ECMWF Global Data Monitoring Report

November 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	Oct	Nov	Ident	Time	Oct	Nov
03238	(00)	27	4	11120	(12)	0	17
06060	(00)	17	0	17281	(12)	33	44
10304	(00)	18	0	23472	(00)	19	30
10954	(00)	18	0	32150	(00)	1	24
27595	(00)	16	0	40811	(00)	0	15
27595	(12)	16	0	42492	(00)	0	23
41256	(00)	35	12	43150	(00)	2	29
43369	(00)	29	6	48453	(00)	0	29
65503	(12)	29	0	64910	(00)	21	36
76644	(12)	30	8	64910	(12)	21	37
78988	(00)	23	0	68512	(12)	31	60
78988	(12)	23	0	70316	(00)	34	45
84628	(12)	17	2	70350	(00)	10	35
96315	(00)	23	6	70350	(12)	10	35
96645	(00)	31	7	70361	(12)	50	36
96645	(12)	31	6	72451	(00)	31	43
-	-	-	-	72672	(00)	33	44
-	-	-	-	72776	(00)	30	41
-	-	-	-	72776	(12)	31	42
-	-	-	-	72797	(12)	31	42
-	-	-	-	76612	(12)	5	24
-	-	-	-	78807	(00)	2	17
-	-	-	-	89662	(00)	4	27
-	-	-	-	89662	(12)	3	25
-	-	-	-	94302	(00)	0	27
-	-	-	-	94302	(12)	0	28
-	-	-	-	94312	(00)	0	15
-	-	-	-	94638	(00)	4	17
-	-	-	-	96481	(00)	18	29
-	-	-	-	96481	(12)	19	30
-	-	-	-	96996	(00)	18	30

2.2 Drifting Buoys

Surface pressure observations from **1524** 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

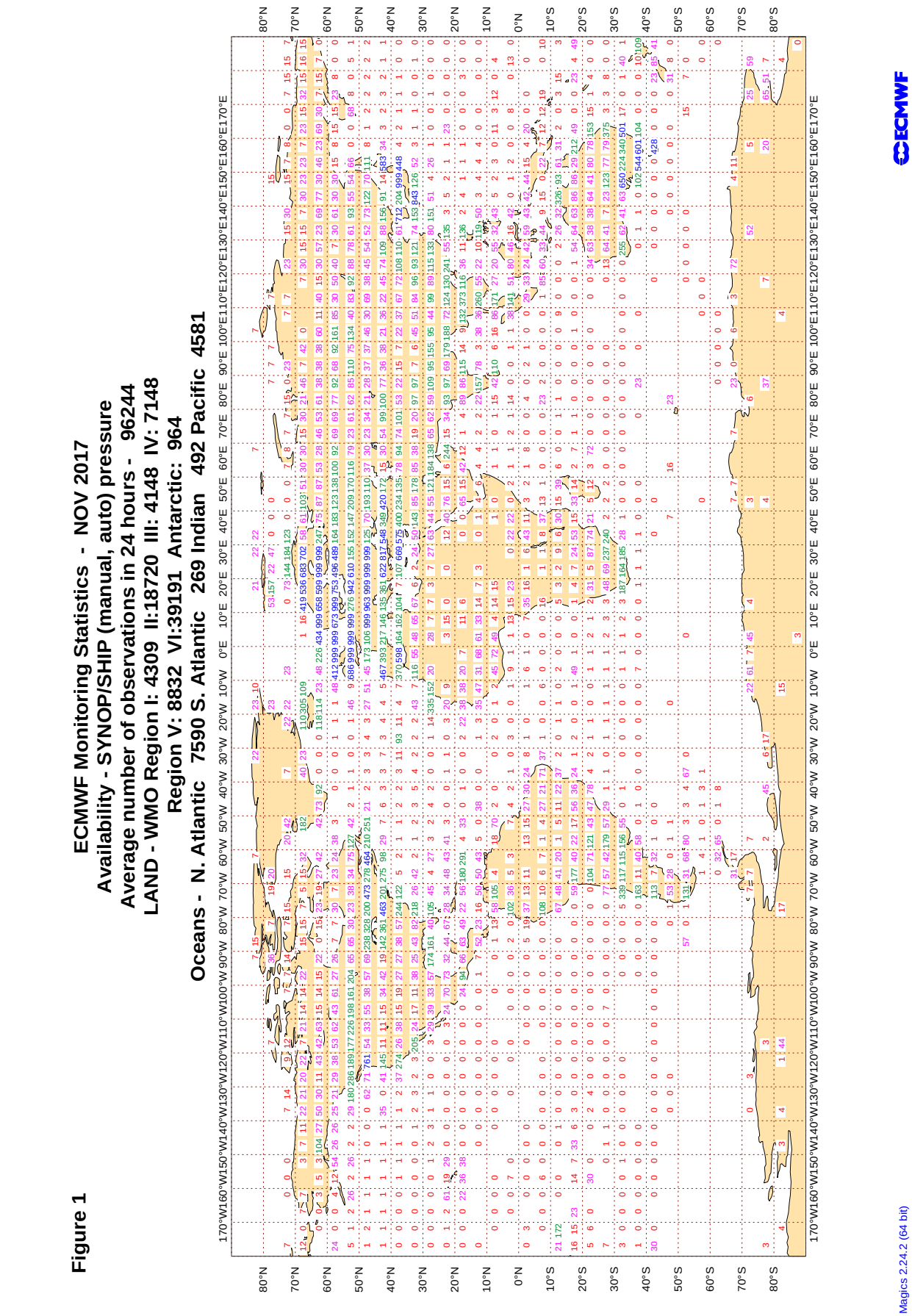


Figure 1

3.2.2 Figure 2 - Availability - DRIFTER PRESSURE

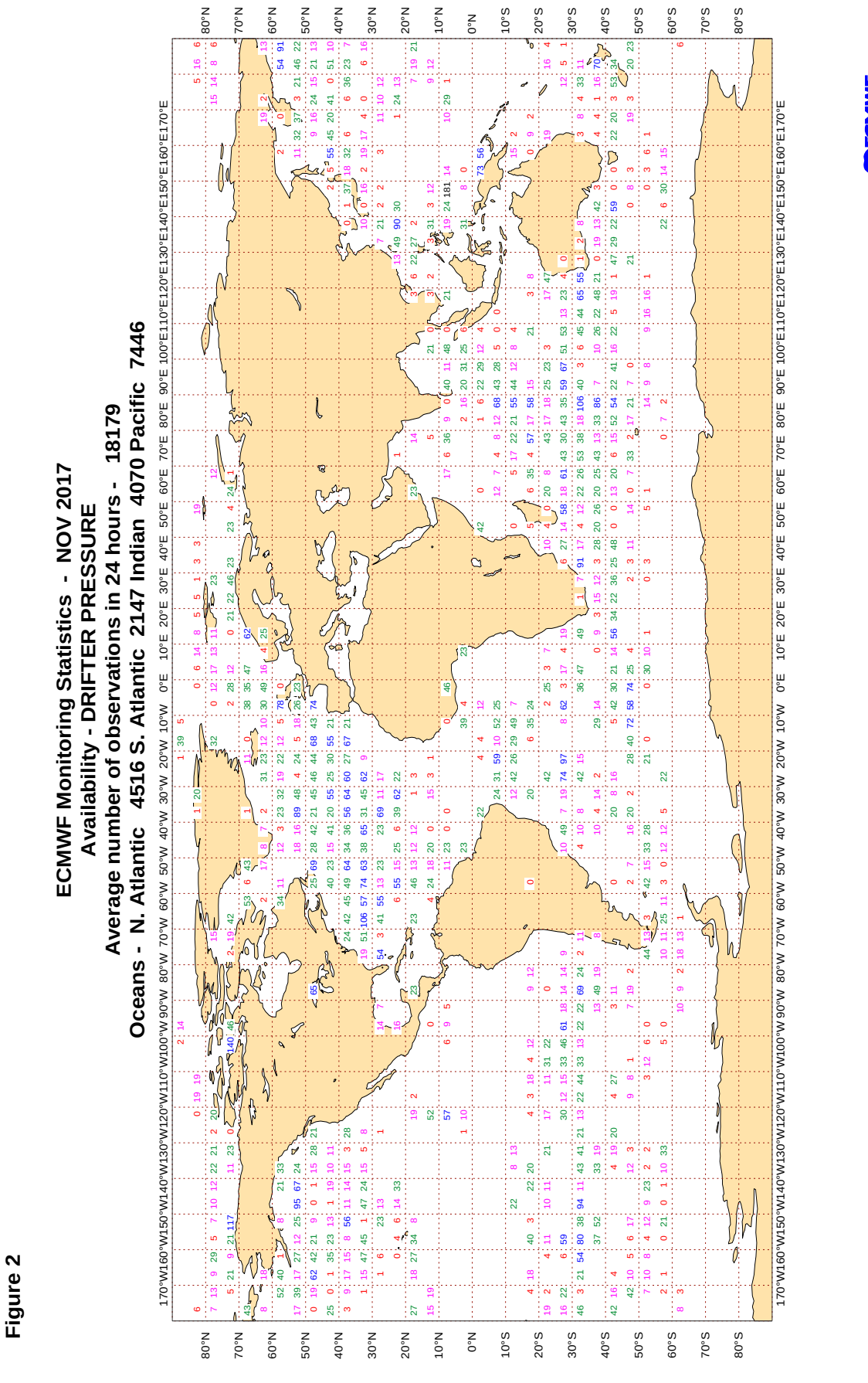


Figure 2

3.2.3 Figure 3 - Availability - TEMP 500 hPa geopotential

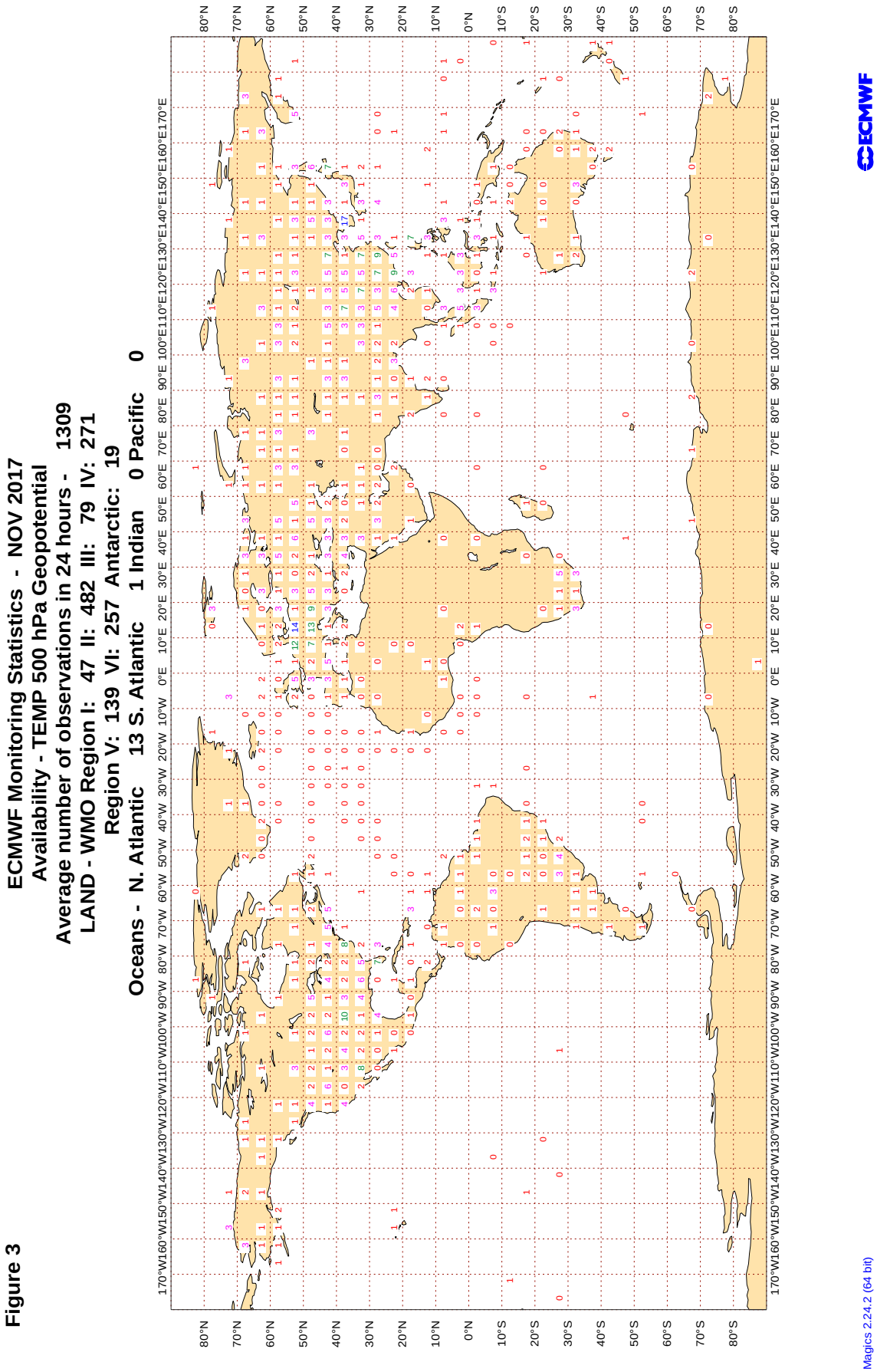


Figure 3

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

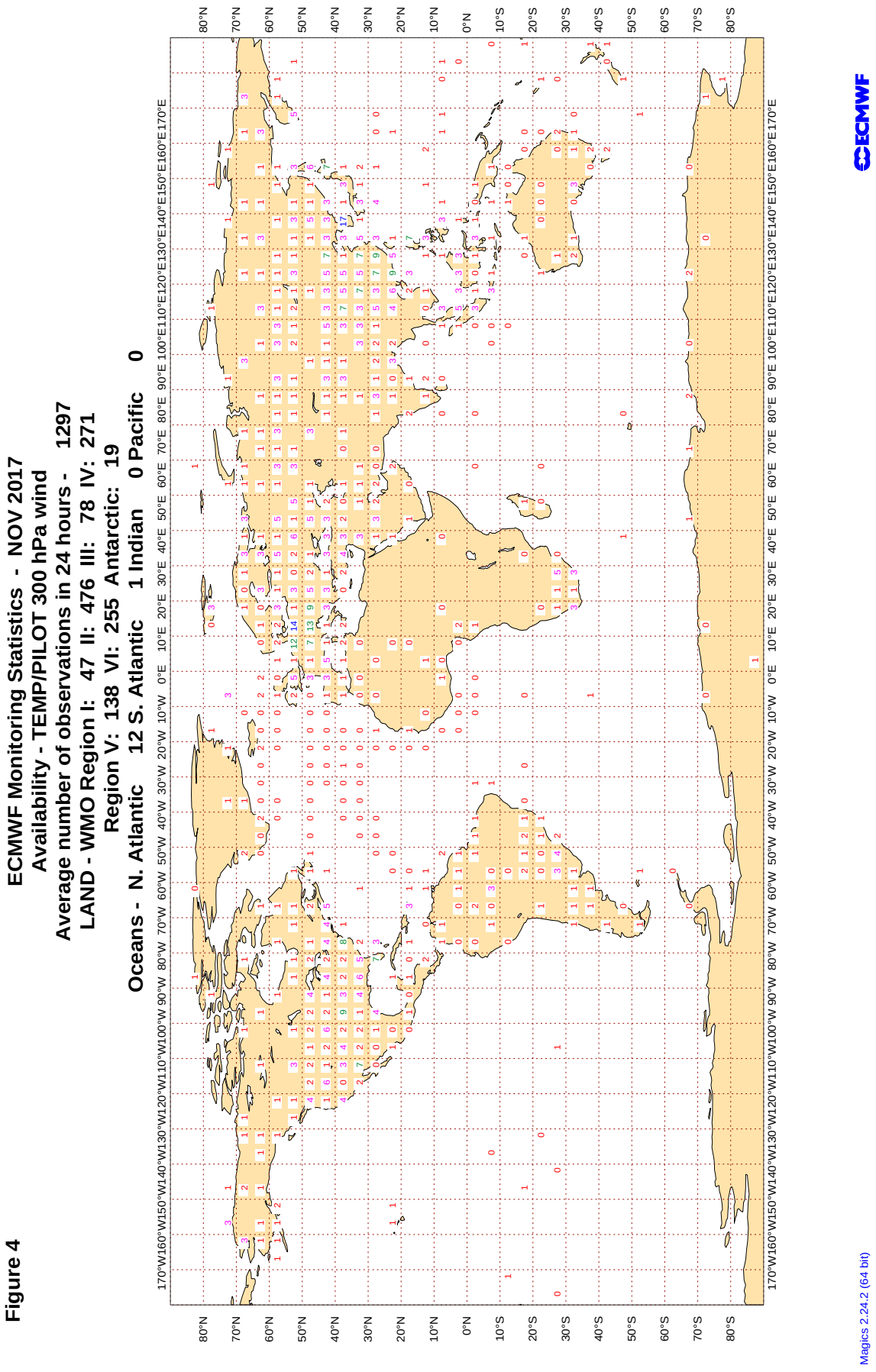


Figure 4

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

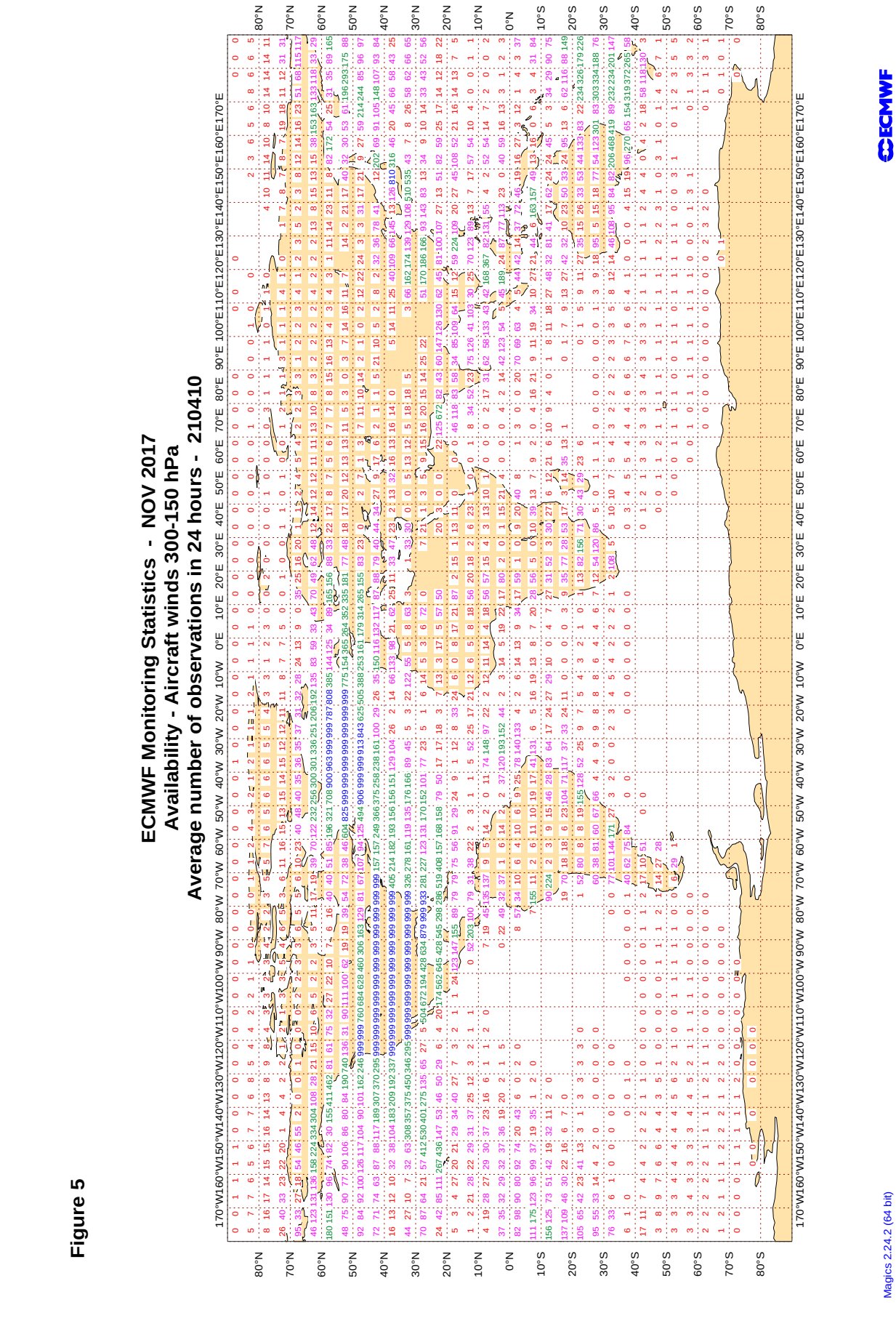
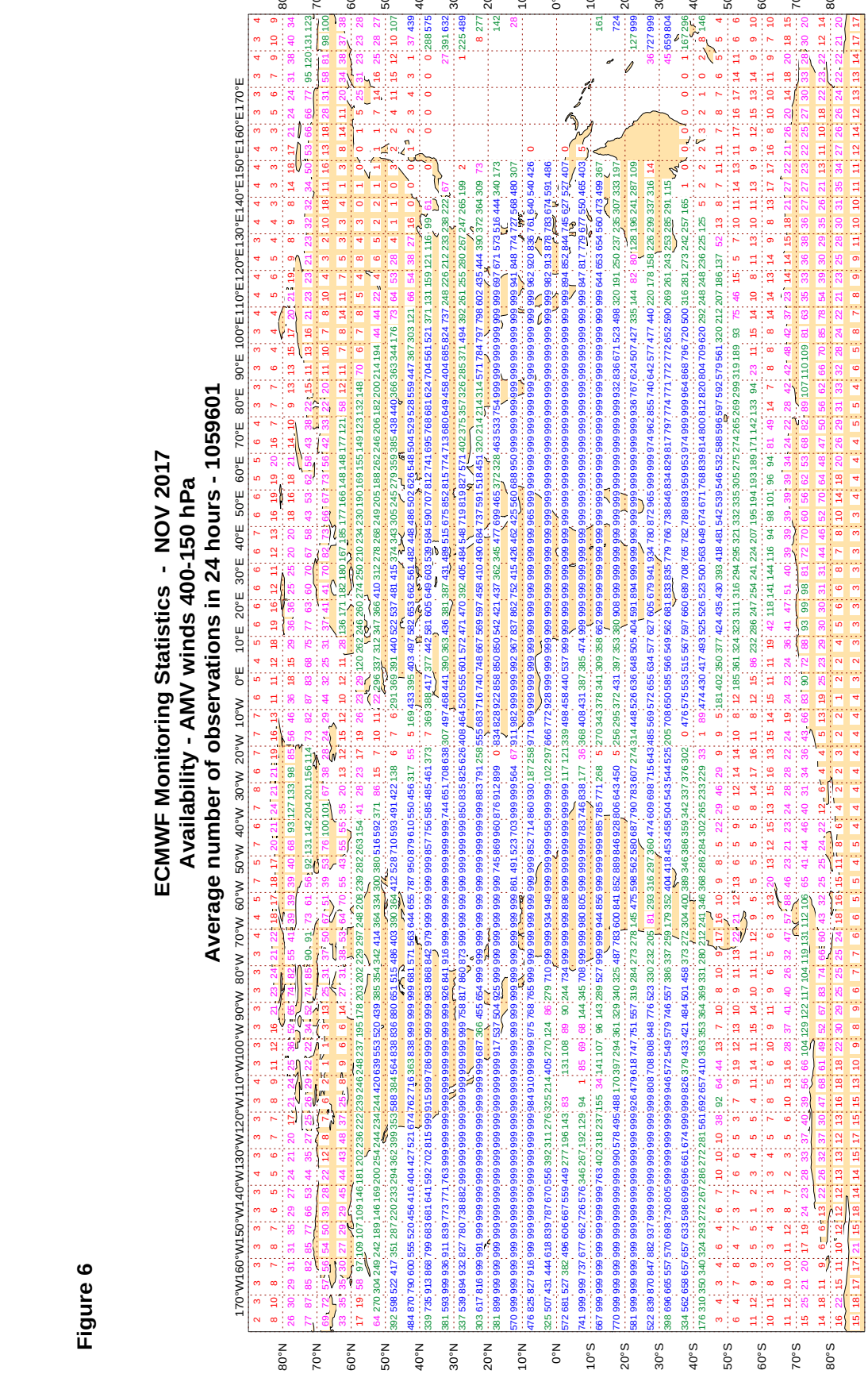


Figure 5

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

Figure 6



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

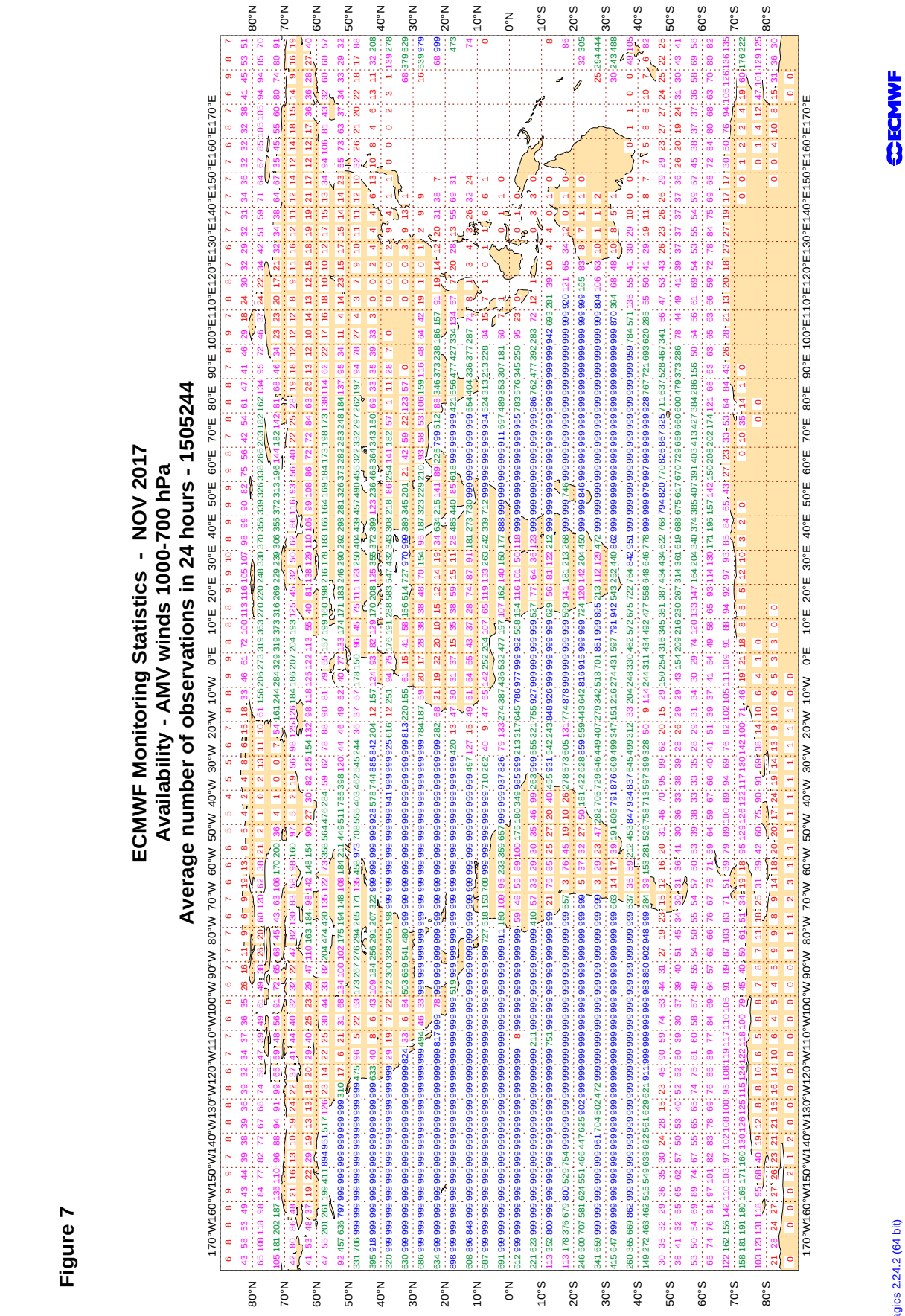


Figure 7

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

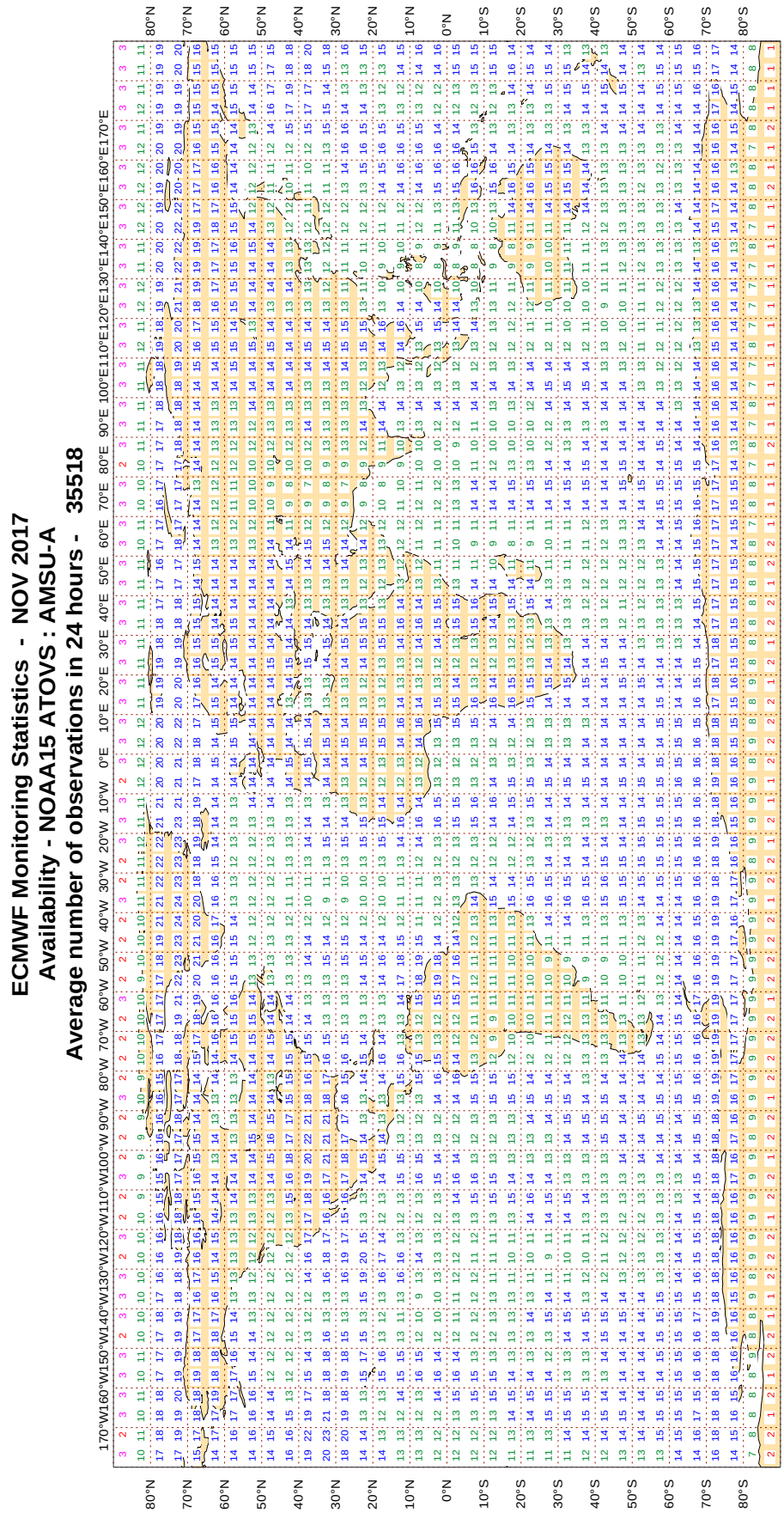
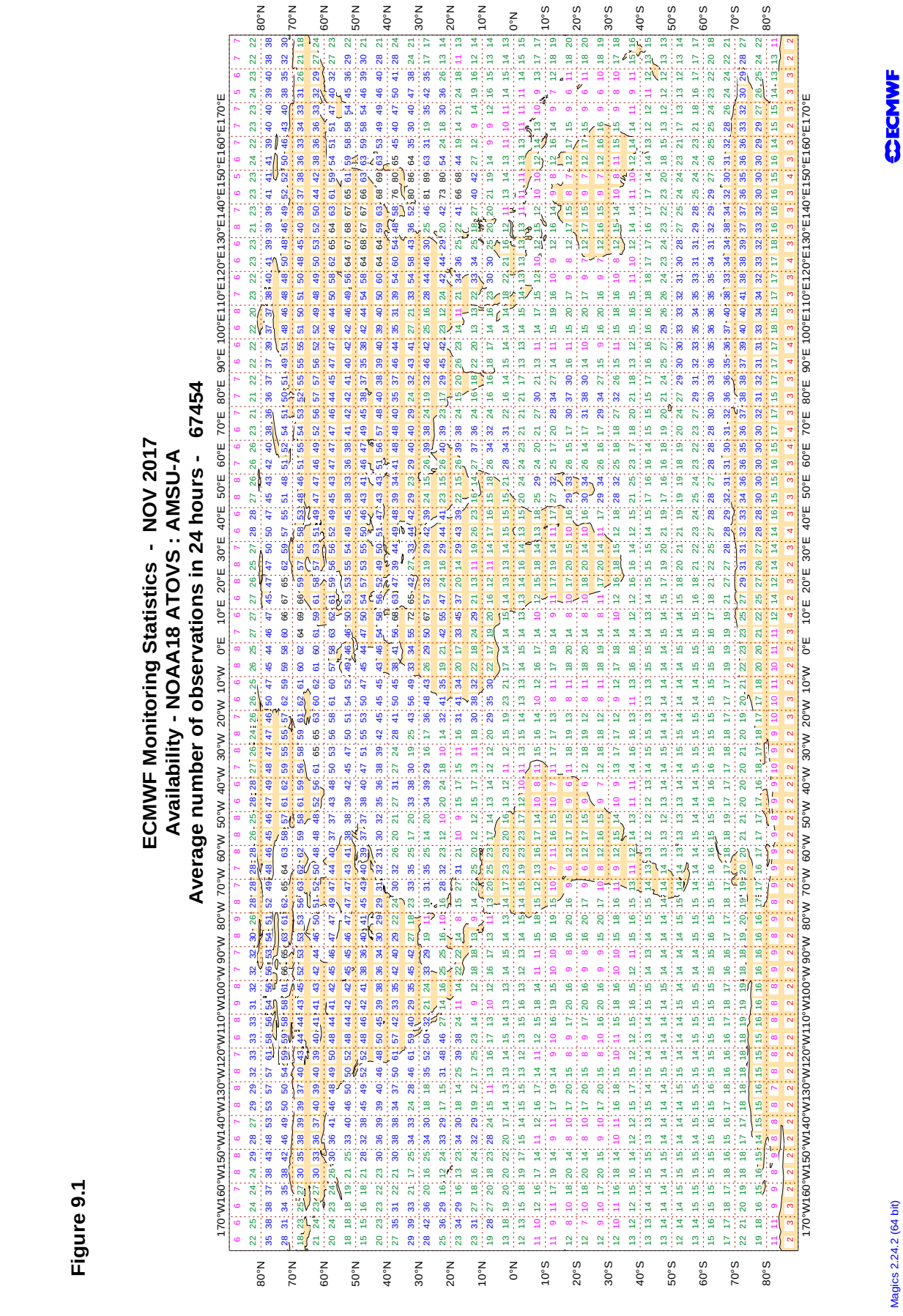
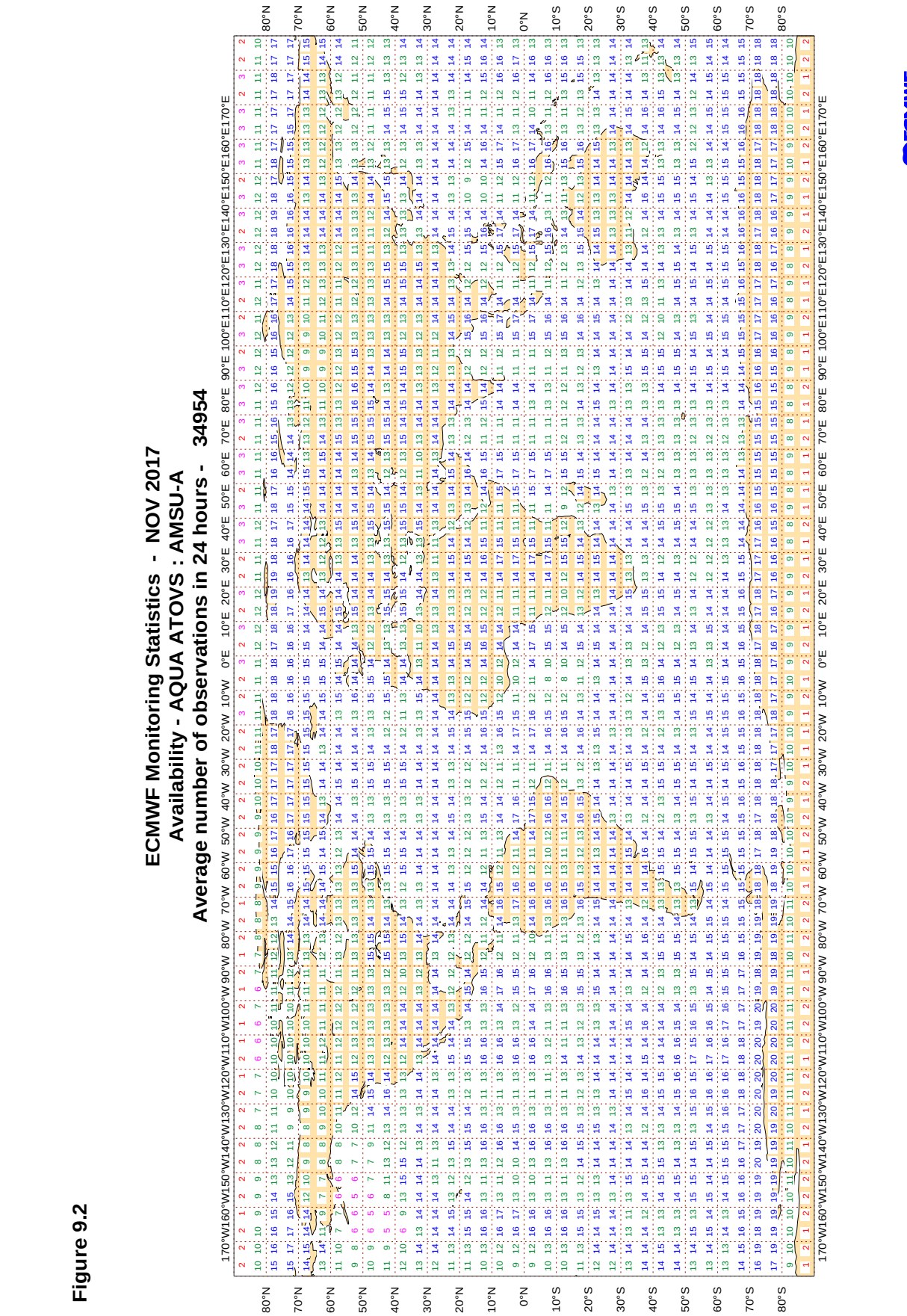


Figure 8

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



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



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

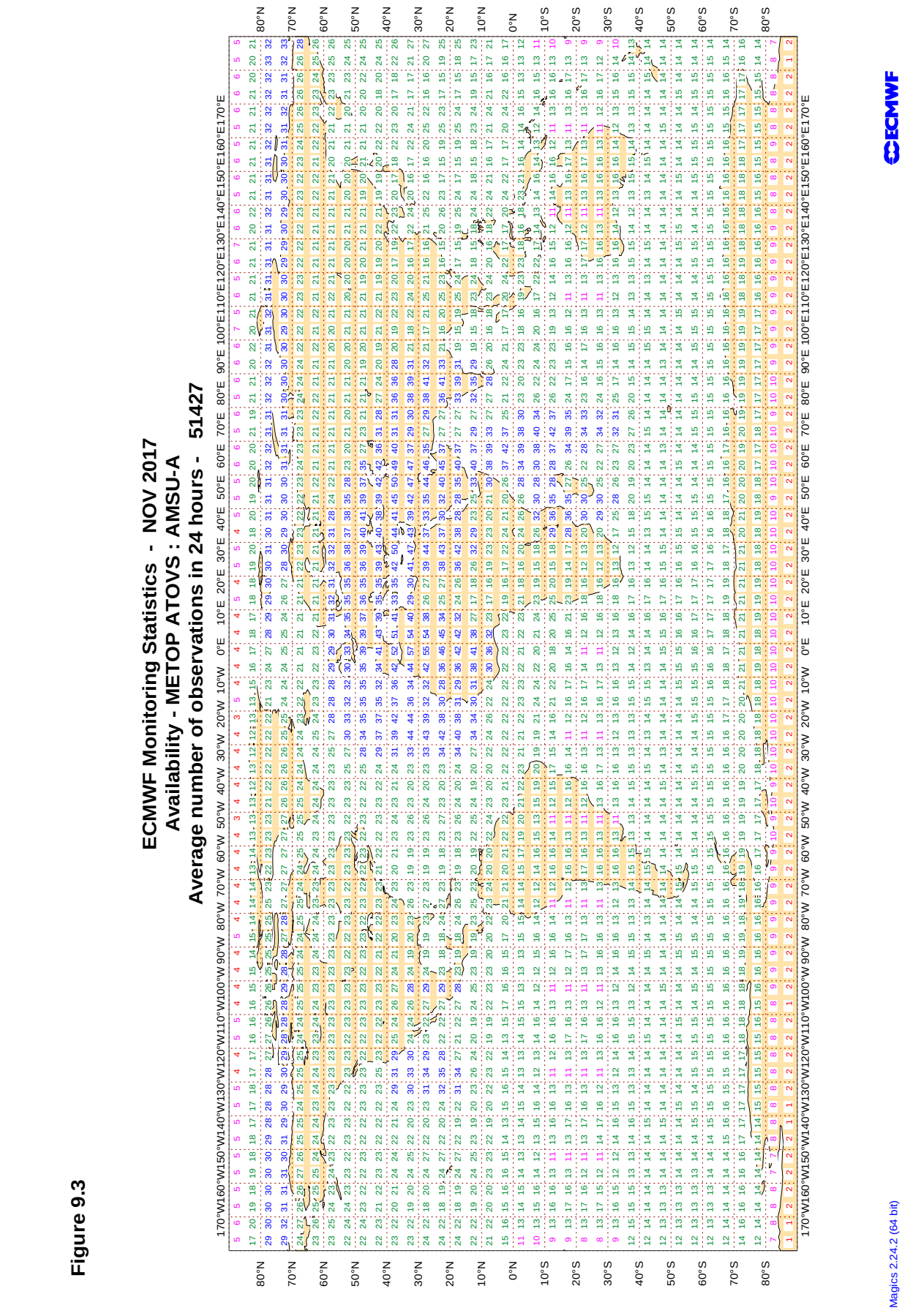


Figure 9.3

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                : NOV 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
3EOF8	99	P	SUR	25	1	5.1	-0.4	5.1
3EUQ8	99	P	SUR	27	0	0.5	5.0	5.0
3FFA5	99	P	SUR	24	0	0.9	3.1	3.2
3FPB5	99	P	SUR	18	0	1.7	3.5	3.9
5BZE2	99	P	SUR	34	1	1.2	3.5	3.7
9HJD9	99	P	SUR	20	0	0.7	-3.7	3.7
9V2732	99	P	SUR	37	0	3.0	6.9	7.5
9V9832	99	P	SUR	32	0	0.9	-4.1	4.2
AUYJ	99	P	SUR	44	0	2.8	8.5	9.0
C6AB9	99	P	SUR	35	8	8.0	-8.8	11.9
C6BR3	99	P	SUR	48	0	4.2	11.4	12.1
C6FN2	99	P	SUR	33	0	1.0	3.9	4.0
C6YM5	99	P	SUR	34	0	1.0	4.4	4.5
D5HF3	99	P	SUR	24	0	1.4	9.3	9.4
H3VR	99	P	SUR	31	0	1.4	-3.2	3.5
OZ2049	99	P	SUR	28	0	1.1	-5.0	5.1
PFBF	99	P	SUR	24	0	0.9	3.7	3.8
UBMO9	99	P	SUR	18	0	1.2	3.4	3.6
UCTS	99	P	SUR	24	0	2.1	-3.4	4.0
UFJN	99	P	SUR	65	0	1.1	-4.8	5.0
UFMK	99	P	SUR	28	0	6.9	-0.9	7.0
UGZM	99	P	SUR	21	0	0.6	-3.2	3.2
UIZZ	99	P	SUR	63	2	1.7	4.1	4.4
V7RF4	99	P	SUR	22	0	1.2	6.6	6.7
V7SY6	99	P	SUR	18	0	1.7	-8.5	8.7
VRCS2	99	P	SUR	20	0	0.8	3.9	4.0
VRID2	99	P	SUR	84	0	2.0	3.8	4.3
VRKC2	99	P	SUR	16	0	1.4	3.2	3.5
VRLX5	99	P	SUR	32	0	2.1	-3.2	3.8
VRME7	99	P	SUR	24	0	1.3	-4.5	4.6
VROG7	99	P	SUR	34	0	4.8	-4.6	6.6
VRQK3	99	P	SUR	44	0	1.6	-4.0	4.3

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
VTXB	99	P	SUR	103	18	5.6	-1.1	5.7
WAIU	99	P	SUR	24	0	0.8	-5.9	5.9
WC5932	99	P	SUR	32	20	6.9	-10.7	12.7
WCX8884	99	P	SUR	32	1	0.7	5.7	5.8
WDC6925	99	P	SUR	15	0	0.7	3.5	3.6
WDD9283	99	P	SUR	44	2	2.9	5.0	5.8
WTDH	99	P	SUR	49	0	0.4	-4.2	4.2

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                : NOV 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
45141	99	SPEED	SUR	25	0	0	1.9	-5.3	5.7

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                : NOV 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	170	67	0	147.9	87.0	171.6
42045	99	DIRN	SUR	125	0	0	12.2	-45.0	46.6
42360	99	DIRN	SUR	88	0	0	55.3	37.2	66.7
44008	99	DIRN	SUR	41	2	0	153.3	67.9	167.7
44037	99	DIRN	SUR	100	0	0	24.7	31.2	39.8
45154	99	DIRN	SUR	70	0	0	25.8	35.0	43.5
46047	99	DIRN	SUR	55	0	0	71.4	5.9	71.6
46120	99	DIRN	SUR	154	0	0	55.9	-64.9	85.7
46207	99	DIRN	SUR	32	0	0	13.7	42.4	44.5

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                 : NOV 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	684	0	0.6	-5.5	5.5
2101713	99	P	SUR	38	151	97	0	2.3	4.7	5.2
21709	99	P	SUR	38	151	97	0	2.3	4.7	5.2
2200185	99	P	SUR	37	125	47	47	0.0	0.0	0.0
2301550	99	P	SUR	-22	40	169	99	5.6	-1.4	5.8
2301578	99	P	SUR	5	81	211	101	4.7	11.0	11.9
4100707	99	P	SUR	14	-61	128	0	2.5	-7.5	8.0
41707	99	P	SUR	14	-61	128	0	2.5	-7.5	7.9
4500509	99	P	SUR	45	-88	1319	1319	0.0	0.0	0.0
45509	99	P	SUR	45	-88	1394	1394	0.0	0.0	0.0
4601623	99	P	SUR	76	-179	70	0	3.1	4.9	5.8
4601638	99	P	SUR	71	-157	22	5	2.2	-8.3	8.6
4700551	99	P	SUR	57	-6	473	344	6.5	-3.6	7.4
4700552	99	P	SUR	67	-63	616	600	2.5	-10.2	10.5
4700557	99	P	SUR	55	-9	327	0	0.6	-8.2	8.3
4701659	99	P	SUR	71	-104	453	453	0.0	0.0	0.0
4701674	99	P	SUR	71	-68	677	0	0.5	-6.1	6.1
47551	99	P	SUR	57	-6	619	438	6.7	-4.4	8.0
47552	99	P	SUR	67	-63	718	700	2.4	-10.1	10.4
47557	99	P	SUR	55	-9	382	0	0.4	-8.3	8.3
4800631	99	P	SUR	83	18	694	633	2.0	-10.7	10.8
4800790	99	P	SUR	80	-179	471	407	9.1	2.7	9.5
4801622	99	P	SUR	75	-163	422	176	5.9	6.4	8.7
4801626	99	P	SUR	77	-162	439	439	0.0	0.0	0.0
4801710	99	P	SUR	73	-131	425	50	1.8	4.2	4.6
4802000	99	P	SUR	83	-109	505	128	4.7	-1.8	5.0
4802502	99	P	SUR	85	-96	586	443	5.5	6.8	8.8
48790	99	P	SUR	80	-179	661	572	9.1	3.2	9.6
5301603	99	P	SUR	10	95	825	803	4.8	8.9	10.1
5600942	99	P	SUR	-29	79	683	49	3.9	-5.3	6.6
5601611	99	P	SUR	-20	96	664	0	0.0	7.3	7.3
56942	99	P	SUR	-29	79	720	52	3.9	-5.4	6.6

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                : NOV 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
45141	99	SPEED	SUR	61	-115	151	0	0	2.0	-5.4	5.8

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

```
          LIST OF SUSPECT STATIONS         : DRIFTER
                    MONITORING CENTRE      : ECMWF
                    ELEMENT MONITORED      : WIND DIRECTION (DEGREES)
                    PERIOD                 : NOV 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
1300009	99	DIRN	SUR	8	-38	94	0	0	23.1	21.6	31.6
2200106	99	DIRN	SUR	36	130	46	0	9	17.0	-22.5	28.3
2200108	99	DIRN	SUR	36	126	47	0	0	10.1	-20.7	23.1
2200184	99	DIRN	SUR	34	126	47	0	0	15.9	-20.9	26.3
2200188	99	DIRN	SUR	34	128	46	0	0	29.0	21.5	36.1
23001	99	DIRN	SUR	0	81	280	0	0	21.4	20.2	29.5
23092	99	DIRN	SUR	17	89	134	0	95	74.3	-6.5	74.6
23093	99	DIRN	SUR	16	88	162	0	0	17.3	28.8	33.6
23454	99	DIRN	SUR	10	73	52	0	0	23.1	20.5	30.9
23497	99	DIRN	SUR	11	72	41	0	12	35.8	33.4	48.9
3100003	99	DIRN	SUR	-8	-31	267	0	0	15.6	-24.3	28.9
3100229	99	DIRN	SUR	-3	-38	603	2	1	7.5	-23.5	24.7
31003	99	DIRN	SUR	-8	-31	267	0	0	16.0	-24.8	29.5
3100374	99	DIRN	SUR	-23	-43	283	0	1	21.3	-32.8	39.1
31229	99	DIRN	SUR	-3	-38	605	2	1	8.2	-24.0	25.3
31374	99	DIRN	SUR	-23	-43	283	0	1	20.6	-33.6	39.4
4100026	99	DIRN	SUR	12	-38	29	0	0	10.5	-24.6	26.7
41026	99	DIRN	SUR	12	-38	29	0	0	11.5	-24.3	26.9
42045	99	DIRN	SUR	26	-97	798	0	0	11.1	-45.5	46.9
42085	99	DIRN	SUR	18	-67	913	0	1	22.4	26.5	34.7
42090	99	DIRN	SUR	18	-70	27	0	0	21.9	-47.6	52.4
42360	99	DIRN	SUR	27	-91	544	0	13	34.8	31.5	46.9
42361	99	DIRN	SUR	28	-93	539	0	0	13.4	27.3	30.5
42365	99	DIRN	SUR	28	-89	308	0	0	16.0	-28.5	32.6
44008	99	DIRN	SUR	41	-69	243	10	99	2.2	77.0	77.0
44037	99	DIRN	SUR	44	-68	602	0	1	13.7	32.4	35.1
44058	99	DIRN	SUR	38	-76	534	0	0	13.8	-26.6	30.0
45154	99	DIRN	SUR	46	-83	463	0	0	24.1	37.4	44.5
46120	99	DIRN	SUR	48	-122	654	0	23	35.3	-59.7	69.3
46207	99	DIRN	SUR	51	-130	192	0	2	14.3	42.8	45.1
6100280	99	DIRN	SUR	41	1	223	0	5	27.1	34.3	43.7

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                : NOV 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	00	Z	1000	66	-38	18	0	4.0	39.8	40.0
04360	12	Z	1000	66	-38	20	0	10.8	38.4	39.9
21946	12	Z	30	71	148	26	0	48.2	-234.5	239.4
21946	00	Z	50	71	148	27	0	82.2	-139.5	161.9
24125	00	Z	30	69	112	15	0	84.1	-259.5	272.8
24125	12	Z	70	69	112	17	0	58.2	-199.9	208.2
24726	12	Z	70	63	114	27	0	111.7	-64.3	128.9
25123	12	Z	50	69	161	15	0	32.5	-140.6	144.3
25123	00	Z	50	69	161	13	0	40.3	-137.1	142.9
27612	00	Z	50	56	38	16	0	99.6	-106.3	145.7
27707	00	Z	30	54	35	26	0	80.3	-173.5	191.2
27962	00	Z	30	53	45	14	0	136.1	-150.9	203.2
28225	12	Z	30	58	56	27	0	93.2	-191.3	212.8
28661	00	Z	30	55	65	26	0	124.3	-211.1	245.0
28661	12	Z	50	55	65	22	0	96.1	-182.2	206.0
31004	12	Z	50	59	125	25	0	75.7	-168.9	185.1
31004	00	Z	70	59	125	29	0	38.9	-132.2	137.8
31873	12	Z	50	46	134	28	0	39.5	-139.2	144.7
34300	00	Z	50	50	36	22	0	44.0	-143.7	150.3
34858	00	Z	30	46	43	24	1	66.1	-184.2	195.7
38064	12	Z	150	45	66	29	0	84.6	60.2	103.8
47122	12	Z	1000	37	127	29	0	32.3	-24.1	40.3
47122	00	Z	1000	37	127	30	1	33.5	-17.3	37.7
7JUNA4	00	Z	1000	45	-56	10	1	5.4	-36.9	37.3
7JUNA4	12	Z	1000	47	-41	10	1	6.3	-39.8	40.3
96147	12	Z	925	4	108	22	1	7.1	42.1	42.7

LIST OF SUSPECT STATIONS (CONTINUED)

WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
96147	00	Z	925	4	108	27	1	17.6	54.1	56.9
98223	00	Z	30	18	121	25	0	54.7	238.3	244.5

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                : NOV 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
42701	00	V	200	23	85	28	0	-4.8	-4.2	15.8

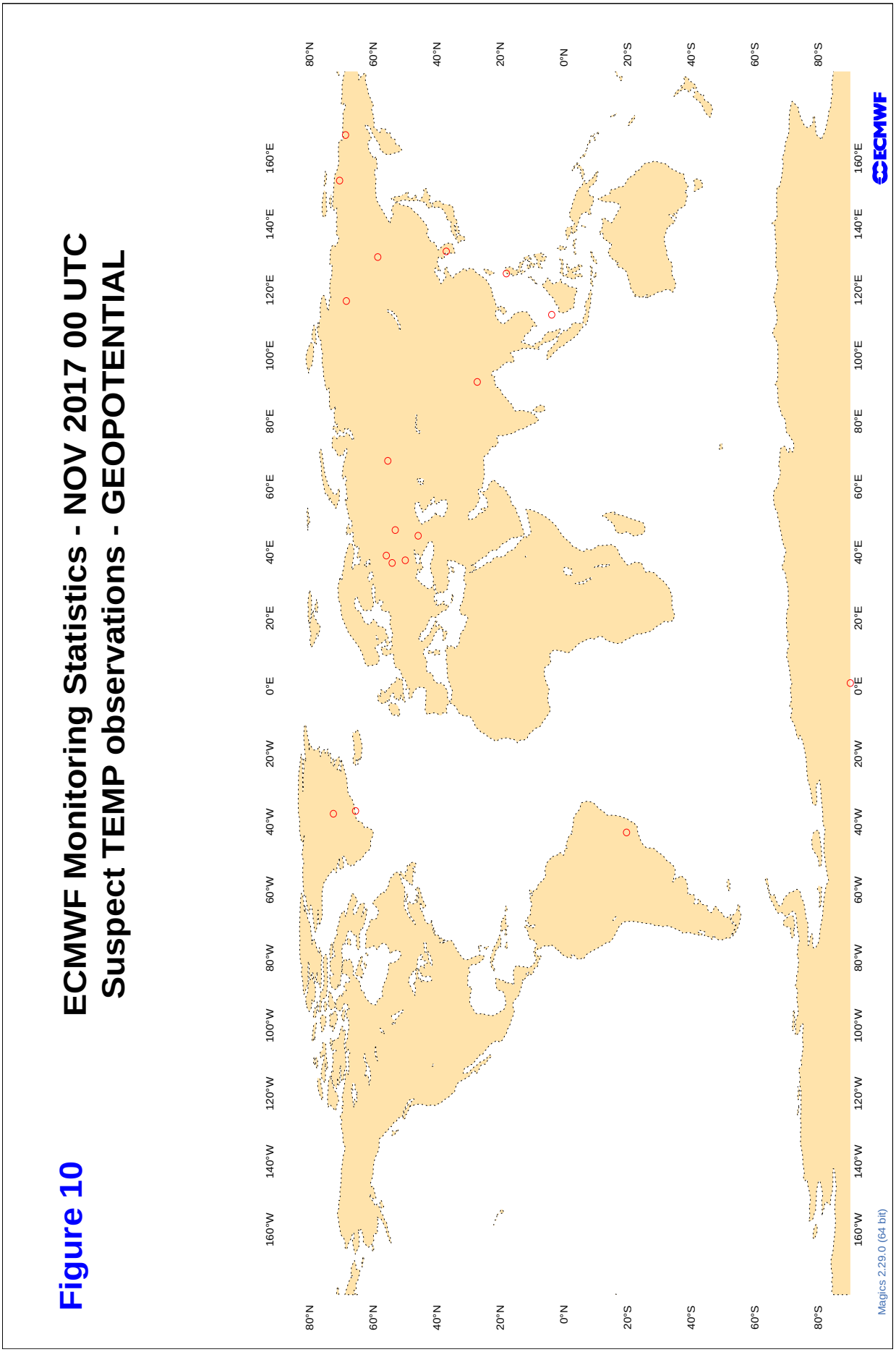
3.2.20 Table 9 - Suspect radiosondes: Wind direction (degrees)

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

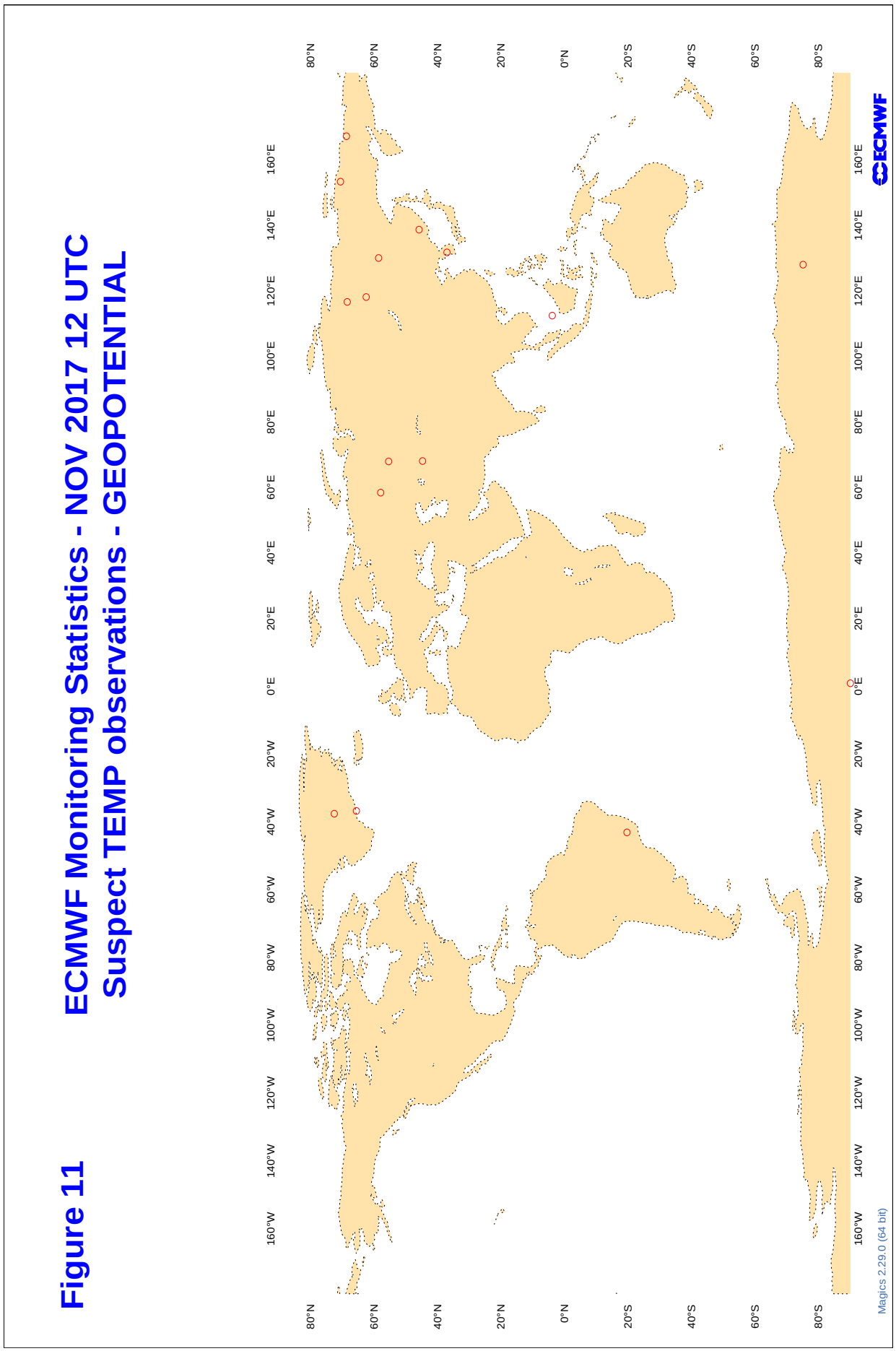

SELECTION CRITERIA: OBSERVED/FORECAST WIND SPEEDS >= 5 M/S
                    NO. OF OBSERVATIONS   >= 5, AND,
                    ABSOLUTE BIAS         >= 10 DEGREES, WITH
                    STANDARD DEVIATION    <  30 DEGREES, AND,
                    VERTICAL SPREAD       < 10 DEGREES
         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

WMO IDENT	OBS TIME	ELM	LAT	LONG	NUM OBS	BIAS	MAX SPREAD	SD
57972	00	DD	26	113	30	10.5	2.3	5.4

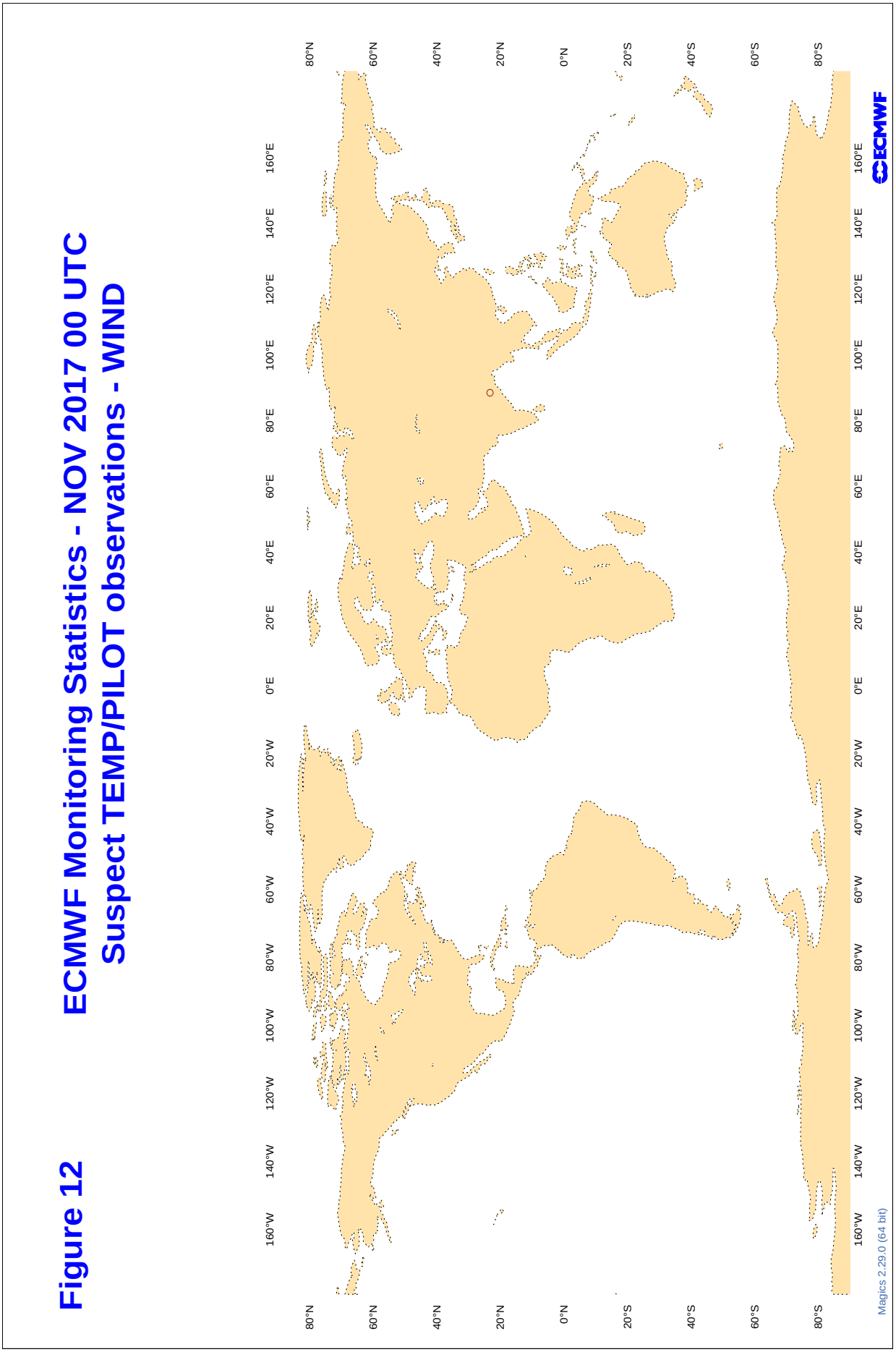
3.2.21 Figure 10 - Suspect TEMP observations - geopotential : 00 UTC



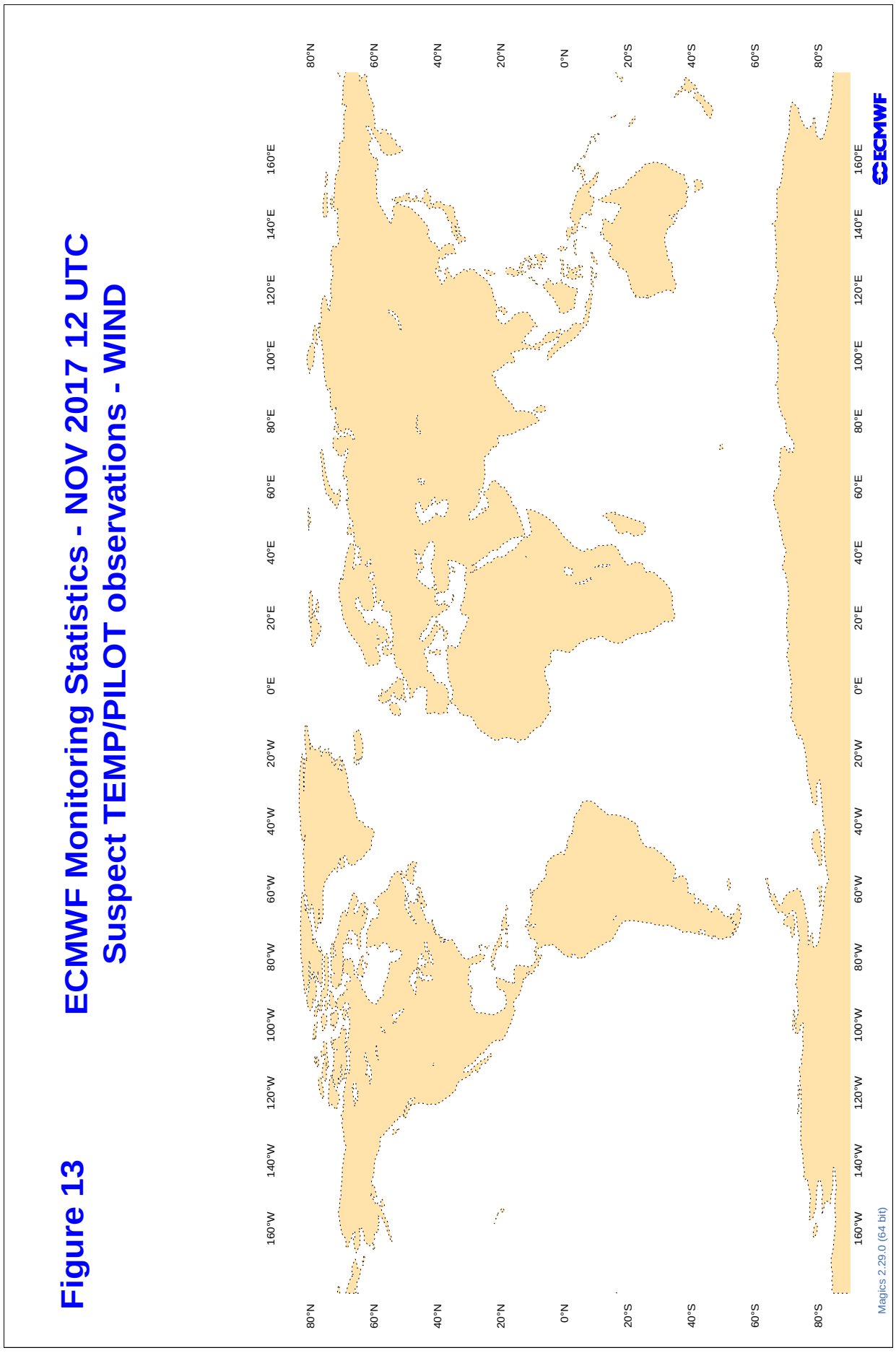
3.2.22 Figure 11 - Suspect TEMP observations - geopotential : 12 UTC



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                : NOV 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
7JUNA4	00	Z	100	10	44.0	-35.5
7JUNA4	12	Z	100	10	29.7	-13.8
ASDE09	12	Z	100	3	23.8	23.1
ASDE9	12	Z	100	1	38.5	38.5
ASDK01	12	Z	100	13	14.4	12.4
ASDK01	00	Z	100	11	30.7	1.5
ASDK02	12	Z	100	1	1.7	1.7
ASDK03	12	Z	100	13	17.8	14.2
ASDK03	00	Z	100	18	23.3	22.2
ASDK1	12	Z	100	9	8.6	3.8
ASDK1	00	Z	100	8	22.6	7.6
ASDK2	12	Z	100	0	0.0	0.0
ASDK3	00	Z	100	13	24.9	21.6
ASDK3	12	Z	100	12	17.6	13.6
ASFR1	12	Z	100	12	16.8	15.2
ASFR1	00	Z	100	14	12.0	7.8
ASFR2	00	Z	100	4	36.5	36.1
ASFR2	12	Z	100	4	39.9	37.6
ASFR3	00	Z	100	13	26.5	25.4
ASFR3	12	Z	100	15	24.6	24.3
ASFR4	12	Z	100	16	33.1	25.3
ASFR4	00	Z	100	21	23.1	19.8
ASUK3	12	Z	100	1	5.5	5.5
FPUW5G	12	Z	100	20	13.0	10.2
FPUWN	12	Z	100	8	9.1	7.1
JGQH	00	Z	100	3	8.5	0.9
JGQH	12	Z	100	3	11.4	11.4
JNKN7J	00	Z	100	4	36.6	35.3
JNKN7J	12	Z	100	5	54.7	54.0
JNSR	00	Z	100	4	13.0	10.8
JNSR	12	Z	100	4	10.9	4.4
KMPLHP	12	Z	100	7	15.3	13.9
KMPLHP	00	Z	100	6	15.1	7.4
LRYQE3	12	Z	100	6	38.9	36.0
LRYQE3	00	Z	100	8	11.1	7.5
VKB4L5	12	Z	100	6	36.2	34.9
VKB4L5	00	Z	100	4	37.3	37.3
VKB4Q	00	Z	100	1	39.8	39.8
XQFJRG	00	Z	100	5	9.6	6.2

RADIOSONDE MONITORING STATISTICS (SHIPS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
XQFJRG	12	Z	100	7	9.9	5.7
XQFJX	00	Z	100	4	4.8	-1.3
XQFJX	12	Z	100	4	7.9	-2.1

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                : NOV 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
7JUNA4	00	V	100	9	3.6	-0.2	0.1
7JUNA4	12	V	100	8	3.2	-0.1	0.8
ASDE09	12	V	100	1	5.6	-0.9	5.5
ASDE9	12	V	100	1	4.3	-2.1	3.7
ASDK01	12	V	100	10	5.8	-0.5	0.7
ASDK01	00	V	100	9	3.9	0.7	-0.9
ASDK02	12	V	100	1	1.6	-1.0	1.2
ASDK03	12	V	100	12	3.8	-0.9	1.1
ASDK03	00	V	100	13	4.7	-0.7	-0.9
ASDK1	12	V	100	9	5.7	-1.1	0.1
ASDK1	00	V	100	8	3.3	0.7	-0.6
ASDK2	12	V	100	0	0.0	0.0	0.0
ASDK3	00	V	100	13	5.2	-0.3	-1.4
ASDK3	12	V	100	12	3.3	-0.4	0.2
ASFR1	12	V	100	8	4.0	-0.2	2.2
ASFR1	00	V	100	9	2.9	0.8	0.4
ASFR2	00	V	100	3	2.5	1.5	-0.7
ASFR2	12	V	100	4	6.9	1.4	1.8
ASFR3	00	V	100	9	3.5	0.7	0.5
ASFR3	12	V	100	9	2.8	-0.8	-0.7
ASFR4	12	V	100	12	3.7	-1.0	1.0
ASFR4	00	V	100	15	3.3	-0.3	-0.6
ASUK3	12	V	100	0	0.0	0.0	0.0
FPUW5G	12	V	100	18	7.2	-3.2	1.3
FPUWN	12	V	100	8	7.5	-4.8	0.9
JGQH	00	V	100	1	5.0	4.5	2.2
JGQH	12	V	100	1	2.5	-2.2	-1.2
JNKN7J	00	V	100	4	5.2	-2.0	-3.0
JNKN7J	12	V	100	5	3.8	1.5	-2.2
JNSR	00	V	100	3	6.8	-0.3	1.9
JNSR	12	V	100	2	4.8	-2.4	-2.2
KMPLHP	12	V	100	5	3.6	0.1	-0.3
KMPLHP	00	V	100	3	4.3	0.8	1.3
LRYQE3	12	V	100	5	4.2	0.4	-2.1
LRYQE3	00	V	100	7	5.3	-0.4	-1.6
VKB4L5	12	V	100	5	2.2	-0.2	0.7
VKB4L5	00	V	100	3	2.8	-0.3	1.3
VKB4Q	00	V	100	1	1.8	-1.5	1.0
XQFJRG	00	V	100	4	3.4	0.1	0.2

RADIOSONDE MONITORING STATISTICS (SHIPS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
XQFJRG	12	V	100	5	4.4	-1.7	1.3
XQFJX	00	V	100	4	3.4	0.9	0.2
XQFJX	12	V	100	4	3.1	-1.7	-1.1

3.2.27 Figure 14 - SATOB Winds: 700-1000hPa

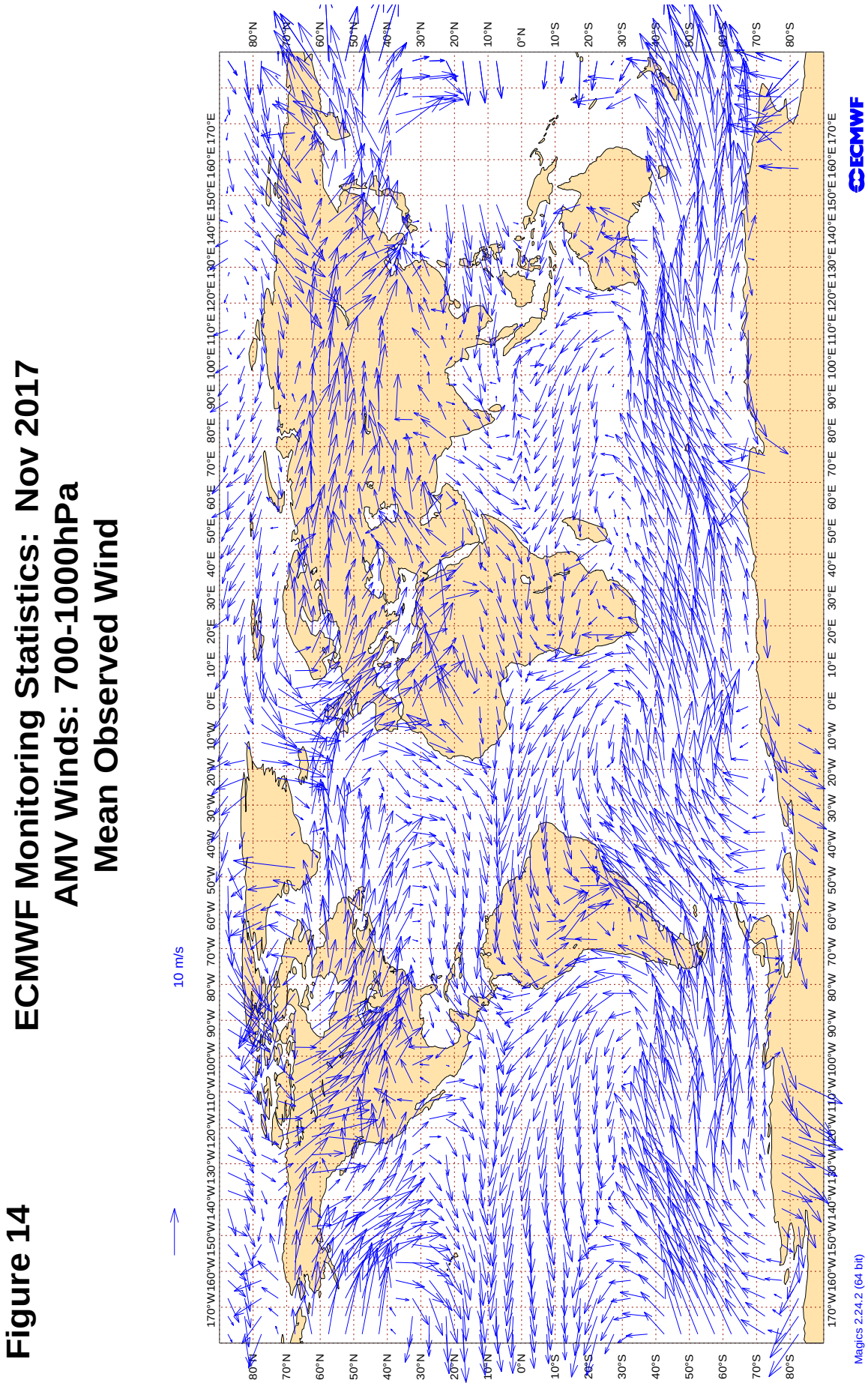


Figure 14

3.2.28 Figure 15 - SATOB Winds: 150- 400hPa

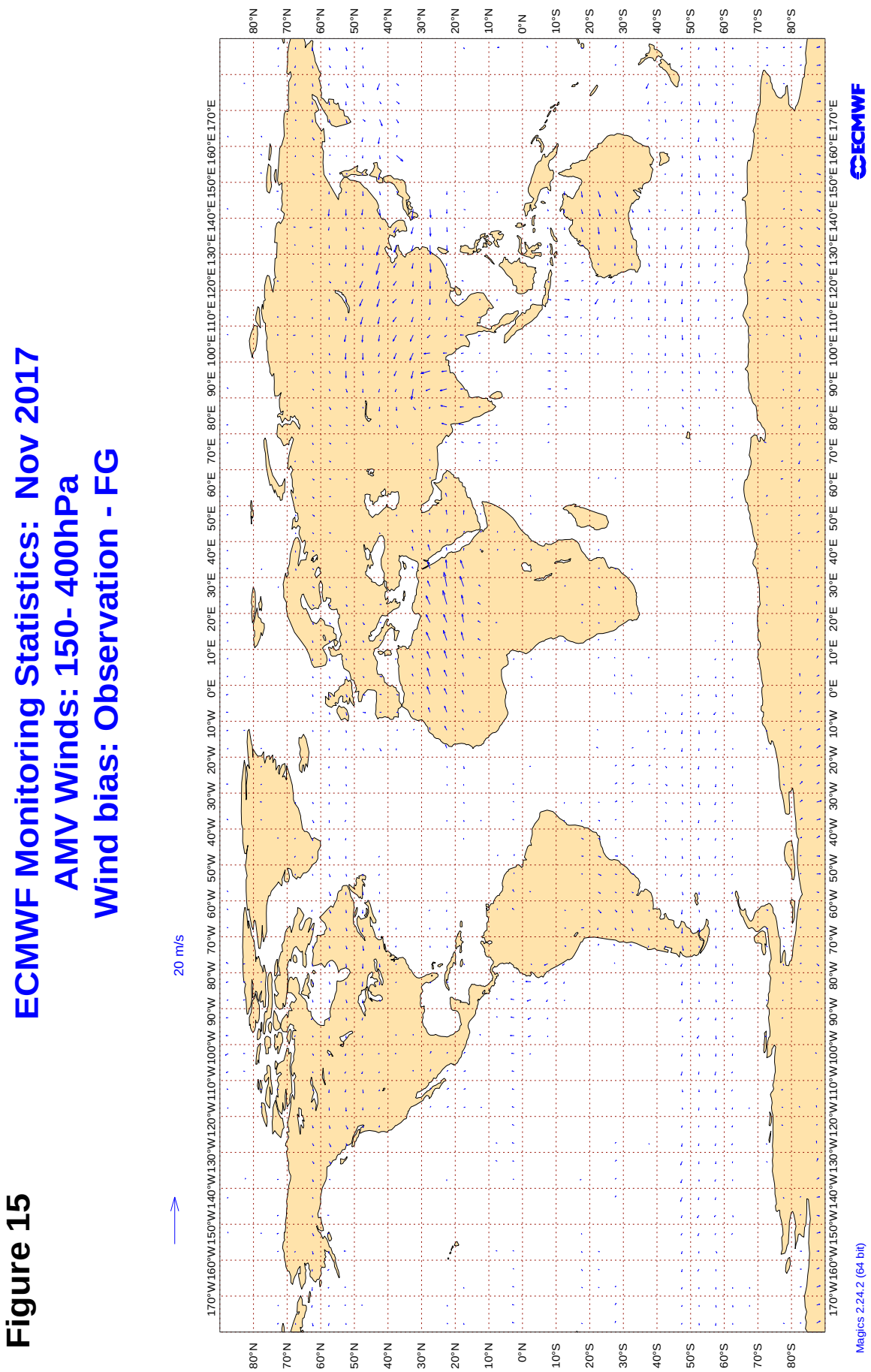


Figure 15

3.2.29 Figure 16 - SATOB Winds: 700-1000hPa

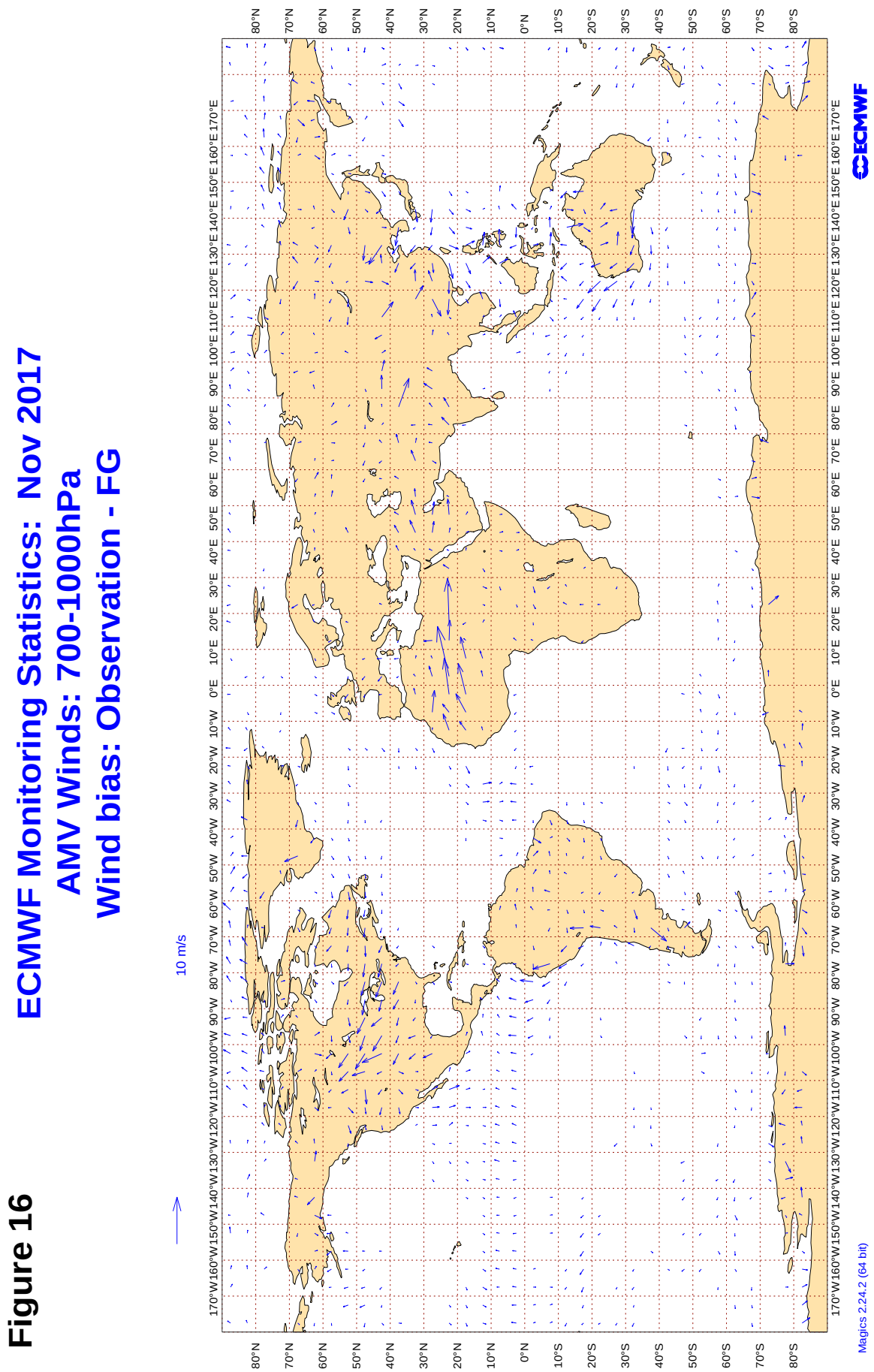


Figure 16

3.2.30 Figure 17 - SATOB Winds: 150- 400hPa

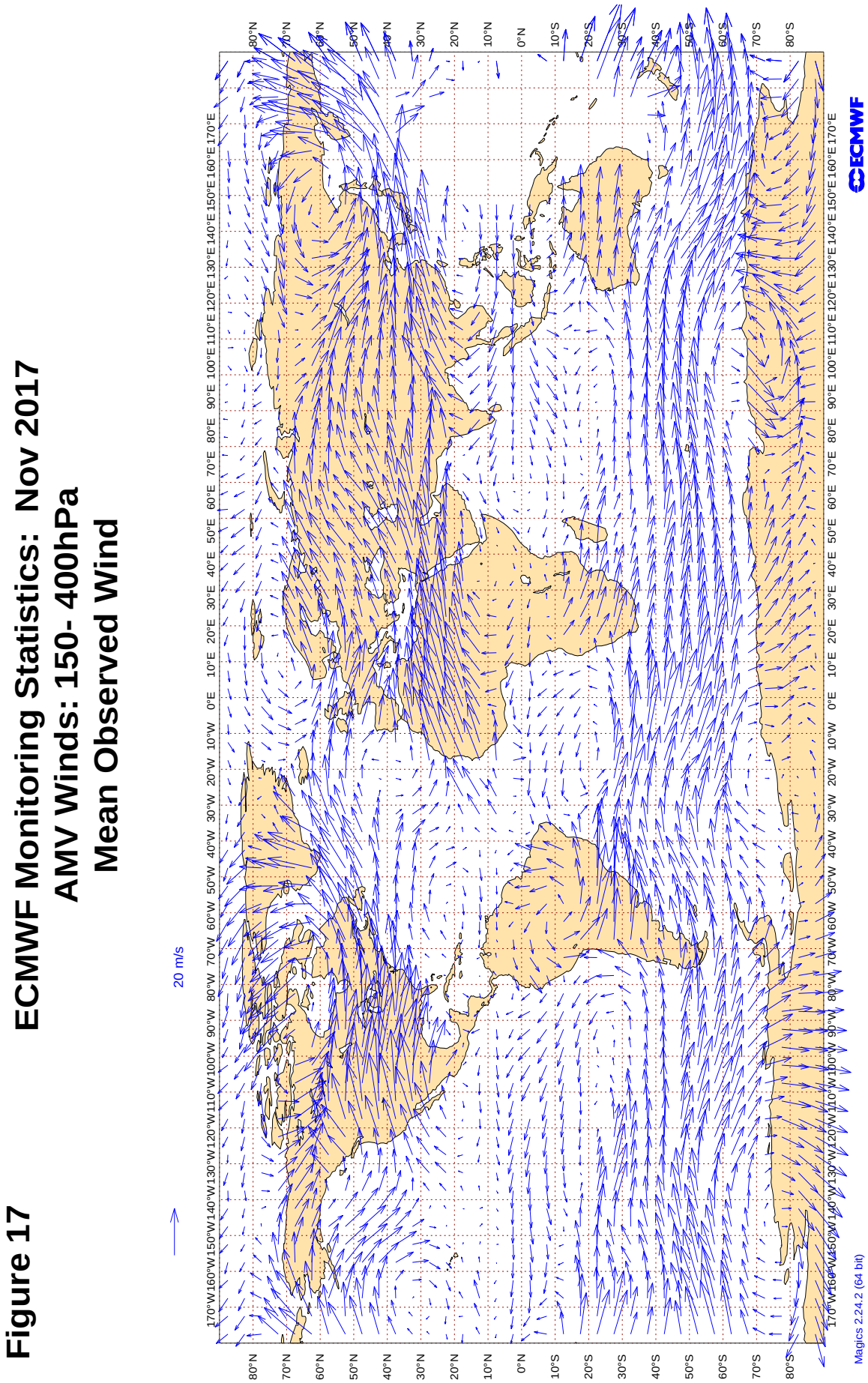


Figure 17

3.2.31 Figure 18 - AIRCRAFT Winds: 150- 300hPa

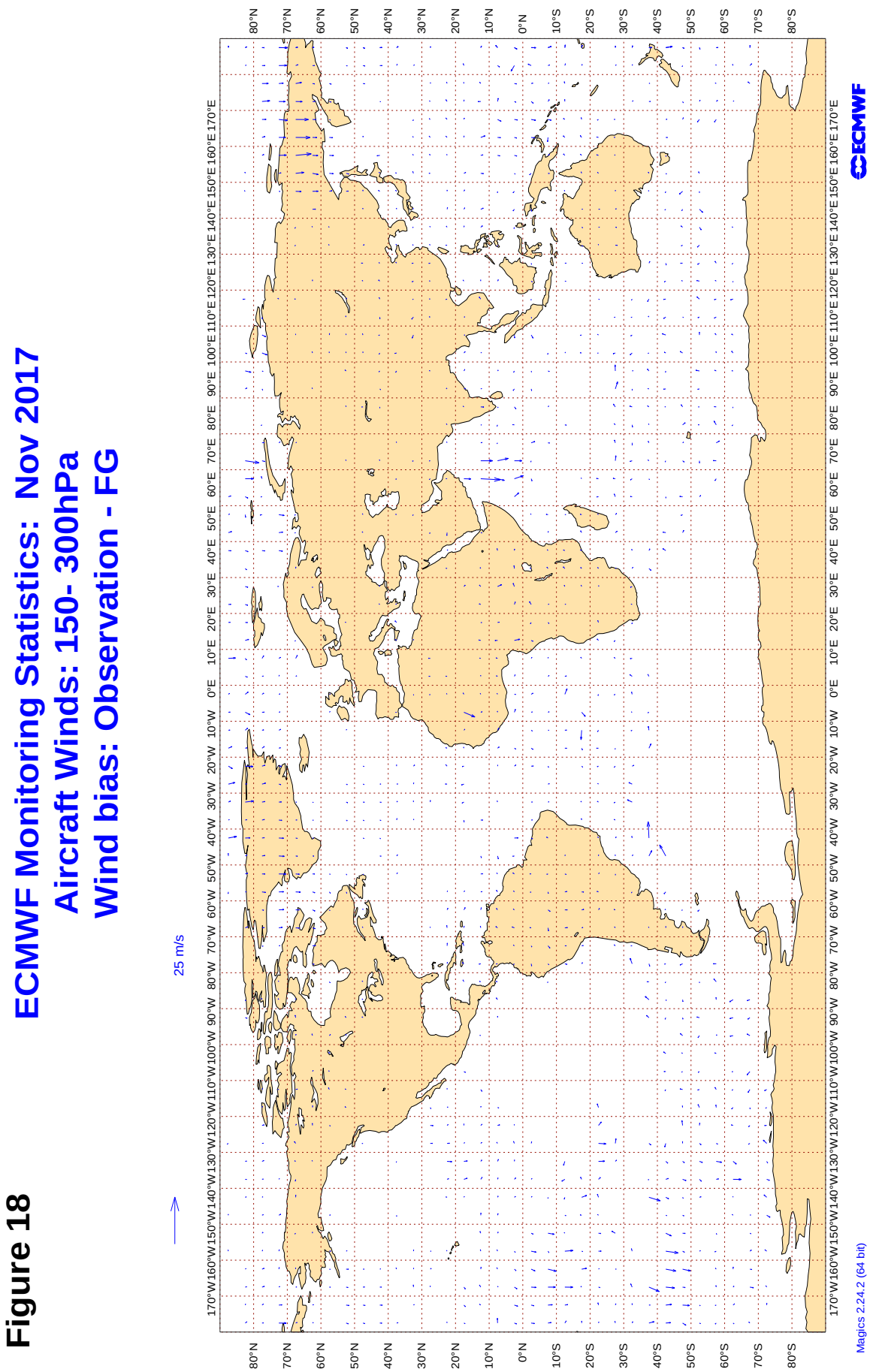


Figure 18

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                : NOV 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	133	0	0	4.0	-0.4
AAL	99	V	300-150	42846	2	0	5.9	0.2
AAR	99	V	300-150	299	0	1	4.4	-1.3
ABD	99	V	300-150	848	0	0	4.6	-0.3
ABP	99	V	300-150	41	0	0	4.3	-1.5
ABW	99	V	300-150	1061	0	0	3.9	-0.7
ABX	99	V	300-150	40	0	10	5.4	0.0
ACA	99	V	300-150	25278	6	0	6.1	0.2
ACI	99	V	300-150	2475	0	0	4.8	0.6
AEA	99	V	300-150	866	1	0	6.2	-0.0
AFL	99	V	300-150	2465	0	0	3.7	0.6
AFR	99	V	300-150	26711	1	0	4.2	0.1
AHY	99	V	300-150	194	27	0	8.7	-0.1
AIC	99	V	300-150	1652	5	0	5.8	-0.0
AMX	99	V	300-150	3448	18	0	9.2	0.0
ANZ	99	V	300-150	22941	1	0	5.7	0.7
AOJ	99	V	300-150	51	0	0	3.5	0.0
ASA	99	V	300-150	833	1	0	5.2	0.6
ASL	99	V	300-150	515	0	0	3.3	0.1
ASV	99	V	300-150	27	0	4	3.4	1.3
ASY	99	V	300-150	124	0	0	5.1	0.1
ATN	99	V	300-150	75	0	4	4.4	0.9
AUA	99	V	300-150	3852	0	0	4.4	-0.3

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
AUH	99	V	300-150	46	11	0	7.2	0.0
AVA	99	V	300-150	399	7	0	7.3	0.4
AWC	99	V	300-150	24	0	0	1.9	-0.1
AXM	99	V	300-150	181	0	1	4.8	0.0
AXY	99	V	300-150	25	0	0	3.9	-0.8
AZA	99	V	300-150	6521	0	0	3.9	0.2
AZG	99	V	300-150	219	0	1	4.3	-0.2
BAH	99	V	300-150	45	0	0	4.0	0.8
BAW	99	V	300-150	53312	3	0	5.1	0.0
BBA	99	V	300-150	21	0	0	4.1	-2.3
BEE	99	V	300-150	44	0	0	3.9	-0.2
BEL	99	V	300-150	1639	0	0	3.9	0.2
BLU	99	V	300-150	77	0	0	4.1	-0.4
BMW	99	V	300-150	116	0	0	3.5	-0.3
BOE	99	V	300-150	24	13	0	3.0	0.2
BOX	99	V	300-150	1795	0	0	3.8	0.1
BOX	99	V	300-150	109	0	0	3.3	-0.4
BRJ	99	V	300-150	24	100	0	0.0	0.0
BRK	99	V	300-150	82	0	0	5.7	1.0
BVR	99	V	300-150	43	0	0	3.0	0.9
CAL	99	V	300-150	276	0	0	4.8	0.3
CAT	99	V	300-150	27	0	0	6.4	2.6
CAZ	99	V	300-150	119	0	0	2.9	0.2
CCA	99	V	300-150	1725	0	0	4.8	0.9
CEF	99	V	300-150	49	0	0	3.7	0.6
CES	99	V	300-150	979	0	0	3.9	0.8
CFC	99	V	300-150	405	0	0	4.5	0.4
CFG	99	V	300-150	4364	0	0	4.3	-0.3
CHH	99	V	300-150	131	0	0	4.4	0.2
CJT	99	V	300-150	469	0	0	4.5	-0.2
CKS	99	V	300-150	1555	0	0	3.9	0.0
CLU	99	V	300-150	246	0	0	3.9	-0.2
CLX	99	V	300-150	3649	0	0	4.2	-0.4
CMB	99	V	300-150	534	0	0	4.4	-0.8
CNV	99	V	300-150	97	0	0	3.8	-0.1
CPA	99	V	300-150	694	0	0	3.6	0.0
CRK	99	V	300-150	770	0	0	3.9	0.4
CRL	99	V	300-150	745	0	0	3.4	-0.2
CRV	99	V	300-150	93	0	0	4.7	-0.7
CSC	99	V	300-150	166	0	0	3.8	0.5
CSN	99	V	300-150	871	0	0	7.8	0.3
CXB	99	V	300-150	32	0	0	2.8	0.5
DAH	99	V	300-150	743	0	0	3.8	0.2

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
DAL	99	V	300-150	55890	0	0	4.0	0.1
DCS	99	V	300-150	31	0	0	3.2	0.2
DGX	99	V	300-150	63	0	0	4.2	-0.1
DHK	99	V	300-150	1219	0	0	4.6	-0.0
DJT	99	V	300-150	1487	0	0	4.8	0.5
DLH	99	V	300-150	30291	0	0	3.8	0.1
DSO	99	V	300-150	21	0	0	5.1	-1.9
DUB	99	V	300-150	107	0	0	3.8	-0.5
EDG	99	V	300-150	74	14	1	19.0	1.0
EDW	99	V	300-150	1336	0	0	3.9	0.1
EIN	99	V	300-150	15264	0	0	3.9	0.3
EJM	99	V	300-150	673	11	0	6.9	-0.2
ELY	99	V	300-150	3444	5	0	5.5	0.1
ETD	99	V	300-150	3732	4	0	4.8	-0.1
ETH	99	V	300-150	2189	8	0	6.0	0.1
EVE	99	V	300-150	40	0	0	3.0	-0.1
EWG	99	V	300-150	2504	0	0	3.8	0.2
EXS	99	V	300-150	81	0	1	3.7	0.3
FDX	99	V	300-150	5791	0	0	3.9	0.1
FIN	99	V	300-150	895	0	0	3.5	0.3
FJI	99	V	300-150	5173	0	0	5.0	1.0
FPG	99	V	300-150	40	0	0	4.3	-0.8
FWI	99	V	300-150	1450	0	0	3.6	0.0
FYG	99	V	300-150	39	0	0	3.5	1.0
FYL	99	V	300-150	42	0	0	4.4	-0.2
GAF	99	V	300-150	104	0	1	3.4	0.3
GCR	99	V	300-150	118	0	0	3.7	0.3
GEC	99	V	300-150	2768	0	0	3.6	0.2
GES	99	V	300-150	66	0	0	4.4	0.6
GLO	99	V	300-150	35	9	3	8.1	1.2
GMA	99	V	300-150	28	0	0	3.4	1.7
GTH	99	V	300-150	23	0	0	3.5	0.4
GTI	99	V	300-150	2272	0	0	4.1	-0.2
HAL	99	V	300-150	3584	0	0	5.2	1.2
HAN	99	V	300-150	31	0	0	4.5	0.1
HRS	99	V	300-150	30	0	0	3.5	-0.0
HRT	99	V	300-150	87	16	0	12.9	-0.2
HZM	99	V	300-150	36	0	0	3.8	0.5
HZS	99	V	300-150	49	0	0	3.2	-1.0
HZS	99	V	300-150	89	0	0	3.4	0.0
IBE	99	V	300-150	2148	0	0	4.0	-0.0
IBK	99	V	300-150	216	0	0	4.0	-0.1
ICE	99	V	300-150	96	1	18	9.1	-2.3

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
ICL	99	V	300-150	938	0	0	4.6	-0.2
ICV	99	V	300-150	271	0	0	4.4	-0.6
IFA	99	V	300-150	29	66	0	26.4	0.1
IJM	99	V	300-150	22	0	0	4.2	0.1
ISS	99	V	300-150	243	0	0	6.8	-1.5
JAF	99	V	300-150	1131	7	0	7.1	-0.5
JAI	99	V	300-150	1183	0	0	3.7	0.3
JAS	99	V	300-150	241	0	0	3.9	0.2
JET	99	V	300-150	21	0	0	2.8	1.1
JJA	99	V	300-150	54	0	0	5.2	0.4
JME	99	V	300-150	42	0	0	4.7	-0.2
JST	99	V	300-150	2194	0	0	8.4	0.9
KAC	99	V	300-150	1144	0	0	3.9	0.4
KAI	99	V	300-150	86	0	0	6.0	-0.4
KAL	99	V	300-150	1946	0	0	4.7	0.7
KAY	99	V	300-150	68	0	0	3.2	0.2
KCE	99	V	300-150	22	0	0	3.0	0.1
KIW	99	V	300-150	67	0	0	3.2	0.8
KLM	99	V	300-150	18248	2	0	4.6	-0.0
LAN	99	V	300-150	2168	8	0	9.2	0.2
LCO	99	V	300-150	98	0	0	3.7	0.2
LDM	99	V	300-150	41	0	0	3.7	-0.2
LEA	99	V	300-150	34	0	0	3.5	-0.9
LOT	99	V	300-150	2304	22	0	9.2	-0.2
LPE	99	V	300-150	67	3	0	6.0	-0.5
LUC	99	V	300-150	66	0	0	3.7	0.7
LXJ	99	V	300-150	213	16	0	6.3	0.3
MAS	99	V	300-150	365	0	0	3.8	0.7
MLN	99	V	300-150	51	0	0	4.2	0.2
MMD	99	V	300-150	307	0	0	3.8	0.2
MNB	99	V	300-150	63	0	0	3.8	0.4
MPH	99	V	300-150	770	0	0	4.6	-0.6
MSR	99	V	300-150	1255	0	0	3.8	0.1
NAX	99	V	300-150	12186	15	0	8.6	-0.1
NCA	99	V	300-150	357	0	0	4.0	-1.4
NJE	99	V	300-150	358	0	0	3.7	-0.1
NOS	99	V	300-150	452	0	0	5.5	-0.3
NWS	99	V	300-150	440	0	0	3.8	0.1
OAE	99	V	300-150	392	0	1	4.3	0.0
OLI	99	V	300-150	24	0	0	2.4	-0.3
OPM	99	V	300-150	23	0	0	3.8	-0.4
PAC	99	V	300-150	215	0	0	4.6	0.7
PAL	99	V	300-150	57	2	0	7.1	0.5

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
PAT	99	V	300-150	43	0	2	3.6	0.4
PEG	99	V	300-150	23	0	4	3.9	1.4
PIA	99	V	300-150	178	0	0	3.9	0.3
PIT	99	V	300-150	20	0	0	9.0	-0.3
PLF	99	V	300-150	56	0	0	4.0	-0.1
PLM	99	V	300-150	53	0	0	4.3	0.0
PRD	99	V	300-150	22	0	5	3.2	1.3
QFA	99	V	300-150	17035	0	0	4.9	0.8
QTR	99	V	300-150	9697	2	0	4.6	0.0
RAM	99	V	300-150	485	13	0	10.4	0.4
RCH	99	V	300-150	4339	0	0	4.5	0.2
RDN	99	V	300-150	32	0	0	3.1	0.7
RJA	99	V	300-150	1300	16	0	9.4	-0.2
ROJ	99	V	300-150	74	0	0	3.7	-0.2
ROU	99	V	300-150	967	0	0	4.8	-0.3
RRR	99	V	300-150	185	0	0	4.0	0.0
RSY	99	V	300-150	338	0	0	3.5	0.1
SAM	99	V	300-150	101	0	1	4.2	-0.7
SAS	99	V	300-150	4172	0	0	3.5	0.2
SDM	99	V	300-150	109	0	0	4.0	0.0
SHE	99	V	300-150	100	0	0	3.3	0.8
SIA	99	V	300-150	2893	0	0	3.6	0.1
SIO	99	V	300-150	45	0	0	4.2	-0.7
SLM	99	V	300-150	183	0	0	3.4	-0.1
SOL	99	V	300-150	20	0	0	5.1	0.9
SOO	99	V	300-150	579	0	0	3.9	-0.2
SPA	99	V	300-150	154	0	0	3.7	0.0
SQC	99	V	300-150	672	0	0	4.1	-0.7
SUI	99	V	300-150	47	0	0	5.8	2.0
SVA	99	V	300-150	2905	4	0	5.2	0.2
SVW	99	V	300-150	138	0	0	4.1	-0.2
SWR	99	V	300-150	10928	0	0	3.8	0.1
TAM	99	V	300-150	324	0	0	3.9	0.1
TAP	99	V	300-150	1111	0	0	4.1	0.4
TAR	99	V	300-150	111	0	0	3.3	0.0
TAY	99	V	300-150	427	0	0	4.6	-0.3
TBJ	99	V	300-150	41	0	0	3.7	-0.5
TCX	99	V	300-150	3609	0	0	3.8	0.3
TFL	99	V	300-150	2027	8	0	7.7	-0.0
THA	99	V	300-150	272	0	0	6.9	0.1
THT	99	V	300-150	3307	0	0	4.1	0.2
THY	99	V	300-150	8126	0	0	3.9	0.2
TMN	99	V	300-150	75	0	24	4.5	0.4

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
TOM	99	V	300-150	5505	10	0	8.8	-0.1
TOW	99	V	300-150	84	0	0	3.0	0.2
TRE	99	V	300-150	54	0	0	3.8	-1.0
TRK	99	V	300-150	66	0	2	4.2	0.1
TSC	99	V	300-150	3940	0	0	3.9	0.1
TVP	99	V	300-150	119	0	0	3.5	-0.0
TWB	99	V	300-150	39	3	0	5.8	-0.5
TWY	99	V	300-150	154	8	0	10.0	-0.3
UAE	99	V	300-150	9957	0	0	3.9	0.0
UAL	99	V	300-150	70982	1	2	5.5	0.2
ULC	99	V	300-150	175	0	0	4.0	-0.6
UPS	99	V	300-150	4736	0	0	4.3	0.2
UZB	99	V	300-150	73	11	0	7.0	-0.2
VAL	99	V	300-150	23	0	0	2.2	-0.3
VCN	99	V	300-150	100	0	0	3.3	0.0
VIR	99	V	300-150	19461	3	0	5.0	-0.0
VJT	99	V	300-150	836	48	0	16.6	0.3
VKG	99	V	300-150	462	0	0	3.6	-0.0
VMP	99	V	300-150	58	0	0	3.7	1.0
VOZ	99	V	300-150	5620	0	0	5.0	0.7
VRD	99	V	300-150	40	5	3	5.8	-0.3
WGN	99	V	300-150	22	0	0	5.8	-3.0
WGT	99	V	300-150	52	0	0	3.2	-0.4
WJA	99	V	300-150	2941	1	0	5.0	0.2
WOW	99	V	300-150	46	2	9	3.3	0.0
XAX	99	V	300-150	378	0	1	3.8	0.7
XLF	99	V	300-150	740	0	0	3.7	0.1

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 $10\,^{\circ}$N - $90\,^{\circ}$N, $70\,^{\circ}$W - $40\,^{\circ}$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 $10\,^{\circ}$N - $90\,^{\circ}$N, $70\,^{\circ}$W - $40\,^{\circ}$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)

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RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
         LEVEL                 :  50 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : NOV 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
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WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	50	26	10.8	7.9
01001	00	Z	50	23	12.0	9.5
01028	00	Z	50	28	7.7	4.3
01028	12	Z	50	29	8.9	5.5
01400	00	Z	50	15	38.2	33.9
01400	12	Z	50	16	37.1	25.0
01415	12	Z	50	30	14.7	11.9
01415	00	Z	50	29	19.1	16.7
02365	12	Z	50	7	16.7	13.7
02365	00	Z	50	6	12.9	10.9
02591	00	Z	50	22	17.3	16.4
02591	12	Z	50	22	17.7	16.1
02836	12	Z	50	30	11.6	7.7
02836	00	Z	50	29	11.6	8.5
02963	12	Z	50	29	14.9	11.9
02963	00	Z	50	27	12.2	8.9
03005	00	Z	50	27	16.1	6.7
03005	12	Z	50	29	17.1	12.7
03238	00	Z	50	4	26.8	24.6
03238	12	Z	50	4	28.1	22.8
03808	12	Z	50	29	16.5	14.0
03808	00	Z	50	29	17.1	14.8
03918	00	Z	50	26	22.8	16.7
03918	12	Z	50	10	17.1	15.1
03953	12	Z	50	27	22.9	14.9
03953	00	Z	50	29	23.9	15.0
04018	12	Z	50	28	16.8	12.8
04018	00	Z	50	30	23.3	10.7
04220	00	Z	50	28	14.3	10.2
04220	12	Z	50	30	10.4	7.8
04270	12	Z	50	28	24.9	5.0
04270	00	Z	50	28	15.7	8.0
04320	12	Z	50	30	13.6	11.2
04320	00	Z	50	28	13.6	8.9
04339	12	Z	50	29	35.8	9.1
04339	00	Z	50	30	12.4	10.1
04360	12	Z	50	18	51.5	48.8
04360	00	Z	50	10	63.9	58.9
06011	12	Z	50	27	22.8	15.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	50	29	21.9	15.7
06260	00	Z	50	29	19.2	11.0
06260	12	Z	50	5	19.5	17.9
06610	12	Z	50	28	18.0	14.5
06610	00	Z	50	29	20.3	9.7
07110	12	Z	50	31	39.6	37.1
07110	00	Z	50	29	37.5	35.8
07510	12	Z	50	29	38.7	36.5
07510	00	Z	50	25	27.3	25.1
07645	12	Z	50	28	33.0	29.3
07645	00	Z	50	29	30.9	30.0
07761	12	Z	50	29	54.2	50.9
07761	00	Z	50	28	54.2	53.2
08001	12	Z	50	26	30.4	22.3
08221	12	Z	50	30	21.6	19.2
08221	00	Z	50	29	21.0	19.4
08302	12	Z	50	25	12.1	7.8
08302	00	Z	50	25	14.3	12.3
08508	12	Z	50	28	27.0	23.2
08522	12	Z	50	27	29.9	27.5
08579	12	Z	50	30	33.9	32.6
10035	00	Z	50	28	25.8	24.9
10035	12	Z	50	29	22.4	21.2
10393	00	Z	50	29	14.1	11.4
10393	12	Z	50	30	12.9	9.8
10410	12	Z	50	30	15.4	11.0
10410	00	Z	50	31	13.8	11.2
10739	12	Z	50	30	13.9	10.7
10739	00	Z	50	27	15.9	13.8
11035	12	Z	50	30	18.3	15.3
11035	00	Z	50	30	20.1	18.5
12982	00	Z	50	28	18.2	13.4
12982	12	Z	50	27	57.4	44.1
16080	12	Z	50	30	12.2	9.2
16080	00	Z	50	30	15.6	12.2
16245	12	Z	50	29	16.4	7.3
16245	00	Z	50	29	14.8	13.3
16320	00	Z	50	30	22.4	20.6
16320	12	Z	50	28	25.4	21.9
16429	12	Z	50	29	19.0	16.8
16429	00	Z	50	30	15.3	12.9
16622	00	Z	50	25	24.7	22.9
16754	00	Z	50	25	25.0	21.9

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	50	29	26.4	25.0
26435	00	Z	50	13	18.4	10.8
60018	00	Z	50	29	15.5	13.9
60018	12	Z	50	29	15.4	13.6
7JUNA4	00	Z	50	5	20.5	-17.6
7JUNA4	12	Z	50	7	29.2	8.0
ASDE09	12	Z	50	2	39.4	37.5
ASDE9	12	Z	50	1	57.3	57.3
ASDK01	12	Z	50	7	27.4	25.0
ASDK01	00	Z	50	8	28.4	17.9
ASDK02	12	Z	50	0	0.0	0.0
ASDK03	12	Z	50	12	29.1	21.6
ASDK03	00	Z	50	12	28.4	26.8
ASDK1	12	Z	50	7	21.3	17.6
ASDK1	00	Z	50	8	28.0	13.6
ASDK2	12	Z	50	0	0.0	0.0
ASDK3	00	Z	50	12	28.3	24.7
ASDK3	12	Z	50	12	29.6	20.6
ASFR1	12	Z	50	11	30.8	29.0
ASFR1	00	Z	50	11	22.9	21.4
ASFR2	00	Z	50	2	62.2	61.6
ASFR2	12	Z	50	4	57.7	56.2
ASFR3	00	Z	50	11	41.2	40.1
ASFR3	12	Z	50	12	43.3	41.8
ASFR4	12	Z	50	13	53.5	40.5
ASFR4	00	Z	50	20	36.8	33.4
FPUW5G	12	Z	50	8	16.0	14.9
FPUWN	12	Z	50	8	14.8	13.7
JNKN7J	00	Z	50	3	41.4	39.3
JNKN7J	12	Z	50	1	88.1	88.1
KMPLHP	12	Z	50	1	31.1	31.1
KMPLHP	00	Z	50	2	34.1	30.7
LRYQE3	12	Z	50	5	65.4	60.9
LRYQE3	00	Z	50	5	15.0	14.2
VKB4L5	12	Z	50	5	49.7	48.6
VKB4L5	00	Z	50	2	50.5	50.5
VKB4Q	00	Z	50	1	50.2	50.2
XQFJRG	00	Z	50	5	11.7	8.4
XQFJRG	12	Z	50	5	14.6	14.1
XQFJX	00	Z	50	4	7.8	6.3
XQFJX	12	Z	50	3	10.0	6.3

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                : NOV 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	50	26	4.6	0.7	-0.5
01001	00	V	50	23	4.0	0.0	-0.5
01028	00	V	50	28	3.5	0.2	0.3
01028	12	V	50	29	3.2	0.0	0.3
01400	00	V	50	11	3.0	0.9	0.3
01400	12	V	50	9	6.3	3.9	0.4
01415	12	V	50	30	5.7	0.4	1.0
01415	00	V	50	28	6.0	-1.4	0.9
02365	12	V	50	4	2.2	0.4	-0.8
02365	00	V	50	4	7.2	2.5	-3.0
02591	00	V	50	21	3.8	-0.6	-0.2
02591	12	V	50	22	4.1	0.6	-0.9
02836	12	V	50	30	3.8	-0.3	-0.5
02836	00	V	50	29	4.0	-0.1	0.2
02963	12	V	50	27	3.3	0.8	-0.6
02963	00	V	50	27	3.5	-1.2	0.1
03005	00	V	50	24	4.4	0.1	-0.8
03005	12	V	50	29	4.2	1.0	0.8
03238	00	V	50	4	6.6	3.3	0.5
03238	12	V	50	4	5.1	0.5	-2.2
03808	12	V	50	27	4.0	1.1	1.0
03808	00	V	50	28	4.0	-0.1	-0.2
03918	00	V	50	26	5.2	0.8	-0.9
03918	12	V	50	10	6.9	3.0	-0.3
03953	12	V	50	27	4.6	0.4	0.3
03953	00	V	50	29	3.3	0.4	-0.3
04018	12	V	50	27	4.2	-0.5	-0.6
04018	00	V	50	29	4.6	0.2	0.4
04220	00	V	50	27	3.8	-0.4	-0.3
04220	12	V	50	29	4.1	-0.2	-0.8
04270	12	V	50	28	8.9	0.7	0.2
04270	00	V	50	28	5.4	-0.4	-0.5
04320	12	V	50	30	3.0	-0.5	0.3
04320	00	V	50	28	3.3	-0.2	0.2
04339	12	V	50	29	3.8	-0.3	0.1
04339	00	V	50	30	3.6	0.2	-0.2
04360	12	V	50	18	3.4	0.2	-0.4
04360	00	V	50	10	4.4	-0.1	-0.3
06011	12	V	50	27	4.0	0.0	0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	50	29	3.9	-1.0	0.1
06260	00	V	50	29	4.6	-0.1	0.2
06260	12	V	50	5	3.0	-1.2	1.1
06610	12	V	50	28	5.2	-0.1	2.3
06610	00	V	50	28	4.2	1.1	0.4
07110	12	V	50	30	4.0	1.3	0.3
07110	00	V	50	28	4.5	0.2	0.9
07510	12	V	50	29	3.8	1.3	0.1
07510	00	V	50	24	3.4	1.1	0.2
07645	12	V	50	28	5.7	1.5	0.1
07645	00	V	50	28	5.7	1.7	0.4
07761	12	V	50	28	4.6	0.8	1.2
07761	00	V	50	28	4.3	1.2	0.4
08001	12	V	50	25	4.5	1.8	0.6
08221	12	V	50	30	4.5	0.5	-0.6
08221	00	V	50	29	3.8	1.5	0.6
08302	12	V	50	24	3.8	0.4	-0.5
08302	00	V	50	25	3.7	0.6	1.0
08508	12	V	50	25	4.3	1.9	0.4
08522	12	V	50	27	4.3	1.2	0.9
08579	12	V	50	29	4.4	0.9	1.0
10035	00	V	50	26	5.0	-0.6	0.4
10035	12	V	50	28	4.5	0.8	0.6
10393	00	V	50	28	4.0	-0.8	1.0
10393	12	V	50	30	3.2	1.0	0.1
10410	12	V	50	28	3.8	0.4	-0.1
10410	00	V	50	28	3.5	-0.2	0.6
10739	12	V	50	30	4.4	1.2	0.4
10739	00	V	50	26	4.0	0.7	0.5
11035	12	V	50	30	3.8	1.1	-1.4
11035	00	V	50	30	4.2	-0.7	-0.1
12982	00	V	50	28	3.7	0.7	-0.2
12982	12	V	50	27	4.3	1.6	-0.6
16080	12	V	50	30	4.1	0.8	0.1
16080	00	V	50	30	3.7	0.6	0.5
16245	12	V	50	29	4.5	0.3	1.8
16245	00	V	50	29	3.0	0.0	-0.5
16320	00	V	50	29	4.5	1.4	0.7
16320	12	V	50	28	4.4	1.7	0.2
16429	12	V	50	29	3.8	0.4	0.5
16429	00	V	50	29	4.5	1.6	0.1
16622	00	V	50	25	4.3	1.3	-0.3
16754	00	V	50	21	5.4	1.6	0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	50	28	4.8	0.7	-0.9
26435	00	V	50	13	4.0	-1.4	0.6
60018	00	V	50	27	4.0	0.0	0.7
60018	12	V	50	29	3.9	0.0	0.0
7JUNA4	00	V	50	5	3.5	-2.7	0.5
7JUNA4	12	V	50	7	4.4	-1.6	1.5
ASDE09	12	V	50	1	5.1	-4.0	3.1
ASDE9	12	V	50	1	5.6	-1.5	5.4
ASDK01	12	V	50	7	3.4	-0.3	0.9
ASDK01	00	V	50	8	4.8	-1.6	0.0
ASDK02	12	V	50	0	0.0	0.0	0.0
ASDK03	12	V	50	12	4.7	-2.8	-0.4
ASDK03	00	V	50	10	4.9	1.4	-0.2
ASDK1	12	V	50	7	3.9	0.5	0.7
ASDK1	00	V	50	8	4.8	-0.6	-0.3
ASDK2	12	V	50	0	0.0	0.0	0.0
ASDK3	00	V	50	10	5.6	2.5	-0.1
ASDK3	12	V	50	12	4.7	-2.7	-0.5
ASFR1	12	V	50	8	3.2	-0.2	0.7
ASFR1	00	V	50	8	3.7	1.0	1.3
ASFR2	00	V	50	2	2.8	0.3	-1.1
ASFR2	12	V	50	4	3.5	-0.6	1.1
ASFR3	00	V	50	8	4.0	0.5	-0.4
ASFR3	12	V	50	9	3.0	0.6	0.0
ASFR4	12	V	50	11	4.0	-1.4	1.3
ASFR4	00	V	50	15	3.0	1.4	0.6
FPUW5G	12	V	50	8	6.4	2.0	1.5
FPUWN	12	V	50	8	6.1	1.0	1.1
JNKN7J	00	V	50	3	5.3	3.6	2.6
JNKN7J	12	V	50	1	2.3	2.2	-0.5
KMPLHP	12	V	50	1	1.5	1.0	1.1
KMPLHP	00	V	50	1	7.0	-6.4	2.8
LRYQE3	12	V	50	5	5.1	1.2	-0.9
LRYQE3	00	V	50	5	1.4	-0.5	0.3
VKB4L5	12	V	50	5	4.7	-0.4	0.5
VKB4L5	00	V	50	1	4.0	0.3	4.0
VKB4Q	00	V	50	1	4.3	-1.0	4.2
XQFJRG	00	V	50	4	5.9	1.5	-0.1
XQFJRG	12	V	50	3	4.9	0.8	1.5
XQFJX	00	V	50	4	4.2	0.6	-0.6
XQFJX	12	V	50	3	5.2	0.7	0.5

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                : NOV 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	100	30	8.7	-2.0
01001	00	Z	100	28	15.8	-3.9
01028	00	Z	100	28	7.9	-5.3
01028	12	Z	100	30	6.2	-3.4
01400	00	Z	100	18	23.6	16.8
01400	12	Z	100	23	22.5	8.5
01415	12	Z	100	30	7.7	1.2
01415	00	Z	100	29	7.8	4.5
02365	12	Z	100	13	6.3	3.9
02365	00	Z	100	13	7.4	4.4
02591	00	Z	100	23	7.9	6.9
02591	12	Z	100	22	8.6	7.2
02836	12	Z	100	30	6.5	-1.9
02836	00	Z	100	30	7.5	-1.9
02963	12	Z	100	30	5.8	0.8
02963	00	Z	100	29	5.5	-0.2
03005	00	Z	100	30	7.8	-0.2
03005	12	Z	100	30	10.8	0.6
03238	00	Z	100	4	14.9	7.5
03238	12	Z	100	4	13.9	-4.4
03808	12	Z	100	30	9.9	5.7
03808	00	Z	100	30	8.2	5.7
03918	00	Z	100	28	13.6	6.7
03918	12	Z	100	10	12.2	8.5
03953	12	Z	100	27	11.4	1.2
03953	00	Z	100	29	12.4	3.4
04018	12	Z	100	29	8.5	2.6
04018	00	Z	100	30	13.0	1.8
04220	00	Z	100	28	8.2	3.3
04220	12	Z	100	30	6.3	1.5
04270	12	Z	100	29	17.1	1.2
04270	00	Z	100	28	12.8	-1.3
04320	12	Z	100	30	5.4	1.9
04320	00	Z	100	28	8.2	1.0
04339	12	Z	100	30	34.7	-0.4
04339	00	Z	100	30	7.5	2.0
04360	12	Z	100	25	36.8	34.9
04360	00	Z	100	18	75.6	51.8
06011	12	Z	100	27	13.1	5.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	100	29	11.8	3.6
06260	00	Z	100	29	13.4	0.2
06260	12	Z	100	5	7.8	4.4
06610	12	Z	100	30	8.9	0.8
06610	00	Z	100	30	9.6	1.5
07110	12	Z	100	31	24.3	21.9
07110	00	Z	100	31	19.0	17.5
07510	12	Z	100	30	21.6	19.5
07510	00	Z	100	30	14.4	11.3
07645	12	Z	100	29	15.4	12.3
07645	00	Z	100	30	16.1	13.4
07761	12	Z	100	30	34.5	31.7
07761	00	Z	100	30	36.3	34.8
08001	12	Z	100	28	21.1	10.6
08221	12	Z	100	30	15.2	12.7
08221	00	Z	100	29	14.6	11.8
08302	12	Z	100	28	8.3	0.6
08302	00	Z	100	28	7.9	2.7
08508	12	Z	100	28	18.9	11.6
08522	12	Z	100	27	17.1	14.8
08579	12	Z	100	30	20.1	18.5
10035	00	Z	100	31	16.3	15.0
10035	12	Z	100	30	12.8	11.6
10393	00	Z	100	30	6.7	0.4
10393	12	Z	100	30	5.5	1.7
10410	12	Z	100	31	8.6	-0.7
10410	00	Z	100	31	8.4	-1.0
10739	12	Z	100	30	8.1	1.7
10739	00	Z	100	30	8.3	2.6
11035	12	Z	100	30	9.4	6.8
11035	00	Z	100	30	9.8	6.9
12982	00	Z	100	29	9.0	4.8
12982	12	Z	100	29	21.4	18.6
16080	12	Z	100	30	6.6	-2.8
16080	00	Z	100	30	9.0	1.6
16245	12	Z	100	30	14.3	-3.7
16245	00	Z	100	29	6.2	2.0
16320	00	Z	100	30	13.0	11.0
16320	12	Z	100	28	16.7	14.5
16429	12	Z	100	30	7.7	4.5
16429	00	Z	100	31	7.5	3.5
16622	00	Z	100	25	12.5	10.4
16754	00	Z	100	27	14.2	9.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	100	30	11.6	9.8
26435	00	Z	100	14	11.2	-1.8
60018	00	Z	100	30	7.3	2.7
60018	12	Z	100	30	7.5	3.7
7JUNA4	00	Z	100	10	44.0	-35.5
7JUNA4	12	Z	100	10	29.7	-13.8
ASDE09	12	Z	100	3	23.8	23.1
ASDE9	12	Z	100	1	38.5	38.5
ASDK01	12	Z	100	13	14.4	12.4
ASDK01	00	Z	100	11	30.7	1.5
ASDK02	12	Z	100	1	1.7	1.7
ASDK03	12	Z	100	13	17.8	14.2
ASDK03	00	Z	100	18	23.3	22.2
ASDK1	12	Z	100	9	8.6	3.8
ASDK1	00	Z	100	8	22.6	7.6
ASDK2	12	Z	100	0	0.0	0.0
ASDK3	00	Z	100	13	24.9	21.6
ASDK3	12	Z	100	12	17.6	13.6
ASFR1	12	Z	100	12	16.8	15.2
ASFR1	00	Z	100	14	12.0	7.8
ASFR2	00	Z	100	4	36.5	36.1
ASFR2	12	Z	100	4	39.9	37.6
ASFR3	00	Z	100	13	26.5	25.4
ASFR3	12	Z	100	15	24.6	24.3
ASFR4	12	Z	100	16	33.1	25.3
ASFR4	00	Z	100	21	23.1	19.8
FPUW5G	12	Z	100	20	13.0	10.2
FPUWN	12	Z	100	8	9.1	7.1
JNKN7J	00	Z	100	4	36.6	35.3
JNKN7J	12	Z	100	5	54.7	54.0
KMPLHP	12	Z	100	7	15.3	13.9
KMPLHP	00	Z	100	6	15.1	7.4
LRYQE3	12	Z	100	6	38.9	36.0
LRYQE3	00	Z	100	8	11.1	7.5
VKB4L5	12	Z	100	6	36.2	34.9
VKB4L5	00	Z	100	4	37.3	37.3
VKB4Q	00	Z	100	1	39.8	39.8
XQFJRG	00	Z	100	5	9.6	6.2
XQFJRG	12	Z	100	7	9.9	5.7
XQFJX	00	Z	100	4	4.8	-1.3
XQFJX	12	Z	100	4	7.9	-2.1

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                : NOV 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	100	30	3.4	0.1	0.0
01001	00	V	100	28	2.3	-0.1	-0.1
01028	00	V	100	28	2.8	0.0	-0.8
01028	12	V	100	30	2.8	-0.2	0.3
01400	00	V	100	12	3.4	-1.4	0.5
01400	12	V	100	15	3.8	-0.9	0.7
01415	12	V	100	30	5.5	-0.4	0.3
01415	00	V	100	28	4.9	-0.2	-0.3
02365	12	V	100	11	3.9	-1.9	0.7
02365	00	V	100	10	3.9	1.3	-0.8
02591	00	V	100	23	3.5	-1.0	0.0
02591	12	V	100	22	3.4	0.0	0.1
02836	12	V	100	30	3.2	0.2	-1.1
02836	00	V	100	30	3.7	1.3	-0.4
02963	12	V	100	30	3.1	-0.2	-0.2
02963	00	V	100	29	3.2	0.3	-0.5
03005	00	V	100	28	3.9	-0.1	0.0
03005	12	V	100	30	5.5	0.5	1.4
03238	00	V	100	4	3.8	1.3	0.5
03238	12	V	100	4	8.6	3.9	-0.9
03808	12	V	100	30	3.2	-0.2	0.1
03808	00	V	100	30	3.4	0.3	-0.2
03918	00	V	100	27	3.9	-0.7	0.8
03918	12	V	100	10	4.9	2.9	-1.4
03953	12	V	100	27	4.7	0.4	0.3
03953	00	V	100	29	3.6	0.0	0.0
04018	12	V	100	29	4.3	-0.1	-0.4
04018	00	V	100	29	4.0	0.3	-0.5
04220	00	V	100	28	3.2	0.4	-0.2
04220	12	V	100	30	3.8	-0.2	-0.8
04270	12	V	100	29	6.8	-0.7	0.0
04270	00	V	100	28	5.6	0.3	-0.4
04320	12	V	100	30	3.1	0.5	-0.6
04320	00	V	100	28	2.7	0.2	-0.8
04339	12	V	100	29	3.2	-0.4	-0.2
04339	00	V	100	30	3.3	0.7	0.0
04360	12	V	100	25	4.7	0.5	-0.6
04360	00	V	100	18	4.3	-0.1	-0.6
06011	12	V	100	27	3.1	-0.6	-0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	100	29	4.0	-0.1	-0.7
06260	00	V	100	29	4.0	0.5	0.2
06260	12	V	100	5	2.5	0.8	0.2
06610	12	V	100	30	3.6	0.7	-0.5
06610	00	V	100	29	4.5	0.0	-0.3
07110	12	V	100	30	3.8	-0.1	0.4
07110	00	V	100	30	3.8	0.3	0.3
07510	12	V	100	30	3.2	1.1	-0.3
07510	00	V	100	30	3.2	-0.4	0.4
07645	12	V	100	29	5.3	-0.4	0.2
07645	00	V	100	29	4.5	-0.4	-0.4
07761	12	V	100	30	4.2	0.6	0.0
07761	00	V	100	30	5.9	-0.8	1.0
08001	12	V	100	27	4.5	0.9	0.3
08221	12	V	100	30	4.3	0.1	0.3
08221	00	V	100	29	5.0	0.1	-0.3
08302	12	V	100	28	5.0	0.1	-0.9
08302	00	V	100	28	5.0	0.0	-0.6
08508	12	V	100	25	3.8	-0.5	-0.3
08522	12	V	100	27	3.9	-0.4	0.2
08579	12	V	100	29	3.2	0.3	0.7
10035	00	V	100	30	4.3	-0.6	1.1
10035	12	V	100	30	4.4	0.3	0.2
10393	00	V	100	29	3.5	0.2	0.4
10393	12	V	100	30	4.2	0.6	0.5
10410	12	V	100	30	4.3	1.2	0.2
10410	00	V	100	28	4.1	-0.5	-0.8
10739	12	V	100	30	4.2	0.7	1.2
10739	00	V	100	30	3.6	0.1	1.0
11035	12	V	100	30	5.6	-0.1	-0.1
11035	00	V	100	30	5.2	0.8	0.2
12982	00	V	100	29	4.4	0.9	0.1
12982	12	V	100	29	4.0	0.3	-0.5
16080	12	V	100	30	4.2	-0.4	-0.3
16080	00	V	100	30	4.7	-0.3	0.9
16245	12	V	100	30	5.7	-0.6	0.5
16245	00	V	100	29	3.7	-1.1	0.1
16320	00	V	100	30	4.6	-0.1	0.3
16320	12	V	100	28	4.2	0.9	-1.3
16429	12	V	100	30	4.7	1.2	0.9
16429	00	V	100	29	3.9	0.0	-1.0
16622	00	V	100	25	3.5	0.6	0.0
16754	00	V	100	27	3.9	0.1	-0.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	100	30	3.8	0.8	-0.8
26435	00	V	100	14	2.6	0.1	-0.7
60018	00	V	100	29	4.3	0.6	0.0
60018	12	V	100	30	3.4	1.3	0.6
7JUNA4	00	V	100	9	3.6	-0.2	0.1
7JUNA4	12	V	100	8	3.2	-0.1	0.8
ASDE09	12	V	100	1	5.6	-0.9	5.5
ASDE9	12	V	100	1	4.3	-2.1	3.7
ASDK01	12	V	100	10	5.8	-0.5	0.7
ASDK01	00	V	100	9	3.9	0.7	-0.9
ASDK02	12	V	100	1	1.6	-1.0	1.2
ASDK03	12	V	100	12	3.8	-0.9	1.1
ASDK03	00	V	100	13	4.7	-0.7	-0.9
ASDK1	12	V	100	9	5.7	-1.1	0.1
ASDK1	00	V	100	8	3.3	0.7	-0.6
ASDK2	12	V	100	0	0.0	0.0	0.0
ASDK3	00	V	100	13	5.2	-0.3	-1.4
ASDK3	12	V	100	12	3.3	-0.4	0.2
ASFR1	12	V	100	8	4.0	-0.2	2.2
ASFR1	00	V	100	9	2.9	0.8	0.4
ASFR2	00	V	100	3	2.5	1.5	-0.7
ASFR2	12	V	100	4	6.9	1.4	1.8
ASFR3	00	V	100	9	3.5	0.7	0.5
ASFR3	12	V	100	9	2.8	-0.8	-0.7
ASFR4	12	V	100	12	3.7	-1.0	1.0
ASFR4	00	V	100	15	3.3	-0.3	-0.6
FPUW5G	12	V	100	18	7.2	-3.2	1.3
FPUWN	12	V	100	8	7.5	-4.8	0.9
JNKN7J	00	V	100	4	5.2	-2.0	-3.0
JNKN7J	12	V	100	5	3.8	1.5	-2.2
KMPLHP	12	V	100	5	3.6	0.1	-0.3
KMPLHP	00	V	100	3	4.3	0.8	1.3
LRYQE3	12	V	100	5	4.2	0.4	-2.1
LRYQE3	00	V	100	7	5.3	-0.4	-1.6
VKB4L5	12	V	100	5	2.2	-0.2	0.7
VKB4L5	00	V	100	3	2.8	-0.3	1.3
VKB4Q	00	V	100	1	1.8	-1.5	1.0
XQFJRG	00	V	100	4	3.4	0.1	0.2
XQFJRG	12	V	100	5	4.4	-1.7	1.3
XQFJX	00	V	100	4	3.4	0.9	0.2
XQFJX	12	V	100	4	3.1	-1.7	-1.1

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                : NOV 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	500	30	6.0	-1.0
01001	00	Z	500	30	14.7	-2.8
01028	00	Z	500	28	4.6	-2.6
01028	12	Z	500	31	5.0	-2.2
01400	00	Z	500	24	18.0	10.3
01400	12	Z	500	27	12.4	6.5
01415	12	Z	500	30	5.2	3.2
01415	00	Z	500	29	4.7	3.4
02365	12	Z	500	13	5.4	4.6
02365	00	Z	500	14	8.6	7.9
02591	00	Z	500	23	9.5	9.0
02591	12	Z	500	22	8.8	8.2
02836	12	Z	500	30	3.5	0.8
02836	00	Z	500	30	4.1	1.6
02963	12	Z	500	30	3.3	1.7
02963	00	Z	500	29	4.1	2.3
03005	00	Z	500	32	7.6	-2.7
03005	12	Z	500	30	23.1	-6.8
03238	00	Z	500	4	3.8	2.9
03238	12	Z	500	4	2.7	1.9
03808	12	Z	500	32	5.8	3.9
03808	00	Z	500	30	4.6	3.1
03918	00	Z	500	28	11.4	10.0
03918	12	Z	500	10	16.7	15.4
03953	12	Z	500	31	8.9	0.7
03953	00	Z	500	30	7.2	-0.6
04018	12	Z	500	29	4.1	1.8
04018	00	Z	500	30	6.1	3.1
04220	00	Z	500	29	4.6	3.0
04220	12	Z	500	30	4.7	1.6
04270	12	Z	500	30	5.3	-0.1
04270	00	Z	500	29	5.9	-1.2
04320	12	Z	500	30	5.0	1.4
04320	00	Z	500	30	6.0	1.6
04339	12	Z	500	30	12.7	4.1
04339	00	Z	500	30	5.5	1.9
04360	12	Z	500	30	38.0	37.3
04360	00	Z	500	30	39.3	38.8
06011	12	Z	500	28	5.6	1.8

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	500	29	5.1	1.6
06260	00	Z	500	30	12.4	-1.3
06260	12	Z	500	5	2.8	1.1
06610	12	Z	500	30	3.3	0.1
06610	00	Z	500	30	4.8	3.2
07110	12	Z	500	31	8.7	7.7
07110	00	Z	500	31	6.9	3.9
07510	12	Z	500	30	9.4	8.7
07510	00	Z	500	30	6.4	4.5
07645	12	Z	500	30	6.7	5.2
07645	00	Z	500	30	5.6	2.3
07761	12	Z	500	30	13.4	12.8
07761	00	Z	500	30	12.5	11.0
08001	12	Z	500	28	21.9	2.9
08221	12	Z	500	30	9.7	8.8
08221	00	Z	500	29	8.5	7.9
08302	12	Z	500	28	3.4	-1.6
08302	00	Z	500	29	4.0	-1.3
08508	12	Z	500	28	16.9	5.8
08522	12	Z	500	30	9.5	8.3
08579	12	Z	500	30	9.4	8.6
10035	00	Z	500	31	15.6	15.2
10035	12	Z	500	30	14.2	13.0
10393	00	Z	500	30	3.5	1.6
10393	12	Z	500	30	4.0	-0.1
10410	12	Z	500	31	5.2	-0.9
10410	00	Z	500	33	4.3	1.0
10739	12	Z	500	32	3.5	0.5
10739	00	Z	500	31	3.2	0.2
11035	12	Z	500	30	7.0	5.8
11035	00	Z	500	30	8.0	6.8
12982	00	Z	500	30	7.5	5.6
12982	12	Z	500	30	6.4	4.4
16080	12	Z	500	30	6.3	-4.8
16080	00	Z	500	30	5.1	-3.0
16245	12	Z	500	30	13.6	-3.5
16245	00	Z	500	30	3.3	-0.6
16320	00	Z	500	30	13.8	13.2
16320	12	Z	500	30	14.4	13.4
16429	12	Z	500	30	5.1	3.9
16429	00	Z	500	31	5.3	4.2
16622	00	Z	500	25	10.7	10.2
16754	00	Z	500	30	6.2	4.5

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	500	30	6.0	5.0
26435	00	Z	500	15	5.4	0.5
60018	00	Z	500	30	3.6	0.3
60018	12	Z	500	30	3.0	1.1
7JUNA4	00	Z	500	10	50.9	-39.7
7JUNA4	12	Z	500	10	47.4	-36.0
ASDE09	12	Z	500	3	21.8	21.7
ASDE9	12	Z	500	1	40.1	40.1
ASDK01	12	Z	500	13	15.6	11.9
ASDK01	00	Z	500	13	23.3	4.4
ASDK02	12	Z	500	3	4.0	3.9
ASDK03	12	Z	500	19	24.0	23.4
ASDK03	00	Z	500	22	25.1	24.5
ASDK1	12	Z	500	9	11.6	2.6
ASDK1	00	Z	500	9	16.0	7.9
ASDK2	12	Z	500	1	7.8	7.8
ASDK3	00	Z	500	13	20.3	17.3
ASDK3	12	Z	500	13	26.4	23.0
ASFR1	12	Z	500	14	4.7	1.0
ASFR1	00	Z	500	17	6.1	-4.6
ASFR2	00	Z	500	4	18.6	17.9
ASFR2	12	Z	500	4	20.9	19.6
ASFR3	00	Z	500	14	9.0	8.1
ASFR3	12	Z	500	15	11.7	11.2
ASFR4	12	Z	500	18	10.4	6.0
ASFR4	00	Z	500	21	7.3	3.8
FPUW5G	12	Z	500	20	6.6	4.9
FPUWN	12	Z	500	8	7.7	6.2
JNKN7J	00	Z	500	4	45.7	45.6
JNKN7J	12	Z	500	7	43.3	42.6
KMPLHP	12	Z	500	9	3.7	1.5
KMPLHP	00	Z	500	9	10.2	6.6
LRYQE3	12	Z	500	8	25.7	18.4
LRYQE3	00	Z	500	9	4.5	0.2
VKB4L5	12	Z	500	6	28.7	27.6
VKB4L5	00	Z	500	4	30.7	30.6
VKB4Q	00	Z	500	1	24.5	24.5
XQFJRG	00	Z	500	7	4.1	-1.0
XQFJRG	12	Z	500	7	4.7	-4.3
XQFJX	00	Z	500	4	7.5	-2.1
XQFJX	12	Z	500	4	11.1	-9.5

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                : NOV 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	500	30	3.1	0.8	-0.2
01001	00	V	500	30	3.4	-0.2	-0.3
01028	00	V	500	28	2.4	-0.4	-0.1
01028	12	V	500	30	2.9	-0.8	-0.2
01400	00	V	500	23	3.1	-0.1	-0.7
01400	12	V	500	27	2.8	0.2	-0.1
01415	12	V	500	30	2.6	0.1	1.3
01415	00	V	500	28	3.5	0.1	0.8
02365	12	V	500	13	3.5	1.0	0.9
02365	00	V	500	13	2.8	0.4	1.2
02591	00	V	500	23	2.5	-0.1	0.2
02591	12	V	500	22	3.4	-0.6	0.0
02836	12	V	500	30	3.1	0.7	-0.5
02836	00	V	500	30	2.8	-0.1	0.0
02963	12	V	500	30	2.9	-0.2	-0.1
02963	00	V	500	29	3.0	0.0	0.0
03005	00	V	500	30	3.5	0.4	-0.6
03005	12	V	500	30	3.7	1.1	0.0
03238	00	V	500	4	3.1	0.3	2.0
03238	12	V	500	4	2.8	-1.9	-1.1
03808	12	V	500	30	3.2	0.3	-0.7
03808	00	V	500	30	3.3	-0.1	-0.4
03918	00	V	500	28	3.3	0.6	0.2
03918	12	V	500	10	2.8	0.3	-0.1
03953	12	V	500	30	2.8	0.0	-0.3
03953	00	V	500	30	3.3	-0.1	-0.4
04018	12	V	500	29	3.7	0.3	0.1
04018	00	V	500	29	2.9	0.8	-0.3
04220	00	V	500	29	3.1	1.1	-0.7
04220	12	V	500	30	3.4	0.3	-0.4
04270	12	V	500	30	4.0	-0.1	0.9
04270	00	V	500	29	3.1	0.2	0.1
04320	12	V	500	30	2.8	-0.4	-0.1
04320	00	V	500	30	2.9	0.8	0.0
04339	12	V	500	30	2.6	0.4	0.6
04339	00	V	500	30	3.3	0.1	-0.1
04360	12	V	500	30	2.9	-0.6	0.7
04360	00	V	500	29	3.6	-0.1	-0.1
06011	12	V	500	28	3.4	0.6	-0.5

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	500	29	2.7	0.3	0.2
06260	00	V	500	30	2.8	0.3	0.6
06260	12	V	500	5	2.1	0.4	-0.7
06610	12	V	500	30	2.8	0.2	-0.4
06610	00	V	500	29	3.1	0.1	-0.3
07110	12	V	500	30	2.8	0.3	-0.8
07110	00	V	500	30	3.5	0.4	0.3
07510	12	V	500	30	2.2	-0.2	0.2
07510	00	V	500	30	3.1	0.1	-0.4
07645	12	V	500	30	3.1	-0.2	0.1
07645	00	V	500	29	3.0	-0.4	-0.1
07761	12	V	500	30	3.5	0.8	0.1
07761	00	V	500	30	3.5	0.3	-0.1
08001	12	V	500	27	3.4	0.8	1.2
08221	12	V	500	30	2.6	0.5	-0.4
08221	00	V	500	29	3.3	0.6	0.3
08302	12	V	500	28	2.8	-0.4	-0.3
08302	00	V	500	29	2.8	0.4	0.5
08508	12	V	500	26	3.0	0.3	-0.6
08522	12	V	500	30	3.4	0.4	-0.7
08579	12	V	500	29	2.1	-0.3	0.1
10035	00	V	500	30	3.0	-0.3	-0.8
10035	12	V	500	30	2.9	0.3	-0.2
10393	00	V	500	30	2.4	0.2	0.2
10393	12	V	500	30	2.7	0.3	0.7
10410	12	V	500	30	2.7	0.3	-0.6
10410	00	V	500	30	2.3	0.3	0.1
10739	12	V	500	30	3.4	0.3	0.3
10739	00	V	500	31	2.5	0.2	0.0
11035	12	V	500	30	3.3	0.9	0.3
11035	00	V	500	30	3.7	0.2	0.0
12982	00	V	500	30	2.6	-0.1	0.0
12982	12	V	500	30	3.3	0.0	0.0
16080	12	V	500	30	3.3	-0.3	-1.2
16080	00	V	500	30	3.6	0.0	-0.7
16245	12	V	500	30	3.2	0.3	0.2
16245	00	V	500	30	3.8	-0.5	0.1
16320	00	V	500	30	2.7	0.5	0.4
16320	12	V	500	30	3.2	-0.5	-0.3
16429	12	V	500	30	3.1	0.3	0.9
16429	00	V	500	30	3.5	-0.6	0.6
16622	00	V	500	25	3.3	0.8	0.0
16754	00	V	500	30	2.8	0.7	0.7

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	500	30	2.1	0.1	-0.6
26435	00	V	500	15	2.5	0.3	0.5
60018	00	V	500	29	2.5	0.1	-0.7
60018	12	V	500	30	3.2	0.1	-0.4
7JUNA4	00	V	500	9	3.5	-0.2	-0.9
7JUNA4	12	V	500	8	4.0	0.7	0.9
ASDE09	12	V	500	1	2.4	1.9	1.5
ASDE9	12	V	500	1	3.8	-1.4	-3.5
ASDK01	12	V	500	10	3.0	1.2	0.9
ASDK01	00	V	500	10	3.8	-0.5	-0.4
ASDK02	12	V	500	2	0.9	-0.8	0.0
ASDK03	12	V	500	16	3.1	0.7	-0.7
ASDK03	00	V	500	15	3.1	0.4	-1.1
ASDK1	12	V	500	9	3.7	1.6	0.0
ASDK1	00	V	500	9	4.2	0.4	0.4
ASDK2	12	V	500	1	0.9	0.9	-0.3
ASDK3	00	V	500	13	5.0	0.1	-2.1
ASDK3	12	V	500	13	4.1	1.8	-0.4
ASFR1	12	V	500	10	2.4	0.0	0.5
ASFR1	00	V	500	12	4.0	-1.5	-0.1
ASFR2	00	V	500	3	3.7	0.1	-1.9
ASFR2	12	V	500	4	3.7	-0.7	1.3
ASFR3	00	V	500	10	2.6	0.3	-0.5
ASFR3	12	V	500	9	3.1	0.3	1.1
ASFR4	12	V	500	14	2.3	-0.1	-0.4
ASFR4	00	V	500	15	2.5	0.4	0.8
FPUW5G	12	V	500	18	2.5	0.3	-0.4
FPUWN	12	V	500	8	2.8	1.0	-0.1
JNKN7J	00	V	500	4	2.9	-0.3	-0.4
JNKN7J	12	V	500	6	2.5	-0.8	1.1
KMPLHP	12	V	500	7	2.6	-1.3	0.9
KMPLHP	00	V	500	7	2.0	0.0	1.1
LRYQE3	12	V	500	7	3.0	0.4	-0.8
LRYQE3	00	V	500	8	3.7	-0.8	0.6
VKB4L5	12	V	500	6	2.6	1.1	-0.7
VKB4L5	00	V	500	3	2.4	-0.4	0.6
VKB4Q	00	V	500	1	6.9	6.0	-3.4
XQFJRG	00	V	500	5	4.2	-0.6	0.5
XQFJRG	12	V	500	5	3.0	1.2	-1.4
XQFJX	00	V	500	4	3.1	1.3	-0.2
XQFJX	12	V	500	4	3.4	0.6	-2.2

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                : NOV 2017
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	850	30	3.9	-1.5
01001	00	Z	850	30	15.2	-3.3
01028	00	Z	850	29	5.3	-2.9
01028	12	Z	850	31	5.4	-3.2
01400	00	Z	850	25	17.6	9.2
01400	12	Z	850	27	10.1	5.0
01415	12	Z	850	30	4.3	3.2
01415	00	Z	850	29	4.4	2.8
02365	12	Z	850	13	4.9	4.4
02365	00	Z	850	14	7.0	6.7
02591	00	Z	850	23	8.3	8.1
02591	12	Z	850	22	9.9	9.6
02836	12	Z	850	30	2.9	2.3
02836	00	Z	850	30	3.3	2.0
02963	12	Z	850	30	3.6	3.0
02963	00	Z	850	29	3.6	3.4
03005	00	Z	850	32	3.7	-0.9
03005	12	Z	850	30	9.8	-2.3
03238	00	Z	850	4	3.2	3.1
03238	12	Z	850	4	1.5	0.5
03808	12	Z	850	32	3.3	2.2
03808	00	Z	850	30	3.1	2.3
03918	00	Z	850	28	9.8	9.3
03918	12	Z	850	10	10.9	10.5
03953	12	Z	850	31	5.3	3.9
03953	00	Z	850	30	3.5	1.6
04018	12	Z	850	29	3.4	0.4
04018	00	Z	850	30	2.7	1.2
04220	00	Z	850	29	5.1	1.2
04220	12	Z	850	30	3.5	1.4
04270	12	Z	850	30	4.8	-1.5
04270	00	Z	850	29	7.3	-2.6
04320	12	Z	850	30	3.8	-0.5
04320	00	Z	850	30	4.4	0.6
04339	12	Z	850	30	12.7	5.0
04339	00	Z	850	30	6.0	3.4
04360	12	Z	850	32	41.0	40.8
04360	00	Z	850	31	41.0	40.7
06011	12	Z	850	29	4.7	3.5

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	850	29	4.9	3.6
06260	00	Z	850	30	12.8	-0.7
06260	12	Z	850	5	0.9	-0.3
06610	12	Z	850	30	3.0	1.6
06610	00	Z	850	30	5.1	4.5
07110	12	Z	850	31	4.3	3.3
07110	00	Z	850	31	4.0	2.8
07510	12	Z	850	30	5.7	5.2
07510	00	Z	850	30	4.7	3.5
07645	12	Z	850	30	4.5	3.2
07645	00	Z	850	31	3.7	2.7
07761	12	Z	850	30	5.6	4.3
07761	00	Z	850	30	4.2	3.1
08001	12	Z	850	28	3.1	1.6
08221	12	Z	850	31	3.4	2.5
08221	00	Z	850	29	4.8	4.4
08302	12	Z	850	28	5.1	-4.6
08302	00	Z	850	29	3.3	-2.5
08508	12	Z	850	28	16.0	0.6
08522	12	Z	850	30	4.8	4.1
08579	12	Z	850	30	5.1	4.2
10035	00	Z	850	31	14.5	14.4
10035	12	Z	850	30	13.5	13.3
10393	00	Z	850	30	2.7	1.5
10393	12	Z	850	30	1.9	-0.1
10410	12	Z	850	31	2.2	0.3
10410	00	Z	850	33	2.8	1.6
10739	12	Z	850	32	2.7	-0.3
10739	00	Z	850	31	2.3	1.1
11035	12	Z	850	30	7.9	6.9
11035	00	Z	850	30	8.1	7.6
12982	00	Z	850	30	6.8	5.9
12982	12	Z	850	30	6.0	5.0
16080	12	Z	850	30	5.0	-4.2
16080	00	Z	850	30	4.0	-2.2
16245	12	Z	850	30	14.9	-3.8
16245	00	Z	850	30	3.4	-0.7
16320	00	Z	850	30	15.0	14.2
16320	12	Z	850	31	15.6	14.9
16429	12	Z	850	30	4.6	3.3
16429	00	Z	850	31	4.0	3.0
16622	00	Z	850	25	9.2	8.6
16754	00	Z	850	30	3.2	1.7

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	850	30	3.8	3.2
26435	00	Z	850	15	3.2	1.2
60018	00	Z	850	30	3.6	-2.0
60018	12	Z	850	30	3.6	-2.9
7JUNA4	00	Z	850	10	34.3	-34.1
7JUNA4	12	Z	850	9	37.0	-36.3
ASDE09	12	Z	850	3	19.3	19.3
ASDE9	12	Z	850	1	42.4	42.4
ASDK01	12	Z	850	13	15.4	12.5
ASDK01	00	Z	850	14	24.3	2.3
ASDK02	12	Z	850	3	6.0	5.7
ASDK03	12	Z	850	19	24.3	23.9
ASDK03	00	Z	850	22	24.8	24.5
ASDK1	12	Z	850	9	13.2	9.8
ASDK1	00	Z	850	9	17.9	11.4
ASDK2	12	Z	850	1	17.3	17.3
ASDK3	00	Z	850	13	25.8	24.6
ASDK3	12	Z	850	13	27.9	26.9
ASFR1	12	Z	850	19	6.1	-5.0
ASFR1	00	Z	850	18	5.8	-5.0
ASFR2	00	Z	850	4	12.0	11.2
ASFR2	12	Z	850	4	13.7	12.4
ASFR3	00	Z	850	14	5.0	4.4
ASFR3	12	Z	850	15	4.2	3.8
ASFR4	12	Z	850	18	4.4	-1.6
ASFR4	00	Z	850	21	4.2	-1.3
FPUW5G	12	Z	850	20	4.5	-0.2
FPUWN	12	Z	850	8	6.8	6.2
JNKN7J	00	Z	850	4	42.2	42.1
JNKN7J	12	Z	850	6	42.7	42.5
KMPLHP	12	Z	850	11	4.1	-3.2
KMPLHP	00	Z	850	9	6.8	-4.7
LRYQE3	12	Z	850	8	6.4	5.5
LRYQE3	00	Z	850	10	8.6	0.6
VKB4L5	12	Z	850	6	25.6	24.3
VKB4L5	00	Z	850	4	28.5	28.1
VKB4Q	00	Z	850	1	33.5	33.5
XQFJRG	00	Z	850	7	10.5	-8.9
XQFJRG	12	Z	850	7	11.6	-11.2
XQFJX	00	Z	850	4	7.1	-4.8
XQFJX	12	Z	850	4	12.6	-11.6

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

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	850	30	3.8	0.4	0.2
01001	00	V	850	30	4.3	1.0	0.6
01028	00	V	850	29	3.0	0.4	-0.4
01028	12	V	850	30	2.8	-0.2	-0.2
01400	00	V	850	24	2.4	0.2	-0.2
01400	12	V	850	27	3.1	0.7	0.0
01415	12	V	850	30	2.8	0.2	0.1
01415	00	V	850	28	2.8	0.1	0.4
02365	12	V	850	13	2.7	0.8	0.1
02365	00	V	850	13	2.0	-0.2	0.7
02591	00	V	850	23	2.1	0.4	0.0
02591	12	V	850	22	2.3	-0.3	-0.7
02836	12	V	850	30	2.6	-0.1	-0.1
02836	00	V	850	30	2.5	-0.1	0.0
02963	12	V	850	30	2.5	-0.4	0.2
02963	00	V	850	29	2.2	0.1	-0.2
03005	00	V	850	30	2.4	-0.4	0.7
03005	12	V	850	30	2.6	0.8	0.0
03238	00	V	850	4	1.2	0.3	0.1
03238	12	V	850	4	3.1	-0.3	-0.4
03808	12	V	850	30	2.8	-0.3	-0.7
03808	00	V	850	30	2.3	0.3	-0.3
03918	00	V	850	28	2.5	0.1	-0.4
03918	12	V	850	10	2.8	-0.3	-0.2
03953	12	V	850	30	3.5	0.8	0.0
03953	00	V	850	30	3.3	-0.4	0.6
04018	12	V	850	29	3.6	0.5	0.1
04018	00	V	850	29	3.1	0.9	1.1
04220	00	V	850	29	4.3	0.2	-1.1
04220	12	V	850	30	3.7	-0.9	0.1
04270	12	V	850	30	4.3	0.1	0.1
04270	00	V	850	29	4.6	0.6	0.1
04320	12	V	850	30	3.4	-0.3	-0.3
04320	00	V	850	30	4.4	0.2	0.4
04339	12	V	850	30	6.4	1.8	1.8
04339	00	V	850	30	5.0	1.3	1.2
04360	12	V	850	30	4.9	1.2	0.5
04360	00	V	850	29	6.3	1.9	0.1
06011	12	V	850	29	2.8	-0.9	0.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	850	29	2.8	-0.7	-0.3
06260	00	V	850	30	2.4	0.8	-0.3
06260	12	V	850	5	2.1	-0.4	-0.8
06610	12	V	850	30	2.5	0.4	0.0
06610	00	V	850	29	3.1	0.5	-0.2
07110	12	V	850	30	3.8	0.3	0.5
07110	00	V	850	30	3.8	0.3	0.6
07510	12	V	850	30	2.7	0.1	-0.3
07510	00	V	850	30	3.2	-0.2	0.2
07645	12	V	850	30	3.8	-0.4	0.5
07645	00	V	850	30	4.4	1.1	-0.1
07761	12	V	850	30	5.2	0.4	1.6
07761	00	V	850	30	5.2	1.2	-0.2
08001	12	V	850	27	3.2	0.6	-0.5
08221	12	V	850	30	3.7	1.4	0.6
08221	00	V	850	29	4.4	1.6	1.6
08302	12	V	850	28	3.8	0.5	0.4
08302	00	V	850	29	2.8	0.3	-0.3
08508	12	V	850	26	2.8	-0.7	0.4
08522	12	V	850	30	3.2	0.9	-0.3
08579	12	V	850	28	3.2	-0.5	-0.2
10035	00	V	850	30	2.6	-0.1	-0.4
10035	12	V	850	30	2.9	0.2	-1.1
10393	00	V	850	30	2.0	-0.5	-0.2
10393	12	V	850	30	2.2	-0.1	0.0
10410	12	V	850	30	2.7	0.4	-0.6
10410	00	V	850	30	2.5	0.4	-0.1
10739	12	V	850	30	2.5	0.0	-0.3
10739	00	V	850	31	2.3	0.5	-0.5
11035	12	V	850	30	2.8	0.2	-0.2
11035	00	V	850	30	3.4	0.6	-0.2
12982	00	V	850	30	2.6	-0.4	-0.3
12982	12	V	850	30	2.9	0.3	0.3
16080	12	V	850	30	3.6	1.0	-0.7
16080	00	V	850	30	3.3	1.0	-0.2
16245	12	V	850	30	3.3	0.2	0.1
16245	00	V	850	30	3.3	-0.1	-0.3
16320	00	V	850	30	3.5	0.0	0.3
16320	12	V	850	30	3.7	0.9	-0.1
16429	12	V	850	30	2.5	0.0	0.0
16429	00	V	850	30	2.7	0.2	0.6
16622	00	V	850	25	3.2	1.1	0.1
16754	00	V	850	30	2.2	0.5	-0.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	850	30	2.8	0.8	0.0
26435	00	V	850	15	2.4	0.1	0.2
60018	00	V	850	30	3.0	0.6	-0.1
60018	12	V	850	30	3.4	0.5	-0.1
7JUNA4	00	V	850	9	7.1	-2.9	0.8
7JUNA4	12	V	850	8	1.9	0.6	0.0
ASDE09	12	V	850	1	0.7	-0.3	0.6
ASDE9	12	V	850	1	3.7	-3.5	1.2
ASDK01	12	V	850	10	2.6	0.0	0.2
ASDK01	00	V	850	11	6.0	-1.5	-0.6
ASDK02	12	V	850	2	1.7	0.2	-0.5
ASDK03	12	V	850	16	3.1	0.4	0.2
ASDK03	00	V	850	15	2.3	0.0	0.3
ASDK1	12	V	850	9	3.3	0.0	0.3
ASDK1	00	V	850	9	5.7	-1.7	-0.6
ASDK2	12	V	850	1	2.6	0.5	2.6
ASDK3	00	V	850	13	3.3	-0.1	-0.8
ASDK3	12	V	850	13	4.7	0.5	0.8
ASFR1	12	V	850	14	5.0	1.9	-0.5
ASFR1	00	V	850	13	2.8	1.2	0.4
ASFR2	00	V	850	3	3.0	2.4	-0.7
ASFR2	12	V	850	4	1.5	0.0	-0.7
ASFR3	00	V	850	10	3.4	0.2	-0.5
ASFR3	12	V	850	9	3.8	1.2	0.3
ASFR4	12	V	850	14	2.4	0.1	-0.1
ASFR4	00	V	850	15	2.7	0.3	-0.6
FPUW5G	12	V	850	18	3.3	-1.8	-1.1
FPUWN	12	V	850	8	3.6	-2.6	-0.8
JNKN7J	00	V	850	4	2.6	-1.9	0.0
JNKN7J	12	V	850	6	3.9	1.7	1.3
KMPLHP	12	V	850	9	3.4	-0.2	-0.7
KMPLHP	00	V	850	7	1.9	0.3	-0.1
LRYQE3	12	V	850	7	4.7	2.2	-0.3
LRYQE3	00	V	850	9	2.9	0.2	0.4
VKB4L5	12	V	850	6	3.0	0.2	0.7
VKB4L5	00	V	850	3	4.3	1.5	-1.3
VKB4Q	00	V	850	1	4.0	-4.0	0.2
XQFJRG	00	V	850	5	2.9	-1.3	0.9
XQFJRG	12	V	850	5	2.2	-0.5	1.2
XQFJX	00	V	850	4	2.8	0.5	-0.3
XQFJX	12	V	850	4	3.2	-1.9	0.6

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                 : NOV 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
03380	99	P	SUR	54	0	709	0	0.3	-0.2	0.4
1300001	99	P	SUR	11	-23	708	0	0.3	-0.2	0.4
1300008	99	P	SUR	15	-38	150	0	0.3	-0.1	0.3
1300130	99	P	SUR	28	-16	361	0	0.3	-0.1	0.3
1300131	99	P	SUR	28	-17	361	0	0.3	-0.0	0.3
1300869	99	P	SUR	26	-61	719	0	0.3	-0.2	0.4
1300872	99	P	SUR	35	-46	719	0	0.9	0.1	0.9
1301603	99	P	SUR	20	-26	719	0	0.3	0.1	0.3
1301604	99	P	SUR	11	-25	719	0	0.3	0.0	0.3
1301605	99	P	SUR	20	-33	719	0	0.2	-0.0	0.2
1301606	99	P	SUR	15	-30	718	0	0.3	0.1	0.3
13869	99	P	SUR	26	-61	719	0	0.3	-0.2	0.4
13872	99	P	SUR	35	-46	719	0	0.9	0.1	0.9
1501529	99	P	SUR	30	-27	679	0	0.3	0.2	0.4
1501531	99	P	SUR	21	-37	682	0	0.3	0.1	0.3
1501534	99	P	SUR	24	-33	683	0	0.2	-0.2	0.3
1501609	99	P	SUR	12	-51	719	0	0.3	0.8	0.9
2601560	99	P	SUR	74	-9	96	0	3.5	-0.5	3.5
4100139	99	P	SUR	20	-38	696	0	0.2	-0.2	0.3
4100506	99	P	SUR	31	-50	503	23	0.4	-0.2	0.4
4100590	99	P	SUR	38	-21	377	0	0.3	-0.5	0.5
4100597	99	P	SUR	36	-41	719	0	0.4	0.1	0.5
4100707	99	P	SUR	14	-61	128	0	2.5	-7.5	8.0
4100729	99	P	SUR	36	-32	552	0	2.0	-0.3	2.1
4101538	99	P	SUR	38	-66	557	0	0.5	0.2	0.5
4101539	99	P	SUR	30	-67	634	0	0.4	0.4	0.5
4101554	99	P	SUR	32	-61	698	0	0.4	0.3	0.5
4101555	99	P	SUR	33	-69	715	0	0.4	0.0	0.4
4101556	99	P	SUR	42	-42	713	0	0.6	0.4	0.7
4101557	99	P	SUR	37	-62	505	0	0.6	0.0	0.6
4101558	99	P	SUR	43	-47	440	0	0.6	0.3	0.7
4101560	99	P	SUR	37	-53	672	0	0.5	0.7	0.8
4101561	99	P	SUR	32	-65	708	0	0.4	0.0	0.4
4101562	99	P	SUR	37	-40	673	0	0.5	0.6	0.8
4101563	99	P	SUR	35	-60	686	0	0.5	0.2	0.5
4101564	99	P	SUR	37	-42	669	0	0.3	0.3	0.4

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4101576	99	P	SUR	12	-49	372	0	0.3	0.5	0.5
4101577	99	P	SUR	21	-40	369	0	0.2	0.3	0.4
4101579	99	P	SUR	18	-43	373	0	0.3	0.2	0.3
4101580	99	P	SUR	14	-46	370	0	0.2	0.3	0.4
4101700	99	P	SUR	32	-31	719	0	0.4	0.2	0.5
4101702	99	P	SUR	30	-55	719	0	0.4	0.1	0.4
4101703	99	P	SUR	25	-58	719	0	0.4	0.4	0.6
4101704	99	P	SUR	18	-67	719	0	0.4	0.6	0.7
4101705	99	P	SUR	35	-39	719	0	0.4	0.2	0.5
4101706	99	P	SUR	34	-50	719	0	0.5	-0.5	0.7
4101707	99	P	SUR	38	-32	719	0	0.4	0.0	0.4
4101708	99	P	SUR	34	-34	719	0	0.4	-0.2	0.5
4101709	99	P	SUR	40	-22	583	0	0.7	0.7	1.0
4101710	99	P	SUR	34	-53	718	0	0.5	0.1	0.5
4101712	99	P	SUR	33	-58	704	0	0.3	-0.1	0.4
4101713	99	P	SUR	31	-55	717	0	0.4	-0.1	0.4
4101741	99	P	SUR	22	-58	719	0	0.3	0.4	0.5
4101742	99	P	SUR	21	-51	541	0	2.4	-0.4	2.5
4101743	99	P	SUR	21	-46	719	0	0.3	0.6	0.7
4101744	99	P	SUR	15	-57	718	0	0.3	-0.6	0.6
4101746	99	P	SUR	19	-56	717	0	0.3	-0.0	0.3
41040	99	P	SUR	15	-53	1017	0	0.4	-0.4	0.5
41041	99	P	SUR	14	-46	1136	0	0.4	0.3	0.5
41043	99	P	SUR	21	-65	1197	0	0.4	-0.5	0.6
41044	99	P	SUR	22	-59	1190	0	0.4	-0.0	0.4
41046	99	P	SUR	24	-68	1179	0	0.5	0.2	0.5
41048	99	P	SUR	32	-70	1187	0	0.4	-0.2	0.4
41049	99	P	SUR	28	-63	718	0	0.4	0.1	0.4
41052	99	P	SUR	18	-65	1877	0	0.4	-2.2	2.2
41053	99	P	SUR	19	-66	1867	0	0.4	-0.8	0.9
41056	99	P	SUR	18	-66	1524	0	0.4	-0.2	0.4
41506	99	P	SUR	31	-50	503	23	0.4	-0.2	0.4
41590	99	P	SUR	38	-21	377	0	0.3	-0.5	0.5
41597	99	P	SUR	36	-41	719	0	0.4	0.1	0.5
41707	99	P	SUR	14	-61	128	0	2.5	-7.5	7.9
41729	99	P	SUR	36	-32	552	0	2.0	-0.3	2.1
42059	99	P	SUR	15	-68	1154	0	0.5	-0.3	0.6
42085	99	P	SUR	18	-67	1111	0	0.4	-1.1	1.1
42090	99	P	SUR	18	-70	118	0	0.4	-0.1	0.4
44005	99	P	SUR	43	-69	396	0	0.7	-0.3	0.7
4400510	99	P	SUR	47	-13	1351	1	0.3	0.5	0.6
4400513	99	P	SUR	54	-10	718	0	0.4	-0.5	0.7
4400517	99	P	SUR	25	-37	719	0	0.3	0.3	0.4

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4400521	99	P	SUR	34	-37	696	1	0.3	-0.7	0.8
4400746	99	P	SUR	30	-29	719	0	0.4	0.1	0.4
4400765	99	P	SUR	64	10	705	0	0.6	-0.4	0.7
4400766	99	P	SUR	23	-34	543	0	1.9	-1.5	2.4
4400768	99	P	SUR	31	-66	719	0	0.4	0.3	0.5
4400776	99	P	SUR	27	-53	718	0	0.4	0.4	0.5
4400777	99	P	SUR	33	-47	719	0	0.5	0.1	0.5
4400778	99	P	SUR	30	-30	717	0	0.4	0.3	0.5
44008	99	P	SUR	41	-69	718	0	0.5	-0.7	0.9
4400848	99	P	SUR	30	-65	718	0	0.4	0.0	0.4
4400857	99	P	SUR	32	-25	717	0	0.4	0.2	0.4
4400874	99	P	SUR	29	-39	719	0	0.3	0.4	0.5
4400875	99	P	SUR	37	-34	47	1	3.4	1.4	3.7
4400887	99	P	SUR	37	-49	714	0	0.5	-0.1	0.5
4400891	99	P	SUR	36	-56	719	0	0.4	-0.9	1.0
44011	99	P	SUR	41	-67	719	0	0.5	-0.9	1.1
4401501	99	P	SUR	52	-5	716	0	1.0	-0.2	1.1
4401503	99	P	SUR	32	-66	719	0	0.3	-0.0	0.3
4401525	99	P	SUR	13	-60	594	0	0.4	0.1	0.4
4401527	99	P	SUR	26	-66	715	0	0.4	0.0	0.4
4401529	99	P	SUR	26	-69	716	0	0.4	-0.1	0.4
4401530	99	P	SUR	31	-53	718	0	0.4	-0.5	0.7
4401531	99	P	SUR	35	-67	719	0	0.5	0.2	0.5
4401535	99	P	SUR	56	-20	1	0	0.0	-2.8	2.8
4401536	99	P	SUR	48	-33	664	0	0.5	0.3	0.5
4401537	99	P	SUR	36	-28	640	0	0.4	-0.6	0.7
4401538	99	P	SUR	40	-26	528	0	0.7	-1.6	1.8
4401539	99	P	SUR	34	-53	718	0	0.5	0.0	0.5
4401540	99	P	SUR	34	-66	718	0	0.4	0.0	0.4
4401541	99	P	SUR	37	-62	716	0	0.6	-0.1	0.6
4401542	99	P	SUR	35	-67	718	0	0.5	0.3	0.6
4401543	99	P	SUR	27	-65	715	0	0.4	-0.1	0.4
4401546	99	P	SUR	43	-21	719	0	0.3	0.6	0.7
4401548	99	P	SUR	50	-9	719	1	0.4	-0.2	0.5
4401550	99	P	SUR	47	-29	656	0	0.7	0.1	0.7
4401551	99	P	SUR	32	-42	695	3	2.1	-0.2	2.2
4401552	99	P	SUR	42	-19	718	0	0.5	0.3	0.5
4401553	99	P	SUR	55	-40	719	0	0.4	0.2	0.5
4401554	99	P	SUR	56	-34	719	0	0.4	0.4	0.6
4401555	99	P	SUR	56	-24	719	0	0.4	-0.2	0.5
4401556	99	P	SUR	38	-35	719	0	0.4	0.2	0.4
4401557	99	P	SUR	41	-55	718	0	0.5	0.1	0.5
4401558	99	P	SUR	42	-55	718	0	0.6	0.0	0.6

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4401559	99	P	SUR	44	-33	719	0	0.8	0.6	1.0
4401560	99	P	SUR	42	-27	718	0	0.7	0.5	0.8
4401561	99	P	SUR	45	-53	719	0	0.5	0.3	0.6
4401562	99	P	SUR	40	-32	719	0	0.5	-0.0	0.5
4401563	99	P	SUR	29	-31	718	0	0.4	-0.1	0.4
4401564	99	P	SUR	40	-37	455	0	1.0	1.3	1.7
4401565	99	P	SUR	46	-46	718	0	0.8	0.2	0.8
4401566	99	P	SUR	52	-45	719	0	0.5	0.6	0.8
4401601	99	P	SUR	55	-50	671	0	0.5	0.2	0.5
4401602	99	P	SUR	46	-58	681	0	0.5	0.6	0.8
4401603	99	P	SUR	53	-35	677	0	0.3	0.2	0.4
4401605	99	P	SUR	54	-40	673	0	0.4	-0.3	0.5
4401606	99	P	SUR	49	-20	675	0	0.5	0.0	0.5
4401609	99	P	SUR	42	-49	671	0	1.1	0.5	1.2
4401611	99	P	SUR	48	-52	679	0	0.5	0.5	0.7
4401613	99	P	SUR	47	-23	683	0	0.8	0.4	0.9
4401616	99	P	SUR	40	-38	674	0	0.6	-0.0	0.6
4401629	99	P	SUR	46	-38	677	0	0.6	1.4	1.5
4401631	99	P	SUR	52	-16	673	0	0.3	-0.1	0.3
4401633	99	P	SUR	45	-28	669	0	0.4	0.2	0.5
4401634	99	P	SUR	60	-8	350	3	5.3	0.1	5.3
4401752	99	P	SUR	64	-23	490	0	0.5	0.6	0.8
4401755	99	P	SUR	63	-12	51	0	0.3	0.5	0.6
4401756	99	P	SUR	65	-38	628	0	0.7	0.4	0.8
4401757	99	P	SUR	68	-3	612	0	0.5	0.5	0.8
4401802	99	P	SUR	43	-57	678	0	0.8	0.5	1.0
44027	99	P	SUR	44	-67	884	0	0.6	-0.2	0.7
44032	99	P	SUR	44	-69	648	0	0.5	-0.8	0.9
44033	99	P	SUR	44	-69	697	0	0.4	-0.4	0.6
44034	99	P	SUR	44	-68	711	0	0.5	-0.4	0.7
44037	99	P	SUR	44	-68	694	0	0.5	-1.0	1.1
44137	99	P	SUR	42	-62	638	0	0.6	-0.2	0.6
44139	99	P	SUR	44	-57	577	0	0.5	0.0	0.5
44150	99	P	SUR	43	-64	691	0	0.5	-0.1	0.5
44258	99	P	SUR	45	-63	341	0	0.5	0.2	0.5
44510	99	P	SUR	47	-12	1351	1	0.3	0.5	0.6
44513	99	P	SUR	54	-10	718	0	0.4	-0.5	0.7
44517	99	P	SUR	25	-37	719	0	0.3	0.3	0.4
44521	99	P	SUR	34	-37	696	1	0.3	-0.7	0.8
44746	99	P	SUR	30	-29	719	0	0.4	0.1	0.4
44765	99	P	SUR	64	10	705	0	0.6	-0.4	0.7
44766	99	P	SUR	23	-34	543	0	1.9	-1.5	2.4
44768	99	P	SUR	31	-66	719	0	0.4	0.3	0.5

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
44776	99	P	SUR	27	-53	718	0	0.4	0.4	0.5
44777	99	P	SUR	33	-47	719	0	0.5	0.1	0.5
44778	99	P	SUR	30	-30	717	0	0.4	0.3	0.5
44848	99	P	SUR	30	-65	718	0	0.4	0.0	0.4
44857	99	P	SUR	32	-25	717	0	0.4	0.2	0.4
44874	99	P	SUR	29	-39	719	0	0.3	0.4	0.5
44875	99	P	SUR	37	-34	47	1	3.4	1.4	3.7
44887	99	P	SUR	37	-49	714	0	0.5	-0.1	0.5
44891	99	P	SUR	36	-56	719	0	0.4	-0.9	1.0
45138	99	P	SUR	50	-66	362	0	0.6	0.2	0.6
4700546	99	P	SUR	39	-25	627	0	0.9	0.7	1.2
4700551	99	P	SUR	57	-6	473	344	6.5	-3.6	7.4
4700552	99	P	SUR	67	-63	616	600	2.5	-10.2	10.5
4700555	99	P	SUR	44	-15	681	0	0.4	0.4	0.6
4700557	99	P	SUR	55	-9	327	0	0.6	-8.2	8.3
4700560	99	P	SUR	63	7	678	0	0.4	0.3	0.5
4700562	99	P	SUR	60	-1	619	0	0.6	0.3	0.7
4700568	99	P	SUR	47	-8	682	0	0.4	0.6	0.7
4700574	99	P	SUR	39	-17	684	0	0.5	0.3	0.5
4701661	99	P	SUR	84	-36	680	0	0.6	-0.1	0.6
4701662	99	P	SUR	70	-67	637	0	0.5	-1.7	1.7
4701668	99	P	SUR	49	-53	675	0	0.6	0.6	0.9
4701669	99	P	SUR	49	-51	676	0	0.7	0.4	0.8
4701670	99	P	SUR	62	-65	64	0	0.7	-1.8	1.9
4701674	99	P	SUR	71	-68	677	0	0.5	-6.1	6.1
4701675	99	P	SUR	46	-50	517	1	1.6	1.0	1.9
4701676	99	P	SUR	65	-61	332	0	3.9	1.7	4.3
4701677	99	P	SUR	59	-62	719	0	0.6	0.1	0.6
4701678	99	P	SUR	59	-63	683	0	1.2	0.4	1.2
4701679	99	P	SUR	69	-59	236	0	0.9	0.2	1.0
47546	99	P	SUR	39	-25	649	0	0.9	0.7	1.1
47551	99	P	SUR	57	-6	619	438	6.7	-4.4	8.0
47552	99	P	SUR	67	-63	718	700	2.4	-10.1	10.4
47555	99	P	SUR	44	-15	719	0	0.4	0.4	0.5
47557	99	P	SUR	55	-9	382	0	0.4	-8.3	8.3
47560	99	P	SUR	63	7	717	0	0.4	0.2	0.5
47562	99	P	SUR	60	-1	697	0	0.4	0.3	0.6
47568	99	P	SUR	47	-8	719	0	0.4	0.6	0.7
47574	99	P	SUR	39	-17	719	0	0.5	0.3	0.5
4800510	99	P	SUR	86	-13	679	0	0.6	-0.2	0.6
4800600	99	P	SUR	58	-24	713	0	0.5	0.0	0.5
4800631	99	P	SUR	83	18	694	633	2.0	-10.7	10.8
4800770	99	P	SUR	79	-18	507	0	0.5	0.1	0.5

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4802004	99	P	SUR	82	-7	652	0	0.4	0.1	0.4
4802008	99	P	SUR	84	-68	675	0	0.5	-0.3	0.6
4802009	99	P	SUR	79	-4	674	0	0.5	0.5	0.7
48510	99	P	SUR	86	-13	720	0	0.6	-0.2	0.6
48600	99	P	SUR	58	-24	712	0	0.5	0.0	0.5
48770	99	P	SUR	79	-18	538	0	0.5	0.1	0.5
6100001	99	P	SUR	43	8	713	0	0.6	-0.2	0.6
6100002	99	P	SUR	42	5	720	0	0.6	-0.0	0.6
61001	99	P	SUR	43	8	712	0	0.6	-0.2	0.6
6100196	99	P	SUR	42	4	347	0	1.6	-0.9	1.9
6100197	99	P	SUR	40	4	361	0	0.6	-0.3	0.7
6100198	99	P	SUR	37	-2	344	0	0.5	-0.0	0.5
61002	99	P	SUR	42	5	719	0	0.6	-0.0	0.6
6100280	99	P	SUR	41	1	316	0	0.5	-0.1	0.5
6100281	99	P	SUR	40	0	336	0	0.4	-0.1	0.5
6100417	99	P	SUR	38	0	324	0	0.4	-0.1	0.4
6100430	99	P	SUR	40	2	271	0	0.4	-0.2	0.5
6101001	99	P	SUR	38	24	226	0	0.6	0.4	0.7
6101003	99	P	SUR	40	25	229	0	0.5	0.3	0.6
6101007	99	P	SUR	36	25	234	0	0.7	2.4	2.5
6101008	99	P	SUR	37	22	179	0	0.5	0.1	0.5
6200024	99	P	SUR	44	-3	329	0	0.4	0.0	0.4
6200025	99	P	SUR	44	-6	352	0	0.3	-0.1	0.4
6200082	99	P	SUR	44	-8	302	0	0.3	0.1	0.3
6200083	99	P	SUR	43	-9	361	0	0.4	0.0	0.4
6200084	99	P	SUR	42	-9	361	0	0.4	-0.3	0.5
6200085	99	P	SUR	36	-7	356	0	0.4	-0.0	0.4
6200091	99	P	SUR	53	-5	635	1	0.7	-0.2	0.7
6200093	99	P	SUR	55	-10	718	0	0.5	-0.5	0.7
6200094	99	P	SUR	52	-7	683	0	0.5	-0.1	0.5
62001	99	P	SUR	45	-5	711	0	0.4	0.0	0.4
6200191	99	P	SUR	41	-10	594	0	0.4	-0.5	0.6
6200192	99	P	SUR	40	-10	224	0	0.4	-1.0	1.1
6200199	99	P	SUR	40	-9	592	0	0.4	0.0	0.4
6200200	99	P	SUR	36	-8	591	0	0.3	-0.1	0.3
6200513	99	P	SUR	62	-26	719	0	0.6	-0.1	0.6
6200554	99	P	SUR	38	-19	719	0	0.4	0.3	0.5
6200559	99	P	SUR	56	-6	656	0	0.6	0.0	0.6
6200940	99	P	SUR	29	-36	719	0	0.3	0.0	0.3
6200941	99	P	SUR	22	-57	709	0	0.5	-0.4	0.6
6201030	99	P	SUR	44	-4	31	0	0.4	1.1	1.2
6201070	99	P	SUR	43	-9	709	0	0.8	-1.1	1.3
62023	99	P	SUR	51	-8	708	0	0.4	0.2	0.4

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62027	99	P	SUR	49	-2	215	0	0.5	0.0	0.5
62029	99	P	SUR	49	-12	1430	0	1.2	-0.3	1.2
62030	99	P	SUR	50	-4	23	0	0.3	0.1	0.3
6203503	99	P	SUR	29	-36	718	0	0.3	-0.6	0.6
6203504	99	P	SUR	25	-42	717	0	0.4	0.2	0.4
6203510	99	P	SUR	14	-49	684	0	0.3	0.2	0.3
6203520	99	P	SUR	64	-22	3	0	0.2	-1.5	1.5
6203521	99	P	SUR	64	-22	90	0	0.5	-2.4	2.4
6203523	99	P	SUR	64	-13	103	0	0.3	-0.3	0.4
6203524	99	P	SUR	66	-53	635	0	0.5	0.8	0.9
6203526	99	P	SUR	64	1	642	0	0.5	0.4	0.7
6203528	99	P	SUR	36	-12	677	0	0.4	0.2	0.4
6203529	99	P	SUR	15	-35	32	0	0.4	0.2	0.4
6203600	99	P	SUR	47	-19	719	0	0.6	0.4	0.7
6203601	99	P	SUR	48	-19	719	0	0.4	0.4	0.5
6203602	99	P	SUR	59	-31	718	0	0.5	0.2	0.5
6203603	99	P	SUR	54	-38	718	0	0.4	-0.1	0.4
6203604	99	P	SUR	48	-32	718	0	0.5	0.3	0.6
6203605	99	P	SUR	55	-36	719	0	0.4	-0.0	0.4
6203606	99	P	SUR	46	-21	624	10	1.9	0.5	2.0
62050	99	P	SUR	50	-4	718	0	0.3	0.3	0.5
62095	99	P	SUR	53	-16	1377	0	0.4	-0.3	0.5
62102	99	P	SUR	58	2	552	0	0.5	-0.1	0.5
62103	99	P	SUR	50	-3	718	0	0.4	0.5	0.7
62104	99	P	SUR	57	1	709	0	0.5	-0.1	0.5
62105	99	P	SUR	55	-13	685	3	0.5	-0.5	0.7
62107	99	P	SUR	50	-6	1432	0	0.9	0.3	1.0
62111	99	P	SUR	58	0	709	0	0.5	1.3	1.4
62112	99	P	SUR	58	0	709	0	0.4	0.1	0.4
62113	99	P	SUR	58	0	696	0	0.6	0.2	0.7
62114	99	P	SUR	58	0	1412	0	0.6	0.0	0.6
62115	99	P	SUR	58	-3	696	0	0.5	-0.1	0.5
62116	99	P	SUR	58	1	696	0	0.6	-0.2	0.6
62118	99	P	SUR	58	1	686	0	0.5	0.6	0.8
62119	99	P	SUR	57	2	709	0	0.5	0.3	0.5
62120	99	P	SUR	56	2	693	0	0.6	-0.1	0.7
62121	99	P	SUR	54	3	518	0	0.5	0.1	0.5
62122	99	P	SUR	57	2	1408	0	0.6	-0.0	0.6
62124	99	P	SUR	54	-4	708	0	0.4	-0.1	0.4
62127	99	P	SUR	54	1	709	0	0.4	0.5	0.6
62129	99	P	SUR	58	0	709	0	0.6	0.0	0.6
62130	99	P	SUR	59	1	643	0	0.4	-0.2	0.5
62131	99	P	SUR	54	1	694	0	0.4	0.4	0.5

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62132	99	P	SUR	56	2	709	0	0.6	0.6	0.8
62133	99	P	SUR	57	1	707	0	0.5	-0.1	0.5
62134	99	P	SUR	58	1	707	0	0.4	0.3	0.5
62135	99	P	SUR	54	2	706	0	0.5	0.3	0.6
62136	99	P	SUR	54	3	709	0	0.4	0.5	0.7
62138	99	P	SUR	54	0	1412	0	0.5	0.8	1.0
62139	99	P	SUR	53	2	1412	0	0.4	0.3	0.5
62140	99	P	SUR	57	1	1373	0	0.5	-0.1	0.5
62141	99	P	SUR	58	-4	706	0	0.6	-2.4	2.4
62143	99	P	SUR	58	2	703	0	0.6	0.9	1.1
62144	99	P	SUR	53	2	709	0	0.4	0.3	0.5
62145	99	P	SUR	53	3	1378	0	0.4	0.6	0.7
62146	99	P	SUR	57	2	703	0	0.6	0.4	0.7
62148	99	P	SUR	54	2	708	0	0.4	1.5	1.6
62149	99	P	SUR	54	1	707	0	0.4	0.6	0.7
62150	99	P	SUR	54	1	709	0	0.4	1.4	1.5
62151	99	P	SUR	57	2	1394	0	0.4	0.1	0.4
62152	99	P	SUR	57	2	700	0	0.4	0.5	0.7
62153	99	P	SUR	57	2	1408	0	0.5	0.3	0.5
62154	99	P	SUR	56	2	709	0	0.4	-0.1	0.4
62155	99	P	SUR	58	1	539	0	0.5	0.5	0.7
62157	99	P	SUR	58	0	708	0	0.5	-0.2	0.5
62160	99	P	SUR	57	2	1401	0	0.4	0.2	0.5
62161	99	P	SUR	58	1	707	0	0.7	0.0	0.7
62162	99	P	SUR	57	1	705	0	0.4	-0.2	0.5
62163	99	P	SUR	48	-8	714	0	0.5	0.2	0.6
62164	99	P	SUR	57	1	707	0	0.4	0.3	0.5
62165	99	P	SUR	54	1	709	0	0.5	0.7	0.8
62168	99	P	SUR	58	1	709	0	0.4	0.0	0.4
62170	99	P	SUR	51	2	719	0	0.5	0.3	0.5
62296	99	P	SUR	53	2	709	0	0.4	-0.0	0.4
62297	99	P	SUR	59	2	1283	0	0.4	-0.0	0.4
62302	99	P	SUR	61	-2	707	0	0.6	-0.3	0.7
62304	99	P	SUR	51	2	684	5	0.5	0.4	0.6
62305	99	P	SUR	50	0	483	0	0.4	0.3	0.5
62442	99	P	SUR	49	-16	715	0	0.4	-0.1	0.4
62513	99	P	SUR	62	-26	719	0	0.6	-0.1	0.6
62554	99	P	SUR	39	-19	719	0	0.4	0.3	0.5
62559	99	P	SUR	56	-6	651	0	0.6	0.0	0.6
62940	99	P	SUR	29	-36	719	0	0.3	0.0	0.3
62941	99	P	SUR	22	-57	709	0	0.5	-0.4	0.6
6301552	99	P	SUR	79	27	717	0	0.3	-0.1	0.3
6301553	99	P	SUR	82	39	521	0	2.8	-0.3	2.8

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
6301554	99	P	SUR	71	25	718	0	0.5	-0.1	0.5
6301555	99	P	SUR	73	25	719	0	0.4	0.6	0.7
6301556	99	P	SUR	70	-1	719	0	1.0	1.8	2.0
6301557	99	P	SUR	75	10	718	0	0.6	0.8	1.0
63055	99	P	SUR	61	2	708	0	0.6	0.2	0.6
63056	99	P	SUR	60	2	707	0	0.6	0.1	0.6
63057	99	P	SUR	59	2	709	0	0.4	-0.2	0.5
63058	99	P	SUR	53	2	2124	0	0.4	0.2	0.4
63059	99	P	SUR	58	-1	709	0	0.4	0.3	0.5
63101	99	P	SUR	61	1	709	0	0.6	-0.0	0.6
63102	99	P	SUR	61	1	709	0	0.6	0.4	0.7
63103	99	P	SUR	61	1	709	0	0.5	0.4	0.6
63104	99	P	SUR	61	2	709	0	0.6	0.3	0.7
63105	99	P	SUR	61	2	709	0	0.5	-0.3	0.6
63108	99	P	SUR	61	2	709	0	0.6	0.1	0.6
63109	99	P	SUR	60	2	709	0	0.5	-0.1	0.5
63110	99	P	SUR	60	2	709	0	0.5	-0.3	0.6
63111	99	P	SUR	61	2	1391	0	0.6	-0.5	0.8
63112	99	P	SUR	61	1	709	0	0.5	-0.4	0.6
63115	99	P	SUR	62	1	701	0	0.6	0.3	0.7
63117	99	P	SUR	61	1	1412	0	0.6	0.3	0.7
63118	99	P	SUR	61	-2	1406	0	0.8	-0.7	1.0
63120	99	P	SUR	54	2	642	0	0.4	0.5	0.7
6400524	99	P	SUR	67	13	266	0	1.0	-0.6	1.1
6400526	99	P	SUR	48	-27	579	0	0.4	0.2	0.5
6400551	99	P	SUR	53	-29	719	0	1.4	-0.4	1.5
6400562	99	P	SUR	71	0	719	0	0.6	0.1	0.6
6401501	99	P	SUR	66	3	654	0	0.5	0.3	0.6
6401507	99	P	SUR	71	15	645	0	0.5	0.3	0.6
6401508	99	P	SUR	79	5	610	0	2.6	-0.2	2.6
6401550	99	P	SUR	68	12	719	0	0.5	0.0	0.5
6401555	99	P	SUR	69	-4	719	0	0.5	0.6	0.8
6401556	99	P	SUR	68	-6	718	0	0.6	0.6	0.8
6401557	99	P	SUR	60	-44	717	0	0.6	0.2	0.6
6401558	99	P	SUR	61	0	220	0	1.4	0.7	1.6
6401560	99	P	SUR	62	-6	719	0	0.4	0.4	0.6
6401561	99	P	SUR	60	-28	718	0	0.4	0.3	0.5
6401562	99	P	SUR	62	-12	585	0	0.6	0.2	0.6
6401563	99	P	SUR	62	-17	535	0	1.3	1.7	2.1
64041	99	P	SUR	61	-3	707	0	0.5	-0.2	0.5
64045	99	P	SUR	59	-12	779	2	0.5	-0.3	0.6
64046	99	P	SUR	61	-4	719	0	0.4	-0.1	0.4
64524	99	P	SUR	67	13	266	0	1.0	-0.6	1.1

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
64526	99	P	SUR	48	-27	579	0	0.4	0.2	0.5
64551	99	P	SUR	53	-28	719	0	1.4	-0.4	1.5
64562	99	P	SUR	71	0	719	0	0.6	0.1	0.6
6500519	99	P	SUR	70	33	719	0	0.5	-0.4	0.7
6500596	99	P	SUR	78	4	711	0	1.2	0.6	1.3
6500599	99	P	SUR	73	19	719	0	0.6	0.2	0.6
6500602	99	P	SUR	64	-5	718	0	0.7	0.3	0.7
6501551	99	P	SUR	48	-44	719	0	0.6	-0.1	0.6
6501553	99	P	SUR	53	-40	719	0	0.5	0.3	0.5
6501555	99	P	SUR	65	-52	718	0	0.5	-0.5	0.7
6501556	99	P	SUR	52	-36	719	0	0.4	0.3	0.5
65519	99	P	SUR	70	33	719	0	0.5	-0.4	0.7
65596	99	P	SUR	78	4	711	0	1.2	0.6	1.3
65599	99	P	SUR	73	19	719	0	0.6	0.2	0.6
65602	99	P	SUR	64	-5	718	0	0.7	0.3	0.7

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

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


TIME = 99 => AVERAGE OF ALL OBSERVATIONS


GROSS ERROR LIMIT FOR VECTOR WIND = 25 M/S
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WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
1300001	99	SPEED	SUR	11	-23	708	0	0	1.0	0.8	1.3
1300002	99	SPEED	SUR	20	-23	702	0	0	0.8	0.4	0.9
1300008	99	SPEED	SUR	15	-38	150	0	0	0.7	0.0	0.7
1300130	99	SPEED	SUR	28	-16	360	0	0	1.2	0.3	1.2
1300131	99	SPEED	SUR	28	-17	359	0	0	1.9	2.2	2.9
4100026	99	SPEED	SUR	12	-38	29	0	0	0.8	-0.6	1.0
4100139	99	SPEED	SUR	20	-38	696	0	0	1.0	0.3	1.0
4100300	99	SPEED	SUR	16	-57	288	0	0	0.9	-0.3	0.9
41026	99	SPEED	SUR	12	-38	29	0	0	0.8	-0.5	1.0
41040	99	SPEED	SUR	15	-53	1182	0	0	1.0	-0.1	1.0
41041	99	SPEED	SUR	14	-46	1135	0	0	0.8	-0.3	0.9
41043	99	SPEED	SUR	21	-65	1184	0	0	1.5	-0.5	1.6
41044	99	SPEED	SUR	22	-59	1190	0	0	1.1	-0.2	1.1
41046	99	SPEED	SUR	24	-68	1178	0	0	1.4	-0.2	1.4
41048	99	SPEED	SUR	32	-70	1186	0	0	1.2	-0.1	1.2
41049	99	SPEED	SUR	28	-63	718	0	0	1.3	0.3	1.4
41052	99	SPEED	SUR	18	-65	1879	0	0	1.1	-0.2	1.1
41053	99	SPEED	SUR	19	-66	1866	0	0	1.6	0.6	1.7
41056	99	SPEED	SUR	18	-66	1519	0	0	1.3	-0.4	1.3
41300	99	SPEED	SUR	16	-57	287	0	0	0.9	-0.2	1.0
42059	99	SPEED	SUR	15	-68	1172	0	0	1.2	0.1	1.2
42085	99	SPEED	SUR	18	-67	1103	0	0	1.5	-0.0	1.5
42090	99	SPEED	SUR	18	-70	118	0	0	1.5	-0.3	1.5
44008	99	SPEED	SUR	41	-69	278	10	0	1.4	0.4	1.4
44032	99	SPEED	SUR	44	-69	703	0	0	1.5	0.1	1.5
44033	99	SPEED	SUR	44	-69	697	0	0	1.3	0.3	1.3
44034	99	SPEED	SUR	44	-68	711	0	0	1.4	-0.1	1.4
44037	99	SPEED	SUR	44	-68	694	0	0	1.2	0.0	1.2
44137	99	SPEED	SUR	42	-62	640	0	0	1.7	0.6	1.8
44139	99	SPEED	SUR	44	-57	584	0	0	1.5	-0.3	1.5
44150	99	SPEED	SUR	43	-64	684	0	0	1.5	0.0	1.5
44258	99	SPEED	SUR	45	-63	342	0	0	1.6	0.5	1.7
45138	99	SPEED	SUR	50	-66	366	0	0	2.0	0.3	2.0
6100001	99	SPEED	SUR	43	8	713	0	0	2.1	-0.1	2.1

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
6100002	99	SPEED	SUR	42	5	720	0	0	1.3	0.2	1.3
61001	99	SPEED	SUR	43	8	712	0	0	2.3	-0.6	2.3
6100196	99	SPEED	SUR	42	4	310	0	0	1.9	-1.7	2.5
6100197	99	SPEED	SUR	40	4	361	0	0	1.8	-0.3	1.8
6100198	99	SPEED	SUR	37	-2	305	0	0	1.8	-0.6	1.9
61002	99	SPEED	SUR	42	5	719	0	0	1.3	-0.5	1.4
6100280	99	SPEED	SUR	41	1	314	0	0	1.9	-1.2	2.2
6100281	99	SPEED	SUR	40	0	240	0	0	2.4	0.3	2.4
6100417	99	SPEED	SUR	38	0	266	0	0	1.6	0.2	1.6
6100430	99	SPEED	SUR	40	2	264	0	0	2.0	-0.5	2.0
6101001	99	SPEED	SUR	38	24	226	0	0	2.0	0.1	2.0
6101003	99	SPEED	SUR	40	25	229	0	0	2.5	-1.5	2.9
6101007	99	SPEED	SUR	36	25	234	0	0	1.8	-0.5	1.9
6101008	99	SPEED	SUR	37	22	179	0	0	1.7	-0.4	1.7
6200024	99	SPEED	SUR	44	-3	328	0	0	1.6	-0.0	1.6
6200025	99	SPEED	SUR	44	-6	349	0	0	1.6	-0.5	1.7
6200082	99	SPEED	SUR	44	-8	301	0	0	1.1	-0.8	1.4
6200083	99	SPEED	SUR	43	-9	360	0	0	1.5	-1.0	1.8
6200084	99	SPEED	SUR	42	-9	361	0	0	1.2	-0.1	1.2
6200085	99	SPEED	SUR	36	-7	361	0	0	1.2	0.0	1.2
6200091	99	SPEED	SUR	53	-5	4	0	0	0.6	1.2	1.3
6200093	99	SPEED	SUR	55	-10	718	0	0	1.3	-0.7	1.5
6200094	99	SPEED	SUR	52	-7	683	0	0	1.2	0.1	1.2
62001	99	SPEED	SUR	45	-5	711	0	0	1.2	0.6	1.3
6200191	99	SPEED	SUR	41	-10	594	0	0	1.4	0.3	1.4
6200192	99	SPEED	SUR	40	-10	224	0	0	1.4	0.2	1.4
6200199	99	SPEED	SUR	40	-9	592	0	0	1.3	0.4	1.4
6200200	99	SPEED	SUR	36	-8	591	0	0	1.1	0.0	1.1
6201030	99	SPEED	SUR	44	-4	16	0	0	3.4	-2.1	4.0
6201070	99	SPEED	SUR	43	-9	704	0	0	1.6	-0.5	1.7
62023	99	SPEED	SUR	51	-8	708	0	0	1.7	0.0	1.7
62027	99	SPEED	SUR	49	-2	208	0	0	1.4	0.4	1.5
62050	99	SPEED	SUR	50	-4	718	0	0	1.1	0.5	1.2
62095	99	SPEED	SUR	53	-16	1377	0	0	1.4	0.1	1.4
62102	99	SPEED	SUR	58	2	552	0	0	1.5	-0.6	1.6
62103	99	SPEED	SUR	50	-3	714	0	0	1.4	1.4	2.0
62104	99	SPEED	SUR	57	1	709	0	0	1.5	-0.9	1.8
62105	99	SPEED	SUR	55	-13	632	0	0	1.6	0.1	1.7
62107	99	SPEED	SUR	50	-6	1432	0	0	1.4	0.7	1.6
62111	99	SPEED	SUR	58	0	705	0	0	1.7	-0.2	1.8
62112	99	SPEED	SUR	58	0	709	0	0	2.4	-2.3	3.3

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
62113	99	SPEED	SUR	58	0	697	0	0	1.7	-0.7	1.9
62114	99	SPEED	SUR	58	0	1412	0	0	1.7	0.0	1.7
62118	99	SPEED	SUR	58	1	708	0	0	1.6	-0.2	1.7
62119	99	SPEED	SUR	57	2	709	0	0	2.4	-1.2	2.7
62120	99	SPEED	SUR	56	2	693	0	0	1.7	-0.3	1.8
62121	99	SPEED	SUR	54	3	518	0	0	1.2	-0.3	1.3
62122	99	SPEED	SUR	57	2	1408	0	0	1.4	-0.7	1.6
62129	99	SPEED	SUR	58	0	709	0	0	1.6	-0.9	1.8
62131	99	SPEED	SUR	54	1	694	0	0	1.3	0.0	1.3
62132	99	SPEED	SUR	56	2	709	0	0	3.0	-2.4	3.9
62133	99	SPEED	SUR	57	1	706	0	0	1.4	-0.7	1.6
62134	99	SPEED	SUR	58	1	707	0	0	1.5	-0.9	1.7
62140	99	SPEED	SUR	57	1	1373	0	0	1.6	-0.3	1.7
62143	99	SPEED	SUR	58	2	703	0	0	2.6	-1.8	3.1
62144	99	SPEED	SUR	53	2	709	0	0	1.5	-0.8	1.7
62145	99	SPEED	SUR	53	3	1247	0	0	1.4	-0.2	1.4
62146	99	SPEED	SUR	57	2	703	0	0	1.9	-0.2	2.0
62148	99	SPEED	SUR	54	2	708	0	0	1.7	-0.7	1.8
62149	99	SPEED	SUR	54	1	707	0	0	1.2	0.0	1.2
62150	99	SPEED	SUR	54	1	709	0	0	2.9	-1.6	3.3
62152	99	SPEED	SUR	57	2	700	1	0	2.0	-2.1	2.9
62153	99	SPEED	SUR	57	2	1408	0	0	3.1	-2.9	4.2
62154	99	SPEED	SUR	56	2	706	0	0	1.6	-1.0	1.9
62155	99	SPEED	SUR	58	1	538	0	0	2.1	-1.1	2.3
62163	99	SPEED	SUR	48	-8	714	0	0	1.1	0.1	1.1
62164	99	SPEED	SUR	57	1	707	0	0	1.8	-1.8	2.5
62165	99	SPEED	SUR	54	1	709	0	0	1.8	-0.9	2.0
62170	99	SPEED	SUR	51	2	719	0	0	1.6	1.5	2.2
62304	99	SPEED	SUR	51	2	684	0	0	1.6	1.5	2.2
62305	99	SPEED	SUR	50	0	483	0	0	1.5	1.1	1.9
62442	99	SPEED	SUR	49	-16	715	0	0	1.3	-0.7	1.5
63055	99	SPEED	SUR	61	2	709	0	0	1.7	-1.9	2.5
63056	99	SPEED	SUR	60	2	704	0	0	1.4	-0.4	1.5
63057	99	SPEED	SUR	59	2	709	0	0	2.2	-0.6	2.3
63058	99	SPEED	SUR	53	2	1414	0	0	1.2	-0.1	1.2
63101	99	SPEED	SUR	61	1	709	0	0	1.5	-0.8	1.7
63103	99	SPEED	SUR	61	1	709	0	0	1.8	-0.3	1.8
63104	99	SPEED	SUR	61	2	709	0	0	1.6	-0.9	1.9
63105	99	SPEED	SUR	61	2	709	0	0	1.7	-0.4	1.7
63106	99	SPEED	SUR	61	2	709	0	0	1.7	-0.4	1.7
63108	99	SPEED	SUR	61	2	709	0	0	2.0	-0.4	2.0

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
63109	99	SPEED	SUR	60	2	699	0	0	1.4	-0.1	1.4
63110	99	SPEED	SUR	60	2	709	0	0	1.4	-1.0	1.7
63112	99	SPEED	SUR	61	1	709	0	0	1.4	-0.9	1.7
63113	99	SPEED	SUR	61	2	702	0	0	1.7	-0.8	1.8
63115	99	SPEED	SUR	62	1	701	0	0	1.6	-0.7	1.7
63117	99	SPEED	SUR	61	1	1412	0	0	1.5	-1.2	1.9
64041	99	SPEED	SUR	61	-3	706	0	0	1.4	-0.7	1.5
64045	99	SPEED	SUR	59	-12	779	0	0	1.3	-0.1	1.3
64046	99	SPEED	SUR	61	-4	719	0	0	1.2	0.1	1.2
66021	99	SPEED	SUR	55	14	716	0	0	1.1	0.9	1.4
66022	99	SPEED	SUR	54	14	1257	0	0	1.0	0.0	1.0
66024	99	SPEED	SUR	55	13	717	0	0	1.3	0.9	1.5

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                : NOV 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	544	0	0	15.6	4.0	16.2
1300002	99	DIRN	SUR	20	-23	586	0	0	10.9	0.0	10.9
1300008	99	DIRN	SUR	15	-38	121	0	0	10.1	6.4	11.9
1300130	99	DIRN	SUR	28	-16	304	0	0	12.6	3.4	13.1
1300131	99	DIRN	SUR	28	-17	241	0	0	11.4	3.5	11.9
4100026	99	DIRN	SUR	12	-38	29	0	0	10.5	-24.6	26.7
4100139	99	DIRN	SUR	20	-38	531	0	0	13.7	3.6	14.2
41002	99	DIRN	SUR	32	-75	617	0	3	22.5	6.1	23.3
4100300	99	DIRN	SUR	16	-57	263	0	0	9.4	-15.0	17.8
41004	99	DIRN	SUR	33	-79	921	0	0	15.4	6.7	16.8
41008	99	DIRN	SUR	31	-81	661	0	0	18.8	3.7	19.2
41009	99	DIRN	SUR	29	-80	938	0	0	19.5	5.8	20.3
41013	99	DIRN	SUR	33	-78	888	0	1	16.0	6.3	17.2
41024	99	DIRN	SUR	34	-79	404	0	0	14.6	-12.8	19.4
41025	99	DIRN	SUR	35	-75	865	0	2	20.8	7.3	22.1
41026	99	DIRN	SUR	12	-38	29	0	0	11.5	-24.3	26.9
41029	99	DIRN	SUR	33	-80	625	0	0	16.3	-0.9	16.4
41033	99	DIRN	SUR	32	-80	424	0	1	19.8	5.7	20.6
41037	99	DIRN	SUR	34	-77	525	0	1	18.7	-8.9	20.8
41038	99	DIRN	SUR	34	-78	477	0	0	17.8	-2.9	18.1
41040	99	DIRN	SUR	15	-53	1143	0	0	10.6	-7.5	13.0
41041	99	DIRN	SUR	14	-46	1112	0	0	10.1	-12.8	16.3
41043	99	DIRN	SUR	21	-65	1047	0	2	16.5	-0.7	16.5
41044	99	DIRN	SUR	22	-59	1047	0	0	15.7	-0.7	15.7
41046	99	DIRN	SUR	24	-68	991	0	0	19.8	-1.6	19.8
41047	99	DIRN	SUR	28	-72	1077	0	1	18.5	-4.0	18.9
41048	99	DIRN	SUR	32	-70	981	0	0	18.5	-4.8	19.1
41049	99	DIRN	SUR	28	-63	626	0	1	18.0	9.7	20.5
41052	99	DIRN	SUR	18	-65	1665	0	0	15.1	8.0	17.0
41053	99	DIRN	SUR	19	-66	786	0	0	18.1	-0.2	18.1
41056	99	DIRN	SUR	18	-66	1257	0	0	18.7	6.0	19.6
41063	99	DIRN	SUR	35	-76	600	0	1	19.7	-2.9	20.0

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
41064	99	DIRN	SUR	34	-77	268	0	3	20.6	-13.2	24.4
41300	99	DIRN	SUR	16	-57	255	0	0	9.4	-15.1	17.7
42013	99	DIRN	SUR	27	-83	650	0	0	15.1	0.5	15.2
42036	99	DIRN	SUR	29	-85	415	0	0	14.0	5.2	14.9
42056	99	DIRN	SUR	20	-85	987	0	0	13.3	5.1	14.2
42057	99	DIRN	SUR	17	-81	960	0	1	19.5	5.4	20.3
42058	99	DIRN	SUR	15	-75	1076	0	0	16.5	12.4	20.7
42059	99	DIRN	SUR	15	-68	1086	0	0	14.2	1.1	14.2
42085	99	DIRN	SUR	18	-67	913	0	1	22.4	26.5	34.7
42090	99	DIRN	SUR	18	-70	27	0	0	21.9	-47.6	52.4
44007	99	DIRN	SUR	44	-70	751	0	0	14.3	7.0	15.9
44008	99	DIRN	SUR	41	-69	243	10	99	2.2	77.0	77.0
44009	99	DIRN	SUR	39	-75	573	0	0	13.0	15.8	20.4
44013	99	DIRN	SUR	42	-71	763	0	0	17.7	10.8	20.8
44014	99	DIRN	SUR	37	-75	554	0	0	15.1	4.4	15.8
44020	99	DIRN	SUR	41	-70	679	0	16	26.8	6.5	27.6
44022	99	DIRN	SUR	41	-74	414	0	0	20.6	10.2	23.0
44025	99	DIRN	SUR	40	-73	802	0	0	13.4	3.0	13.8
44029	99	DIRN	SUR	43	-71	1022	0	0	18.0	3.6	18.4
44030	99	DIRN	SUR	43	-70	623	0	0	14.0	6.1	15.3
44032	99	DIRN	SUR	44	-69	606	0	0	12.1	16.6	20.5
44033	99	DIRN	SUR	44	-69	597	0	0	14.3	-0.6	14.3
44034	99	DIRN	SUR	44	-68	614	0	0	13.8	8.3	16.1
44037	99	DIRN	SUR	44	-68	602	0	1	13.7	32.4	35.1
44039	99	DIRN	SUR	41	-73	443	0	0	16.0	2.1	16.1
44040	99	DIRN	SUR	41	-74	566	0	0	15.1	3.6	15.5
44041	99	DIRN	SUR	37	-77	114	0	0	15.9	-14.4	21.5
44042	99	DIRN	SUR	38	-76	546	0	0	17.8	-6.7	19.0
44043	99	DIRN	SUR	39	-76	550	0	0	17.8	-1.9	17.9
44057	99	DIRN	SUR	40	-76	272	0	0	18.3	6.6	19.5
44058	99	DIRN	SUR	38	-76	534	0	0	13.8	-26.6	30.0
44062	99	DIRN	SUR	39	-76	611	0	0	21.5	-13.0	25.1
44063	99	DIRN	SUR	39	-76	529	0	0	28.5	-10.2	30.3
44064	99	DIRN	SUR	37	-76	516	0	0	18.0	-19.5	26.5
44065	99	DIRN	SUR	40	-74	652	0	0	12.9	6.2	14.3
44066	99	DIRN	SUR	40	-73	676	0	0	14.0	1.6	14.1
44069	99	DIRN	SUR	41	-73	628	0	0	14.1	3.9	14.7
44072	99	DIRN	SUR	37	-76	543	0	0	14.6	-12.5	19.2
44137	99	DIRN	SUR	42	-62	602	0	0	16.4	-11.3	20.0
44139	99	DIRN	SUR	44	-57	520	0	0	13.9	5.3	14.9
44150	99	DIRN	SUR	43	-64	628	0	0	11.8	7.9	14.2

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
44258	99	DIRN	SUR	45	-63	292	0	0	14.9	-12.3	19.3
45003	99	DIRN	SUR	45	-83	671	0	0	13.8	3.8	14.3
45005	99	DIRN	SUR	42	-82	922	0	0	13.1	8.8	15.8
45008	99	DIRN	SUR	44	-82	1019	0	0	12.6	0.0	12.6
45012	99	DIRN	SUR	44	-77	627	0	0	17.9	7.2	19.3
45132	99	DIRN	SUR	43	-81	517	0	0	13.5	-0.4	13.5
45135	99	DIRN	SUR	44	-77	804	0	0	13.7	-1.7	13.8
45137	99	DIRN	SUR	46	-81	634	0	1	18.7	7.3	20.0
45138	99	DIRN	SUR	50	-66	289	0	0	16.8	-6.0	17.8
45139	99	DIRN	SUR	43	-80	533	0	0	16.7	2.7	16.9
45142	99	DIRN	SUR	43	-79	507	0	0	16.2	-3.6	16.6
45143	99	DIRN	SUR	45	-81	1096	0	1	16.8	2.2	16.9
45147	99	DIRN	SUR	42	-83	259	0	0	15.9	4.1	16.4
45149	99	DIRN	SUR	44	-82	444	0	0	12.3	-2.2	12.5
45151	99	DIRN	SUR	45	-79	573	0	1	15.2	4.4	15.8
45154	99	DIRN	SUR	46	-83	463	0	0	24.1	37.4	44.5
45169	99	DIRN	SUR	42	-82	290	0	2	17.6	-14.3	22.7
45175	99	DIRN	SUR	46	-85	106	0	4	21.1	-11.2	23.8
45176	99	DIRN	SUR	42	-82	293	0	2	23.1	-16.4	28.3
45178	99	DIRN	SUR	45	-73	17	0	0	15.8	-11.2	19.3
6100198	99	DIRN	SUR	37	-2	207	0	0	18.2	6.2	19.2
6100281	99	DIRN	SUR	40	0	143	0	57	43.5	14.0	45.7
6100417	99	DIRN	SUR	38	0	216	0	0	17.7	8.1	19.5
6200024	99	DIRN	SUR	44	-3	282	0	0	22.0	10.8	24.6
6200025	99	DIRN	SUR	44	-6	225	0	2	23.7	9.9	25.7
6200082	99	DIRN	SUR	44	-8	248	0	0	15.7	2.3	15.9
6200083	99	DIRN	SUR	43	-9	301	0	0	17.0	3.4	17.3
6200084	99	DIRN	SUR	42	-9	344	0	0	12.2	8.3	14.8
6200085	99	DIRN	SUR	36	-7	327	0	0	13.8	4.2	14.4
6200091	99	DIRN	SUR	53	-5	4	0	100	0.0	0.0	0.0
6200093	99	DIRN	SUR	55	-10	671	0	0	12.5	-0.7	12.5
6200094	99	DIRN	SUR	52	-7	605	0	1	12.6	0.1	12.6
62001	99	DIRN	SUR	45	-5	606	0	0	14.5	2.5	14.7
6200191	99	DIRN	SUR	41	-10	528	0	0	14.3	-1.3	14.4
6200192	99	DIRN	SUR	40	-10	199	0	0	15.0	5.0	15.8
6200199	99	DIRN	SUR	40	-9	469	0	0	13.4	-0.6	13.4
6200200	99	DIRN	SUR	36	-8	502	0	100	0.0	0.0	0.0
6201030	99	DIRN	SUR	44	-4	9	0	0	16.9	-26.3	31.2
6201070	99	DIRN	SUR	43	-9	355	0	1	23.8	4.6	24.2
62023	99	DIRN	SUR	51	-8	625	0	0	14.8	10.1	17.9
62027	99	DIRN	SUR	49	-2	178	0	0	16.4	-7.5	18.0

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
62050	99	DIRN	SUR	50	-4	641	0	0	12.1	-0.2	12.1
62095	99	DIRN	SUR	53	-16	1249	0	1	13.2	5.9	14.4
62103	99	DIRN	SUR	50	-3	659	0	0	16.0	5.1	16.8
62105	99	DIRN	SUR	55	-13	586	0	0	12.3	3.9	12.9
62107	99	DIRN	SUR	50	-6	1354	0	0	13.4	-1.1	13.5
62111	99	DIRN	SUR	58	0	680	0	1	12.5	-4.5	13.3
62112	99	DIRN	SUR	58	0	647	0	0	11.9	2.3	12.1
62114	99	DIRN	SUR	58	0	1360	0	0	9.5	1.1	9.5
62163	99	DIRN	SUR	48	-8	585	0	0	14.0	-0.5	14.0
62305	99	DIRN	SUR	50	0	434	0	0	17.0	-1.1	17.0
62442	99	DIRN	SUR	49	-16	668	0	0	16.0	-9.4	18.5
64041	99	DIRN	SUR	61	-3	684	0	0	8.8	8.9	12.5
64045	99	DIRN	SUR	59	-12	757	0	0	11.5	4.6	12.4
64046	99	DIRN	SUR	61	-4	693	0	0	10.3	-4.0	11.1

4.12 Table 24 - List of Assimilated BUFR Encoded Radiosonde Stations

ASDE09	ASDK01	ASDK02	ASDK03	ASFR1	ASFR2	ASFR3	ASFR4	FPUW5GN
JGQH	JNKN7JF	KMPLHPW	LRYQE3U	VKB4L5Q	XQFJRGX	ZVQEQCM	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	04220	04270	04320	04339
04360	04417	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	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	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	72632	72634	72645
72649	72659	72662	72672	72681	72712	72747	72764	72776
72786	72797	74389	74494	74560	76612	76679	76743	76805
76903	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	ASDK01	ASDK02	ASDK03	ASFR1	ASFR2	ASFR3	ASFR4	FPUW5GN
JNKN7JF	KMPLHPW	LRYQE3U	VKB4L5Q	XQFJRGX	ZVQEQCM	7JUNA4N	01206	08098
14101	17607	40186	42647	47155	76743	76903		

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.