99	P	SUR	58	0	744	0	0.7	0.2	0.7
62114	99	P	SUR	58	0	1478	0	0.7	0.1	0.7
62115	99	P	SUR	58	-3	195	0	0.4	-0.2	0.5
62116	99	P	SUR	58	1	744	0	0.5	-0.2	0.5
62118	99	P	SUR	58	1	744	0	0.5	0.5	0.7
62119	99	P	SUR	57	2	744	0	0.5	0.4	0.6
62120	99	P	SUR	56	2	744	0	0.6	-0.2	0.6
62121	99	P	SUR	54	3	744	0	0.7	0.3	0.8
62122	99	P	SUR	57	2	1478	0	0.6	0.1	0.6
62124	99	P	SUR	54	-4	744	0	0.4	-0.1	0.4
62127	99	P	SUR	54	1	744	0	0.4	0.5	0.6
62129	99	P	SUR	58	0	743	0	0.6	0.2	0.6
62130	99	P	SUR	59	1	744	0	0.4	-0.1	0.5
62131	99	P	SUR	54	1	740	0	0.4	0.4	0.5
62132	99	P	SUR	56	2	710	0	0.5	0.6	0.8
62133	99	P	SUR	57	1	744	0	0.5	-0.1	0.5
62134	99	P	SUR	58	1	740	0	0.5	0.4	0.6
62135	99	P	SUR	54	2	735	0	0.6	0.3	0.6
62136	99	P	SUR	54	3	744	0	0.5	0.5	0.7
62138	99	P	SUR	54	0	1476	0	0.5	0.9	1.1
62139	99	P	SUR	53	2	1478	0	0.4	0.3	0.5
62140	99	P	SUR	57	1	1476	0	0.5	-0.0	0.5
62141	99	P	SUR	58	-4	702	0	0.5	-2.4	2.4
62143	99	P	SUR	58	2	744	0	0.6	1.0	1.2
62144	99	P	SUR	53	2	744	0	0.5	0.4	0.6
62145	99	P	SUR	53	3	1472	0	0.4	0.5	0.7
62146	99	P	SUR	57	2	744	0	0.6	0.5	0.8
62148	99	P	SUR	54	2	101	0	2.0	-0.5	2.0
62149	99	P	SUR	54	1	743	0	0.4	0.6	0.8
62150	99	P	SUR	54	1	744	0	0.4	1.3	1.4
62151	99	P	SUR	57	2	1475	0	0.4	0.1	0.5
62152	99	P	SUR	57	2	744	0	0.5	0.6	0.8
62153	99	P	SUR	57	2	1478	0	0.5	0.3	0.6
62154	99	P	SUR	56	2	744	0	0.4	-0.0	0.4

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62155	99	P	SUR	58	1	506	0	0.5	0.5	0.7
62157	99	P	SUR	58	0	744	0	0.5	-0.1	0.5
62160	99	P	SUR	57	2	1475	0	0.5	0.2	0.5
62161	99	P	SUR	58	1	744	0	0.7	0.0	0.7
62162	99	P	SUR	57	1	744	0	0.5	-0.1	0.5
62163	99	P	SUR	48	-8	722	0	0.6	0.2	0.7
62164	99	P	SUR	57	1	743	0	0.5	0.2	0.5
62165	99	P	SUR	54	1	744	0	0.5	0.6	0.7
62168	99	P	SUR	58	1	742	0	0.4	0.1	0.4
62170	99	P	SUR	51	2	726	0	0.4	0.3	0.5
62296	99	P	SUR	53	2	738	0	0.4	-0.0	0.4
62297	99	P	SUR	59	2	1477	0	0.4	0.0	0.4
62302	99	P	SUR	61	-2	744	0	0.7	-0.2	0.8
62304	99	P	SUR	51	2	669	6	0.6	0.3	0.7
62305	99	P	SUR	50	0	721	0	0.5	0.3	0.6
62442	99	P	SUR	49	-16	725	0	0.5	-0.3	0.6
62513	99	P	SUR	61	-24	701	0	0.5	-0.2	0.6
62554	99	P	SUR	37	-20	701	0	0.4	0.5	0.6
62559	99	P	SUR	56	-6	658	0	0.8	0.3	0.8
62940	99	P	SUR	27	-38	701	0	0.3	-0.1	0.4
62941	99	P	SUR	26	-60	681	0	0.3	-0.4	0.5
6301552	99	P	SUR	79	27	701	0	0.5	-0.1	0.5
6301553	99	P	SUR	82	16	699	40	2.8	0.2	2.8
6301554	99	P	SUR	71	25	695	2	0.4	-0.2	0.5
6301555	99	P	SUR	73	27	700	0	0.4	0.7	0.8
6301556	99	P	SUR	71	-3	700	0	0.9	1.0	1.3
6301557	99	P	SUR	76	7	699	0	0.4	0.9	1.0
63055	99	P	SUR	61	2	744	0	0.5	0.1	0.5
63056	99	P	SUR	60	2	744	0	0.6	0.2	0.6
63057	99	P	SUR	59	2	744	0	0.5	-0.2	0.5
63058	99	P	SUR	53	2	2193	0	0.4	0.3	0.5
63059	99	P	SUR	58	-1	744	0	0.5	0.3	0.5
63101	99	P	SUR	61	1	744	0	0.5	-0.0	0.5
63102	99	P	SUR	61	1	744	0	0.6	0.3	0.7
63103	99	P	SUR	61	1	744	0	0.5	0.3	0.6
63104	99	P	SUR	61	2	744	0	0.6	0.3	0.6
63105	99	P	SUR	61	2	744	0	0.6	-0.3	0.7
63108	99	P	SUR	61	2	742	0	0.5	0.0	0.5
63109	99	P	SUR	60	2	744	0	0.6	-0.1	0.6
63110	99	P	SUR	60	2	744	0	0.5	-0.3	0.6
63111	99	P	SUR	61	2	1456	0	0.6	-0.5	0.8
63112	99	P	SUR	61	1	744	0	0.5	-0.5	0.7
63115	99	P	SUR	62	1	744	0	0.8	0.3	0.9

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
63117	99	P	SUR	61	1	1478	0	0.5	0.2	0.6
63118	99	P	SUR	61	-2	1057	0	2.3	-0.1	2.3
63120	99	P	SUR	54	2	668	0	0.4	0.5	0.6
6400526	99	P	SUR	48	-26	570	0	0.7	-0.1	0.7
6400551	99	P	SUR	53	-23	255	3	4.7	-1.8	5.0
6400562	99	P	SUR	68	-6	701	0	0.5	0.2	0.5
6401501	99	P	SUR	65	3	688	0	0.4	0.4	0.6
6401507	99	P	SUR	73	15	667	0	0.5	0.5	0.7
6401550	99	P	SUR	68	12	700	0	0.4	-0.1	0.4
6401555	99	P	SUR	68	-7	700	0	0.4	0.6	0.7
6401556	99	P	SUR	65	-7	699	0	0.5	0.6	0.8
6401557	99	P	SUR	61	-54	701	0	0.5	0.5	0.7
6401560	99	P	SUR	60	-4	700	0	0.5	0.5	0.7
6401561	99	P	SUR	59	-30	699	0	0.7	0.2	0.7
6401562	99	P	SUR	62	-10	701	0	0.7	0.2	0.7
6401563	99	P	SUR	62	-14	486	0	1.1	1.0	1.5
64041	99	P	SUR	61	-3	744	0	0.6	-0.1	0.6
64045	99	P	SUR	59	-12	777	0	0.6	-0.3	0.7
64046	99	P	SUR	61	-4	727	0	0.5	-0.1	0.5
64526	99	P	SUR	48	-26	570	0	0.7	-0.1	0.7
64551	99	P	SUR	53	-23	255	3	4.7	-1.8	5.0
64562	99	P	SUR	68	-6	701	0	0.5	0.2	0.5
6500519	99	P	SUR	70	33	701	0	0.5	-0.7	0.9
6500596	99	P	SUR	76	-2	680	1	2.4	0.8	2.6
6500599	99	P	SUR	73	28	701	0	0.5	0.1	0.5
6500602	99	P	SUR	64	0	700	0	0.6	0.4	0.7
6501551	99	P	SUR	49	-43	701	0	0.6	0.2	0.7
6501553	99	P	SUR	52	-37	698	0	0.5	0.1	0.5
6501555	99	P	SUR	65	-52	700	0	0.5	-0.4	0.7
6501556	99	P	SUR	53	-33	700	0	0.4	0.3	0.5
65519	99	P	SUR	70	33	701	0	0.5	-0.7	0.8
65596	99	P	SUR	76	-2	680	1	2.4	0.8	2.6
65599	99	P	SUR	73	27	701	0	0.5	0.1	0.5
65602	99	P	SUR	64	0	700	0	0.6	0.4	0.7
66023	99	P	SUR	55	11	1	0	0.0	0.5	0.5

4.10 Table 22 - Drifter Monitoring Statistics (EUCOS): Wind speed (m/s)

```
          DRIFTER MONITORING STATISTICS (EUCOS)
                   MONITORING CENTRE     : ECMWF
                   ELEMENT MONITORED     : WIND SPEED (M/S)
                   AREA                  : 10N - 90N, 70W - 40E
                   PERIOD                : DEC 2017
                   STANDARD OF COMPARISON: FIRST-GUESS FIELD


TIME = 99 => AVERAGE OF ALL OBSERVATIONS


GROSS ERROR LIMIT FOR VECTOR WIND = 25 M/S
```

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
012	99	SPEED	SUR	77	30	4	0	0	1.4	0.8	1.6
1300001	99	SPEED	SUR	11	-23	687	0	0	0.7	0.6	1.0
1300002	99	SPEED	SUR	20	-23	738	0	0	0.7	0.7	1.0
1300008	99	SPEED	SUR	15	-38	738	0	0	0.9	0.1	0.9
1300130	99	SPEED	SUR	28	-16	732	0	0	1.5	0.1	1.5
1300131	99	SPEED	SUR	28	-17	743	0	0	2.0	1.3	2.5
4100026	99	SPEED	SUR	12	-38	324	0	0	1.0	-0.4	1.1
4100139	99	SPEED	SUR	20	-38	744	0	0	1.1	0.3	1.1
41026	99	SPEED	SUR	12	-38	324	0	0	1.0	-0.4	1.1
41040	99	SPEED	SUR	15	-53	1199	0	0	0.9	0.0	0.9
41041	99	SPEED	SUR	14	-46	1173	0	0	0.9	-0.2	0.9
41043	99	SPEED	SUR	21	-65	1196	0	0	1.0	0.0	1.0
41044	99	SPEED	SUR	22	-59	1225	0	0	1.1	-0.3	1.1
41046	99	SPEED	SUR	24	-68	1202	0	0	1.1	-0.1	1.1
41048	99	SPEED	SUR	32	-70	1227	0	0	1.3	-0.2	1.3
41049	99	SPEED	SUR	28	-63	744	0	0	1.3	0.1	1.3
41052	99	SPEED	SUR	18	-65	2026	0	0	1.1	-0.6	1.2
41053	99	SPEED	SUR	19	-66	1941	0	0	1.5	0.8	1.7
41056	99	SPEED	SUR	18	-66	1579	0	0	1.1	-0.8	1.4
42059	99	SPEED	SUR	15	-68	1208	0	0	1.0	-0.2	1.0
42085	99	SPEED	SUR	18	-67	791	0	0	1.2	0.1	1.2
44032	99	SPEED	SUR	44	-69	697	0	0	1.6	0.0	1.6
44033	99	SPEED	SUR	44	-69	733	0	0	1.4	0.2	1.4
44034	99	SPEED	SUR	44	-68	742	0	0	1.5	-0.2	1.5
44037	99	SPEED	SUR	44	-68	708	0	0	1.3	0.0	1.3
44137	99	SPEED	SUR	42	-62	722	1	0	1.9	0.3	1.9
44139	99	SPEED	SUR	44	-57	351	1	0	1.9	-0.4	1.9
44150	99	SPEED	SUR	43	-64	728	0	0	1.9	-0.2	2.0
6100001	99	SPEED	SUR	43	8	744	0	0	1.8	-0.0	1.8
6100002	99	SPEED	SUR	42	5	743	0	0	1.6	0.3	1.7
61001	99	SPEED	SUR	43	8	743	0	0	2.1	-0.9	2.3
6100197	99	SPEED	SUR	40	4	743	0	0	1.4	-0.3	1.5
6100198	99	SPEED	SUR	37	-2	1	0	0	0.0	-5.2	5.2
61002	99	SPEED	SUR	42	5	743	0	0	1.6	-0.5	1.7

DRIFTER MONITORING STATISTICS (EUCOS)
MONITORING CENTRE : ECMWF
ELEMENT MONITORED : WIND SPEED (M/S) (CONTINU

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
6100280	99	SPEED	SUR	41	1	734	0	0	1.9	-1.1	2.2
6100281	99	SPEED	SUR	40	0	278	0	0	2.3	1.2	2.6
6100417	99	SPEED	SUR	38	0	744	0	0	1.5	0.0	1.5
6100430	99	SPEED	SUR	40	2	740	0	0	1.5	-0.5	1.6
6101001	99	SPEED	SUR	38	24	245	0	0	1.7	-0.4	1.7
6101003	99	SPEED	SUR	40	25	244	0	0	2.3	-1.5	2.7
6101007	99	SPEED	SUR	36	25	246	0	0	2.9	-0.5	2.9
6101008	99	SPEED	SUR	37	22	165	0	0	1.7	-0.4	1.7
6200024	99	SPEED	SUR	44	-3	481	0	0	1.9	-0.1	1.9
6200025	99	SPEED	SUR	44	-6	6	0	0	1.6	-9.3	9.4
6200082	99	SPEED	SUR	44	-8	743	0	0	1.3	-0.8	1.5
6200083	99	SPEED	SUR	43	-9	742	0	0	1.3	-0.2	1.4
6200084	99	SPEED	SUR	42	-9	743	0	0	1.5	-0.5	1.6
6200085	99	SPEED	SUR	36	-7	744	0	0	1.0	0.1	1.0
6200092	99	SPEED	SUR	51	-11	656	0	0	1.4	-0.5	1.5
6200093	99	SPEED	SUR	55	-10	743	0	0	1.5	-0.5	1.6
6200094	99	SPEED	SUR	52	-7	743	0	0	1.4	-0.0	1.4
62001	99	SPEED	SUR	45	-5	722	0	0	1.4	0.6	1.5
6200191	99	SPEED	SUR	41	-10	397	0	0	1.3	0.1	1.3
6200192	99	SPEED	SUR	40	-10	396	0	0	1.1	0.0	1.2
6200199	99	SPEED	SUR	40	-9	396	0	0	1.4	0.0	1.4
6200200	99	SPEED	SUR	36	-8	395	0	0	0.9	-0.1	0.9
6201030	99	SPEED	SUR	44	-4	602	0	0	1.6	-0.6	1.7
6201070	99	SPEED	SUR	43	-9	681	0	0	1.5	-0.2	1.5
62023	99	SPEED	SUR	51	-8	744	0	0	2.1	-0.1	2.1
62027	99	SPEED	SUR	49	-2	232	0	0	1.7	0.2	1.7
62029	99	SPEED	SUR	49	-12	1252	0	0	1.7	-0.0	1.7
62050	99	SPEED	SUR	50	-4	725	0	0	1.4	0.5	1.5
62081	99	SPEED	SUR	51	-13	709	0	0	1.3	-0.2	1.4
62095	99	SPEED	SUR	53	-16	861	0	0	2.0	-0.4	2.0
62102	99	SPEED	SUR	58	2	744	0	0	1.5	-0.3	1.5
62103	99	SPEED	SUR	50	-3	723	0	0	1.8	1.6	2.3
62104	99	SPEED	SUR	57	1	744	0	0	1.5	-0.6	1.6
62105	99	SPEED	SUR	55	-13	409	1	0	1.3	0.0	1.3
62107	99	SPEED	SUR	50	-6	1445	0	0	1.7	1.1	2.0
62111	99	SPEED	SUR	58	0	743	0	0	1.9	-0.1	1.9
62112	99	SPEED	SUR	58	0	744	0	0	2.0	-1.5	2.5
62113	99	SPEED	SUR	58	0	744	0	0	2.0	-0.0	2.0
62114	99	SPEED	SUR	58	0	1478	0	0	1.9	0.6	2.0
62118	99	SPEED	SUR	58	1	744	0	0	1.8	0.3	1.8
62119	99	SPEED	SUR	57	2	744	0	0	2.1	-0.5	2.2

DRIFTER MONITORING STATISTICS (EUCOS)
MONITORING CENTRE : ECMWF
ELEMENT MONITORED : WIND SPEED (M/S) (CONTINU

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
62120	99	SPEED	SUR	56	2	744	0	0	1.6	0.0	1.6
62121	99	SPEED	SUR	54	3	744	0	0	1.6	-0.0	1.7
62122	99	SPEED	SUR	57	2	1478	0	0	1.6	-0.4	1.6
62129	99	SPEED	SUR	58	0	744	0	0	1.8	-0.1	1.8
62131	99	SPEED	SUR	54	1	740	0	0	1.6	-0.2	1.6
62132	99	SPEED	SUR	56	2	710	0	0	3.0	-2.2	3.7
62133	99	SPEED	SUR	57	1	744	0	0	1.6	-0.4	1.6
62134	99	SPEED	SUR	58	1	740	0	0	1.7	-0.4	1.7
62140	99	SPEED	SUR	57	1	1476	0	0	1.7	-0.1	1.7
62143	99	SPEED	SUR	58	2	744	0	0	2.5	-1.4	2.9
62144	99	SPEED	SUR	53	2	744	0	0	1.9	-0.7	2.0
62145	99	SPEED	SUR	53	3	1470	0	0	1.9	0.2	2.0
62146	99	SPEED	SUR	57	2	731	0	0	1.8	0.0	1.8
62148	99	SPEED	SUR	54	2	707	0	0	1.9	-0.7	2.0
62149	99	SPEED	SUR	54	1	743	0	0	1.3	0.0	1.3
62150	99	SPEED	SUR	54	1	744	0	0	2.2	-1.2	2.5
62152	99	SPEED	SUR	57	2	744	0	0	1.8	-1.6	2.4
62153	99	SPEED	SUR	57	2	1478	0	0	2.9	-2.3	3.7
62154	99	SPEED	SUR	56	2	744	0	0	1.4	-0.6	1.5
62155	99	SPEED	SUR	58	1	506	0	0	2.3	-0.8	2.4
62163	99	SPEED	SUR	48	-8	722	0	0	1.4	-0.3	1.4
62164	99	SPEED	SUR	57	1	743	0	0	1.7	-1.5	2.3
62165	99	SPEED	SUR	54	1	744	0	0	1.9	-1.0	2.1
62170	99	SPEED	SUR	51	2	726	0	0	1.8	1.6	2.4
62304	99	SPEED	SUR	51	2	669	0	0	2.0	1.6	2.5
62305	99	SPEED	SUR	50	0	721	0	0	1.9	1.5	2.4
62442	99	SPEED	SUR	49	-16	722	0	0	1.3	-1.3	1.9
63055	99	SPEED	SUR	61	2	744	0	0	1.7	-1.8	2.5
63056	99	SPEED	SUR	60	2	744	0	0	1.5	-0.2	1.5
63057	99	SPEED	SUR	59	2	744	0	0	2.0	-0.3	2.1
63058	99	SPEED	SUR	53	2	1295	0	0	1.4	0.0	1.4
63101	99	SPEED	SUR	61	1	744	0	0	1.7	-0.6	1.8
63103	99	SPEED	SUR	61	1	744	0	0	1.9	-0.4	1.9
63104	99	SPEED	SUR	61	2	744	0	0	1.6	-0.6	1.7
63105	99	SPEED	SUR	61	2	743	0	0	1.6	-0.5	1.6
63106	99	SPEED	SUR	61	2	743	0	0	1.6	-0.4	1.7
63108	99	SPEED	SUR	61	2	744	0	0	2.2	-0.5	2.3
63109	99	SPEED	SUR	60	2	738	0	0	1.7	0.1	1.7
63110	99	SPEED	SUR	60	2	744	0	0	1.5	-0.8	1.7
63112	99	SPEED	SUR	61	1	744	0	0	1.7	-0.9	1.9
63113	99	SPEED	SUR	61	2	743	0	0	1.6	-0.8	1.8

DRIFTER MONITORING STATISTICS (EUCOS)
MONITORING CENTRE : ECMWF
ELEMENT MONITORED : WIND SPEED (M/S) (CONTINU

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
63115	99	SPEED	SUR	62	1	744	0	0	1.6	-0.6	1.7
63117	99	SPEED	SUR	61	1	1478	0	0	1.6	-0.8	1.8
64041	99	SPEED	SUR	61	-3	557	0	0	1.7	-0.4	1.7
64045	99	SPEED	SUR	59	-12	777	0	0	1.4	0.2	1.4
64046	99	SPEED	SUR	61	-4	727	0	0	1.3	0.3	1.4
66021	99	SPEED	SUR	55	14	744	0	0	1.2	1.1	1.6
66022	99	SPEED	SUR	54	14	831	0	0	1.6	-0.4	1.6
66023	99	SPEED	SUR	55	11	1	0	0	0.0	4.6	4.6
66024	99	SPEED	SUR	55	13	743	0	0	1.3	1.3	1.8

4.11 Table 23 - Drifter Monitoring Statistics (EUCOS): Wind direction

```
          DRIFTER MONITORING STATISTICS (EUCOS)
                   MONITORING CENTRE     : ECMWF
                   ELEMENT MONITORED     : WIND DIRECTION (DEGREES)
                   AREA                  : 10N - 90N, 70W - 40E
                   PERIOD                : DEC 2017
                   STANDARD OF COMPARISON: FIRST-GUESS FIELD


TIME = 99 => AVERAGE OF ALL OBSERVATIONS
GROSS ERROR LIMIT FOR VECTOR WIND = 25 M/S
WIND SPEEDS > 3M/S USED
```

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
1300001	99	DIRN	SUR	11	-23	687	0	0	8.0	0.6	8.0
1300002	99	DIRN	SUR	20	-23	737	0	0	7.0	0.5	7.1
1300008	99	DIRN	SUR	15	-38	721	0	0	11.3	7.1	13.3
1300130	99	DIRN	SUR	28	-16	652	0	0	10.5	-0.8	10.6
1300131	99	DIRN	SUR	28	-17	578	0	0	15.2	1.5	15.2
4100026	99	DIRN	SUR	12	-38	314	0	0	11.6	-1.2	11.7
4100139	99	DIRN	SUR	20	-38	675	0	0	12.5	3.9	13.1
41002	99	DIRN	SUR	32	-75	690	0	1	16.7	5.7	17.7
41004	99	DIRN	SUR	33	-79	1019	0	0	15.0	6.9	16.5
41008	99	DIRN	SUR	31	-81	698	0	0	20.7	9.7	22.8
41009	99	DIRN	SUR	29	-80	932	0	1	17.0	5.9	18.0
41013	99	DIRN	SUR	33	-78	1067	0	1	17.0	6.7	18.2
41024	99	DIRN	SUR	34	-79	453	0	0	14.6	-11.3	18.4
41025	99	DIRN	SUR	35	-75	1076	0	0	15.9	3.4	16.3
41026	99	DIRN	SUR	12	-38	314	0	0	12.4	-2.0	12.5
41029	99	DIRN	SUR	33	-80	686	0	0	13.9	-1.2	14.0
41033	99	DIRN	SUR	32	-80	547	0	0	19.5	9.0	21.5
41037	99	DIRN	SUR	34	-77	640	0	1	17.5	-4.4	18.1
41038	99	DIRN	SUR	34	-78	554	0	2	13.0	-2.0	13.1
41040	99	DIRN	SUR	15	-53	1154	0	0	11.5	-9.2	14.7
41041	99	DIRN	SUR	14	-46	1170	0	0	10.7	-10.6	15.0
41043	99	DIRN	SUR	21	-65	1036	0	0	12.3	-2.6	12.5
41044	99	DIRN	SUR	22	-59	1016	0	0	13.1	2.2	13.3
41046	99	DIRN	SUR	24	-68	885	0	0	13.8	3.7	14.2
41047	99	DIRN	SUR	28	-72	986	0	0	15.4	-6.8	16.8
41048	99	DIRN	SUR	32	-70	1088	0	1	14.0	-5.9	15.2
41049	99	DIRN	SUR	28	-63	571	0	1	16.9	6.7	18.2
41052	99	DIRN	SUR	18	-65	1852	0	0	12.4	6.0	13.8
41053	99	DIRN	SUR	19	-66	1393	0	0	14.8	-3.0	15.1
41056	99	DIRN	SUR	18	-66	1392	0	0	13.6	2.8	13.9
41063	99	DIRN	SUR	35	-76	731	0	1	15.4	-7.5	17.1
41064	99	DIRN	SUR	34	-77	626	0	2	21.5	-11.1	24.2

DRIFTER MONITORING STATISTICS (EUCOS)
MONITORING CENTRE : ECMWF
ELEMENT MONITORED : WIND DIRECTION (DEGREES)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
42013	99	DIRN	SUR	27	-83	663	0	0	18.6	-2.9	18.8
42056	99	DIRN	SUR	20	-85	1094	0	0	11.1	5.0	12.2
42057	99	DIRN	SUR	17	-81	1187	0	0	10.9	3.2	11.4
42058	99	DIRN	SUR	15	-75	1251	0	0	7.5	8.1	11.0
42059	99	DIRN	SUR	15	-68	1174	0	0	11.1	3.7	11.8
42085	99	DIRN	SUR	18	-67	671	0	0	14.7	24.3	28.4
44007	99	DIRN	SUR	44	-70	808	0	2	18.3	8.3	20.1
44009	99	DIRN	SUR	39	-75	608	0	0	15.3	12.5	19.8
44013	99	DIRN	SUR	42	-71	828	0	2	15.8	7.3	17.4
44014	99	DIRN	SUR	37	-75	646	0	0	13.3	1.7	13.5
44020	99	DIRN	SUR	41	-70	639	0	0	14.5	3.8	15.0
44022	99	DIRN	SUR	41	-74	435	0	0	18.9	10.6	21.7
44025	99	DIRN	SUR	40	-73	784	0	0	14.2	0.2	14.2
44029	99	DIRN	SUR	43	-71	1139	0	2	16.4	-4.1	16.9
44030	99	DIRN	SUR	43	-70	587	0	2	18.7	4.0	19.2
44032	99	DIRN	SUR	44	-69	613	0	0	15.7	9.8	18.5
44033	99	DIRN	SUR	44	-69	631	0	1	16.6	-1.8	16.7
44034	99	DIRN	SUR	44	-68	681	0	0	16.1	5.0	16.8
44037	99	DIRN	SUR	44	-68	658	0	0	14.1	30.7	33.8
44039	99	DIRN	SUR	41	-73	472	0	1	18.7	1.6	18.8
44040	99	DIRN	SUR	41	-74	323	0	0	15.6	-1.1	15.7
44041	99	DIRN	SUR	37	-77	211	0	0	16.2	-13.8	21.3
44042	99	DIRN	SUR	38	-76	739	0	0	20.2	-8.7	22.0
44043	99	DIRN	SUR	39	-76	11	0	0	14.2	7.3	16.0
44057	99	DIRN	SUR	40	-76	65	0	0	14.5	-0.3	14.5
44058	99	DIRN	SUR	38	-76	748	0	0	17.6	-29.2	34.1
44062	99	DIRN	SUR	39	-76	760	0	0	30.0	-17.5	34.7
44063	99	DIRN	SUR	39	-76	17	0	0	27.7	-25.5	37.7
44064	99	DIRN	SUR	37	-76	840	0	1	19.0	-19.4	27.2
44065	99	DIRN	SUR	40	-74	624	0	0	14.6	3.9	15.1
44066	99	DIRN	SUR	40	-73	670	0	0	12.7	-1.4	12.8
44069	99	DIRN	SUR	41	-73	294	0	0	12.8	-0.7	12.8
44072	99	DIRN	SUR	37	-76	798	0	0	18.3	-15.3	23.8
44137	99	DIRN	SUR	42	-62	667	1	1	18.1	-14.2	23.0
44139	99	DIRN	SUR	44	-57	310	1	0	16.8	5.5	17.7
44150	99	DIRN	SUR	43	-64	668	0	1	14.0	7.8	16.1
45003	99	DIRN	SUR	45	-83	158	0	0	15.5	8.7	17.8
45008	99	DIRN	SUR	44	-82	216	0	0	12.7	-0.5	12.7
45012	99	DIRN	SUR	44	-77	24	0	0	11.0	-1.4	11.1
45135	99	DIRN	SUR	44	-77	48	0	0	22.8	0.9	22.9
45137	99	DIRN	SUR	46	-81	20	0	0	17.4	9.2	19.7

DRIFTER MONITORING STATISTICS (EUCOS)
MONITORING CENTRE : ECMWF
ELEMENT MONITORED : WIND DIRECTION (DEGREES)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
45139	99	DIRN	SUR	43	-80	16	0	0	24.6	1.7	24.6
45143	99	DIRN	SUR	45	-81	31	0	0	10.8	12.1	16.2
45151	99	DIRN	SUR	45	-79	17	0	0	12.9	9.7	16.1
6100198	99	DIRN	SUR	37	-2	1	0	100	0.0	0.0	0.0
6100281	99	DIRN	SUR	40	0	219	0	16	24.5	6.1	25.3
6100417	99	DIRN	SUR	38	0	591	0	0	19.0	9.7	21.4
6200024	99	DIRN	SUR	44	-3	379	0	0	20.7	8.2	22.3
6200082	99	DIRN	SUR	44	-8	657	0	0	12.8	4.3	13.5
6200083	99	DIRN	SUR	43	-9	656	0	0	13.9	7.6	15.9
6200084	99	DIRN	SUR	42	-9	582	0	0	14.6	9.5	17.4
6200085	99	DIRN	SUR	36	-7	664	0	0	14.8	3.8	15.2
6200092	99	DIRN	SUR	51	-11	616	0	0	12.3	5.6	13.5
6200093	99	DIRN	SUR	55	-10	696	0	0	11.7	-2.0	11.8
6200094	99	DIRN	SUR	52	-7	698	0	1	11.2	-0.0	11.2
62001	99	DIRN	SUR	45	-5	654	0	0	15.3	3.3	15.7
6200191	99	DIRN	SUR	41	-10	345	0	1	15.4	0.3	15.4
6200192	99	DIRN	SUR	40	-10	324	0	0	13.6	4.4	14.3
6200199	99	DIRN	SUR	40	-9	265	0	0	17.6	2.4	17.7
6200200	99	DIRN	SUR	36	-8	365	0	100	0.0	0.0	0.0
6201030	99	DIRN	SUR	44	-4	479	0	0	16.0	-17.9	24.0
6201070	99	DIRN	SUR	43	-9	455	0	0	18.4	7.6	19.9
62023	99	DIRN	SUR	51	-8	704	0	0	12.3	11.5	16.8
62027	99	DIRN	SUR	49	-2	206	0	0	16.8	-6.8	18.1
62029	99	DIRN	SUR	49	-12	1144	0	1	11.4	10.0	15.1
62050	99	DIRN	SUR	50	-4	677	0	0	12.2	-0.3	12.2
62081	99	DIRN	SUR	51	-13	645	0	0	12.5	12.8	17.9
62095	99	DIRN	SUR	53	-16	734	0	0	16.0	8.2	18.0
62103	99	DIRN	SUR	50	-3	685	0	0	13.5	3.9	14.1
62105	99	DIRN	SUR	55	-13	384	1	1	12.9	6.2	14.3
62107	99	DIRN	SUR	50	-6	1387	0	0	15.1	0.4	15.2
62111	99	DIRN	SUR	58	0	698	0	0	13.1	-1.1	13.2
62112	99	DIRN	SUR	58	0	656	0	0	12.4	3.7	12.9
62114	99	DIRN	SUR	58	0	1372	0	0	12.1	1.3	12.1
62163	99	DIRN	SUR	48	-8	601	0	0	14.5	-2.0	14.6
62305	99	DIRN	SUR	50	0	693	0	1	15.5	0.4	15.5
62442	99	DIRN	SUR	49	-16	681	0	0	12.5	-11.1	16.7
64041	99	DIRN	SUR	61	-3	523	0	0	12.6	9.3	15.6
64045	99	DIRN	SUR	59	-12	737	0	0	15.1	6.0	16.2
64046	99	DIRN	SUR	61	-4	693	0	0	13.2	-2.3	13.4

4.12 Table 24 - List of Assimilated BUFR Encoded Radiosonde Stations

ASDE09	ASDE09	ASDK01	ASDK03	ASFR1	ASFR2	ASFR3	ASFR4	FPUW5GN
JGQH	JNKN7JF	JNSR	KMPLHPW	LRYQE3U	VKB4L5Q	XQFJRGX	YLV96WM	ZVQEQCM
5QPW8XG	7JUNA4N	01001	01004	01010	01028	01206	01241	01400
01415	01492	02185	02365	02527	02591	02836	02963	03005
03238	03354	03502	03743	03808	03882	03918	03953	04018
04220	04270	04320	04339	04360	06011	06260	06610	07110
07145	07510	07645	07761	08001	08023	08190	08221	08302
08430	08508	08522	08579	10035	10113	10184	10238	10304
10393	10410	10548	10618	10739	10771	10868	10954	10962
11010	11035	11120	11240	11520	11747	11952	12120	12374
12425	12843	12982	16045	16080	16113	16144	16245	16320
16429	16546	16622	16716	16754	17030	17064	17095	17220
17281	17351	17516	17607	33008	40179	40186	43599	47102
47104	47138	47155	47169	47186	60018	61901	61980	61998
67083	68263	68424	68442	68512	68538	68816	68842	70026
70200	70219	70231	70261	70316	70326	70350	70361	70398
71109	71600	71603	71722	71802	71811	71836	71845	71867
71906	71909	71913	71924	71925	71934	71945	71957	71964
72201	72206	72208	72210	72214	72233	72240	72248	72251
72261	72265	72274	72293	72317	72327	72363	72364	72365
72426	72440	72451	72476	72489	72493	72501	72518	72520
72528	72558	72562	72572	72632	72634	72645	72649	72659
72662	72672	72681	72694	72712	72747	72764	72768	72776
72786	72797	74389	74494	74560	76612	76679	76692	76743
76805	78897	78954	81405	85442	85469	85586	85799	85934
88889	89002	89564	89571	89611	89642	89859	91212	91592
91925	91938	91948	91958	93112	93417	93817	93844	93997
94120	94150	94170	94203	94294	94299	94302	94312	94326
94332	94374	94403	94430	94461	94510	94578	94610	94637
94638	94653	94659	94672	94711	94767	94776	94802	94821
94866	94910	94975	94995	94996	94998	95527	96996	

4.13 Table 25 - List of BUFR Encoded Radiosonde Stations with no TAC Counterpart

ASDE09	ASDE09	ASDK01	ASDK03	ASFR1	ASFR2	ASFR3	ASFR4	FPUW5GN
JNKN7JF	KMPLHPW	LRYQE3U	VKB4L5Q	XQFJRGX	YLV96WM	ZVQEQCM	5QPW8XG	7JUNA4N
01206	14101	17607	40186	47155	76743	94653	94767	

5 Annex - Explanations of figures and tables

5.1 General

All information presented in this report is based on data received at ECMWF before the appropriate analysis. Approximate cut-off times (UTC) are shown below:

Analysis	Obs Time	Cut-off
0000	2101-0300	1530 (16 hours)
1200	0901-1500	1900 (7 hours)

5.2 Data Availability

For each observation type/parameter the average number of reports received per day is displayed in boxes of 5 degrees square. The numbers plotted are the nearest integer values - e.g. if 40 reports were received during the month then the average daily value plotted will be 1. If the average number is greater than 1000 then 999 will be plotted. If the average number is less than 0.5 then the digit 0 will be plotted. If no observations were received then the box will be left blank.

5.3 Data Quality

The information presented on data quality is based on differences between observations and the values of the most recent ECMWF forecast ("first guess") of the same parameter. Depending on the time of the observation, the forecast range is between 9 and 15 hours. The ability of a modern data assimilation system to provide the diagnostic facilities to monitor the performance of the observational network is demonstrated by A. Hollingsworth et. al., Monthly Weather Review, Vol 114, No. 5, May 1986.

It should be noted that:

(i) all results are based on software that may undergo further development;

(ii) although the quality of the ECMWF first-guess fields is of a generally high standard this is only true to a limited extent in the tropics, where small-scale processes such as convection are of much greater importance than in mid-latitudes, and the observations will sometimes not be representative of the scales of motion given by the first-guess;

(iii) the first-guess fields themselves will vary in accuracy depending on the density and quality of data, particularly in the upstream regions and over Antarctica and the southern hemisphere mid-latitudes. Direct comparisons between stations (or airlines) should preferably be restricted to observations in a reasonably homogeneous climatic region.

Tables 1-9 contain lists of SHIPs (including fixed marine platforms), DRIFTERs, TEMPs and TEMPs/PILOTs believed to have supplied suspect reports of surface pressure, geopotential height or wind during the month. The format of the tables is according to Recommendation 3 CBS-Ext(85) and the criteria for stations or data platforms to be classified as suspect are given at the top of each table. For tables 7 and 8 data for the worst

standard pressure level are shown. Units of RMS, standard deviation and bias are hPa in tables 1 and 4, m in table 7 and ms^{-1} in tables 2, 5 and 8. In tables 7 and 8 the station position is indicated; in the case of TEMPSHIPs and PILOTSHIPs this position is obtained from the first report of the month. The gross error limits for first-guess deviations of geopotential in table 7 are as follows:

Level	Geop
1000	100m
925	100m
850	100m
700	100m
500	150m
400	175m
300	200m
250	225m
200	250m
150	275m
100	300m
70	375m
50	400m
30	450m

The corresponding limits for wind (table 8) are:

Level	Wind
1000	$35ms^{-1}$
925	$35ms^{-1}$
850	$35ms^{-1}$
700	$40ms^{-1}$
500	$45ms^{-1}$
400	$50ms^{-1}$
300	$60ms^{-1}$
250	$60ms^{-1}$
200	$50ms^{-1}$
150	$50ms^{-1}$
100	$45ms^{-1}$

In table 7 the weighted RMS values at standard levels are calculated using the following weights:

Level	Weight
1000	3.70
925	3.55
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

Tables 10 and 11 provide geopotential and wind quality statistics (100 hPa level) for TEMPSHIPs and PILOTSHIPs received during the month. Units and display format are identical to those in tables 7 and 8 respectively. Tables 13, 14 (50 hPa), 15 and 16 (100 hPa), 17 and 18 (500hPa), 19 and 20 (850hPa) provide similar radiosonde statistics for the EUCOS area.

Tables 21-23 are similar to tables 4-6 with data coverage restricted to the EUCOS area.

Figures 14-18 show global charts of SATOB and aircraft wind quality, where the statistics have been averaged over latitude/longitude boxes of 5 degrees square, and the mean observed minus first-guess (or 'bias') wind vectors have been plotted. All observations in the specified layers have been used. For comparison the mean observed wind (from the SATOB reports only) for each layer is shown in figures 14 and 15. A reference value of wind speed is plotted in the top right corner of each figure. An arrow is only plotted if 10 or more observations have been received in that 5 degree square.

Table 12 provides quality statistics of aircraft wind observations in the layer 300-150 hPa stratified by airline carrier. The format and specifications of the table have been defined by NMC Washington, the lead centre for the monitoring of aircraft and satellite data.

Table 24 shows list of Assimilated BUFR Encoded Radiosonde Stations monitored within the month.

Table 25 shows list of BUFR Encoded Radiosonde Stations with no TAC Counterpart monitored within the month.