ECMWF Global Data Monitoring Report

November 2015

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 18) – 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 (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 26 (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 25 (Dec 14) – Coverage chart for ATOVS AMSU-A for Noaa_16 removed

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
03354	(12)	22	8	02836	(12)	31	45
03882	(12)	12	1	11120	(00)	14	29
06060	(00)	14	0	25123	(00)	14	30
08160	(00)	15	0	25123	(12)	15	30
08160	(12)	13	0	30554	(00)	11	30
10304	(00)	16	0	30554	(12)	12	30
10954	(00)	19	0	41169	(00)	0	27
10954	(12)	36	17	42339	(12)	8	29
16754	(00)	12	0	42379	(00)	11	27
25400	(00)	31	15	42701	(00)	16	27
25400	(12)	31	14	43185	(00)	1	16
33041	(12)	30	1	51656	(00)	0	26
41256	(12)	29	0	51656	(12)	0	27
43333	(00)	29	0	64458	(00)	14	27
43599	(12)	27	13	64458	(12)	14	28
48327	(00)	22	11	64650	(00)	7	26
48453	(00)	31	2	68512	(12)	0	25
61052	(00)	31	0	76256	(12)	0	16
61052	(12)	31	0	76394	(12)	8	30
61291	(12)	23	12	85934	(12)	9	30
65344	(12)	26	6	86218	(12)	0	15
68512	(00)	25	0	89571	(00)	10	27
74004	(12)	32	17	89662	(00)	0	27
76526	(12)	27	12	89662	(12)	1	27
76654	(00)	13	0	89859	(00)	0	15
78397	(00)	12	0	98328	(12)	0	30
78583	(00)	16	0	-	-	-	-
78866	(00)	12	0	-	-	-	-
78954	(00)	15	0	-	-	-	-
78988	(00)	15	0	-	-	-	-
83566	(00)	30	16	-	-	-	-
83566	(12)	31	15	-	-	-	-
91610	(00)	30	1	-	-	-	-
91643	(00)	24	9	-	-	-	-
96645	(00)	29	4	-	-	-	-
96645	(12)	29	3	-	-	-	-
96805	(00)	31	3	-	-	-	-
96805	(12)	30	2	-	-	-	-

2.2 Drifting Buoys

Surface pressure observations from **1495** drifting buoys were received during the month.

3 Global monitoring statistics

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

3.1 Data Availability

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

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

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

3.2 Data Quality

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

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

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

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

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

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

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

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

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

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

3.2.1 Figure 1 - Availability - SYNOP PRESSURE

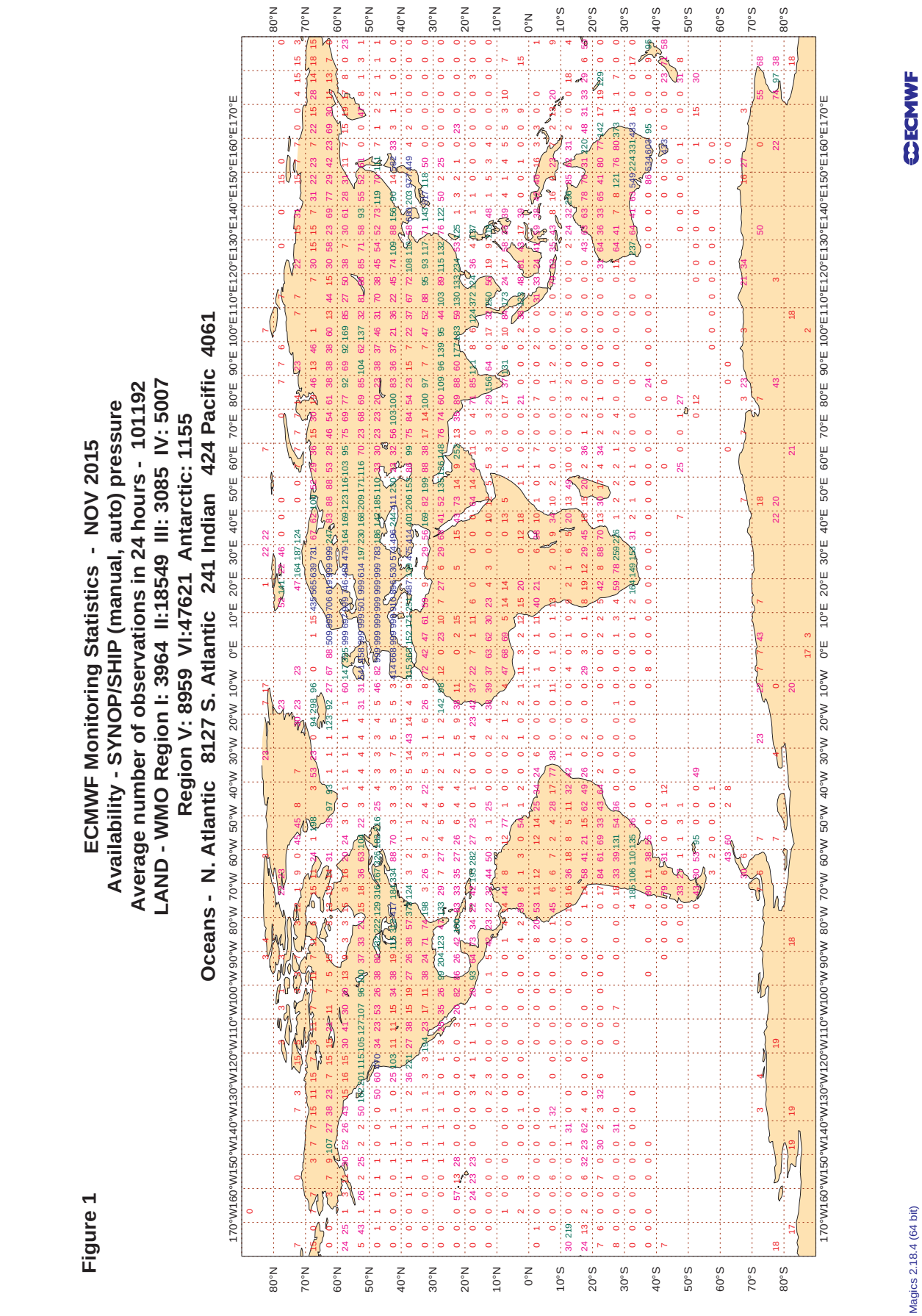


Figure 1

3.2.2 Figure 2 - Availability - DRIFTER PRESSURE

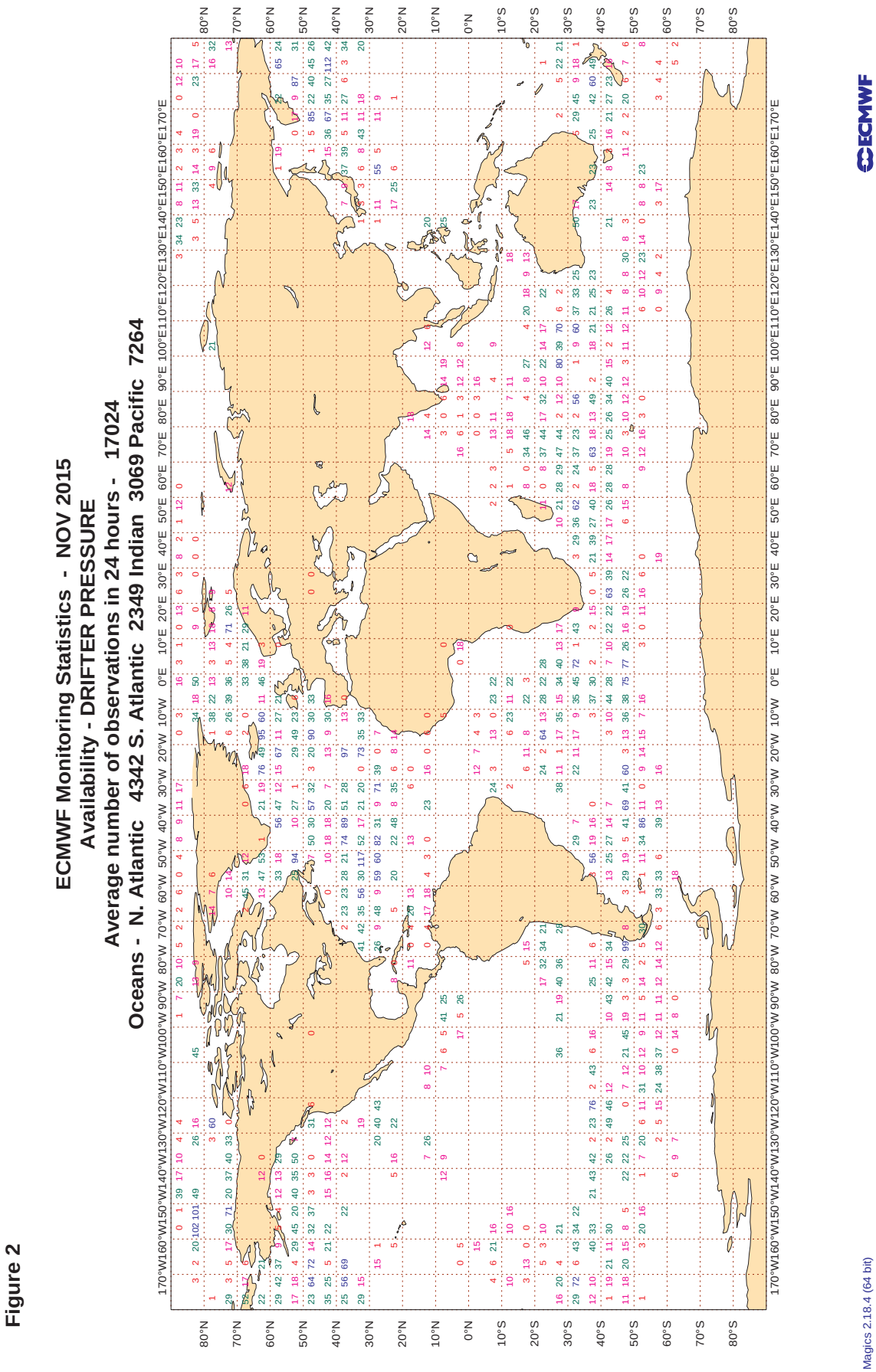


Figure 2

3.2.3 Figure 3 - Availability - TEMP 500 hPa geopotential

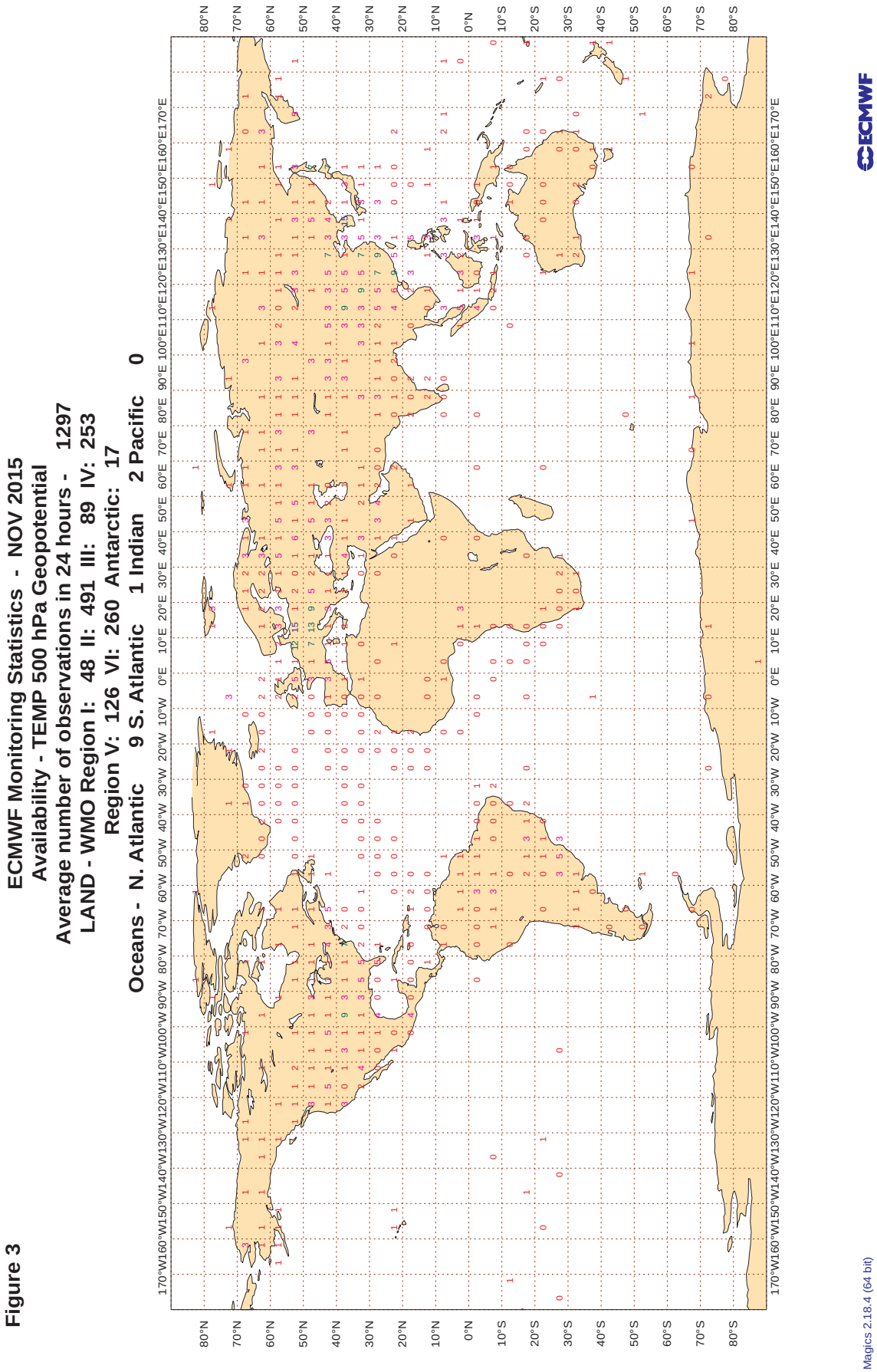


Figure 3

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

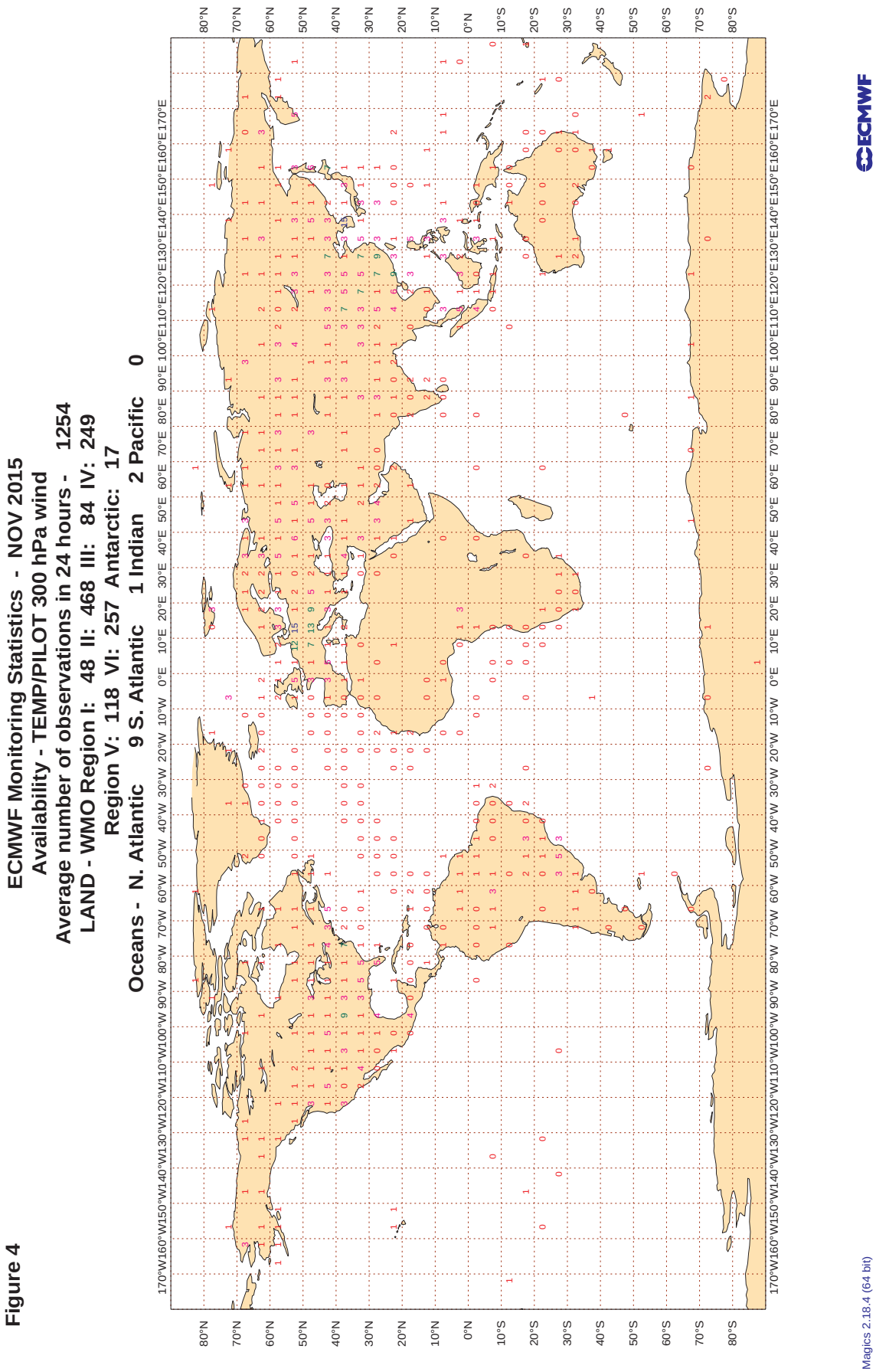


Figure 4

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

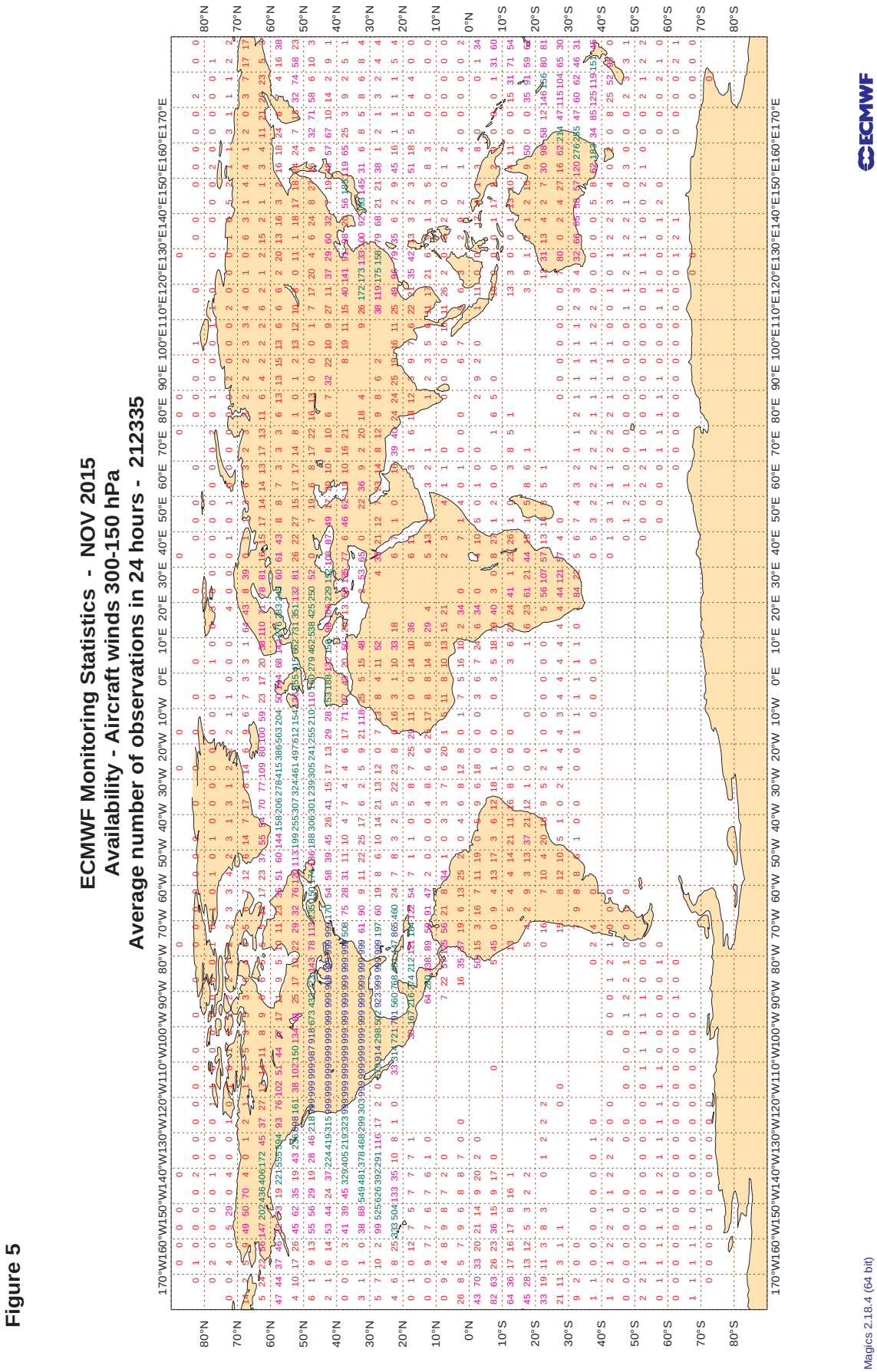


Figure 5

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

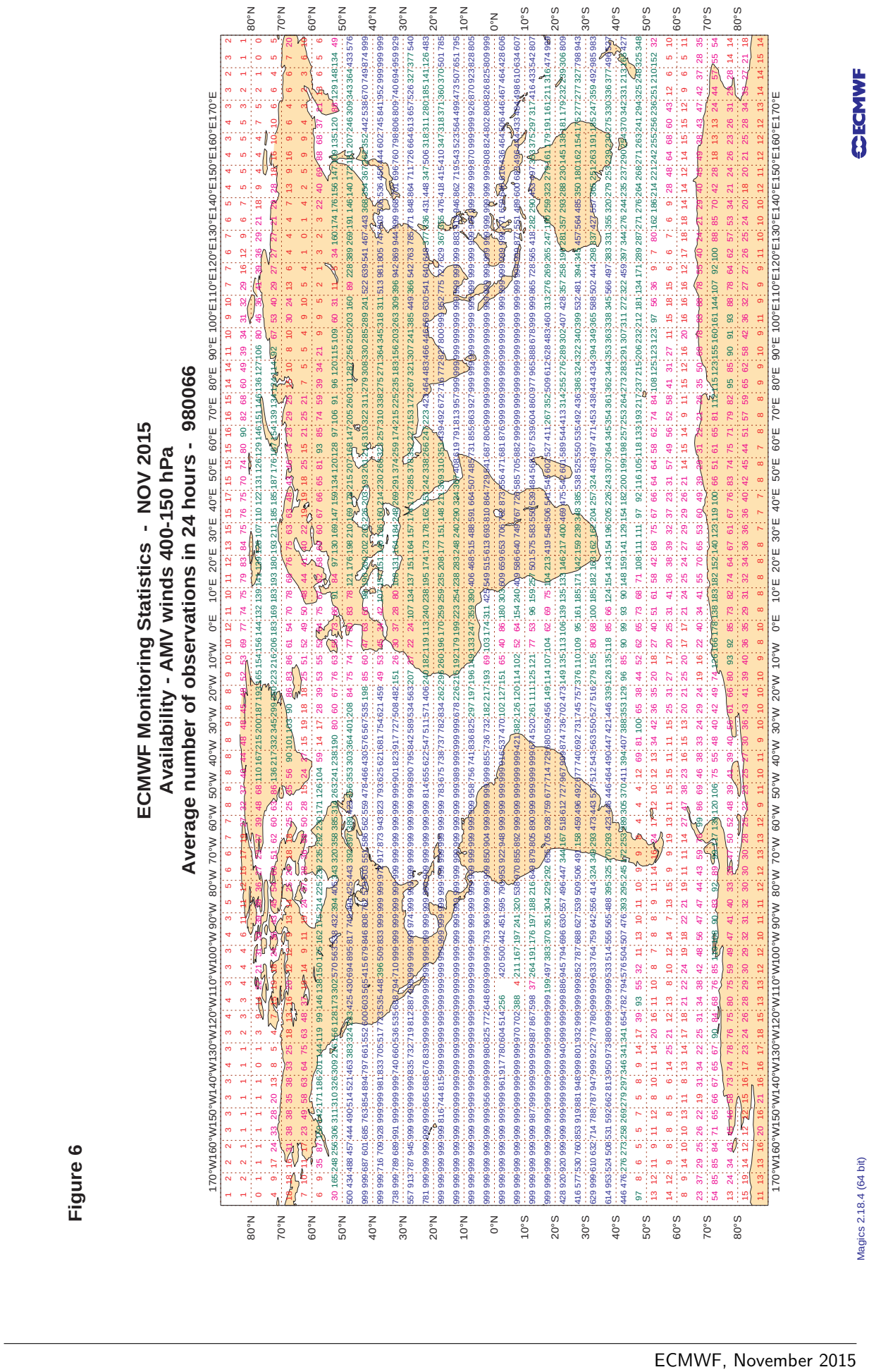


Figure 6

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

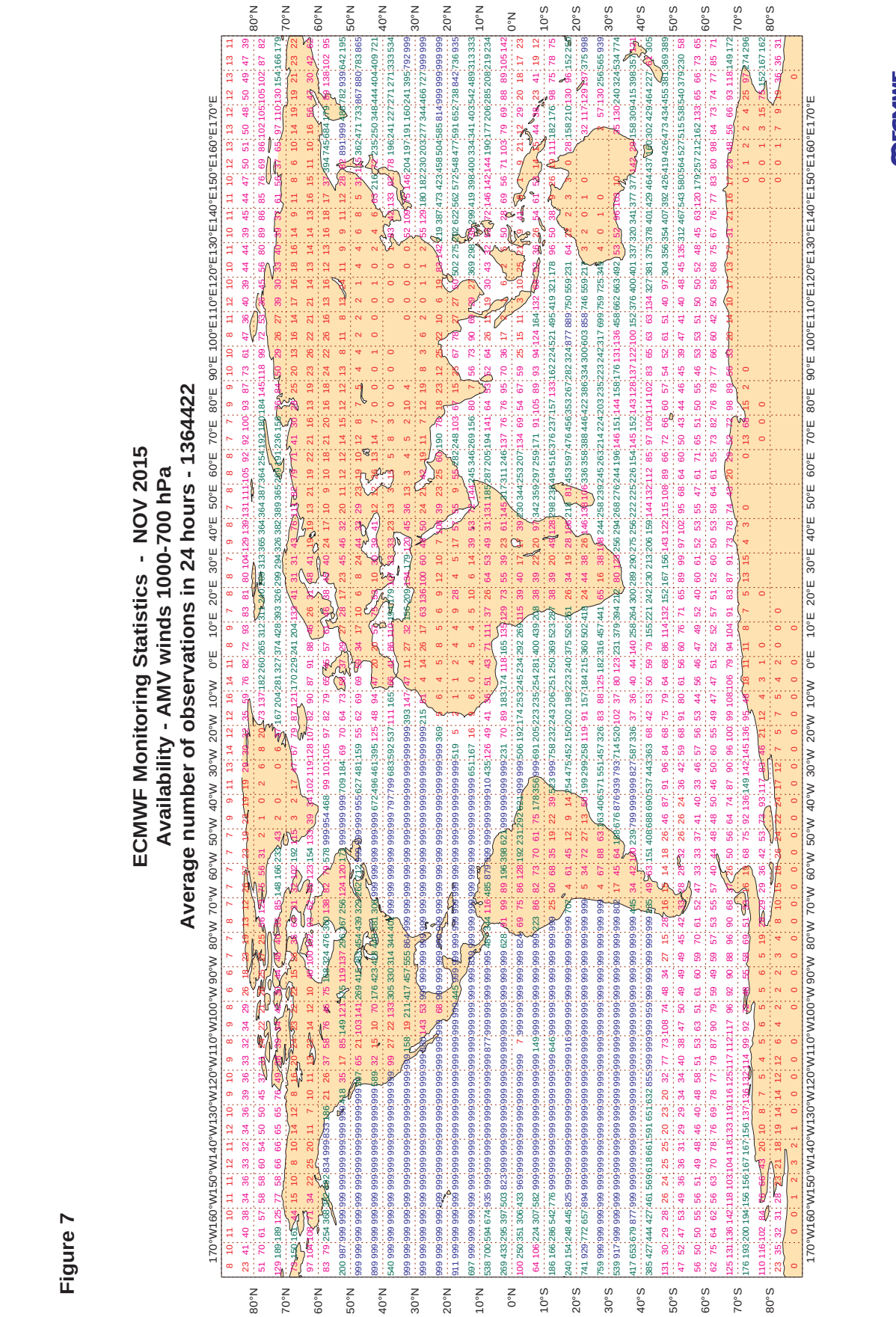


Figure 7

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

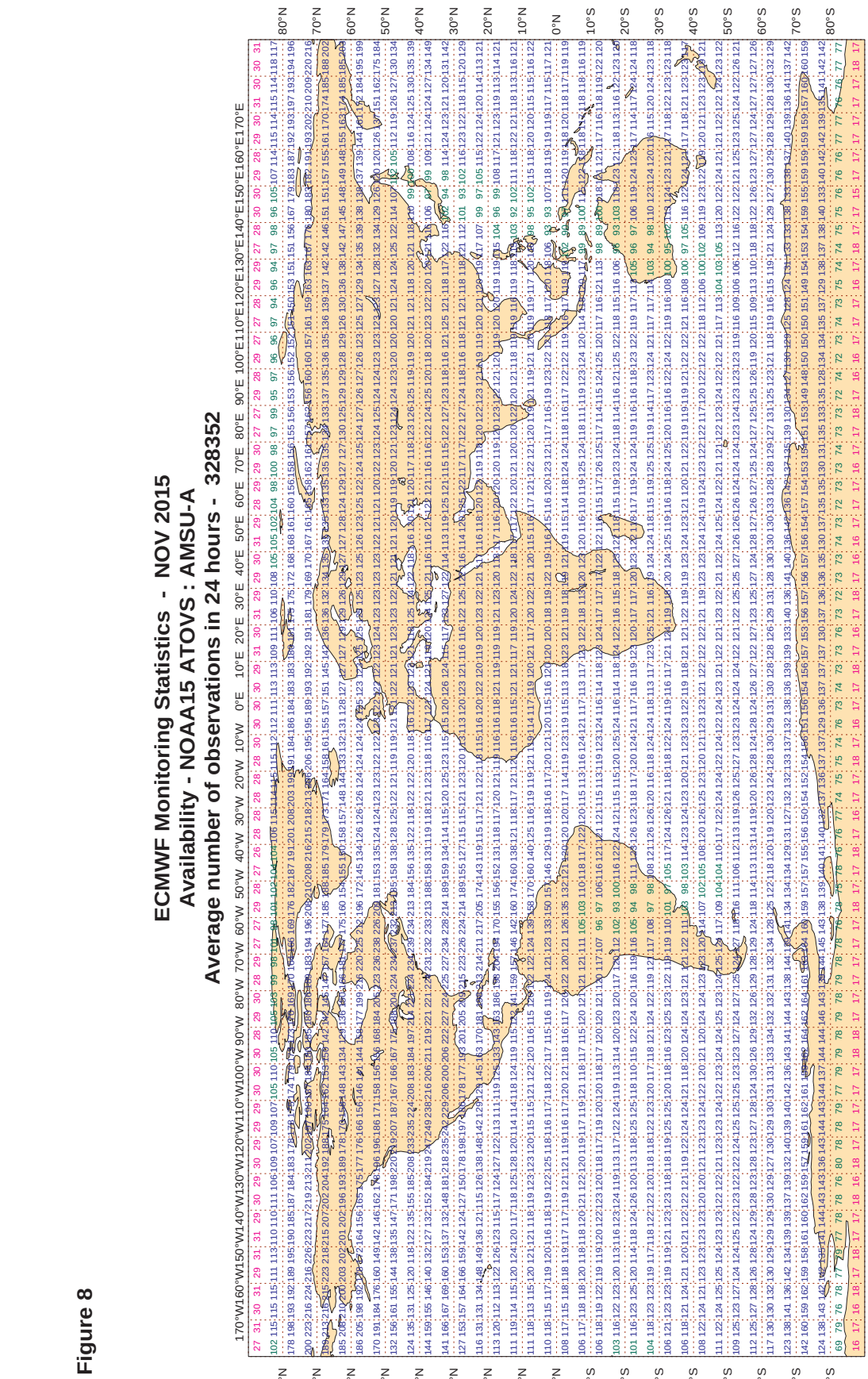


Figure 8

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

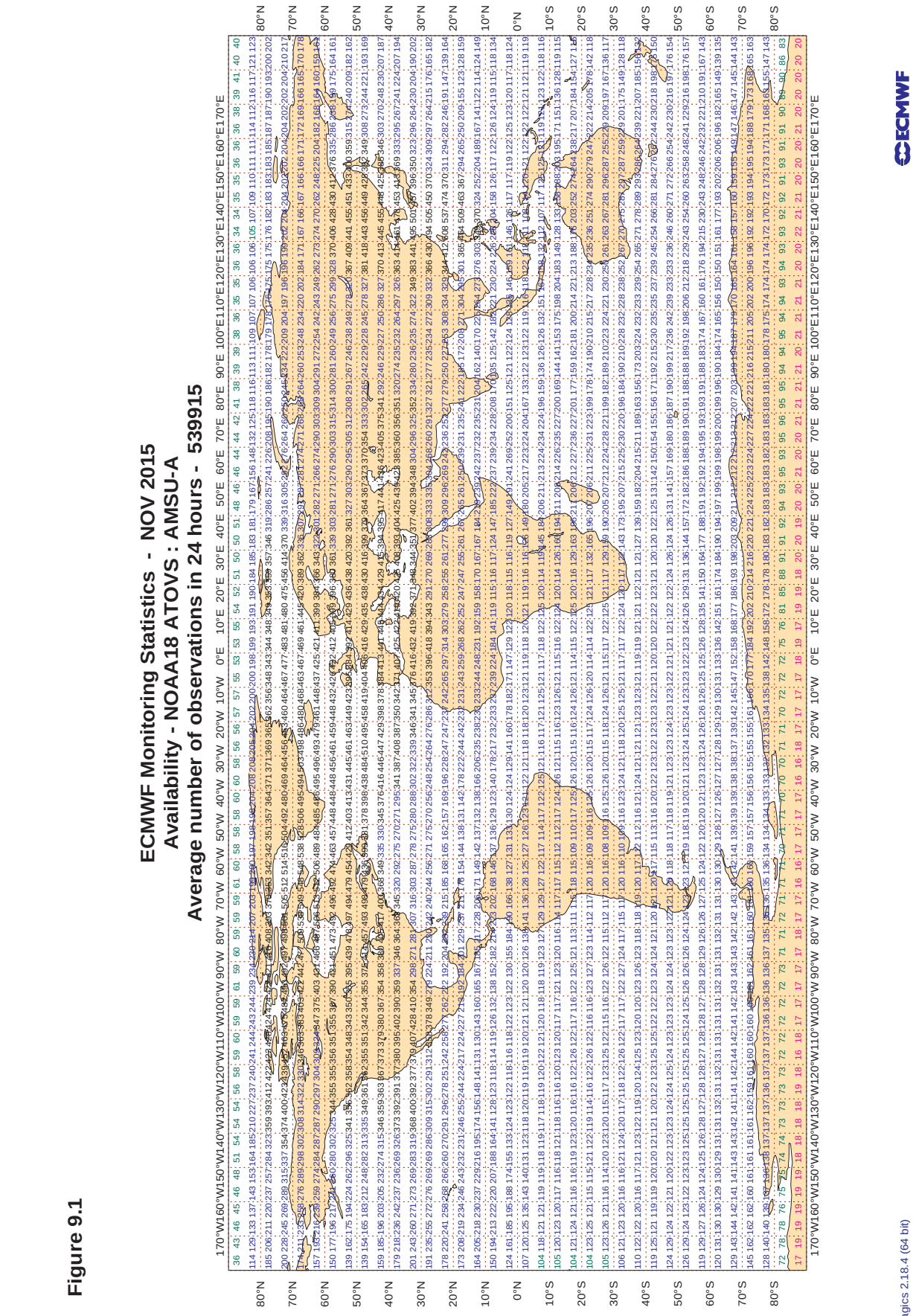


Figure 9.1

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

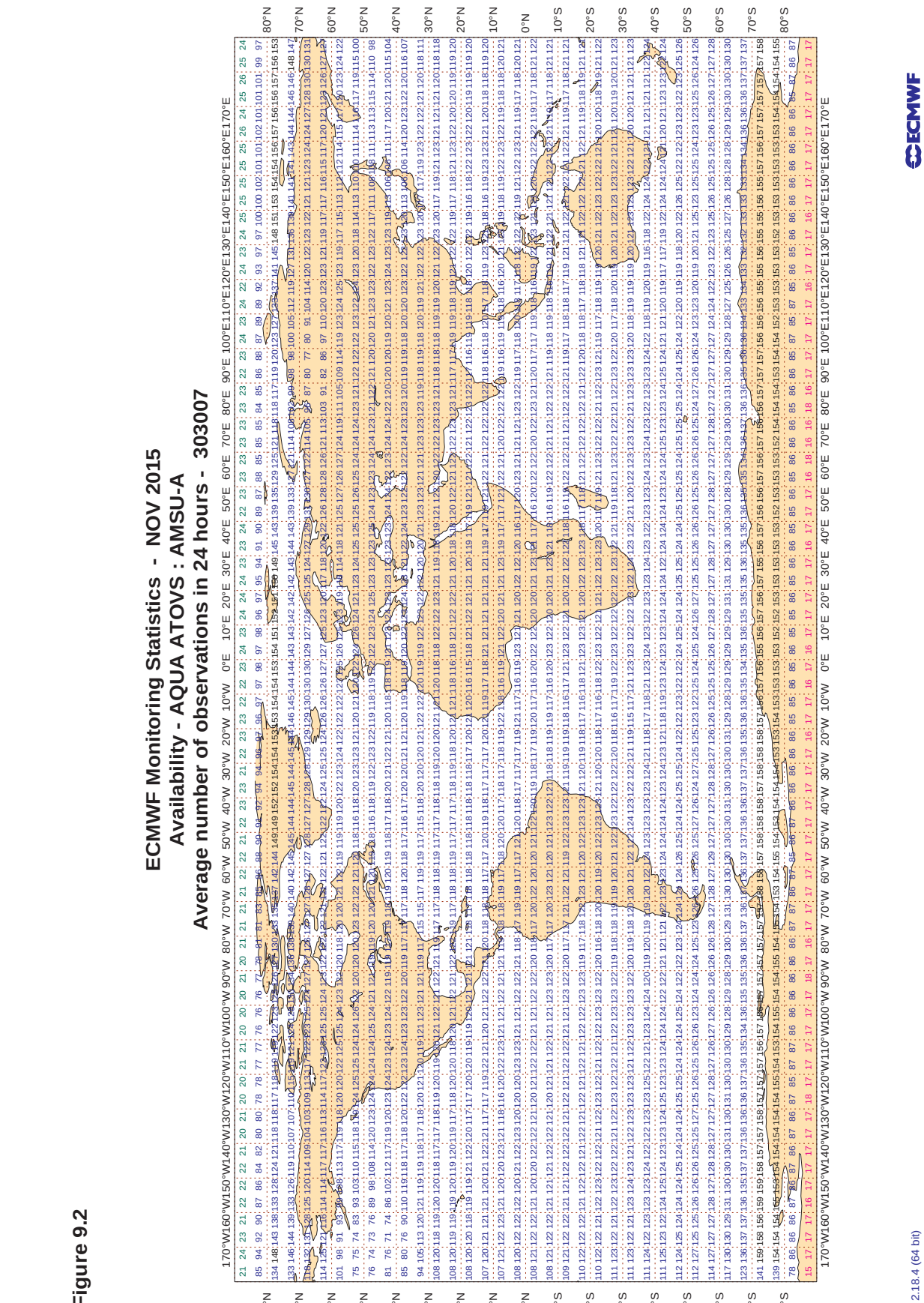


Figure 9.2

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

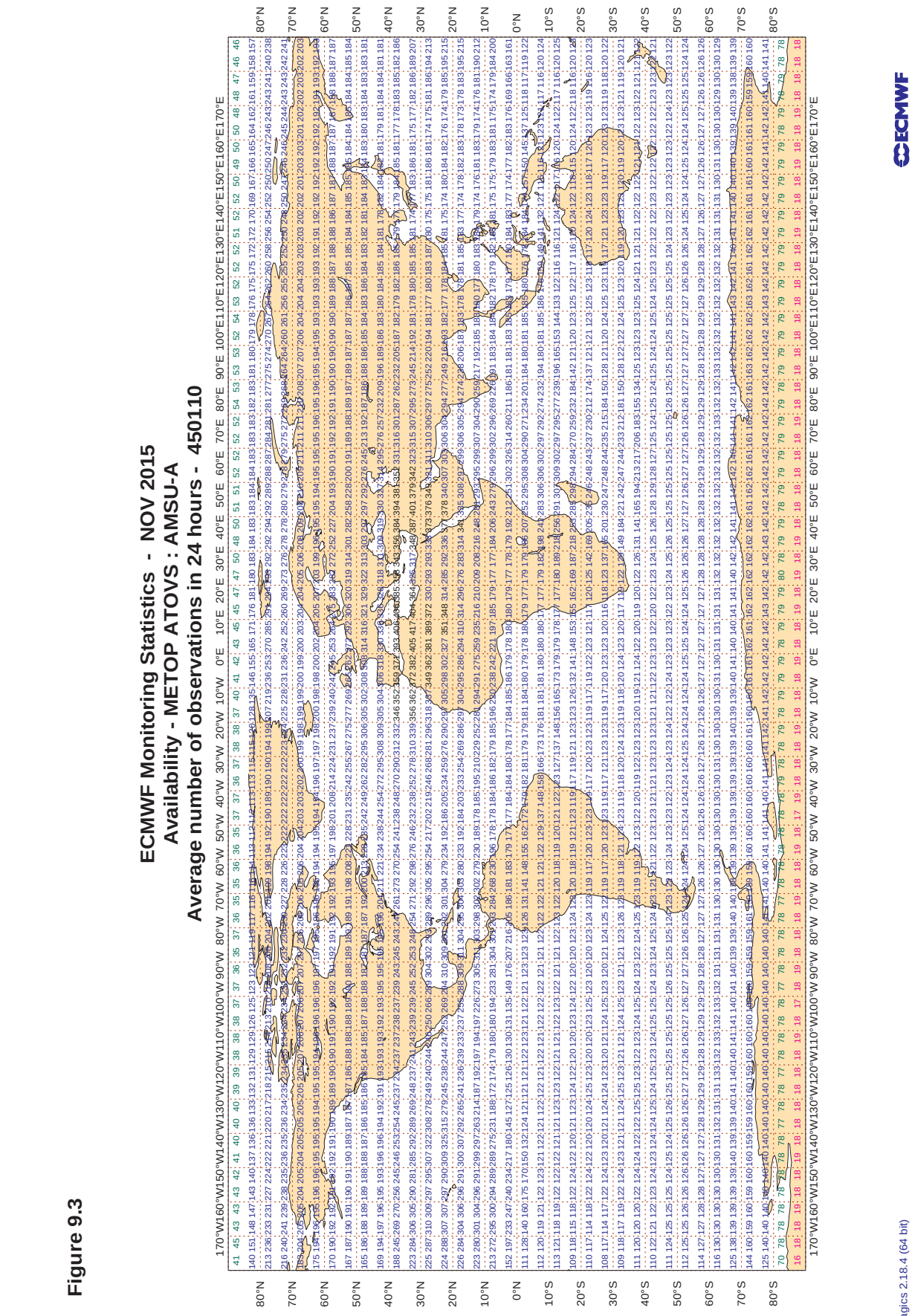


Figure 9.3

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

```
          LIST OF SUSPECT STATIONS        : SHIPS + FIXED MARINE PLATFORMS
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : SURFACE PRESSURE (HPA)
                    AREA                  : GLOBAL
                    PERIOD                : NOV 2015
                    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
3FAE4	99	P	SUR	43	0	1.7	10.0	10.2
3FNZ5	99	P	SUR	56	0	1.8	5.4	5.8
62141	99	P	SUR	155	0	4.1	-3.5	5.4
9HA3489	99	P	SUR	18	0	1.5	-3.6	3.9
9V9131	99	P	SUR	29	0	1.2	3.2	3.4
C6AX4	99	P	SUR	36	0	1.2	-4.1	4.2
C6FM5	99	P	SUR	20	0	0.6	-3.2	3.2
C6FR3	99	P	SUR	25	0	2.3	-3.9	4.5
C6JT	99	P	SUR	50	0	1.6	-4.5	4.8
C6LU4	99	P	SUR	29	0	1.6	5.0	5.2
CQII	99	P	SUR	40	0	0.8	3.1	3.2
CQIS	99	P	SUR	52	0	0.9	-4.6	4.6
LAPD7	99	P	SUR	24	1	2.3	5.3	5.8
LAQM7	99	P	SUR	54	0	1.8	4.4	4.8
ONDY	99	P	SUR	156	0	3.5	-6.6	7.5
ONIK	99	P	SUR	22	0	1.0	7.5	7.6
OWFD2	99	P	SUR	30	1	3.5	-3.3	4.8
OZ2049	99	P	SUR	44	1	1.2	-4.6	4.8
UANA	99	P	SUR	29	0	0.6	-3.4	3.5
UHSY	99	P	SUR	58	2	1.7	8.8	9.0
VQGQ4	99	P	SUR	35	0	1.7	3.3	3.8
VRBH2	99	P	SUR	49	0	5.8	1.1	5.9
VRBH3	99	P	SUR	17	0	3.1	7.8	8.4
VRBU6	99	P	SUR	15	0	1.0	-4.6	4.7
VRCX7	99	P	SUR	15	0	3.4	4.5	5.6
VRDJ3	99	P	SUR	79	0	0.9	-3.3	3.4
VRDW2	99	P	SUR	49	0	1.4	5.4	5.6
VRFI7	99	P	SUR	103	0	0.9	4.6	4.6
VRGE3	99	P	SUR	15	0	1.4	3.4	3.6
VRID2	99	P	SUR	37	0	1.8	3.2	3.7
VRID5	99	P	SUR	26	0	1.4	5.3	5.5
VRIM5	99	P	SUR	50	0	2.3	-3.4	4.1

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
VRKF2	99	P	SUR	71	0	2.0	4.0	4.5
VRNR5	99	P	SUR	17	1	2.7	-5.1	5.8
WGAX	99	P	SUR	34	0	0.7	4.5	4.5
WNFQ	99	P	SUR	26	0	3.2	-4.9	5.9

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 2015
                    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
44141	99	SPEED	SUR	117	0	0	5.0	-6.9	8.5
46081	99	SPEED	SUR	128	0	0	3.1	5.0	5.9
46181	99	SPEED	SUR	119	0	0	3.2	4.1	5.2

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 2015
                    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
41010	99	DIRN	SUR	62	0	0	17.8	49.3	52.4
42002	99	DIRN	SUR	110	0	0	22.6	30.0	37.6
44059	99	DIRN	SUR	30	0	0	23.3	-38.3	44.8

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 2015
                    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
15654	99	P	SUR	-40	51	49	47	1.3	13.5	13.6
25529	99	P	SUR	77	136	633	114	6.3	0.3	6.3
33581	99	P	SUR	-48	-12	571	568	5.6	7.0	9.0
33666	99	P	SUR	-44	11	66	66	0.0	0.0	0.0
41632	99	P	SUR	28	-66	376	133	2.2	-0.7	2.3
46920	99	P	SUR	32	-128	590	315	4.0	8.7	9.6
47503	99	P	SUR	61	-30	600	488	0.7	13.7	13.7
48513	99	P	SUR	75	175	639	231	7.6	-1.6	7.8
48570	99	P	SUR	68	-176	680	369	8.5	0.5	8.5
48618	99	P	SUR	74	-173	710	0	2.7	5.7	6.3
48623	99	P	SUR	73	180	374	167	5.8	-6.0	8.4
48638	99	P	SUR	72	-173	632	246	4.6	-2.9	5.4
48643	99	P	SUR	70	-144	636	636	0.0	0.0	0.0
48652	99	P	SUR	71	-154	658	129	2.1	10.3	10.6
51618	99	P	SUR	6	-102	620	7	1.7	12.0	12.2
55923	99	P	SUR	-35	173	198	194	1.9	12.5	12.7
56524	99	P	SUR	-40	108	175	175	0.0	0.0	0.0
64532	99	P	SUR	54	-40	533	79	0.0	-14.3	14.3
64534	99	P	SUR	60	-22	164	164	0.0	0.0	0.0
65511	99	P	SUR	70	-59	208	58	4.8	4.6	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 2015
                    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
44141	99	SPEED	SUR	43	-58	703	0	0	4.9	-6.8	8.4

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 2015
                    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
14041	99	DIRN	SUR	-8	55	34	0	0	36.9	-21.4	42.7
23095	99	DIRN	SUR	11	94	160	0	0	20.8	20.9	29.5
23099	99	DIRN	SUR	13	80	90	0	0	78.1	39.2	87.4
23454	99	DIRN	SUR	10	73	64	0	0	147.8	-59.1	159.2
23460	99	DIRN	SUR	7	88	113	0	0	150.6	-57.8	161.3
23491	99	DIRN	SUR	12	93	32	0	0	40.7	34.6	53.5
23492	99	DIRN	SUR	11	72	54	0	0	138.0	54.6	148.4
23497	99	DIRN	SUR	11	72	71	0	0	145.8	58.2	157.0
31051	99	DIRN	SUR	-23	-43	124	0	0	42.9	36.9	56.6
31053	99	DIRN	SUR	-32	-50	541	1	0	23.0	-54.4	59.0
31374	99	DIRN	SUR	-25	-45	538	0	0	45.4	-27.1	52.9
31380	99	DIRN	SUR	-20	-40	557	0	0	21.7	-25.3	33.3
41010	99	DIRN	SUR	29	-79	216	0	0	18.0	47.7	50.9
42002	99	DIRN	SUR	26	-94	662	0	0	19.7	30.6	36.4
42361	99	DIRN	SUR	28	-93	664	4	0	23.3	27.3	35.9
42362	99	DIRN	SUR	28	-91	498	6	0	35.5	20.3	40.9
42390	99	DIRN	SUR	26	-95	448	2	0	28.6	22.8	36.6
44059	99	DIRN	SUR	37	-76	131	0	0	16.7	-30.6	34.9
45142	99	DIRN	SUR	43	-79	579	0	0	17.2	-22.3	28.2
52315	99	DIRN	SUR	8	-180	640	0	0	74.4	24.5	78.3
53040	99	DIRN	SUR	-8	95	465	0	0	136.7	86.8	161.9
61002	99	DIRN	SUR	42	5	77	2	0	91.3	22.0	93.9

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 2015
                    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
06011	12	Z	250	62	-7	27	2	80.1	41.4	90.2
06458	00	Z	850	51	5	24	0	30.7	25.2	39.7
33658	00	Z	70	48	26	13	0	84.3	114.3	142.0
38064	00	Z	200	45	66	29	1	63.4	64.2	90.2
38064	12	Z	200	45	66	28	0	51.0	72.3	88.5
40417	12	Z	1000	26	50	29	0	8.4	31.8	32.9
40417	00	Z	1000	26	50	26	0	8.8	34.5	35.6
40430	00	Z	925	25	40	27	0	6.8	38.3	38.9
40430	12	Z	925	25	40	30	0	8.9	38.7	39.7
43128	00	Z	30	17	78	20	0	65.8	244.8	253.5
43185	00	Z	700	16	81	16	1	30.7	39.3	49.9
43369	00	Z	50	8	73	13	0	7.4	137.7	137.9
47058	00	Z	200	39	126	11	3	59.7	164.5	175.0
76405	12	Z	400	24	-110	28	0	65.3	48.2	81.2
91680	12	Z	925	-18	177	29	0	2.5	31.2	31.3
91680	00	Z	1000	-18	177	29	0	6.3	28.0	28.7
96147	12	Z	925	4	108	30	1	18.6	52.5	55.7
96147	00	Z	850	4	108	30	3	18.3	56.5	59.4

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 2015
                    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
```

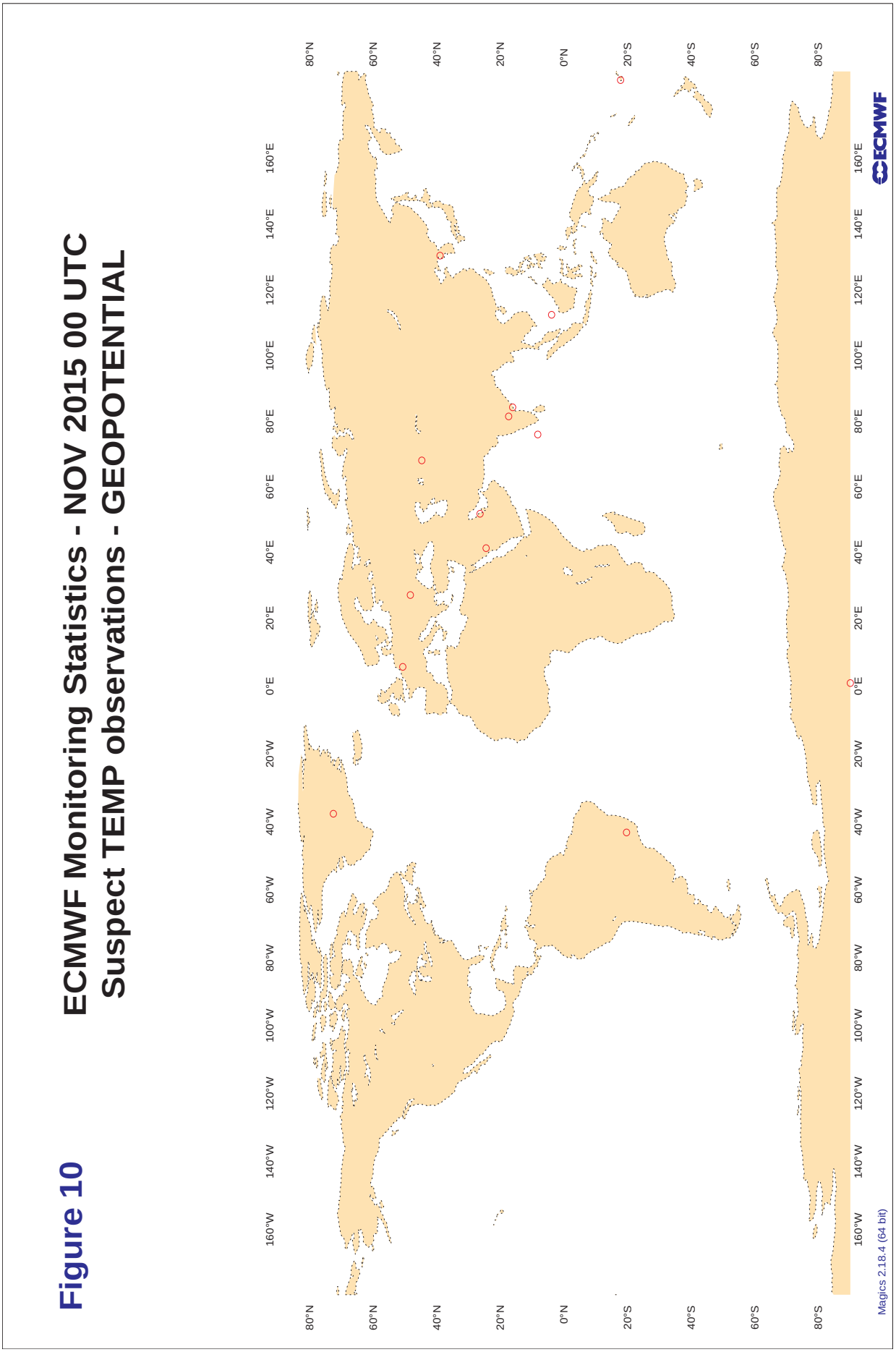
WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	UBIAS	VBIAS	RMS
42399	00	V	150	27	89	20	0	-6.8	1.1	16.8
55299	12	V	100	31	92	25	0	-1.2	0.5	15.4
87155	00	V	150	-27	-59	20	0	3.4	-0.9	15.1

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

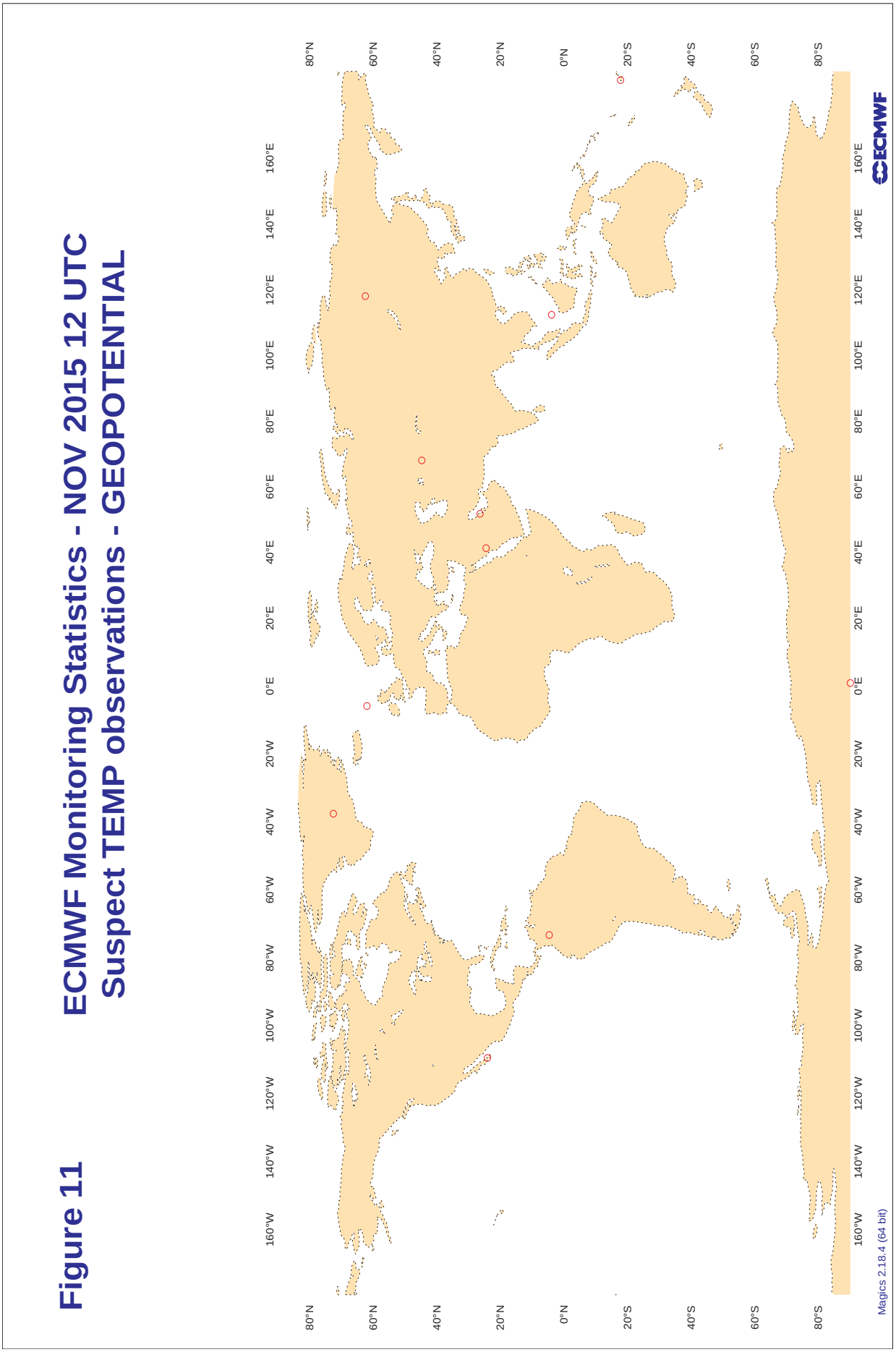
```
          LIST OF SUSPECT STATIONS        : RADIOSONDES
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND DIRECTION (DEGREES)
                    AREA                  : GLOBAL
                    PERIOD                : NOV 2015
                    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
54342	00	DD	42	124	30	11.0	1.5	8.4
54342	12	DD	42	124	29	10.4	1.4	5.8

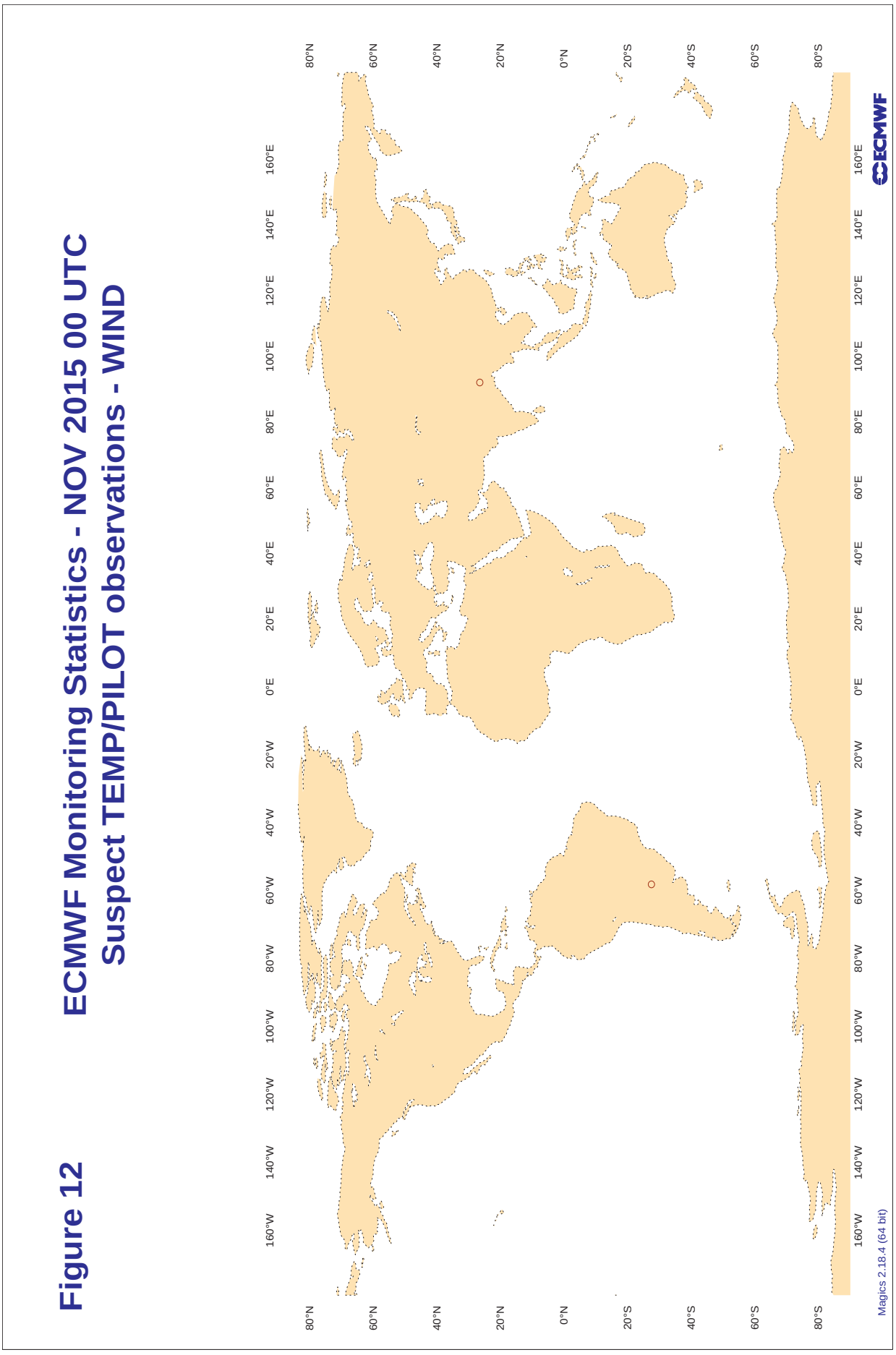
3.2.21 Figure 10 - Suspect TEMP observations - geopotential : 00 UTC



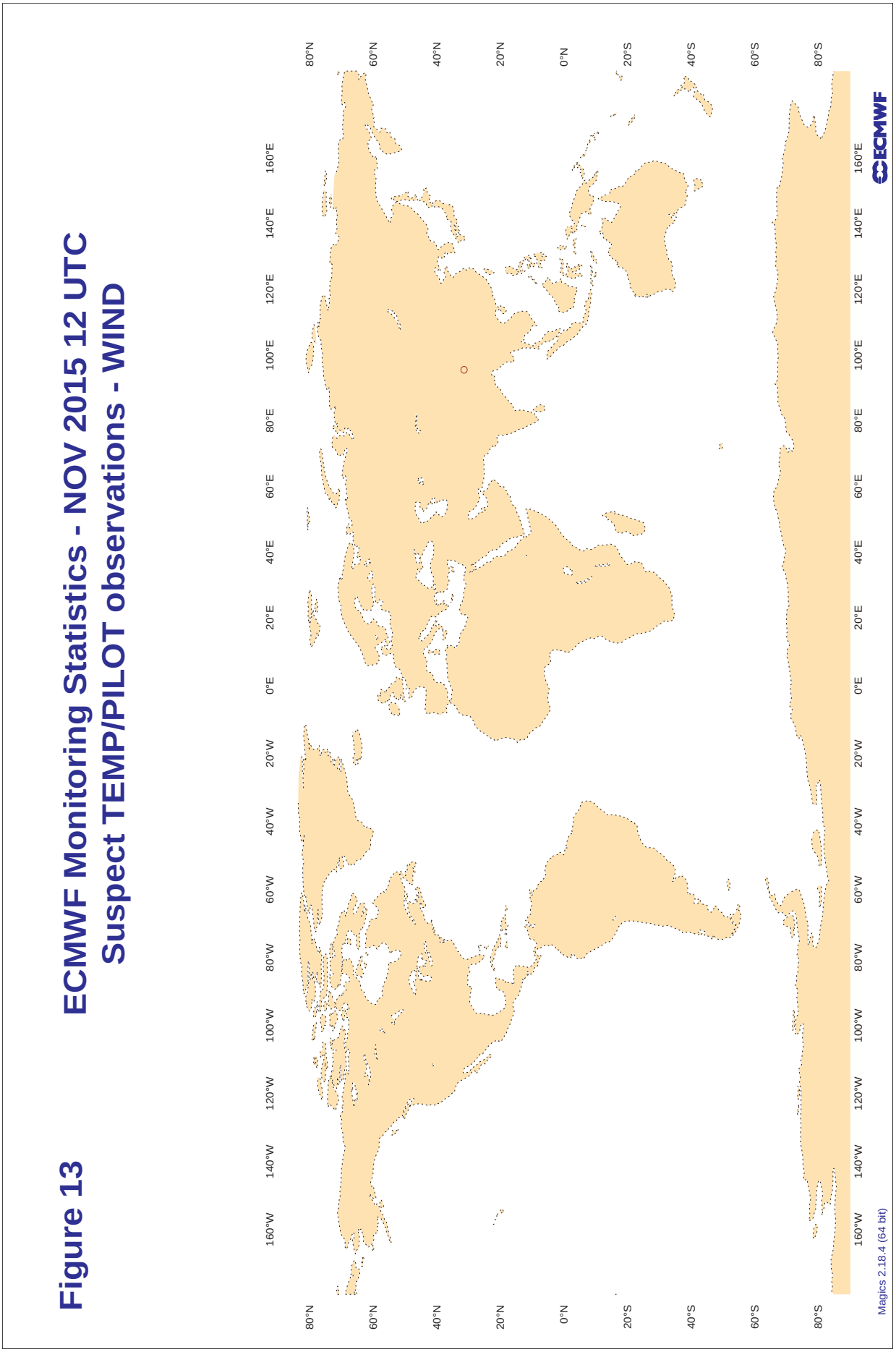
3.2.22 Figure 11 - Suspect TEMP observations - geopotential : 12 UTC



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 2015
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASDE01	12	Z	100	8	23.8	21.4
ASDE01	00	Z	100	9	10.9	-0.3
ASDE02	00	Z	100	1	20.7	20.7
ASDE02	12	Z	100	18	16.7	12.4
ASDE03	12	Z	100	11	28.8	25.7
ASDE03	00	Z	100	14	11.1	5.4
ASDE09	12	Z	100	3	28.5	20.9
ASDK01	12	Z	100	0	0.0	0.0
ASDK02	12	Z	100	17	12.2	9.7
ASDK02	00	Z	100	17	16.8	9.9
ASDK03	00	Z	100	3	38.1	38.1
ASDK1	12	Z	100	0	0.0	0.0
ASDK2	00	Z	100	13	14.3	7.0
ASDK2	12	Z	100	11	12.4	7.4
ASDK3	00	Z	100	3	36.3	34.8
ASES01	12	Z	100	17	32.9	31.2
ASEU01	12	Z	100	20	20.5	19.0
ASEU01	00	Z	100	10	9.4	8.1
ASEU02	12	Z	100	8	41.9	41.2
ASEU02	00	Z	100	8	38.9	37.0
ASEU03	12	Z	100	5	59.3	55.8
ASEU03	00	Z	100	10	14.8	8.4
ASEU04	12	Z	100	6	14.1	11.5
ASEU04	00	Z	100	5	20.1	-7.1
ASEU06	12	Z	100	8	48.3	41.5
ASEU06	00	Z	100	10	34.4	22.1
ASFR1	12	Z	100	8	20.7	18.3
ASFR1	00	Z	100	6	22.5	18.6
ASFR2	12	Z	100	9	35.2	32.4
ASFR2	00	Z	100	11	19.9	17.2
ASFR3	00	Z	100	1	3.1	3.1
ASFR3	12	Z	100	0	0.0	0.0
ASFR4	12	Z	100	13	24.9	22.6
ASFR4	00	Z	100	10	27.0	25.4
DBLK	12	Z	100	46	11.7	7.7
JGQH	12	Z	100	5	19.6	16.5
JGQH	00	Z	100	4	25.1	23.5
JNSR	12	Z	100	29	11.9	7.1
JNSR	00	Z	100	25	11.6	6.9

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 2015
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASDE01	12	V	100	8	5.0	0.7	-0.4
ASDE01	00	V	100	8	5.1	0.1	-0.3
ASDE02	00	V	100	1	2.3	-2.2	0.8
ASDE02	12	V	100	17	6.1	-0.2	-0.3
ASDE03	12	V	100	10	4.8	0.5	-1.4
ASDE03	00	V	100	11	3.6	-0.3	-0.4
ASDE09	12	V	100	3	2.8	0.7	-1.0
ASDK01	12	V	100	0	0.0	0.0	0.0
ASDK02	12	V	100	12	4.6	0.4	-0.2
ASDK02	00	V	100	13	4.1	-0.7	-0.7
ASDK03	00	V	100	3	4.8	-1.1	-2.3
ASDK1	12	V	100	0	0.0	0.0	0.0
ASDK2	00	V	100	13	4.4	-0.7	-0.6
ASDK2	12	V	100	11	4.7	0.7	-0.6
ASDK3	00	V	100	3	5.5	-2.3	-1.8
ASES01	12	V	100	16	4.6	1.4	-0.4
ASEU01	12	V	100	18	4.7	1.4	1.4
ASEU01	00	V	100	9	3.5	-0.2	-0.6
ASEU02	12	V	100	8	5.1	-0.6	2.9
ASEU02	00	V	100	8	3.8	-1.0	0.3
ASEU03	12	V	100	2	4.3	-2.9	-0.3
ASEU03	00	V	100	4	4.3	-0.1	0.3
ASEU04	12	V	100	5	5.5	0.8	-0.4
ASEU04	00	V	100	4	2.9	1.1	1.8
ASEU06	12	V	100	6	6.3	-2.5	2.5
ASEU06	00	V	100	7	5.5	-2.8	1.2
ASFR1	12	V	100	8	4.9	-0.6	2.7
ASFR1	00	V	100	6	2.8	0.7	-1.3
ASFR2	12	V	100	7	3.5	-1.6	-0.9
ASFR2	00	V	100	10	3.8	1.1	0.2
ASFR3	00	V	100	1	7.3	-3.0	6.7
ASFR3	12	V	100	0	0.0	0.0	0.0
ASFR4	12	V	100	12	4.5	-0.1	-0.6
ASFR4	00	V	100	9	5.1	-0.2	-0.7
DBLK	12	V	100	26	5.1	-0.1	0.7
JGQH	12	V	100	5	3.7	-0.6	0.4
JGQH	00	V	100	4	4.0	-1.5	0.1
JNSR	12	V	100	10	4.8	2.1	0.2
JNSR	00	V	100	10	4.7	1.3	-2.3

3.2.27 Figure 14 - SATOB Winds: 700-1000hPa

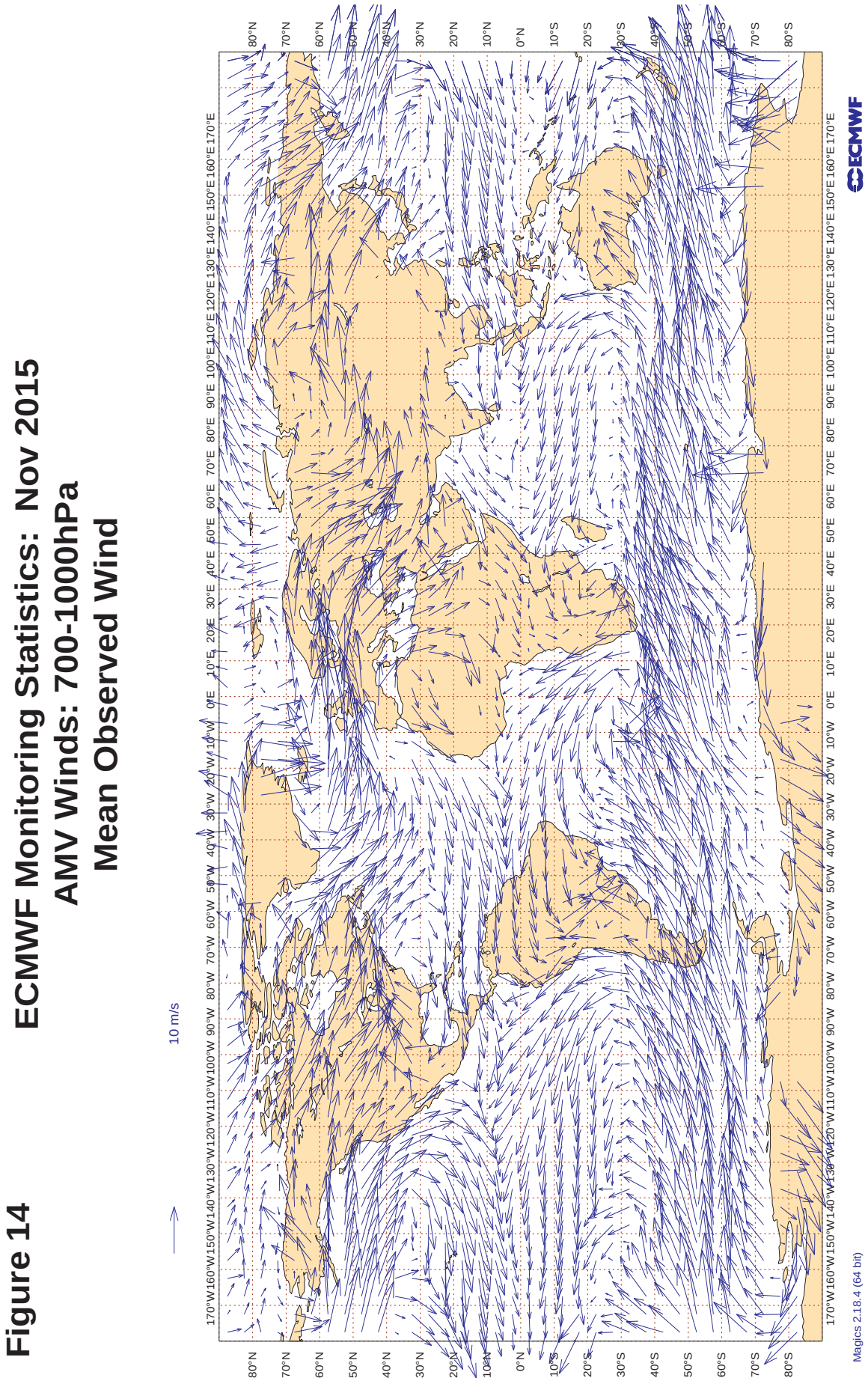


Figure 14

3.2.28 Figure 15 - SATOB Winds: 150- 400hPa

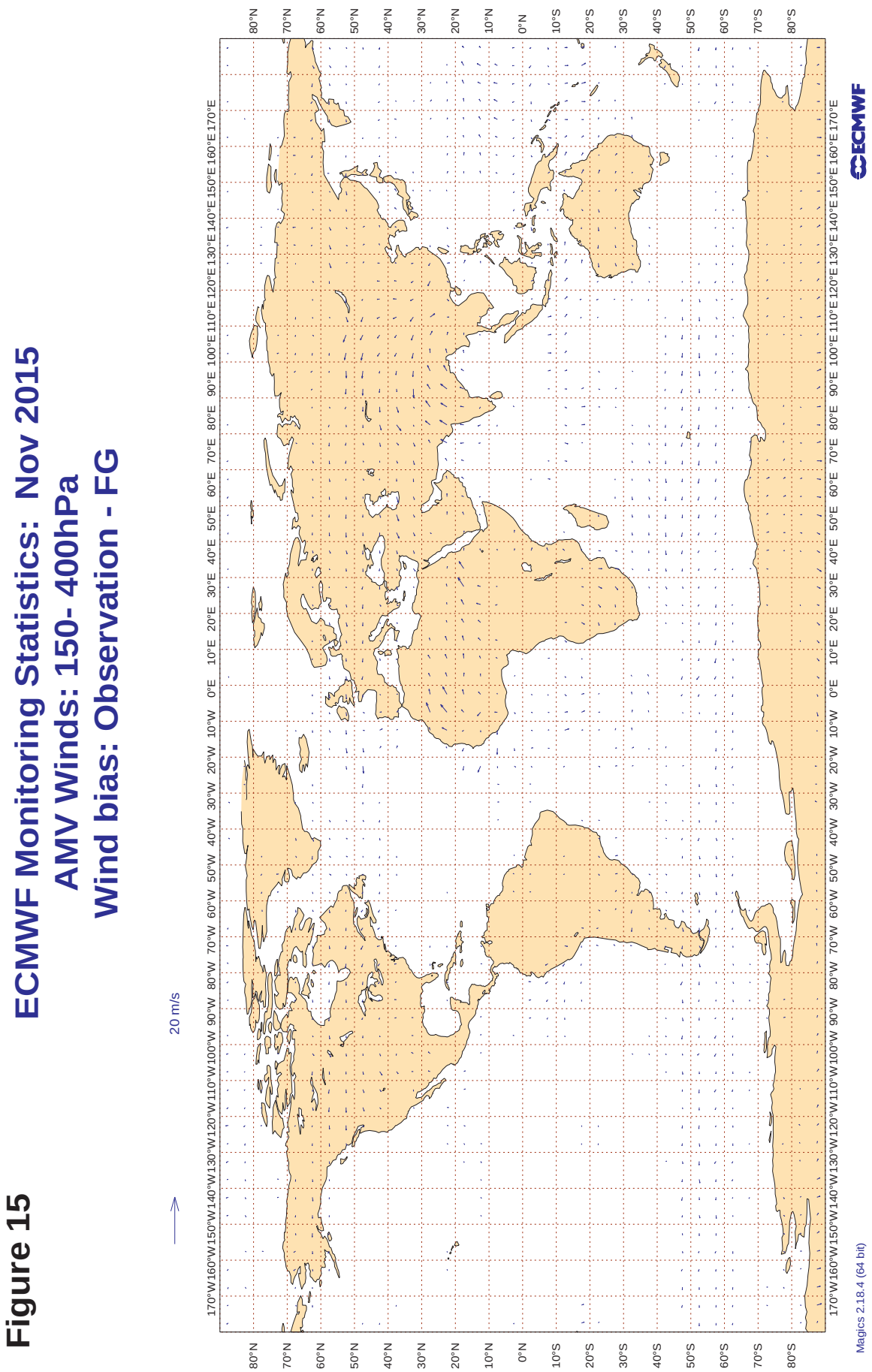


Figure 15

3.2.29 Figure 16 - SATOB Winds: 700-1000hPa

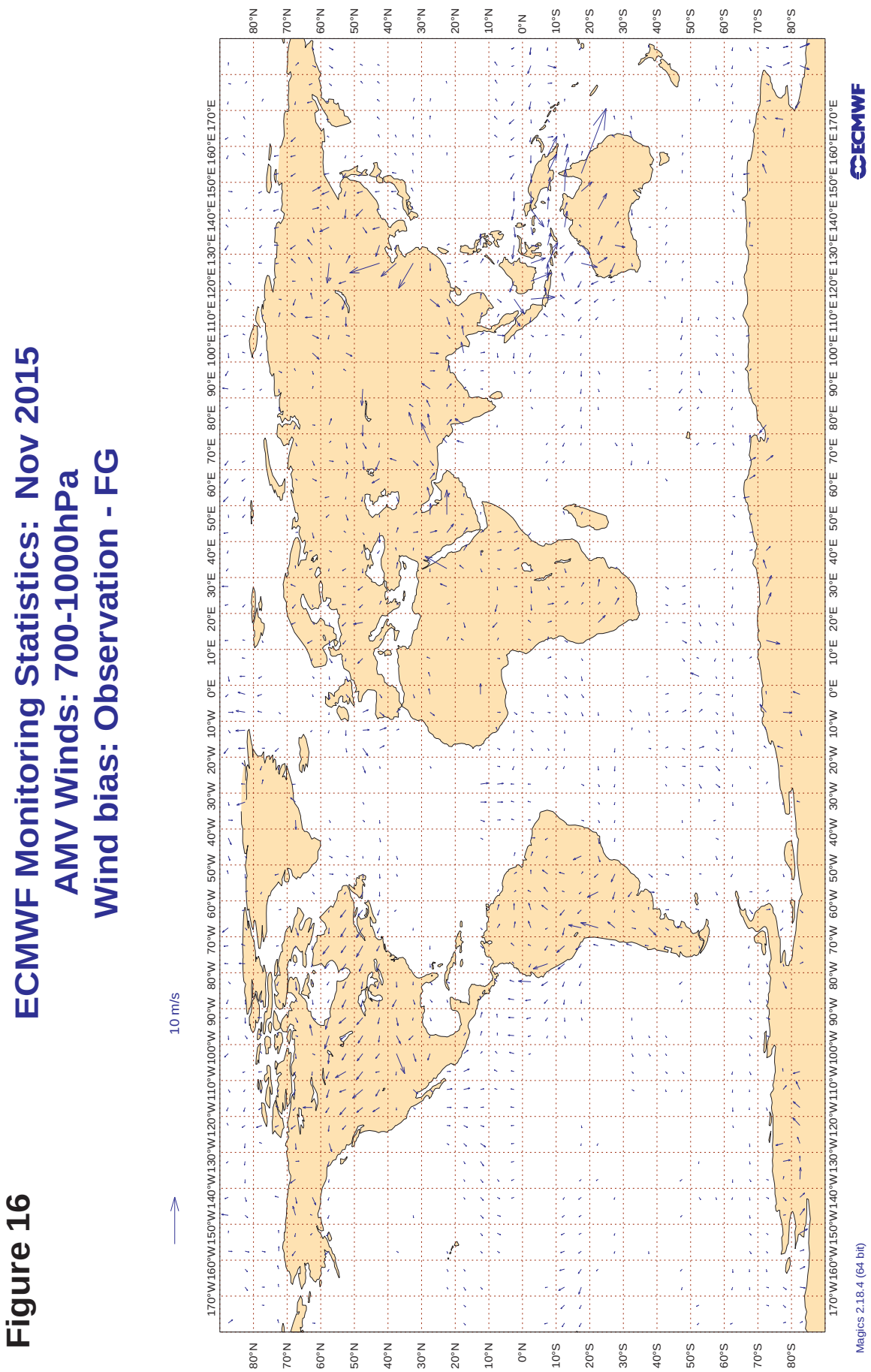


Figure 16

3.2.30 Figure 17 - SATOB Winds: 150- 400hPa

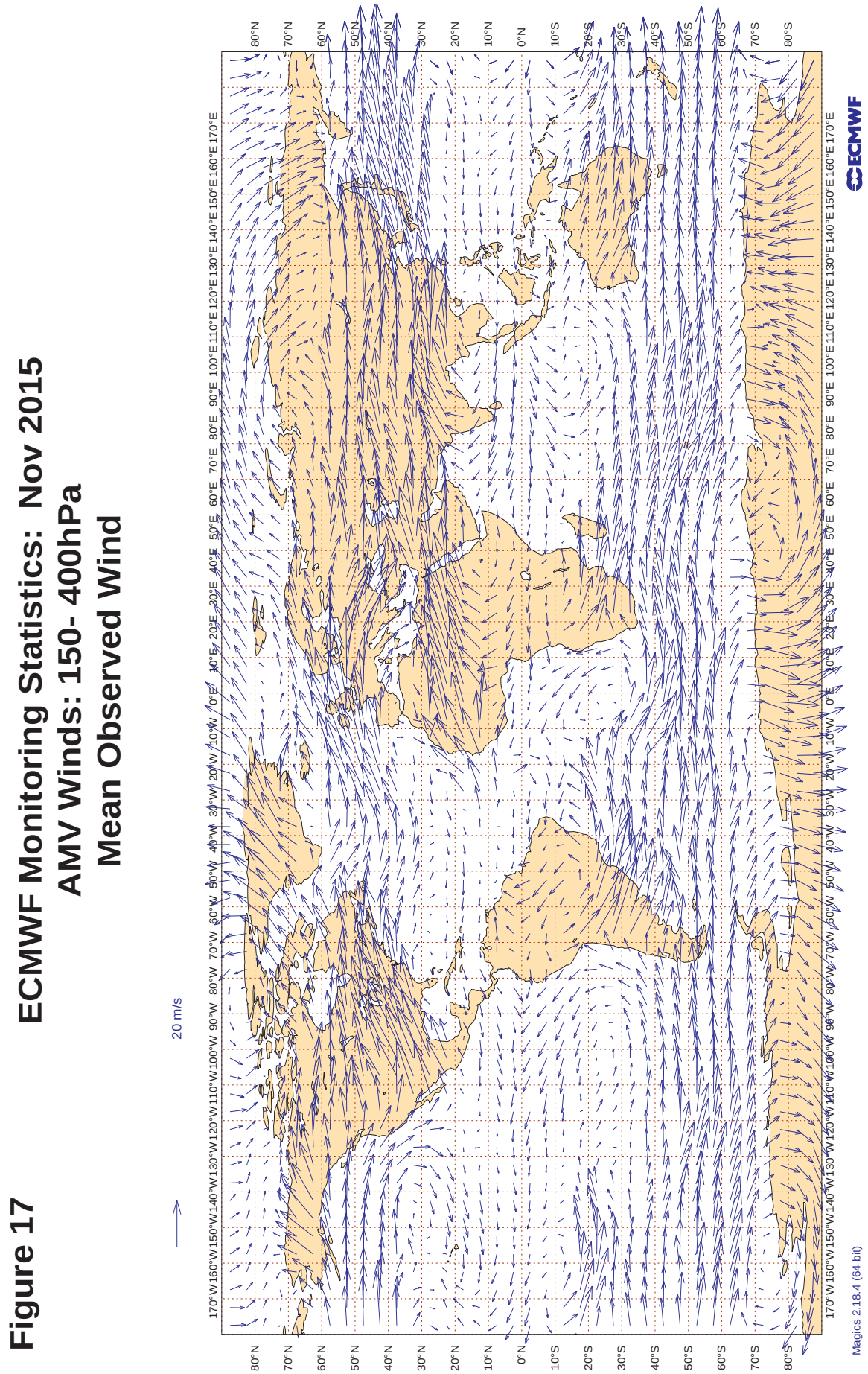


Figure 17

3.2.31 Figure 18 - AIRCRAFT Winds: 150- 300hPa

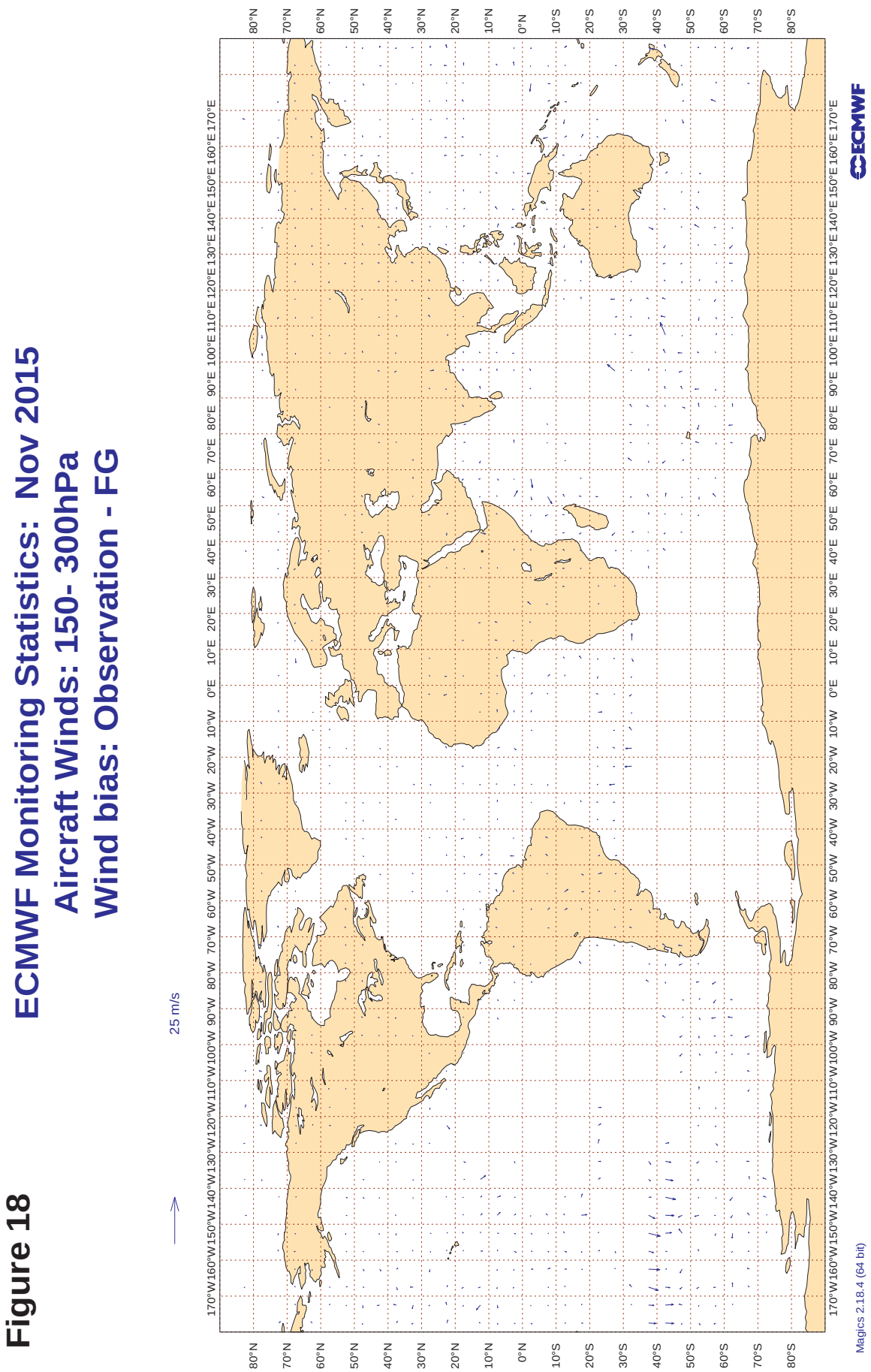


Figure 18

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 2015
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
AAL	99	V	300-150	17662	0	0	4.4	0.1
AAR	99	V	300-150	179	0	0	4.7	-1.3
AAY	99	V	300-150	216	0	0	4.9	0.4
ABW	99	V	300-150	458	0	0	4.1	-0.6
ABX	99	V	300-150	126	0	0	5.9	0.2
ACA	99	V	300-150	8763	2	0	5.1	0.0
ACI	99	V	300-150	2255	0	0	4.2	0.4
AEA	99	V	300-150	295	2	0	4.3	0.0
AFL	99	V	300-150	700	0	0	3.4	0.6
AFR	99	V	300-150	12065	0	0	4.2	0.2
AHY	99	V	300-150	114	15	0	6.0	-0.1
AIC	99	V	300-150	712	0	0	3.6	-0.2
AMX	99	V	300-150	833	21	0	10.9	-0.2
ANZ	99	V	300-150	13584	2	0	5.5	0.4
ASA	99	V	300-150	7235	0	0	5.4	0.3
ASY	99	V	300-150	222	0	0	5.4	0.1
AUA	99	V	300-150	1555	0	0	4.5	-0.5
AVA	99	V	300-150	85	0	0	3.4	-0.2
AVN	99	V	300-150	103	2	0	4.0	0.5
AXM	99	V	300-150	101	2	0	6.8	0.6
AZA	99	V	300-150	2615	0	0	4.2	0.4
BAW	99	V	300-150	19555	2	0	5.0	0.1
BEL	99	V	300-150	371	0	0	3.6	0.2
BER	99	V	300-150	2844	0	0	4.1	0.5
BLX	99	V	300-150	70	0	0	4.4	-0.5
BOX	99	V	300-150	379	0	0	3.7	-0.2
CAL	99	V	300-150	485	1	0	4.6	0.2
CAO	99	V	300-150	115	0	0	3.9	0.4

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
CAZ	99	V	300-150	25	0	0	6.0	1.1
CES	99	V	300-150	754	0	0	3.7	0.3
CFC	99	V	300-150	77	0	0	6.0	0.6
CFF	99	V	300-150	20	100	0	0.0	0.0
CFG	99	V	300-150	1748	0	0	4.6	-0.7
CGD	99	V	300-150	49	61	0	27.0	-0.8
CGP	99	V	300-150	57	65	0	27.4	-1.4
CGS	99	V	300-150	23	0	0	4.7	-1.5
CJT	99	V	300-150	76	0	0	4.6	0.0
CKS	99	V	300-150	823	0	0	5.5	-0.5
CLX	99	V	300-150	1713	0	0	4.5	-0.3
CMB	99	V	300-150	147	0	0	4.6	0.2
CNV	99	V	300-150	72	0	0	4.1	0.4
CPA	99	V	300-150	76	0	0	4.0	-0.1
CRL	99	V	300-150	294	0	0	4.1	0.2
CRV	99	V	300-150	27	0	0	4.4	0.7
CSN	99	V	300-150	685	3	0	6.7	0.6
DAH	99	V	300-150	222	0	0	4.1	0.4
DAL	99	V	300-150	24927	0	0	4.3	0.0
DHK	99	V	300-150	729	0	0	4.6	-0.3
DLH	99	V	300-150	9644	0	0	4.1	0.0
DUB	99	V	300-150	23	0	0	5.4	0.1
EDG	99	V	300-150	30	57	0	8.7	0.0
EDW	99	V	300-150	208	0	0	4.9	0.6
EIN	99	V	300-150	4251	0	0	4.0	0.1
EJM	99	V	300-150	227	25	0	13.4	-0.4
ELY	99	V	300-150	1144	0	0	4.3	-0.2
ETD	99	V	300-150	1429	4	0	4.3	0.2
ETH	99	V	300-150	852	17	0	10.1	0.1
EWG	99	V	300-150	562	0	0	4.9	-0.2
FDX	99	V	300-150	2653	0	0	4.2	0.0
FHF	99	V	300-150	30	33	0	22.7	0.3
FIN	99	V	300-150	313	0	0	3.2	0.3
FJI	99	V	300-150	4692	0	0	4.7	0.6
FPG	99	V	300-150	27	33	0	6.4	-0.6
FWI	99	V	300-150	535	0	0	4.2	0.2
GAF	99	V	300-150	26	35	0	19.5	-0.5
GEC	99	V	300-150	1353	0	0	4.1	0.1
GLO	99	V	300-150	67	4	0	10.6	0.0
GNJ	99	V	300-150	31	0	0	4.1	0.4
GOY	99	V	300-150	125	0	0	3.8	0.3
GRL	99	V	300-150	24	4	0	3.3	-0.8
GTI	99	V	300-150	1200	0	0	4.6	-0.6

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
HAL	99	V	300-150	4487	0	0	4.9	0.9
HBJ	99	V	300-150	87	40	0	11.5	-0.5
HZA	99	V	300-150	35	0	0	5.8	-0.6
HZM	99	V	300-150	22	0	0	3.1	0.8
IAF	99	V	300-150	32	0	0	5.8	0.1
IBE	99	V	300-150	798	0	0	4.6	0.1
ICE	99	V	300-150	106	1	0	5.9	-1.2
ICL	99	V	300-150	233	0	0	5.3	-0.6
ICV	99	V	300-150	110	0	0	4.8	-0.7
JAF	99	V	300-150	479	14	0	8.3	0.0
JAI	99	V	300-150	850	0	0	3.7	0.2
JAS	99	V	300-150	101	17	0	5.6	0.3
JJA	99	V	300-150	48	0	0	5.6	0.5
JME	99	V	300-150	34	41	0	18.4	1.4
JST	99	V	300-150	2919	1	0	6.8	0.6
KAC	99	V	300-150	370	0	0	4.3	0.6
KAI	99	V	300-150	48	0	0	5.3	1.0
KAL	99	V	300-150	1528	0	0	4.7	0.4
KIW	99	V	300-150	57	0	0	4.6	1.1
KLM	99	V	300-150	6969	0	0	4.1	0.0
LAE	99	V	300-150	118	0	0	4.3	-0.6
LAN	99	V	300-150	1588	5	0	9.4	0.3
LCO	99	V	300-150	70	0	0	3.9	-0.4
LOB	99	V	300-150	28	0	0	11.4	0.8
LOT	99	V	300-150	556	12	0	8.6	0.0
LXG	99	V	300-150	21	24	0	11.9	2.0
MAL	99	V	300-150	21	67	0	34.0	-0.8
MAR	99	V	300-150	34	0	0	4.2	0.3
MAS	99	V	300-150	284	4	0	5.3	0.3
MAT	99	V	300-150	22	27	0	16.7	-1.4
MMD	99	V	300-150	84	0	0	4.4	0.7
MMN	99	V	300-150	51	0	0	3.6	-0.2
MPH	99	V	300-150	184	1	0	5.0	-1.6
MSR	99	V	300-150	470	0	0	3.6	0.1
MYS	99	V	300-150	21	33	0	17.6	0.0
NAX	99	V	300-150	1950	17	0	11.4	-0.2
NCA	99	V	300-150	136	0	0	4.0	-0.6
NCR	99	V	300-150	26	0	0	5.0	-2.5
NJE	99	V	300-150	241	15	0	9.8	0.1
NOS	99	V	300-150	219	0	0	4.5	-0.3
NWS	99	V	300-150	108	0	0	3.4	-0.1
OAE	99	V	300-150	187	1	0	6.3	-0.4
OKG	99	V	300-150	20	0	0	11.2	0.8

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
OKK	99	V	300-150	38	0	0	3.2	-0.3
OOL	99	V	300-150	23	0	0	3.0	0.6
ORB	99	V	300-150	98	0	0	3.7	0.2
PAC	99	V	300-150	152	0	0	4.8	0.5
PAL	99	V	300-150	25	4	0	5.9	0.2
PIA	99	V	300-150	91	0	0	3.2	0.8
PIR	99	V	300-150	25	20	0	14.9	5.1
QAF	99	V	300-150	66	0	0	3.1	0.4
QFA	99	V	300-150	15189	0	0	4.6	0.3
QTR	99	V	300-150	2255	0	0	4.1	-0.1
RAM	99	V	300-150	27	15	0	12.6	-0.1
RCH	99	V	300-150	2267	0	0	5.1	0.0
RJA	99	V	300-150	483	22	0	11.5	-0.1
ROJ	99	V	300-150	48	0	0	3.8	-0.4
ROU	99	V	300-150	573	0	0	4.4	-0.1
RRR	99	V	300-150	41	0	0	3.7	1.3
SAM	99	V	300-150	226	11	0	6.9	0.2
SAS	99	V	300-150	1319	0	0	3.3	0.0
SCX	99	V	300-150	34	3	0	4.3	0.1
SHE	99	V	300-150	26	0	0	2.6	0.5
SIA	99	V	300-150	1047	0	0	4.0	0.3
SLM	99	V	300-150	95	0	0	3.6	0.2
SOL	99	V	300-150	26	0	0	3.5	-0.1
SOO	99	V	300-150	229	0	0	4.3	-0.4
SPA	99	V	300-150	45	0	0	3.5	-0.3
SQC	99	V	300-150	411	0	0	4.6	-0.6
SVA	99	V	300-150	1273	0	0	4.2	-0.1
SVW	99	V	300-150	20	70	0	29.0	-0.8
SWR	99	V	300-150	4397	0	0	4.2	0.4
TAM	99	V	300-150	161	1	0	6.2	0.3
TAP	99	V	300-150	171	0	0	4.9	-0.2
TAY	99	V	300-150	613	0	0	4.6	-0.5
TCV	99	V	300-150	51	0	0	6.6	0.6
TCX	99	V	300-150	1503	0	0	4.1	0.4
TFL	99	V	300-150	839	18	0	9.2	0.0
TGM	99	V	300-150	45	56	0	9.9	0.0
THA	99	V	300-150	142	0	0	4.9	0.2
THT	99	V	300-150	2771	0	0	4.7	0.6
THY	99	V	300-150	3721	0	0	4.0	0.3
TMN	99	V	300-150	116	1	0	7.5	1.3
TOM	99	V	300-150	2155	21	0	9.8	0.2
TSC	99	V	300-150	941	0	0	3.9	0.0
TWB	99	V	300-150	53	0	0	6.2	0.1

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
TWY	99	V	300-150	32	13	0	6.7	-0.6
UAE	99	V	300-150	5013	0	0	4.2	0.0
UAL	99	V	300-150	35099	1	0	5.0	0.1
UPS	99	V	300-150	2582	0	0	4.4	-0.1
VHL	99	V	300-150	83	76	0	22.7	-0.7
VHT	99	V	300-150	63	38	0	25.2	0.7
VHV	99	V	300-150	69	88	1	36.1	-1.9
VIR	99	V	300-150	8907	1	0	4.6	0.1
VJT	99	V	300-150	152	69	0	31.5	-0.1
VKG	99	V	300-150	220	0	0	3.9	-0.1
VMP	99	V	300-150	43	60	0	20.5	0.4
VOZ	99	V	300-150	4918	0	0	4.3	0.4
VPB	99	V	300-150	162	2	0	5.7	-0.1
VPC	99	V	300-150	52	19	0	8.5	-0.6
VQB	99	V	300-150	63	0	0	4.8	-0.6
WGT	99	V	300-150	38	0	0	2.9	0.0
WJA	99	V	300-150	1149	1	0	5.8	0.2
XAD	99	V	300-150	24	0	0	4.1	-1.1
XLF	99	V	300-150	462	0	0	3.9	0.4
YZR	99	V	300-150	23	9	0	5.9	0.2

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)

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
         LEVEL                 :  50 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : NOV 2015
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	50	30	17.6	11.4
01001	00	Z	50	28	12.3	5.3
01028	12	Z	50	28	12.4	1.5
01028	00	Z	50	30	9.0	2.8
01400	12	Z	50	13	31.6	25.7
01400	00	Z	50	15	17.5	13.4
01415	12	Z	50	29	21.0	11.7
01415	00	Z	50	29	13.6	8.1
02365	12	Z	50	32	12.6	6.0
02365	00	Z	50	28	14.5	0.1
02591	00	Z	50	41	18.1	16.7
02591	12	Z	50	36	24.0	22.6
02836	00	Z	50	37	10.3	-0.9
02836	12	Z	50	45	13.2	7.0
02963	12	Z	50	33	11.6	8.9
02963	00	Z	50	30	12.1	7.0
03005	12	Z	50	30	17.5	4.1
03005	00	Z	50	28	11.1	5.5
03238	00	Z	50	30	16.1	12.5
03238	12	Z	50	10	28.8	21.7
03808	00	Z	50	29	12.7	8.5
03808	12	Z	50	30	19.9	15.9
03918	12	Z	50	21	25.7	22.3
03918	00	Z	50	26	23.6	16.5
03953	12	Z	50	10	18.9	14.9
03953	00	Z	50	12	25.6	23.0
04018	00	Z	50	29	14.6	8.6
04018	12	Z	50	27	23.4	19.8
04220	12	Z	50	29	16.1	12.4
04220	00	Z	50	29	15.7	6.7
04270	00	Z	50	28	31.8	17.2
04270	12	Z	50	30	20.0	12.1
04320	12	Z	50	29	13.5	5.6
04320	00	Z	50	28	13.1	2.9
04339	00	Z	50	28	38.2	27.6
04339	12	Z	50	28	48.9	31.7
04360	00	Z	50	15	17.3	11.8
04360	12	Z	50	12	13.2	10.5
06011	12	Z	50	22	18.6	8.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	50	20	16.9	-1.8
06260	00	Z	50	30	15.8	13.6
06260	12	Z	50	4	14.5	11.0
06610	12	Z	50	30	24.3	16.4
06610	00	Z	50	29	16.9	7.9
07110	00	Z	50	30	16.5	12.9
07110	12	Z	50	28	26.7	21.8
07510	12	Z	50	16	34.0	31.9
07510	00	Z	50	21	26.2	23.3
07645	12	Z	50	28	28.7	19.0
07645	00	Z	50	27	13.7	4.3
07761	12	Z	50	27	15.4	2.2
07761	00	Z	50	24	19.4	1.6
08001	12	Z	50	28	30.4	28.7
08001	00	Z	50	28	21.1	19.4
08221	12	Z	50	28	22.9	19.0
08221	00	Z	50	28	17.4	15.4
08302	00	Z	50	28	12.5	8.7
08302	12	Z	50	30	13.7	10.7
08508	12	Z	50	27	35.6	34.5
08522	12	Z	50	26	20.1	17.8
08579	12	Z	50	29	27.7	20.6
10035	12	Z	50	30	15.2	11.6
10035	00	Z	50	28	9.7	3.5
10393	12	Z	50	30	13.0	7.0
10393	00	Z	50	29	7.3	3.6
10410	12	Z	50	29	14.2	10.7
10410	00	Z	50	28	9.6	2.6
10739	00	Z	50	30	16.2	11.0
10739	12	Z	50	30	21.1	16.4
11035	00	Z	50	27	28.6	23.2
11035	12	Z	50	27	30.1	24.6
12982	12	Z	50	30	36.9	34.8
12982	00	Z	50	29	9.3	6.8
16044	12	Z	50	30	39.0	2.1
16044	00	Z	50	30	14.9	11.6
16080	12	Z	50	30	32.3	-0.3
16080	00	Z	50	30	30.2	0.9
16245	12	Z	50	30	12.7	4.3
16245	00	Z	50	29	9.7	5.9
16320	12	Z	50	29	19.8	11.7
16320	00	Z	50	30	13.0	9.8
16429	12	Z	50	30	15.0	10.9

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	00	Z	50	29	14.5	11.0
16622	00	Z	50	27	43.0	40.2
17607	12	Z	50	20	16.6	-13.8
26435	00	Z	50	13	10.8	6.2
60018	12	Z	50	30	14.3	11.3
60018	00	Z	50	29	13.4	8.3
ASDE01	12	Z	50	8	39.7	38.9
ASDE01	00	Z	50	8	16.5	3.6
ASDE03	12	Z	50	8	47.1	45.1
ASDE03	00	Z	50	9	19.2	9.9
ASDE09	12	Z	50	3	43.9	36.8
ASDK01	12	Z	50	0	0.0	0.0
ASDK02	12	Z	50	11	18.6	15.4
ASDK02	00	Z	50	11	15.6	10.5
ASDK03	00	Z	50	2	37.7	37.4
ASDK1	12	Z	50	0	0.0	0.0
ASDK2	00	Z	50	11	14.7	7.6
ASDK2	12	Z	50	11	15.5	12.1
ASDK3	00	Z	50	3	36.1	35.9
ASES01	12	Z	50	16	43.2	41.4
ASEU01	12	Z	50	18	30.4	28.8
ASEU01	00	Z	50	9	17.0	16.5
ASEU02	12	Z	50	8	53.9	52.8
ASEU02	00	Z	50	8	48.0	46.6
ASEU03	12	Z	50	2	73.7	73.2
ASEU03	00	Z	50	2	28.5	28.4
ASEU04	12	Z	50	5	23.2	22.0
ASEU04	00	Z	50	4	19.7	2.1
ASEU06	12	Z	50	5	78.2	71.9
ASEU06	00	Z	50	5	16.2	11.7
ASFR1	12	Z	50	7	20.9	19.6
ASFR1	00	Z	50	6	27.6	24.8
ASFR2	12	Z	50	8	122.1	86.1
ASFR2	00	Z	50	10	32.2	25.9
ASFR3	00	Z	50	1	13.9	13.9
ASFR3	12	Z	50	0	0.0	0.0
ASFR4	12	Z	50	11	40.6	38.5
ASFR4	00	Z	50	9	37.1	36.7
DBLK	12	Z	50	26	18.1	11.2

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

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RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : WIND (M/S)
         LEVEL                 :  50 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : NOV 2015
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	50	30	4.0	0.3	-0.4
01001	00	V	50	28	5.0	-0.8	-0.4
01028	12	V	50	28	3.0	-0.1	-0.7
01028	00	V	50	29	3.5	-0.3	-0.9
01400	12	V	50	7	4.4	-0.8	0.7
01400	00	V	50	9	3.8	0.9	-2.1
01415	12	V	50	29	6.9	1.3	0.7
01415	00	V	50	28	5.6	0.9	-1.4
02365	12	V	50	22	5.3	0.1	-1.1
02365	00	V	50	19	7.4	0.5	-2.3
02591	00	V	50	30	5.2	-0.9	-0.1
02591	12	V	50	28	4.6	0.1	-0.5
02836	00	V	50	28	3.7	0.2	-1.0
02836	12	V	50	29	5.0	-0.9	-0.4
02963	12	V	50	29	3.6	0.2	-0.7
02963	00	V	50	29	4.0	-0.3	0.2
03005	12	V	50	30	5.8	0.8	0.4
03005	00	V	50	28	5.6	0.6	-0.8
03238	00	V	50	29	6.4	1.3	-0.8
03238	12	V	50	10	7.4	0.3	-0.2
03808	00	V	50	28	4.4	1.2	0.2
03808	12	V	50	28	5.1	0.1	0.0
03918	12	V	50	20	6.4	-0.9	0.4
03918	00	V	50	21	5.4	-2.1	-1.2
03953	12	V	50	10	3.4	-0.5	0.4
03953	00	V	50	12	4.1	0.3	1.4
04018	00	V	50	25	4.0	0.2	-0.6
04018	12	V	50	25	3.8	0.0	0.2
04220	12	V	50	29	3.5	-0.8	0.6
04220	00	V	50	29	4.0	-0.8	-0.7
04270	00	V	50	28	4.9	-0.9	-0.5
04270	12	V	50	30	7.3	-0.1	0.2
04320	12	V	50	28	4.0	0.8	-0.5
04320	00	V	50	28	4.0	1.1	-0.7
04339	00	V	50	28	3.8	0.1	-0.9
04339	12	V	50	27	3.5	0.3	-0.2
04360	00	V	50	15	4.2	-1.3	-0.8
04360	12	V	50	12	3.3	-0.4	-0.8
06011	12	V	50	22	4.3	-0.5	1.5

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	50	20	3.5	0.3	0.0
06260	00	V	50	29	5.9	0.2	-1.4
06260	12	V	50	4	6.6	2.7	-1.8
06610	12	V	50	30	5.9	-0.6	0.5
06610	00	V	50	28	5.3	0.0	0.3
07110	00	V	50	30	3.5	0.2	0.7
07110	12	V	50	28	4.0	1.0	0.0
07510	12	V	50	16	3.6	0.6	-0.4
07510	00	V	50	21	4.0	0.3	-0.6
07645	12	V	50	27	4.8	0.9	-1.3
07645	00	V	50	27	5.4	0.2	0.1
07761	12	V	50	27	3.9	0.6	0.8
07761	00	V	50	24	6.8	1.9	-1.0
08001	12	V	50	28	4.2	0.4	0.3
08001	00	V	50	27	4.0	0.7	-0.3
08221	12	V	50	28	4.5	1.1	-0.2
08221	00	V	50	28	3.6	0.2	0.1
08302	00	V	50	28	4.0	0.1	1.8
08302	12	V	50	30	3.1	-0.1	0.4
08508	12	V	50	26	4.3	-0.4	-0.5
08522	12	V	50	26	4.1	-0.2	-0.1
08579	12	V	50	29	3.3	0.9	0.6
10035	12	V	50	30	4.6	0.0	0.7
10035	00	V	50	26	5.3	0.8	-0.2
10393	12	V	50	30	5.0	-0.7	-1.1
10393	00	V	50	29	4.2	0.2	-0.4
10410	12	V	50	29	4.7	0.6	-0.8
10410	00	V	50	28	5.1	1.2	-2.1
10739	00	V	50	30	4.2	-0.1	0.2
10739	12	V	50	30	4.1	0.8	0.6
11035	00	V	50	27	3.9	0.2	-0.2
11035	12	V	50	27	5.0	0.5	0.9
12982	12	V	50	30	3.4	-0.1	-0.2
12982	00	V	50	29	3.6	0.0	0.1
16044	12	V	50	30	4.7	0.9	0.7
16044	00	V	50	30	3.4	0.6	0.1
16080	12	V	50	30	4.6	1.6	-0.9
16080	00	V	50	30	5.1	-0.3	0.1
16245	12	V	50	29	4.9	1.2	0.6
16245	00	V	50	28	3.5	0.6	-0.2
16320	12	V	50	29	3.8	1.4	0.0
16320	00	V	50	30	3.8	0.2	1.0
16429	12	V	50	30	4.1	1.1	0.5

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	00	V	50	27	3.8	0.0	-0.2
16622	00	V	50	21	4.1	-0.7	-1.5
17607	12	V	50	18	4.8	2.0	0.9
26435	00	V	50	13	3.6	-1.3	1.2
60018	12	V	50	30	3.9	0.0	-0.3
60018	00	V	50	28	3.8	0.3	0.8
ASDE01	12	V	50	7	5.0	-1.3	-1.7
ASDE01	00	V	50	8	6.7	1.2	3.2
ASDE03	12	V	50	8	5.7	-1.1	0.7
ASDE03	00	V	50	9	3.6	-0.1	-0.4
ASDE09	12	V	50	2	4.5	-2.0	1.8
ASDK01	12	V	50	0	0.0	0.0	0.0
ASDK02	12	V	50	11	5.1	1.0	0.7
ASDK02	00	V	50	9	5.5	-0.4	-1.0
ASDK03	00	V	50	2	5.9	-3.5	-0.9
ASDK1	12	V	50	0	0.0	0.0	0.0
ASDK2	00	V	50	9	5.4	-0.2	-1.2
ASDK2	12	V	50	11	4.8	1.0	1.0
ASDK3	00	V	50	3	6.9	-4.2	-2.6
ASES01	12	V	50	16	3.6	0.1	-0.9
ASEU01	12	V	50	18	4.7	1.0	0.0
ASEU01	00	V	50	9	4.5	1.0	0.7
ASEU02	12	V	50	8	5.0	0.5	1.3
ASEU02	00	V	50	8	5.6	-0.1	-0.2
ASEU03	12	V	50	1	6.8	-0.8	6.8
ASEU03	00	V	50	0	0.0	0.0	0.0
ASEU04	12	V	50	5	3.8	2.1	-1.0
ASEU04	00	V	50	4	6.1	0.6	3.6
ASEU06	12	V	50	5	2.8	-1.6	-0.7
ASEU06	00	V	50	3	3.5	-2.3	-2.1
ASFR1	12	V	50	7	4.2	-0.8	0.8
ASFR1	00	V	50	6	4.6	-0.2	1.4
ASFR2	12	V	50	8	4.8	1.0	0.3
ASFR2	00	V	50	10	4.2	0.0	1.9
ASFR3	00	V	50	1	3.0	0.4	3.0
ASFR3	12	V	50	0	0.0	0.0	0.0
ASFR4	12	V	50	11	4.0	0.0	-0.2
ASFR4	00	V	50	9	4.2	0.8	-1.6
DBLK	12	V	50	26	4.5	-0.2	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 2015
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	100	34	12.6	3.8
01001	00	Z	100	31	7.2	-0.6
01028	12	Z	100	32	9.8	1.2
01028	00	Z	100	33	7.0	-2.2
01400	12	Z	100	21	26.4	18.9
01400	00	Z	100	20	14.2	11.1
01415	12	Z	100	33	14.0	4.1
01415	00	Z	100	32	14.7	2.5
02365	12	Z	100	42	7.2	1.4
02365	00	Z	100	43	9.4	-1.0
02591	00	Z	100	44	13.5	11.9
02591	12	Z	100	42	15.2	14.1
02836	00	Z	100	40	9.0	-5.6
02836	12	Z	100	49	8.1	3.8
02963	12	Z	100	37	6.2	1.7
02963	00	Z	100	33	7.4	3.1
03005	12	Z	100	30	15.6	2.9
03005	00	Z	100	30	7.1	-2.3
03238	00	Z	100	30	16.0	12.0
03238	12	Z	100	11	24.7	19.3
03808	00	Z	100	30	9.7	5.7
03808	12	Z	100	30	12.2	7.7
03918	12	Z	100	24	16.3	12.5
03918	00	Z	100	27	17.5	12.6
03953	12	Z	100	30	16.5	11.7
03953	00	Z	100	27	16.1	9.3
04018	00	Z	100	29	12.2	8.4
04018	12	Z	100	28	15.2	13.2
04220	12	Z	100	30	12.0	4.7
04220	00	Z	100	30	13.0	3.2
04270	00	Z	100	28	27.2	11.0
04270	12	Z	100	30	21.0	4.3
04320	12	Z	100	29	11.9	4.3
04320	00	Z	100	29	9.2	3.0
04339	00	Z	100	30	22.8	12.6
04339	12	Z	100	29	33.0	17.4
04360	00	Z	100	18	12.4	8.3
04360	12	Z	100	19	12.4	9.2
06011	12	Z	100	26	11.4	4.8

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	100	26	12.0	-2.8
06260	00	Z	100	33	10.4	7.1
06260	12	Z	100	4	7.1	5.6
06610	12	Z	100	30	19.5	10.9
06610	00	Z	100	30	53.8	16.8
07110	00	Z	100	30	10.8	5.9
07110	12	Z	100	30	17.1	13.2
07510	12	Z	100	23	21.3	20.0
07510	00	Z	100	27	16.5	14.0
07645	12	Z	100	28	16.6	9.9
07645	00	Z	100	28	12.0	-0.4
07761	12	Z	100	27	11.8	-1.1
07761	00	Z	100	24	9.6	0.3
08001	12	Z	100	30	20.3	17.9
08001	00	Z	100	29	16.8	13.9
08221	12	Z	100	28	19.8	15.5
08221	00	Z	100	28	13.0	9.7
08302	00	Z	100	29	7.2	3.4
08302	12	Z	100	30	8.0	4.2
08508	12	Z	100	27	23.0	21.3
08522	12	Z	100	27	11.5	7.7
08579	12	Z	100	29	22.9	10.8
10035	12	Z	100	34	9.4	4.7
10035	00	Z	100	34	8.5	0.0
10393	12	Z	100	35	9.5	2.0
10393	00	Z	100	33	5.5	-2.0
10410	12	Z	100	32	8.4	2.3
10410	00	Z	100	33	6.6	-0.3
10739	00	Z	100	33	12.3	9.0
10739	12	Z	100	34	14.9	10.5
11035	00	Z	100	31	22.1	15.2
11035	12	Z	100	28	23.3	15.9
12982	12	Z	100	30	22.9	21.4
12982	00	Z	100	28	7.8	2.6
16044	12	Z	100	30	38.9	-3.9
16044	00	Z	100	30	8.2	5.8
16080	12	Z	100	30	32.5	-6.8
16080	00	Z	100	30	26.8	-2.8
16245	12	Z	100	30	10.2	-2.4
16245	00	Z	100	29	10.2	-1.1
16320	12	Z	100	29	13.7	5.6
16320	00	Z	100	30	9.7	4.7
16429	12	Z	100	27	9.4	4.9

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	00	Z	100	29	9.7	6.5
16622	00	Z	100	29	32.7	29.1
17607	12	Z	100	39	12.8	-10.7
26435	00	Z	100	14	11.6	1.3
60018	12	Z	100	34	10.3	7.7
60018	00	Z	100	32	10.0	3.8
ASDE01	12	Z	100	8	23.8	21.4
ASDE01	00	Z	100	9	10.9	-0.3
ASDE03	12	Z	100	11	28.8	25.7
ASDE03	00	Z	100	14	11.1	5.4
ASDE09	12	Z	100	3	28.5	20.9
ASDK01	12	Z	100	0	0.0	0.0
ASDK02	12	Z	100	17	12.2	9.7
ASDK02	00	Z	100	17	16.8	9.9
ASDK03	00	Z	100	3	38.1	38.1
ASDK1	12	Z	100	0	0.0	0.0
ASDK2	00	Z	100	13	14.3	7.0
ASDK2	12	Z	100	11	12.4	7.4
ASDK3	00	Z	100	3	36.3	34.8
ASES01	12	Z	100	17	32.9	31.2
ASEU01	12	Z	100	20	20.5	19.0
ASEU01	00	Z	100	10	9.4	8.1
ASEU02	12	Z	100	8	41.9	41.2
ASEU02	00	Z	100	8	38.9	37.0
ASEU03	12	Z	100	5	59.3	55.8
ASEU03	00	Z	100	10	14.8	8.4
ASEU04	12	Z	100	6	14.1	11.5
ASEU04	00	Z	100	5	20.1	-7.1
ASEU06	12	Z	100	8	48.3	41.5
ASEU06	00	Z	100	10	34.4	22.1
ASFR1	12	Z	100	8	20.7	18.3
ASFR1	00	Z	100	6	22.5	18.6
ASFR2	12	Z	100	9	35.2	32.4
ASFR2	00	Z	100	11	19.9	17.2
ASFR3	00	Z	100	1	3.1	3.1
ASFR3	12	Z	100	0	0.0	0.0
ASFR4	12	Z	100	13	24.9	22.6
ASFR4	00	Z	100	10	27.0	25.4
DBLK	12	Z	100	46	11.7	7.7

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 2015
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	100	30	3.3	0.0	-0.1
01001	00	V	100	29	3.8	-0.3	-0.2
01028	12	V	100	28	3.3	-0.6	-0.1
01028	00	V	100	29	3.3	0.7	-0.3
01400	12	V	100	11	3.4	0.2	0.1
01400	00	V	100	13	3.8	0.8	-1.3
01415	12	V	100	29	5.1	-0.2	-1.1
01415	00	V	100	29	5.5	0.4	-1.0
02365	12	V	100	28	3.5	0.4	-0.9
02365	00	V	100	29	4.9	0.0	-0.1
02591	00	V	100	29	4.0	0.0	-1.3
02591	12	V	100	29	4.6	0.0	-1.4
02836	00	V	100	29	3.4	0.2	-0.7
02836	12	V	100	30	4.3	0.1	0.5
02963	12	V	100	30	4.1	-0.6	-0.2
02963	00	V	100	30	3.6	0.6	-0.8
03005	12	V	100	30	4.8	0.4	-0.5
03005	00	V	100	30	4.0	0.0	0.0
03238	00	V	100	29	5.9	-0.7	0.0
03238	12	V	100	10	7.2	-1.3	-1.3
03808	00	V	100	29	4.5	0.4	-0.5
03808	12	V	100	30	4.2	0.5	0.7
03918	12	V	100	24	4.5	1.0	-0.2
03918	00	V	100	23	5.5	-1.8	-0.5
03953	12	V	100	29	6.8	0.2	-1.4
03953	00	V	100	27	5.3	-0.3	-0.2
04018	00	V	100	29	3.7	-0.6	-0.5
04018	12	V	100	28	3.7	1.1	0.1
04220	12	V	100	30	3.5	-0.2	-0.2
04220	00	V	100	29	3.0	-0.2	-0.1
04270	00	V	100	28	8.0	-1.4	-0.1
04270	12	V	100	30	4.2	0.1	-0.1
04320	12	V	100	29	3.9	-0.3	-0.2
04320	00	V	100	28	3.0	-0.6	0.4
04339	00	V	100	30	3.2	-0.2	0.7
04339	12	V	100	28	4.4	0.6	0.2
04360	00	V	100	18	2.7	-0.1	1.0
04360	12	V	100	19	2.8	0.4	0.3
06011	12	V	100	26	4.2	-1.2	-0.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	100	26	4.3	0.7	-0.3
06260	00	V	100	30	5.4	-0.1	-2.0
06260	12	V	100	4	2.5	0.1	0.6
06610	12	V	100	30	4.7	0.8	0.7
06610	00	V	100	29	4.8	0.9	-0.1
07110	00	V	100	30	3.6	0.2	-1.0
07110	12	V	100	30	4.1	0.1	-0.3
07510	12	V	100	22	3.0	0.5	0.5
07510	00	V	100	26	4.0	-0.1	0.0
07645	12	V	100	24	5.0	0.1	0.0
07645	00	V	100	25	6.4	-0.4	1.3
07761	12	V	100	19	3.2	0.8	0.2
07761	00	V	100	16	3.8	-0.5	-0.3
08001	12	V	100	30	4.9	-0.9	-0.2
08001	00	V	100	27	4.3	0.7	0.0
08221	12	V	100	28	4.6	-0.6	-0.7
08221	00	V	100	28	4.1	-0.3	-0.7
08302	00	V	100	29	4.2	0.2	0.1
08302	12	V	100	30	3.9	0.3	0.4
08508	12	V	100	26	4.0	-1.8	0.8
08522	12	V	100	26	4.0	0.3	0.3
08579	12	V	100	29	3.4	0.5	-0.2
10035	12	V	100	30	4.8	-0.5	-0.3
10035	00	V	100	30	4.8	-0.9	-0.9
10393	12	V	100	30	4.3	0.1	-1.0
10393	00	V	100	30	3.4	-0.1	-0.1
10410	12	V	100	29	4.1	1.7	0.0
10410	00	V	100	30	5.1	0.8	-1.4
10739	00	V	100	30	4.0	-0.2	0.1
10739	12	V	100	30	4.3	-0.4	-0.6
11035	00	V	100	30	5.4	-0.5	-0.2
11035	12	V	100	28	6.5	0.4	0.5
12982	12	V	100	30	5.0	-0.1	-0.6
12982	00	V	100	28	4.8	-0.4	-0.4
16044	12	V	100	30	4.8	0.4	1.5
16044	00	V	100	30	4.3	-0.1	-0.3
16080	12	V	100	30	4.9	0.5	0.8
16080	00	V	100	30	3.7	0.7	-0.1
16245	12	V	100	30	4.0	0.8	0.8
16245	00	V	100	28	4.5	0.4	-0.4
16320	12	V	100	29	5.3	0.6	-0.8
16320	00	V	100	30	5.1	0.5	0.4
16429	12	V	100	27	5.1	0.5	-0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	00	V	100	28	4.0	-0.3	0.5
16622	00	V	100	24	4.7	-0.1	0.4
17607	12	V	100	21	4.5	1.9	-1.1
26435	00	V	100	13	4.6	0.2	-0.1
60018	12	V	100	30	3.7	1.2	-0.1
60018	00	V	100	29	4.0	0.8	-0.5
ASDE01	12	V	100	8	5.0	0.7	-0.4
ASDE01	00	V	100	8	5.1	0.1	-0.3
ASDE03	12	V	100	10	4.8	0.5	-1.4
ASDE03	00	V	100	11	3.6	-0.3	-0.4
ASDE09	12	V	100	3	2.8	0.7	-1.0
ASDK01	12	V	100	0	0.0	0.0	0.0
ASDK02	12	V	100	12	4.6	0.4	-0.2
ASDK02	00	V	100	13	4.1	-0.7	-0.7
ASDK03	00	V	100	3	4.8	-1.1	-2.3
ASDK1	12	V	100	0	0.0	0.0	0.0
ASDK2	00	V	100	13	4.4	-0.7	-0.6
ASDK2	12	V	100	11	4.7	0.7	-0.6
ASDK3	00	V	100	3	5.5	-2.3	-1.8
ASES01	12	V	100	16	4.6	1.4	-0.4
ASEU01	12	V	100	18	4.7	1.4	1.4
ASEU01	00	V	100	9	3.5	-0.2	-0.6
ASEU02	12	V	100	8	5.1	-0.6	2.9
ASEU02	00	V	100	8	3.8	-1.0	0.3
ASEU03	12	V	100	2	4.3	-2.9	-0.3
ASEU03	00	V	100	4	4.3	-0.1	0.3
ASEU04	12	V	100	5	5.5	0.8	-0.4
ASEU04	00	V	100	4	2.9	1.1	1.8
ASEU06	12	V	100	6	6.3	-2.5	2.5
ASEU06	00	V	100	7	5.5	-2.8	1.2
ASFR1	12	V	100	8	4.9	-0.6	2.7
ASFR1	00	V	100	6	2.8	0.7	-1.3
ASFR2	12	V	100	7	3.5	-1.6	-0.9
ASFR2	00	V	100	10	3.8	1.1	0.2
ASFR3	00	V	100	1	7.3	-3.0	6.7
ASFR3	12	V	100	0	0.0	0.0	0.0
ASFR4	12	V	100	12	4.5	-0.1	-0.6
ASFR4	00	V	100	9	5.1	-0.2	-0.7
DBLK	12	V	100	26	5.1	-0.1	0.7

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 2015
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	500	31	6.5	-1.6
01001	00	Z	500	30	5.5	-0.5
01028	12	Z	500	29	4.5	-0.3
01028	00	Z	500	30	4.1	-1.0
01400	12	Z	500	20	16.1	10.6
01400	00	Z	500	20	10.5	7.8
01415	12	Z	500	29	4.7	3.2
01415	00	Z	500	29	5.7	3.4
02365	12	Z	500	39	4.6	1.1
02365	00	Z	500	40	4.6	1.6
02591	00	Z	500	41	9.3	8.8
02591	12	Z	500	38	9.9	9.3
02836	00	Z	500	37	4.9	-1.1
02836	12	Z	500	45	2.7	-0.2
02963	12	Z	500	33	3.7	2.8
02963	00	Z	500	30	5.1	4.2
03005	12	Z	500	30	6.9	0.1
03005	00	Z	500	30	6.2	0.2
03238	00	Z	500	30	10.2	8.0
03238	12	Z	500	11	7.8	5.1
03808	00	Z	500	31	7.6	5.0
03808	12	Z	500	31	7.1	3.8
03918	12	Z	500	24	8.8	6.5
03918	00	Z	500	28	10.2	8.0
03953	12	Z	500	35	9.6	3.6
03953	00	Z	500	30	12.2	4.0
04018	00	Z	500	29	7.2	4.8
04018	12	Z	500	29	7.7	5.3
04220	12	Z	500	30	7.2	5.5
04220	00	Z	500	30	10.7	3.4
04270	00	Z	500	29	4.9	2.0
04270	12	Z	500	30	7.4	3.0
04320	12	Z	500	29	6.0	3.7
04320	00	Z	500	29	8.8	4.0
04339	00	Z	500	30	6.9	0.4
04339	12	Z	500	29	9.5	2.7
04360	00	Z	500	26	4.8	1.4
04360	12	Z	500	26	6.5	0.4
06011	12	Z	500	29	34.9	19.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	500	30	7.6	1.3
06260	00	Z	500	30	6.0	4.9
06260	12	Z	500	4	7.6	7.2
06610	12	Z	500	30	7.9	5.4
06610	00	Z	500	30	12.4	6.8
07110	00	Z	500	30	6.9	2.8
07110	12	Z	500	30	10.5	2.2
07510	12	Z	500	27	9.5	7.2
07510	00	Z	500	31	5.8	2.2
07645	12	Z	500	29	7.1	1.7
07645	00	Z	500	29	7.0	-3.4
07761	12	Z	500	27	6.0	-0.8
07761	00	Z	500	26	5.0	-0.8
08001	12	Z	500	30	12.3	11.8
08001	00	Z	500	29	11.4	10.8
08221	12	Z	500	28	10.9	9.4
08221	00	Z	500	28	7.7	7.1
08302	00	Z	500	29	4.7	2.7
08302	12	Z	500	30	3.7	1.2
08508	12	Z	500	28	18.3	16.2
08522	12	Z	500	29	9.7	8.2
08579	12	Z	500	29	17.7	7.3
10035	12	Z	500	30	5.5	2.5
10035	00	Z	500	32	6.5	1.1
10393	12	Z	500	31	3.6	-0.2
10393	00	Z	500	31	2.9	0.3
10410	12	Z	500	29	4.0	1.5
10410	00	Z	500	30	5.2	0.0
10739	00	Z	500	31	8.9	6.6
10739	12	Z	500	32	9.7	8.8
11035	00	Z	500	32	12.0	7.9
11035	12	Z	500	30	11.3	7.5
12982	12	Z	500	30	8.2	5.7
12982	00	Z	500	29	5.8	3.5
16044	12	Z	500	30	28.1	-4.8
16044	00	Z	500	30	6.7	4.2
16080	12	Z	500	30	5.8	-0.7
16080	00	Z	500	30	25.8	-4.6
16245	12	Z	500	30	9.7	-7.8
16245	00	Z	500	30	8.3	-5.6
16320	12	Z	500	29	6.1	-1.3
16320	00	Z	500	30	7.4	1.1
16429	12	Z	500	29	7.1	-2.7

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	00	Z	500	30	4.6	0.4
16622	00	Z	500	30	18.9	16.9
17607	12	Z	500	39	6.4	3.8
26435	00	Z	500	15	5.9	1.5
60018	12	Z	500	30	3.9	2.8
60018	00	Z	500	30	3.8	0.1
ASDE01	12	Z	500	9	3.6	1.1
ASDE01	00	Z	500	11	8.9	-5.0
ASDE03	12	Z	500	12	13.4	7.4
ASDE03	00	Z	500	14	9.0	1.5
ASDE09	12	Z	500	3	17.3	15.6
ASDK01	12	Z	500	0	0.0	0.0
ASDK02	12	Z	500	16	7.9	6.1
ASDK02	00	Z	500	18	6.0	4.8
ASDK03	00	Z	500	2	27.9	27.9
ASDK1	12	Z	500	0	0.0	0.0
ASDK2	00	Z	500	15	5.9	2.3
ASDK2	12	Z	500	11	7.6	3.8
ASDK3	00	Z	500	3	29.4	29.3
ASES01	12	Z	500	18	19.8	18.6
ASEU01	12	Z	500	22	7.1	6.1
ASEU01	00	Z	500	10	4.6	1.7
ASEU02	12	Z	500	8	30.6	30.2
ASEU02	00	Z	500	8	32.5	31.4
ASEU03	12	Z	500	7	23.0	17.9
ASEU03	00	Z	500	11	20.8	-4.7
ASEU04	12	Z	500	7	11.2	-5.7
ASEU04	00	Z	500	5	12.5	-10.3
ASEU06	12	Z	500	8	12.1	2.2
ASEU06	00	Z	500	11	11.4	6.3
ASFR1	12	Z	500	8	6.8	-1.4
ASFR1	00	Z	500	7	8.7	-3.7
ASFR2	12	Z	500	11	29.5	18.3
ASFR2	00	Z	500	12	9.3	6.5
ASFR3	00	Z	500	1	9.6	9.6
ASFR3	12	Z	500	0	0.0	0.0
ASFR4	12	Z	500	14	9.8	4.4
ASFR4	00	Z	500	11	5.3	2.9
DBLK	12	Z	500	46	4.7	3.7

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 2015
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	500	30	3.6	0.4	-0.5
01001	00	V	500	30	3.2	0.6	-0.1
01028	12	V	500	29	3.1	0.0	-0.2
01028	00	V	500	29	3.4	-0.3	-0.5
01400	12	V	500	19	3.1	0.5	0.3
01400	00	V	500	20	3.6	-0.5	-0.1
01415	12	V	500	29	3.4	0.0	0.1
01415	00	V	500	29	4.5	0.6	-0.1
02365	12	V	500	29	3.2	0.1	-0.1
02365	00	V	500	30	2.7	0.2	0.5
02591	00	V	500	30	2.8	0.0	-0.4
02591	12	V	500	29	2.9	-0.3	0.0
02836	00	V	500	29	2.8	0.1	0.2
02836	12	V	500	30	3.7	1.1	-0.3
02963	12	V	500	30	2.9	-0.3	0.3
02963	00	V	500	30	2.8	0.5	0.4
03005	12	V	500	30	4.2	0.7	-0.1
03005	00	V	500	30	4.1	0.4	1.2
03238	00	V	500	29	3.9	0.6	0.3
03238	12	V	500	11	3.8	-0.6	-0.8
03808	00	V	500	30	3.1	0.1	0.2
03808	12	V	500	30	4.3	0.9	-0.1
03918	12	V	500	24	5.4	-0.1	0.4
03918	00	V	500	23	4.3	0.5	0.0
03953	12	V	500	30	4.0	0.0	-0.1
03953	00	V	500	30	3.7	-0.6	0.5
04018	00	V	500	29	3.8	-0.8	0.0
04018	12	V	500	29	3.9	0.0	0.1
04220	12	V	500	30	2.9	0.2	-0.4
04220	00	V	500	30	2.9	0.4	0.0
04270	00	V	500	29	2.7	0.0	0.2
04270	12	V	500	30	2.9	0.1	-0.6
04320	12	V	500	29	2.8	0.6	0.0
04320	00	V	500	29	3.1	1.0	0.1
04339	00	V	500	30	2.8	0.7	0.7
04339	12	V	500	28	3.4	-0.4	0.2
04360	00	V	500	26	2.4	-0.3	-0.2
04360	12	V	500	26	3.7	0.1	0.1
06011	12	V	500	29	3.8	0.2	-1.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	500	30	4.0	0.5	-0.8
06260	00	V	500	30	3.4	-0.7	-0.7
06260	12	V	500	4	2.1	0.1	0.2
06610	12	V	500	30	3.0	0.7	0.2
06610	00	V	500	29	4.5	0.5	-0.9
07110	00	V	500	30	3.9	-0.6	1.1
07110	12	V	500	30	4.0	0.6	0.0
07510	12	V	500	27	3.0	1.0	-0.7
07510	00	V	500	29	3.5	-0.3	0.4
07645	12	V	500	29	3.0	0.1	-0.1
07645	00	V	500	29	2.8	-0.1	0.3
07761	12	V	500	27	3.3	0.5	-0.7
07761	00	V	500	25	3.5	-0.2	0.3
08001	12	V	500	30	3.4	-0.5	-0.2
08001	00	V	500	28	2.5	-0.5	0.1
08221	12	V	500	28	3.6	0.3	0.1
08221	00	V	500	28	2.7	-0.7	0.0
08302	00	V	500	29	2.5	-0.4	0.1
08302	12	V	500	30	2.5	0.1	0.1
08508	12	V	500	28	3.3	-0.4	0.2
08522	12	V	500	29	2.4	0.0	-0.4
08579	12	V	500	28	2.7	-0.1	-0.4
10035	12	V	500	30	3.1	-0.1	-1.0
10035	00	V	500	30	3.1	-0.1	0.2
10393	12	V	500	30	3.3	0.6	-0.1
10393	00	V	500	30	2.8	0.2	-0.6
10410	12	V	500	29	3.0	0.6	0.1
10410	00	V	500	30	3.0	1.0	-0.7
10739	00	V	500	30	3.3	0.5	-0.3
10739	12	V	500	30	3.4	1.0	-1.2
11035	00	V	500	30	2.9	-0.1	-0.8
11035	12	V	500	30	3.7	1.2	-0.2
12982	12	V	500	30	3.4	0.0	-0.8
12982	00	V	500	29	3.5	0.9	-0.1
16044	12	V	500	30	3.0	0.2	-0.1
16044	00	V	500	30	2.5	0.0	0.4
16080	12	V	500	30	2.8	0.4	-0.9
16080	00	V	500	30	3.5	0.2	-0.7
16245	12	V	500	30	4.1	0.1	0.0
16245	00	V	500	29	2.7	0.3	0.0
16320	12	V	500	29	3.2	0.1	-0.3
16320	00	V	500	30	3.2	-0.1	-0.4
16429	12	V	500	28	3.5	0.4	0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	00	V	500	28	2.9	0.3	0.7
16622	00	V	500	25	3.8	0.7	-0.2
17607	12	V	500	21	2.8	-0.2	-0.6
26435	00	V	500	15	3.0	-0.3	0.0
60018	12	V	500	30	2.7	0.2	0.4
60018	00	V	500	30	2.5	0.2	0.0
ASDE01	12	V	500	8	3.8	0.8	0.4
ASDE01	00	V	500	10	3.2	-0.1	0.5
ASDE03	12	V	500	11	3.5	0.6	0.7
ASDE03	00	V	500	11	3.3	0.2	0.2
ASDE09	12	V	500	3	0.7	-0.2	-0.1
ASDK01	12	V	500	0	0.0	0.0	0.0
ASDK02	12	V	500	13	2.0	0.1	0.3
ASDK02	00	V	500	15	3.0	0.7	0.1
ASDK03	00	V	500	2	3.8	-3.5	0.9
ASDK1	12	V	500	0	0.0	0.0	0.0
ASDK2	00	V	500	15	3.0	0.7	0.1
ASDK2	12	V	500	11	2.1	-0.3	0.1
ASDK3	00	V	500	3	4.1	-3.2	0.2
ASES01	12	V	500	17	2.4	0.2	0.4
ASEU01	12	V	500	21	3.1	0.2	-0.3
ASEU01	00	V	500	9	3.4	-0.5	-0.1
ASEU02	12	V	500	8	1.8	0.3	-0.2
ASEU02	00	V	500	8	2.6	0.2	-0.1
ASEU03	12	V	500	6	2.5	0.1	0.8
ASEU03	00	V	500	8	4.0	1.9	1.1
ASEU04	12	V	500	6	2.3	0.0	-0.4
ASEU04	00	V	500	5	3.3	0.9	0.8
ASEU06	12	V	500	6	7.5	1.6	0.4
ASEU06	00	V	500	9	3.5	0.2	-1.5
ASFR1	12	V	500	8	4.1	0.6	-0.2
ASFR1	00	V	500	7	2.0	-0.4	-0.1
ASFR2	12	V	500	11	2.4	0.5	-0.2
ASFR2	00	V	500	12	3.0	1.3	0.0
ASFR3	00	V	500	1	4.4	1.4	-4.2
ASFR3	12	V	500	0	0.0	0.0	0.0
ASFR4	12	V	500	14	3.2	0.2	0.4
ASFR4	00	V	500	11	2.7	-0.8	0.7
DBLK	12	V	500	26	3.0	1.0	-0.6

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 2015
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	850	30	5.2	-2.0
01001	00	Z	850	30	4.1	-0.8
01028	12	Z	850	31	4.2	-1.0
01028	00	Z	850	31	4.0	-1.3
01400	12	Z	850	21	13.6	7.4
01400	00	Z	850	20	5.8	3.7
01415	12	Z	850	29	4.0	3.2
01415	00	Z	850	29	4.6	3.8
02365	12	Z	850	39	3.2	1.4
02365	00	Z	850	40	4.8	2.0
02591	00	Z	850	41	8.6	8.1
02591	12	Z	850	38	8.6	8.2
02836	00	Z	850	37	2.7	0.6
02836	12	Z	850	45	2.7	1.3
02963	12	Z	850	33	4.0	3.5
02963	00	Z	850	30	4.7	4.0
03005	12	Z	850	30	4.2	-1.6
03005	00	Z	850	30	3.6	-1.6
03238	00	Z	850	30	7.3	6.5
03238	12	Z	850	11	3.9	2.5
03808	00	Z	850	31	4.2	3.0
03808	12	Z	850	31	4.2	2.1
03918	12	Z	850	24	5.9	4.9
03918	00	Z	850	28	6.2	5.5
03953	12	Z	850	34	4.7	3.0
03953	00	Z	850	30	3.8	2.0
04018	00	Z	850	29	4.3	1.1
04018	12	Z	850	29	4.4	3.1
04220	12	Z	850	30	4.1	3.2
04220	00	Z	850	30	9.7	0.0
04270	00	Z	850	29	4.1	0.4
04270	12	Z	850	30	3.4	1.4
04320	12	Z	850	29	4.5	-0.2
04320	00	Z	850	29	5.7	0.1
04339	00	Z	850	30	5.8	-3.0
04339	12	Z	850	29	5.4	-2.2
04360	00	Z	850	27	7.8	-6.4
04360	12	Z	850	26	6.3	-4.4
06011	12	Z	850	29	7.2	5.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	850	30	14.5	-1.0
06260	00	Z	850	30	4.3	3.6
06260	12	Z	850	4	3.0	1.7
06610	12	Z	850	30	4.6	3.9
06610	00	Z	850	30	7.6	6.0
07110	00	Z	850	30	3.3	1.8
07110	12	Z	850	30	4.4	2.7
07510	12	Z	850	27	2.7	0.0
07510	00	Z	850	32	2.3	-0.7
07645	12	Z	850	30	3.5	-1.4
07645	00	Z	850	29	4.2	-2.9
07761	12	Z	850	29	4.3	-2.7
07761	00	Z	850	27	4.1	-2.2
08001	12	Z	850	30	6.7	5.8
08001	00	Z	850	30	7.2	6.8
08221	12	Z	850	28	4.9	4.4
08221	00	Z	850	28	4.8	4.3
08302	00	Z	850	29	2.2	-0.8
08302	12	Z	850	30	4.0	-3.4
08508	12	Z	850	28	12.7	9.9
08522	12	Z	850	29	4.8	4.3
08579	12	Z	850	29	16.0	1.4
10035	12	Z	850	30	2.8	0.8
10035	00	Z	850	31	3.3	1.4
10393	12	Z	850	31	2.5	-0.1
10393	00	Z	850	30	2.0	0.1
10410	12	Z	850	29	2.5	-1.0
10410	00	Z	850	30	2.2	-0.7
10739	00	Z	850	30	8.5	8.1
10739	12	Z	850	32	7.3	6.8
11035	00	Z	850	32	9.9	6.7
11035	12	Z	850	30	9.9	6.9
12982	12	Z	850	30	4.5	2.5
12982	00	Z	850	30	3.9	2.1
16044	12	Z	850	30	4.5	-3.3
16044	00	Z	850	30	3.7	-0.5
16080	12	Z	850	30	7.2	-5.1
16080	00	Z	850	30	3.2	-0.8
16245	12	Z	850	30	12.0	-11.0
16245	00	Z	850	30	10.0	-8.4
16320	12	Z	850	29	8.0	-4.7
16320	00	Z	850	30	7.3	-2.5
16429	12	Z	850	30	6.6	-4.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	00	Z	850	31	3.4	-0.9
16622	00	Z	850	30	13.2	10.7
17607	12	Z	850	39	4.1	2.7
26435	00	Z	850	15	5.0	4.3
60018	12	Z	850	30	3.8	-2.9
60018	00	Z	850	31	3.4	-1.5
ASDE01	12	Z	850	9	8.2	-7.1
ASDE01	00	Z	850	11	11.2	-10.3
ASDE03	12	Z	850	12	11.3	5.2
ASDE03	00	Z	850	14	3.3	-1.0
ASDE09	12	Z	850	3	15.4	13.5
ASDK01	12	Z	850	0	0.0	0.0
ASDK02	12	Z	850	16	5.1	3.5
ASDK02	00	Z	850	18	5.1	1.7
ASDK03	00	Z	850	2	29.6	29.5
ASDK1	12	Z	850	0	0.0	0.0
ASDK2	00	Z	850	15	5.7	0.6
ASDK2	12	Z	850	12	5.8	3.1
ASDK3	00	Z	850	3	28.0	27.7
ASES01	12	Z	850	18	14.1	13.0
ASEU01	12	Z	850	22	4.3	-0.8
ASEU01	00	Z	850	10	5.6	-3.7
ASEU02	12	Z	850	8	23.3	22.8
ASEU02	00	Z	850	8	23.9	22.8
ASEU03	12	Z	850	7	22.0	14.0
ASEU03	00	Z	850	11	20.2	-7.5
ASEU04	12	Z	850	7	12.8	-9.8
ASEU04	00	Z	850	5	9.6	-8.1
ASEU06	12	Z	850	8	7.5	5.9
ASEU06	00	Z	850	11	8.2	6.0
ASFR1	12	Z	850	8	11.9	-10.5
ASFR1	00	Z	850	7	8.5	-7.1
ASFR2	12	Z	850	11	10.1	6.5
ASFR2	00	Z	850	12	8.3	3.9
ASFR3	00	Z	850	1	0.6	-0.6
ASFR3	12	Z	850	0	0.0	0.0
ASFR4	12	Z	850	14	5.8	-4.0
ASFR4	00	Z	850	11	6.9	-5.1
DBLK	12	Z	850	46	2.5	-0.7

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 2015
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	850	30	4.1	0.3	-0.8
01001	00	V	850	30	4.3	1.3	-0.8
01028	12	V	850	29	3.5	0.9	-0.9
01028	00	V	850	30	2.4	0.4	-0.3
01400	12	V	850	20	2.7	0.5	0.4
01400	00	V	850	20	2.6	0.6	0.8
01415	12	V	850	29	2.8	0.3	0.4
01415	00	V	850	29	3.9	1.1	0.0
02365	12	V	850	29	3.3	0.2	0.3
02365	00	V	850	30	3.0	-0.1	0.4
02591	00	V	850	30	2.5	-0.8	0.1
02591	12	V	850	29	2.5	0.4	-0.7
02836	00	V	850	30	2.4	0.3	0.1
02836	12	V	850	30	2.6	-0.3	-0.5
02963	12	V	850	30	2.6	-0.1	-0.2
02963	00	V	850	30	2.8	-0.3	-0.6
03005	12	V	850	30	3.5	0.5	0.2
03005	00	V	850	30	3.3	-0.7	0.0
03238	00	V	850	29	3.0	0.2	0.4
03238	12	V	850	11	3.3	1.5	0.1
03808	00	V	850	30	3.0	-0.1	-0.1
03808	12	V	850	30	3.3	0.1	0.1
03918	12	V	850	24	4.6	1.0	-1.4
03918	00	V	850	23	2.5	-0.3	-0.7
03953	12	V	850	30	3.5	0.1	0.2
03953	00	V	850	30	2.2	0.1	0.8
04018	00	V	850	29	2.8	0.3	0.8
04018	12	V	850	29	2.8	0.0	-0.2
04220	12	V	850	30	3.7	0.3	0.5
04220	00	V	850	30	4.0	0.0	1.0
04270	00	V	850	29	4.0	0.2	-0.5
04270	12	V	850	30	2.9	0.4	-0.4
04320	12	V	850	29	3.6	0.2	0.4
04320	00	V	850	29	4.7	0.6	0.6
04339	00	V	850	30	7.9	1.8	3.0
04339	12	V	850	28	6.0	1.1	2.9
04360	00	V	850	27	5.0	0.7	1.5
04360	12	V	850	26	4.5	0.7	0.7
06011	12	V	850	29	3.5	-0.7	0.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	850	30	3.3	-0.8	-0.5
06260	00	V	850	30	2.5	0.1	-0.7
06260	12	V	850	4	1.6	-0.3	0.3
06610	12	V	850	30	3.0	0.3	0.4
06610	00	V	850	29	3.2	0.1	-0.8
07110	00	V	850	30	3.2	0.1	-0.5
07110	12	V	850	29	3.9	0.3	0.6
07510	12	V	850	27	3.3	0.2	1.0
07510	00	V	850	30	3.1	-0.5	0.3
07645	12	V	850	29	3.9	-0.4	0.6
07645	00	V	850	29	3.7	-0.7	0.0
07761	12	V	850	28	4.4	0.9	0.8
07761	00	V	850	27	4.5	0.4	1.1
08001	12	V	850	30	3.4	0.7	0.1
08001	00	V	850	29	2.8	-0.4	0.3
08221	12	V	850	28	3.4	-0.1	0.9
08221	00	V	850	28	2.8	0.4	0.7
08302	00	V	850	29	2.5	0.0	0.6
08302	12	V	850	30	2.8	-0.2	0.7
08508	12	V	850	26	3.8	-0.4	0.9
08522	12	V	850	29	3.1	-0.6	-0.3
08579	12	V	850	29	3.1	0.4	-1.0
10035	12	V	850	30	2.5	0.3	-0.6
10035	00	V	850	30	3.2	-0.1	-0.6
10393	12	V	850	30	2.9	0.0	-0.3
10393	00	V	850	30	2.6	-0.2	-0.5
10410	12	V	850	29	3.2	0.5	0.5
10410	00	V	850	30	3.8	-0.3	-1.1
10739	00	V	850	30	2.3	0.0	-0.3
10739	12	V	850	30	2.9	-0.8	-0.1
11035	00	V	850	30	3.6	-0.6	-0.6
11035	12	V	850	30	3.0	-0.3	0.0
12982	12	V	850	30	3.5	0.0	0.6
12982	00	V	850	29	3.6	0.8	-0.2
16044	12	V	850	30	3.5	0.4	0.6
16044	00	V	850	30	3.1	0.5	0.2
16080	12	V	850	30	3.4	0.3	-1.2
16080	00	V	850	30	3.1	0.0	-0.8
16245	12	V	850	30	3.4	1.3	0.3
16245	00	V	850	29	3.5	1.1	-0.6
16320	12	V	850	29	4.5	0.3	-1.0
16320	00	V	850	30	3.7	0.4	-0.5
16429	12	V	850	28	2.8	-0.6	0.9

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	00	V	850	28	2.9	-0.2	-0.1
16622	00	V	850	25	5.2	0.4	-1.0
17607	12	V	850	21	2.9	0.2	0.2
26435	00	V	850	15	2.8	-0.4	0.4
60018	12	V	850	30	3.5	1.3	-0.5
60018	00	V	850	30	2.9	0.3	-0.6
ASDE01	12	V	850	9	2.4	-0.7	0.8
ASDE01	00	V	850	10	1.8	-0.3	-1.0
ASDE03	12	V	850	11	2.9	0.6	0.3
ASDE03	00	V	850	11	3.0	-0.8	0.1
ASDE09	12	V	850	3	1.6	0.7	0.3
ASDK01	12	V	850	0	0.0	0.0	0.0
ASDK02	12	V	850	13	4.5	-0.6	-0.4
ASDK02	00	V	850	15	3.7	0.3	-0.6
ASDK03	00	V	850	2	2.4	2.2	-0.5
ASDK1	12	V	850	0	0.0	0.0	0.0
ASDK2	00	V	850	15	3.7	0.3	-1.1
ASDK2	12	V	850	12	4.3	-0.8	-0.4
ASDK3	00	V	850	3	1.8	1.2	0.9
ASES01	12	V	850	17	2.8	0.5	-0.8
ASEU01	12	V	850	21	3.3	-0.8	0.0
ASEU01	00	V	850	9	2.4	0.1	1.1
ASEU02	12	V	850	8	3.0	0.6	1.4
ASEU02	00	V	850	8	2.1	-0.1	-0.5
ASEU03	12	V	850	7	3.0	0.2	-0.4
ASEU03	00	V	850	8	2.8	0.8	0.8
ASEU04	12	V	850	6	1.8	0.4	-0.1
ASEU04	00	V	850	5	2.3	-0.3	1.3
ASEU06	12	V	850	7	3.2	-0.8	-0.5
ASEU06	00	V	850	9	3.7	1.0	-0.8
ASFR1	12	V	850	8	3.6	-1.3	0.0
ASFR1	00	V	850	7	3.5	1.1	-0.9
ASFR2	12	V	850	11	2.6	0.2	-0.3
ASFR2	00	V	850	12	3.6	-1.1	0.1
ASFR3	00	V	850	1	3.0	0.5	-3.0
ASFR3	12	V	850	0	0.0	0.0	0.0
ASFR4	12	V	850	14	2.9	0.9	1.3
ASFR4	00	V	850	11	4.3	0.6	0.8
DBLK	12	V	850	26	3.0	-0.1	0.5

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

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DRIFTER MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE      : ECMWF
         ELEMENT MONITORED      : SURFACE PRESSURE (HPA)
         AREA                   : 10N - 90N, 70W - 40E
         PERIOD                 : NOV 2015
         STANDARD OF COMPARISON: FIRST-GUESS FIELD


TIME = 99 => AVERAGE OF ALL OBSERVATIONS
GROSS ERROR LIMIT = 15 HPA
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WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
03380	99	P	SUR	54	0	724	0	0.4	-0.3	0.5
13001	99	P	SUR	12	-23	89	0	0.4	0.0	0.4
13008	99	P	SUR	15	-38	73	0	0.3	-0.1	0.3
13515	99	P	SUR	27	-52	513	0	0.3	0.0	0.3
13517	99	P	SUR	15	-47	416	0	0.3	0.0	0.3
13519	99	P	SUR	21	-41	293	1	0.3	0.0	0.3
13531	99	P	SUR	14	-66	619	0	0.5	-0.7	0.8
13569	99	P	SUR	27	-33	396	0	0.3	-0.2	0.3
13570	99	P	SUR	37	-23	657	0	0.3	0.7	0.8
13572	99	P	SUR	31	-33	345	0	0.3	-0.1	0.4
13633	99	P	SUR	31	-25	505	0	0.2	-0.6	0.7
13659	99	P	SUR	34	-45	448	72	2.9	-1.3	3.2
13660	99	P	SUR	31	-47	720	0	0.8	0.0	0.8
13661	99	P	SUR	13	-29	719	0	0.4	-0.5	0.6
13662	99	P	SUR	32	-50	719	0	0.3	-0.2	0.4
13665	99	P	SUR	22	-18	720	0	0.3	0.2	0.4
13868	99	P	SUR	32	-14	711	0	0.3	0.5	0.6
13869	99	P	SUR	24	-40	720	0	0.3	0.0	0.3
13870	99	P	SUR	32	-17	720	0	0.3	1.2	1.2
13871	99	P	SUR	26	-33	689	0	0.3	0.5	0.6
13872	99	P	SUR	25	-27	720	0	0.3	0.5	0.6
21942	99	P	SUR	28	-42	648	0	0.4	0.1	0.4
25540	99	P	SUR	79	-6	642	0	0.6	-0.3	0.6
25575	99	P	SUR	80	-10	649	0	0.6	0.1	0.6
25617	99	P	SUR	82	-14	721	0	0.6	-0.5	0.8
25618	99	P	SUR	85	-4	720	0	0.6	-0.1	0.6
25620	99	P	SUR	81	-2	720	0	0.5	-0.1	0.6
26537	99	P	SUR	75	13	705	0	1.0	0.1	1.0
26545	99	P	SUR	85	33	30	0	0.8	-0.4	0.8
26546	99	P	SUR	85	19	715	0	0.6	0.7	0.9
31515	99	P	SUR	22	-67	625	0	0.4	0.0	0.4
31717	99	P	SUR	19	-68	113	0	0.5	0.1	0.5
31863	99	P	SUR	23	-57	720	0	0.4	0.5	0.6
41040	99	P	SUR	15	-53	717	0	0.4	-0.8	0.8
41041	99	P	SUR	14	-46	716	0	0.3	-0.5	0.6
41043	99	P	SUR	21	-65	722	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
41044	99	P	SUR	22	-59	722	0	0.3	-0.4	0.5
41046	99	P	SUR	24	-68	724	0	0.4	-0.1	0.4
41048	99	P	SUR	32	-70	724	0	0.4	-0.5	0.6
41049	99	P	SUR	28	-63	722	0	0.5	-0.3	0.5
41051	99	P	SUR	18	-65	1566	0	0.4	-0.3	0.5
41052	99	P	SUR	18	-65	936	0	0.4	-1.3	1.3
41053	99	P	SUR	19	-66	1934	0	0.5	-0.5	0.7
41056	99	P	SUR	18	-66	1838	0	0.4	-0.9	1.0
41139	99	P	SUR	20	-38	220	0	0.3	-0.2	0.3
41300	99	P	SUR	16	-58	689	3	0.4	-0.1	0.4
41564	99	P	SUR	28	-32	427	0	0.3	0.3	0.4
41591	99	P	SUR	17	-61	431	0	0.5	0.3	0.6
41594	99	P	SUR	30	-62	585	0	0.3	0.0	0.3
41596	99	P	SUR	26	-68	720	0	0.4	-0.1	0.4
41597	99	P	SUR	25	-58	720	0	0.4	-0.1	0.4
41598	99	P	SUR	23	-55	8	0	0.1	1.1	1.1
41600	99	P	SUR	18	-68	720	0	0.5	0.3	0.6
41632	99	P	SUR	28	-66	376	133	2.2	-0.7	2.3
41635	99	P	SUR	22	-44	716	0	0.3	0.4	0.5
41638	99	P	SUR	14	-50	96	0	0.3	0.3	0.4
41705	99	P	SUR	38	-55	208	18	1.3	-0.5	1.3
41706	99	P	SUR	32	-54	720	0	0.4	0.0	0.4
41707	99	P	SUR	13	-59	688	0	0.5	-0.6	0.8
41708	99	P	SUR	10	-36	720	0	0.3	0.2	0.4
41711	99	P	SUR	31	-38	720	0	0.5	-0.3	0.5
41729	99	P	SUR	37	-56	720	0	0.6	-0.1	0.6
41731	99	P	SUR	27	-54	720	0	0.3	0.1	0.3
41739	99	P	SUR	39	-50	719	0	0.6	-0.8	1.0
41933	99	P	SUR	34	-34	237	0	0.4	-0.4	0.6
41936	99	P	SUR	34	-63	633	1	0.5	-1.0	1.1
41969	99	P	SUR	28	-60	643	0	0.4	-1.1	1.1
41970	99	P	SUR	34	-65	720	0	0.4	0.0	0.4
41972	99	P	SUR	33	-53	718	0	0.4	-0.2	0.5
41975	99	P	SUR	31	-24	552	0	0.3	0.1	0.3
42059	99	P	SUR	15	-68	726	0	0.5	-0.2	0.5
42060	99	P	SUR	16	-63	722	0	0.4	0.0	0.4
42085	99	P	SUR	18	-67	1865	0	0.5	-0.9	1.0
44005	99	P	SUR	43	-69	758	0	0.5	-0.6	0.8
44008	99	P	SUR	41	-69	721	0	0.5	-0.5	0.7
44011	99	P	SUR	41	-67	722	0	0.5	-0.8	1.0
44018	99	P	SUR	42	-70	723	0	0.5	-0.3	0.6
44024	99	P	SUR	42	-66	769	0	0.5	-0.9	1.0
44027	99	P	SUR	44	-67	723	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
44032	99	P	SUR	44	-69	722	0	0.5	-1.0	1.1
44033	99	P	SUR	44	-69	721	0	0.5	-1.3	1.4
44034	99	P	SUR	44	-68	722	0	0.5	-0.3	0.6
44037	99	P	SUR	44	-68	506	0	0.5	0.0	0.5
44137	99	P	SUR	42	-62	717	0	0.5	0.0	0.5
44139	99	P	SUR	44	-57	692	0	0.4	0.0	0.4
44141	99	P	SUR	43	-58	695	0	0.5	0.0	0.5
44150	99	P	SUR	43	-64	656	0	0.6	0.1	0.6
44251	99	P	SUR	46	-53	705	0	0.5	0.2	0.6
44255	99	P	SUR	47	-57	835	0	0.5	0.0	0.5
44258	99	P	SUR	45	-63	83	0	0.5	-0.2	0.5
44513	99	P	SUR	51	-22	720	0	0.6	0.3	0.7
44515	99	P	SUR	46	-42	719	0	0.7	0.1	0.7
44516	99	P	SUR	39	-50	558	0	0.6	0.0	0.6
44517	99	P	SUR	42	-22	719	0	0.4	0.3	0.5
44519	99	P	SUR	50	-21	596	0	0.6	-0.3	0.6
44546	99	P	SUR	27	-48	720	0	0.4	-0.2	0.4
44547	99	P	SUR	60	-19	352	7	4.2	-2.2	4.7
44548	99	P	SUR	59	-24	720	0	0.5	0.3	0.6
44549	99	P	SUR	55	-12	720	0	0.7	-0.2	0.7
44551	99	P	SUR	64	-11	720	0	0.5	-0.1	0.5
44557	99	P	SUR	37	-49	718	0	0.5	0.2	0.5
44558	99	P	SUR	34	-50	552	0	0.4	0.2	0.5
44601	99	P	SUR	49	-14	720	0	0.5	-0.6	0.8
44608	99	P	SUR	47	-19	720	0	0.4	0.0	0.4
44609	99	P	SUR	47	-20	720	0	0.5	0.4	0.6
44613	99	P	SUR	24	-33	720	0	0.3	-0.2	0.3
44614	99	P	SUR	52	-16	720	0	0.7	-0.2	0.7
44620	99	P	SUR	59	-17	720	0	0.6	0.3	0.7
44623	99	P	SUR	63	-30	720	0	0.6	-0.4	0.7
44624	99	P	SUR	23	-32	665	0	0.3	-0.2	0.3
44625	99	P	SUR	66	-26	678	0	0.7	0.1	0.8
44670	99	P	SUR	50	-54	120	0	1.1	-2.3	2.6
44739	99	P	SUR	40	-45	720	0	0.6	0.1	0.6
44740	99	P	SUR	33	-59	720	0	0.3	-0.4	0.5
44744	99	P	SUR	46	-37	720	0	0.7	-0.1	0.7
44746	99	P	SUR	38	-45	720	0	0.7	0.0	0.7
44747	99	P	SUR	48	-38	680	0	0.8	-0.3	0.9
44760	99	P	SUR	57	-42	344	0	0.6	-0.5	0.8
44761	99	P	SUR	55	-24	720	0	0.5	-0.5	0.8
44762	99	P	SUR	46	-46	720	0	0.6	0.5	0.8
44763	99	P	SUR	61	-30	705	0	0.6	-0.1	0.6
44764	99	P	SUR	52	-25	720	0	0.6	-0.5	0.8

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
44765	99	P	SUR	47	-46	647	0	0.6	0.6	0.9
44766	99	P	SUR	46	-50	632	0	0.6	0.5	0.8
44768	99	P	SUR	39	-49	720	2	1.0	0.3	1.0
44769	99	P	SUR	35	-61	720	0	0.5	0.0	0.5
44770	99	P	SUR	56	-17	160	3	1.9	-0.9	2.1
44774	99	P	SUR	37	-49	719	0	0.5	-0.2	0.5
44775	99	P	SUR	37	-70	720	0	0.5	0.2	0.5
44776	99	P	SUR	38	-39	719	0	0.5	0.4	0.7
44778	99	P	SUR	36	-44	719	0	0.5	0.0	0.5
44835	99	P	SUR	37	-24	718	0	0.3	-0.2	0.4
44836	99	P	SUR	61	-19	718	0	0.5	0.0	0.5
44837	99	P	SUR	26	-26	718	0	0.3	-0.1	0.3
44839	99	P	SUR	34	-18	718	0	0.3	0.1	0.3
44846	99	P	SUR	37	-25	718	0	0.4	0.6	0.7
44847	99	P	SUR	41	-10	469	0	0.3	0.4	0.6
44848	99	P	SUR	38	-23	718	0	0.3	0.3	0.5
44863	99	P	SUR	28	-50	720	0	0.3	-0.5	0.6
44866	99	P	SUR	64	-5	720	0	0.5	-0.1	0.5
44867	99	P	SUR	55	-27	720	0	0.5	-0.3	0.6
44868	99	P	SUR	28	-46	720	0	0.5	-0.1	0.5
44869	99	P	SUR	41	-43	720	0	1.1	0.8	1.3
44871	99	P	SUR	46	-13	720	0	0.4	0.0	0.4
44872	99	P	SUR	63	-16	360	60	2.8	-1.2	3.1
44873	99	P	SUR	44	-40	720	0	0.9	0.2	0.9
44874	99	P	SUR	45	-37	720	0	0.8	0.1	0.8
44875	99	P	SUR	38	-39	568	0	1.8	-0.4	1.8
44877	99	P	SUR	28	-18	231	0	0.3	-0.1	0.3
44878	99	P	SUR	39	-11	718	0	0.3	0.2	0.4
44880	99	P	SUR	46	-26	655	3	0.6	-0.3	0.7
44885	99	P	SUR	34	-23	718	0	0.3	0.0	0.3
44887	99	P	SUR	37	-49	718	0	0.5	-0.4	0.7
44888	99	P	SUR	40	-13	718	0	0.3	0.0	0.3
44889	99	P	SUR	32	-54	718	0	0.4	-0.1	0.4
44890	99	P	SUR	31	-68	718	0	0.4	-0.1	0.4
44891	99	P	SUR	28	-50	718	0	0.3	-0.3	0.4
44892	99	P	SUR	51	-11	271	0	0.4	-0.1	0.4
44896	99	P	SUR	31	-50	542	0	0.3	-0.5	0.6
45138	99	P	SUR	50	-66	230	0	0.8	-0.2	0.8
47503	99	P	SUR	61	-30	600	488	0.7	13.7	13.7
47509	99	P	SUR	86	-40	699	0	0.6	0.3	0.6
47539	99	P	SUR	55	-54	578	0	0.7	0.6	1.0
47540	99	P	SUR	54	-54	580	0	0.5	0.5	0.7
47546	99	P	SUR	56	-57	570	0	0.6	0.4	0.8

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
47549	99	P	SUR	55	-59	581	0	0.9	0.4	0.9
47551	99	P	SUR	66	-60	718	0	0.5	-1.4	1.4
47552	99	P	SUR	67	-63	689	0	0.5	-1.9	2.0
47562	99	P	SUR	56	-58	579	0	0.5	0.5	0.7
47567	99	P	SUR	55	-56	571	0	0.5	-0.1	0.5
47568	99	P	SUR	55	-57	578	0	0.6	1.0	1.1
47569	99	P	SUR	55	-57	571	0	0.6	1.1	1.2
47584	99	P	SUR	55	-57	567	0	0.7	0.5	0.8
47586	99	P	SUR	52	-18	625	0	0.6	-0.1	0.7
47589	99	P	SUR	67	-63	708	0	0.6	-2.2	2.3
47590	99	P	SUR	66	-60	634	10	4.9	-1.5	5.2
48520	99	P	SUR	89	-51	599	0	0.5	0.3	0.6
48568	99	P	SUR	56	-35	707	0	0.6	-0.4	0.7
48597	99	P	SUR	78	-11	537	0	0.7	0.4	0.8
61001	99	P	SUR	43	8	709	1	0.5	0.4	0.7
61002	99	P	SUR	42	5	108	0	0.4	-0.1	0.4
62001	99	P	SUR	45	-5	905	0	0.4	0.1	0.4
62027	99	P	SUR	49	-2	231	0	0.5	0.0	0.5
62029	99	P	SUR	49	-12	1177	0	0.5	-0.1	0.5
62030	99	P	SUR	50	-4	1160	0	0.5	0.1	0.5
62081	99	P	SUR	51	-13	724	0	0.5	-0.3	0.6
62082	99	P	SUR	55	6	4	0	0.2	-0.4	0.4
62086	99	P	SUR	55	6	672	0	0.4	-0.2	0.4
62087	99	P	SUR	55	7	717	0	0.5	-0.4	0.6
62091	99	P	SUR	53	-5	720	1	0.6	-0.2	0.6
62092	99	P	SUR	51	-11	720	1	0.5	-0.1	0.6
62093	99	P	SUR	55	-10	719	2	0.8	0.0	0.8
62094	99	P	SUR	52	-7	720	0	0.6	-0.4	0.8
62095	99	P	SUR	53	-16	840	0	0.6	-0.2	0.7
62102	99	P	SUR	58	2	724	0	0.5	-0.1	0.5
62103	99	P	SUR	50	-3	724	0	0.5	0.4	0.6
62104	99	P	SUR	57	1	724	0	0.4	-0.1	0.4
62105	99	P	SUR	55	-13	681	0	0.6	-0.2	0.7
62107	99	P	SUR	50	-6	1153	1	0.7	0.2	0.7
62111	99	P	SUR	58	0	724	0	0.4	1.5	1.6
62112	99	P	SUR	58	0	720	0	0.4	0.0	0.4
62113	99	P	SUR	58	0	722	0	0.6	0.5	0.8
62114	99	P	SUR	58	0	1176	0	0.6	-0.1	0.6
62115	99	P	SUR	58	-3	705	0	0.6	-0.2	0.7
62116	99	P	SUR	58	1	723	0	0.6	-0.2	0.6
62117	99	P	SUR	58	0	719	0	0.4	0.1	0.4
62118	99	P	SUR	58	1	724	0	0.4	0.6	0.7
62119	99	P	SUR	57	2	724	0	0.6	0.5	0.8

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62120	99	P	SUR	56	2	701	0	0.6	0.0	0.6
62121	99	P	SUR	54	3	699	0	0.6	0.6	0.8
62122	99	P	SUR	57	2	1180	0	0.5	0.3	0.6
62123	99	P	SUR	56	2	1180	0	0.5	-0.1	0.5
62124	99	P	SUR	54	-4	691	0	0.5	-0.3	0.6
62127	99	P	SUR	54	1	724	0	0.5	0.3	0.5
62128	99	P	SUR	59	1	724	0	0.5	0.0	0.5
62129	99	P	SUR	58	0	722	0	0.6	0.3	0.7
62130	99	P	SUR	59	1	175	0	0.5	-0.5	0.7
62131	99	P	SUR	54	1	617	0	0.4	0.2	0.5
62132	99	P	SUR	56	2	724	0	0.6	0.5	0.8
62133	99	P	SUR	57	1	724	0	0.6	-0.1	0.6
62134	99	P	SUR	58	1	496	0	0.4	0.3	0.5
62135	99	P	SUR	54	2	724	0	0.6	0.1	0.6
62136	99	P	SUR	54	3	722	0	0.4	0.4	0.6
62137	99	P	SUR	57	2	666	1	0.9	0.0	0.9
62138	99	P	SUR	54	0	1176	0	0.7	1.2	1.3
62139	99	P	SUR	53	2	1180	0	0.4	0.2	0.4
62140	99	P	SUR	57	1	1177	0	0.5	-0.1	0.5
62143	99	P	SUR	58	2	724	0	0.6	0.7	0.9
62144	99	P	SUR	53	2	724	0	0.5	0.4	0.7
62145	99	P	SUR	53	3	1180	0	0.5	0.3	0.6
62146	99	P	SUR	57	2	719	0	0.7	0.7	1.0
62148	99	P	SUR	54	2	724	0	0.5	1.3	1.3
62149	99	P	SUR	54	1	724	0	0.4	0.6	0.7
62150	99	P	SUR	54	1	702	0	0.4	1.1	1.2
62152	99	P	SUR	57	2	715	0	0.5	0.8	0.9
62153	99	P	SUR	57	2	1180	0	0.5	0.1	0.5
62154	99	P	SUR	56	2	724	0	0.4	0.0	0.4
62155	99	P	SUR	58	1	709	0	0.5	0.5	0.7
62157	99	P	SUR	58	0	722	0	0.5	-0.1	0.5
62159	99	P	SUR	58	-4	719	0	0.5	-2.5	2.5
62160	99	P	SUR	57	2	1180	0	0.5	-0.2	0.6
62161	99	P	SUR	58	1	86	0	0.6	0.2	0.7
62162	99	P	SUR	57	1	724	0	0.5	-0.2	0.5
62163	99	P	SUR	48	-8	723	0	0.4	0.0	0.4
62164	99	P	SUR	57	1	723	0	0.4	0.1	0.5
62165	99	P	SUR	54	1	724	0	0.5	0.3	0.6
62167	99	P	SUR	53	2	1180	0	0.4	0.0	0.4
62168	99	P	SUR	58	1	724	0	0.4	0.1	0.4
62170	99	P	SUR	51	2	602	1	1.0	-1.0	1.4
62198	99	P	SUR	52	2	758	0	0.4	0.3	0.5
62297	99	P	SUR	59	2	1178	0	0.5	0.0	0.5

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62298	99	P	SUR	49	-9	724	0	0.5	0.2	0.6
62301	99	P	SUR	52	-5	719	0	0.5	0.0	0.5
62304	99	P	SUR	51	2	822	2	0.5	0.2	0.5
62305	99	P	SUR	50	0	827	3	0.6	0.3	0.7
62513	99	P	SUR	63	-36	720	0	0.6	0.0	0.6
62516	99	P	SUR	23	-44	720	0	0.3	0.3	0.4
62536	99	P	SUR	68	15	537	0	0.7	0.1	0.7
62539	99	P	SUR	59	-15	720	0	0.6	-0.2	0.6
62552	99	P	SUR	49	-9	719	0	0.5	0.1	0.5
62553	99	P	SUR	58	-42	720	0	0.6	-0.1	0.6
62554	99	P	SUR	46	-22	588	0	0.8	0.6	1.0
62555	99	P	SUR	48	-21	720	0	0.6	0.4	0.7
62556	99	P	SUR	39	-36	659	0	0.6	0.8	1.0
62557	99	P	SUR	48	-34	678	0	0.6	-0.2	0.6
62681	99	P	SUR	25	-32	720	0	1.3	-0.2	1.3
62695	99	P	SUR	27	-46	720	0	0.4	0.1	0.4
62713	99	P	SUR	31	-58	696	0	0.3	-0.4	0.5
62714	99	P	SUR	34	-54	718	0	0.4	-0.3	0.5
62940	99	P	SUR	39	-32	718	0	0.5	-0.1	0.5
62941	99	P	SUR	34	-21	718	0	0.3	-0.1	0.3
63055	99	P	SUR	61	2	724	0	0.6	0.3	0.7
63056	99	P	SUR	60	2	724	0	0.6	0.2	0.7
63057	99	P	SUR	59	2	724	0	0.4	-0.3	0.5
63058	99	P	SUR	53	2	1901	0	0.4	0.2	0.4
63059	99	P	SUR	58	-1	724	0	0.4	0.3	0.5
63101	99	P	SUR	61	1	724	0	0.6	0.0	0.6
63102	99	P	SUR	61	1	699	0	0.7	0.5	0.9
63103	99	P	SUR	61	1	724	0	0.6	0.4	0.7
63104	99	P	SUR	61	2	722	0	0.5	-0.1	0.5
63105	99	P	SUR	61	2	724	0	0.5	-0.1	0.5
63107	99	P	SUR	61	2	724	0	0.4	-0.3	0.5
63108	99	P	SUR	61	2	724	0	0.7	0.2	0.7
63109	99	P	SUR	60	2	724	0	0.4	-0.2	0.5
63110	99	P	SUR	60	2	724	0	0.5	-0.4	0.7
63111	99	P	SUR	61	2	1172	0	0.5	-0.4	0.6
63112	99	P	SUR	61	1	724	0	0.5	-0.4	0.7
63114	99	P	SUR	61	2	1148	0	0.4	-0.4	0.6
63115	99	P	SUR	62	1	724	0	0.5	-0.1	0.5
63116	99	P	SUR	59	2	709	0	0.5	0.0	0.5
63117	99	P	SUR	61	1	1180	0	0.6	0.4	0.7
63118	99	P	SUR	52	4	1113	0	0.4	-0.2	0.4
63119	99	P	SUR	58	0	89	0	0.8	-0.4	0.9
63120	99	P	SUR	54	2	722	0	0.6	0.6	0.8

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
63546	99	P	SUR	64	-22	708	71	3.4	-1.2	3.6
63560	99	P	SUR	74	-5	672	0	0.8	-0.2	0.8
63561	99	P	SUR	72	-6	669	0	0.6	0.2	0.6
63645	99	P	SUR	75	20	688	0	0.5	-0.2	0.5
63923	99	P	SUR	85	-5	715	0	0.6	0.0	0.6
64041	99	P	SUR	61	-3	724	0	0.5	0.0	0.5
64045	99	P	SUR	59	-12	1146	0	0.5	0.0	0.5
64046	99	P	SUR	61	-4	724	0	0.5	0.0	0.5
64049	99	P	SUR	56	-3	724	0	0.6	-2.4	2.5
64519	99	P	SUR	71	11	720	0	0.5	0.0	0.5
64521	99	P	SUR	74	10	720	0	0.5	-0.1	0.5
64522	99	P	SUR	72	13	715	0	0.5	-0.2	0.5
64523	99	P	SUR	69	0	568	0	2.0	0.3	2.0
64524	99	P	SUR	67	13	720	0	0.6	-1.0	1.1
64525	99	P	SUR	71	-12	648	0	2.6	-0.4	2.7
64526	99	P	SUR	61	-50	719	0	0.5	0.1	0.5
64527	99	P	SUR	63	-52	352	0	0.4	0.6	0.8
64528	99	P	SUR	63	1	718	0	0.5	0.3	0.6
64529	99	P	SUR	55	-23	720	0	1.6	-0.5	1.6
64530	99	P	SUR	69	-1	718	0	0.4	0.3	0.5
64532	99	P	SUR	54	-40	533	79	0.0	-14.3	14.3
64534	99	P	SUR	60	-22	164	164	0.0	0.0	0.0
64537	99	P	SUR	84	-7	237	0	0.7	-0.5	0.8
64538	99	P	SUR	85	-16	614	125	3.7	-1.1	3.9
64547	99	P	SUR	65	0	718	0	0.6	0.3	0.6
64549	99	P	SUR	63	-21	720	0	0.5	-0.4	0.7
64550	99	P	SUR	59	-31	568	5	1.9	-0.2	1.9
64551	99	P	SUR	58	-44	717	0	0.7	0.7	1.0
64552	99	P	SUR	63	-17	208	17	3.8	-1.7	4.2
64553	99	P	SUR	62	-4	720	0	0.5	-0.1	0.5
64554	99	P	SUR	62	-19	720	0	0.5	0.2	0.5
64555	99	P	SUR	61	-12	176	0	0.6	0.3	0.6
64560	99	P	SUR	62	-15	176	0	0.5	0.3	0.6
64606	99	P	SUR	69	6	654	0	0.5	0.3	0.5
64615	99	P	SUR	70	-18	114	0	4.5	-1.5	4.7
64621	99	P	SUR	64	-25	720	0	0.6	-0.1	0.6
64622	99	P	SUR	71	16	720	0	0.4	0.0	0.4
64623	99	P	SUR	72	-6	720	0	1.4	-0.4	1.5
64666	99	P	SUR	77	13	720	0	2.0	-0.2	2.0
64667	99	P	SUR	61	-1	674	0	0.5	-0.6	0.8
64668	99	P	SUR	72	-14	432	52	4.1	0.7	4.2
64692	99	P	SUR	79	1	502	37	1.8	0.3	1.8
64749	99	P	SUR	89	37	712	0	0.5	-0.3	0.6

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
65511	99	P	SUR	70	-59	208	58	4.8	4.6	6.6
65512	99	P	SUR	75	-69	403	0	3.8	0.1	3.8
65513	99	P	SUR	73	-63	314	0	0.5	0.6	0.8
65514	99	P	SUR	62	-59	720	0	0.9	0.1	0.9
65515	99	P	SUR	65	-55	344	3	1.9	0.6	2.0
65516	99	P	SUR	74	-58	720	57	1.7	-0.5	1.8
65517	99	P	SUR	68	-66	75	0	0.2	0.3	0.4
65596	99	P	SUR	55	-40	720	0	0.7	0.2	0.7
65599	99	P	SUR	55	-43	720	0	0.6	0.1	0.6
65601	99	P	SUR	62	-52	720	0	0.5	0.1	0.5
65602	99	P	SUR	58	-41	720	0	0.5	-0.3	0.6
65603	99	P	SUR	67	-55	720	0	1.5	0.1	1.5
72086	99	P	SUR	55	6	1	0	0.0	0.2	0.2

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 2015
                   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
13001	99	SPEED	SUR	12	-23	89	0	0	1.0	0.8	1.3
13002	99	SPEED	SUR	20	-23	219	0	0	1.0	0.0	1.0
13008	99	SPEED	SUR	15	-38	73	0	0	0.8	0.5	1.0
41026	99	SPEED	SUR	11	-38	65	0	0	1.1	0.5	1.2
41040	99	SPEED	SUR	15	-53	717	0	0	1.1	0.0	1.1
41041	99	SPEED	SUR	14	-46	716	0	0	0.9	0.0	0.9
41043	99	SPEED	SUR	21	-65	722	0	0	1.4	0.1	1.4
41044	99	SPEED	SUR	22	-59	722	0	0	1.1	0.1	1.1
41046	99	SPEED	SUR	24	-68	724	0	0	1.4	0.0	1.4
41048	99	SPEED	SUR	32	-70	724	0	0	1.3	-0.3	1.3
41049	99	SPEED	SUR	28	-63	722	0	0	1.5	0.3	1.5
41051	99	SPEED	SUR	18	-65	1563	0	0	1.4	-0.3	1.4
41052	99	SPEED	SUR	18	-65	936	0	0	1.1	-0.2	1.1
41053	99	SPEED	SUR	19	-66	1934	0	0	1.9	-0.7	2.1
41056	99	SPEED	SUR	18	-66	1838	0	0	1.4	-0.1	1.4
41139	99	SPEED	SUR	20	-38	227	0	0	1.2	-0.1	1.2
41300	99	SPEED	SUR	16	-58	689	0	0	1.4	0.4	1.5
42059	99	SPEED	SUR	15	-68	726	0	0	1.2	0.0	1.2
42060	99	SPEED	SUR	16	-63	722	0	0	1.3	0.1	1.3
42085	99	SPEED	SUR	18	-67	1867	0	0	1.5	-0.1	1.5
44005	99	SPEED	SUR	43	-69	759	0	0	1.3	-0.1	1.3
44008	99	SPEED	SUR	41	-69	721	0	0	1.6	0.0	1.6
44011	99	SPEED	SUR	41	-67	722	0	0	1.7	-0.3	1.7
44018	99	SPEED	SUR	42	-70	723	0	0	1.4	0.1	1.4
44024	99	SPEED	SUR	42	-66	769	0	0	1.3	-0.1	1.3
44027	99	SPEED	SUR	44	-67	723	0	0	1.3	0.3	1.4
44032	99	SPEED	SUR	44	-69	722	0	0	1.3	0.1	1.3
44033	99	SPEED	SUR	44	-69	721	0	0	1.5	1.8	2.4
44034	99	SPEED	SUR	44	-68	722	0	0	1.4	-0.1	1.4
44037	99	SPEED	SUR	44	-68	506	0	0	1.3	0.1	1.3
44137	99	SPEED	SUR	42	-62	717	0	0	1.3	0.8	1.6
44139	99	SPEED	SUR	44	-57	705	0	0	1.2	-0.1	1.2
44141	99	SPEED	SUR	43	-58	703	0	0	4.9	-6.8	8.4
44150	99	SPEED	SUR	43	-64	660	0	0	1.5	0.1	1.5

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
44251	99	SPEED	SUR	46	-53	706	0	0	1.3	-0.2	1.3
44255	99	SPEED	SUR	47	-57	842	0	0	1.4	0.5	1.5
44258	99	SPEED	SUR	45	-63	101	0	0	1.2	-0.2	1.2
45138	99	SPEED	SUR	50	-66	233	0	0	1.3	0.1	1.3
61001	99	SPEED	SUR	43	8	709	0	0	1.8	0.0	1.8
61002	99	SPEED	SUR	42	5	106	2	0	1.8	-0.9	2.0
62001	99	SPEED	SUR	45	-5	905	0	0	1.2	-0.2	1.2
62027	99	SPEED	SUR	49	-2	210	0	0	1.3	0.2	1.3
62029	99	SPEED	SUR	49	-12	1177	0	0	1.1	0.2	1.1
62081	99	SPEED	SUR	51	-13	724	0	0	1.2	0.3	1.2
62082	99	SPEED	SUR	55	6	3	0	0	2.3	2.6	3.5
62086	99	SPEED	SUR	55	6	676	0	0	1.5	1.0	1.8
62087	99	SPEED	SUR	55	7	718	1	0	2.1	0.7	2.2
62091	99	SPEED	SUR	53	-5	720	0	0	1.4	0.1	1.4
62092	99	SPEED	SUR	51	-11	720	0	0	1.4	-0.8	1.6
62093	99	SPEED	SUR	55	-10	719	0	0	1.5	-0.7	1.6
62094	99	SPEED	SUR	52	-7	720	0	0	1.4	-0.4	1.4
62095	99	SPEED	SUR	53	-16	738	1	0	1.4	0.3	1.5
62102	99	SPEED	SUR	58	2	724	0	0	1.5	-0.7	1.7
62103	99	SPEED	SUR	50	-3	724	0	0	1.8	1.0	2.1
62104	99	SPEED	SUR	57	1	724	0	0	1.4	-0.6	1.5
62105	99	SPEED	SUR	55	-13	625	0	0	1.8	0.2	1.9
62107	99	SPEED	SUR	50	-6	1152	0	0	1.7	0.6	1.8
62111	99	SPEED	SUR	58	0	724	0	0	1.7	0.3	1.7
62112	99	SPEED	SUR	58	0	720	0	0	2.2	-1.6	2.7
62113	99	SPEED	SUR	58	0	722	0	0	1.7	0.0	1.7
62114	99	SPEED	SUR	58	0	1176	0	0	1.6	0.5	1.7
62117	99	SPEED	SUR	58	0	719	0	0	1.4	-0.2	1.4
62118	99	SPEED	SUR	58	1	724	0	0	1.9	0.1	1.9
62119	99	SPEED	SUR	57	2	724	0	0	1.6	-1.1	1.9
62120	99	SPEED	SUR	56	2	711	0	0	1.6	0.1	1.6
62121	99	SPEED	SUR	54	3	699	0	0	1.4	-0.2	1.4
62122	99	SPEED	SUR	57	2	1180	0	0	1.4	-0.4	1.5
62123	99	SPEED	SUR	56	2	1180	0	0	1.6	0.1	1.6
62128	99	SPEED	SUR	59	1	724	0	0	1.7	0.5	1.8
62129	99	SPEED	SUR	58	0	722	0	0	1.5	-0.4	1.5
62131	99	SPEED	SUR	54	1	617	0	0	1.5	-0.6	1.6
62132	99	SPEED	SUR	56	2	724	0	0	2.4	-2.0	3.1
62133	99	SPEED	SUR	57	1	724	0	0	1.5	-0.5	1.6
62134	99	SPEED	SUR	58	1	496	0	0	1.7	-0.5	1.8
62140	99	SPEED	SUR	57	1	1167	0	0	1.4	-0.1	1.4

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
62143	99	SPEED	SUR	58	2	724	0	0	2.3	-1.1	2.5
62144	99	SPEED	SUR	53	2	724	0	0	2.1	-0.4	2.1
62145	99	SPEED	SUR	53	3	1180	0	0	1.4	-0.5	1.5
62146	99	SPEED	SUR	57	2	719	0	0	3.5	-3.0	4.6
62148	99	SPEED	SUR	54	2	724	0	0	2.4	-0.5	2.5
62149	99	SPEED	SUR	54	1	724	0	0	1.4	0.4	1.4
62150	99	SPEED	SUR	54	1	702	0	0	2.3	-1.0	2.5
62152	99	SPEED	SUR	57	2	715	0	0	1.8	-1.9	2.6
62153	99	SPEED	SUR	57	2	1180	0	0	2.1	-2.2	3.0
62154	99	SPEED	SUR	56	2	724	0	0	1.6	-0.6	1.7
62155	99	SPEED	SUR	58	1	709	0	0	1.6	0.3	1.6
62163	99	SPEED	SUR	48	-8	723	0	0	1.1	0.3	1.1
62164	99	SPEED	SUR	57	1	723	0	0	1.8	-2.0	2.7
62165	99	SPEED	SUR	54	1	724	0	0	2.1	-1.5	2.5
62170	99	SPEED	SUR	51	2	601	0	0	2.0	2.2	3.0
62198	99	SPEED	SUR	52	2	758	0	0	1.9	1.7	2.5
62298	99	SPEED	SUR	49	-9	724	0	0	1.2	-1.3	1.8
62301	99	SPEED	SUR	52	-5	720	0	0	1.2	-0.3	1.2
62304	99	SPEED	SUR	51	2	820	0	0	2.6	2.5	3.6
62305	99	SPEED	SUR	50	0	789	0	0	2.0	1.0	2.2
62442	99	SPEED	SUR	49	-16	723	0	0	1.3	0.0	1.3
63055	99	SPEED	SUR	61	2	724	0	0	1.7	-1.2	2.1
63056	99	SPEED	SUR	60	2	724	0	0	1.6	-0.5	1.7
63057	99	SPEED	SUR	59	2	724	0	0	2.2	-0.4	2.3
63058	99	SPEED	SUR	53	2	723	0	0	1.6	0.1	1.6
63101	99	SPEED	SUR	61	1	724	0	0	1.8	-1.5	2.3
63104	99	SPEED	SUR	61	2	722	0	0	1.6	-0.8	1.8
63105	99	SPEED	SUR	61	2	724	0	0	1.7	-0.6	1.8
63106	99	SPEED	SUR	61	2	722	0	0	1.7	-0.7	1.8
63107	99	SPEED	SUR	61	2	724	0	0	1.7	-0.5	1.8
63108	99	SPEED	SUR	61	2	724	0	0	2.1	-0.1	2.1
63109	99	SPEED	SUR	60	2	710	0	0	1.6	-0.1	1.6
63110	99	SPEED	SUR	60	2	720	0	0	1.7	-1.1	2.0
63112	99	SPEED	SUR	61	1	724	0	0	1.5	-0.9	1.7
63113	99	SPEED	SUR	61	2	724	0	0	1.7	-0.9	1.9
63114	99	SPEED	SUR	61	2	1148	0	0	1.8	-0.2	1.8
63115	99	SPEED	SUR	62	1	723	0	0	1.7	-0.9	1.9
63117	99	SPEED	SUR	61	1	595	0	0	1.5	-0.4	1.6
63119	99	SPEED	SUR	58	0	88	0	0	2.3	-0.4	2.3
64041	99	SPEED	SUR	61	-3	724	0	0	1.8	-0.6	1.9
64046	99	SPEED	SUR	61	-4	724	0	0	1.7	0.1	1.8

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
66021	99	SPEED	SUR	55	14	717	0	0	1.4	0.5	1.4
66022	99	SPEED	SUR	54	14	1103	0	0	1.3	0.2	1.3
66024	99	SPEED	SUR	55	13	633	0	0	1.4	0.5	1.5
72086	99	SPEED	SUR	55	6	1	0	0	0.0	1.9	1.9

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

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DRIFTER MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE      : ECMWF
         ELEMENT MONITORED      : WIND DIRECTION (DEGREES)
         AREA                   : 10N - 90N, 70W - 40E
         PERIOD                 : NOV 2015
         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
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WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
13001	99	DIRN	SUR	12	-23	78	0	0	12.8	1.8	13.0
13002	99	DIRN	SUR	20	-23	213	0	0	12.6	3.3	13.1
13008	99	DIRN	SUR	15	-38	73	0	0	8.1	1.6	8.3
41001	99	DIRN	SUR	35	-73	1046	0	0	14.6	5.4	15.5
41002	99	DIRN	SUR	32	-75	657	0	0	18.0	-6.0	19.0
41004	99	DIRN	SUR	33	-79	597	0	0	25.4	15.2	29.6
41008	99	DIRN	SUR	31	-81	566	0	0	19.9	7.6	21.3
41009	99	DIRN	SUR	29	-80	763	0	0	16.0	1.8	16.1
41010	99	DIRN	SUR	29	-79	216	0	0	18.0	47.7	50.9
41013	99	DIRN	SUR	33	-78	1080	0	0	27.7	13.9	31.0
41024	99	DIRN	SUR	34	-79	390	0	0	21.4	0.3	21.4
41025	99	DIRN	SUR	35	-75	627	0	0	26.4	6.2	27.1
41026	99	DIRN	SUR	11	-38	65	0	0	15.1	-3.3	15.5
41029	99	DIRN	SUR	33	-80	472	0	0	19.6	-3.6	19.9
41033	99	DIRN	SUR	32	-80	525	0	0	17.0	0.2	17.0
41037	99	DIRN	SUR	34	-77	516	0	0	23.0	-1.9	23.0
41038	99	DIRN	SUR	34	-78	562	0	0	28.3	-5.3	28.7
41040	99	DIRN	SUR	15	-53	666	0	0	13.2	1.3	13.2
41041	99	DIRN	SUR	14	-46	716	0	0	8.8	4.1	9.7
41043	99	DIRN	SUR	21	-65	669	0	0	17.3	6.3	18.4
41044	99	DIRN	SUR	22	-59	702	0	0	12.8	-1.3	12.9
41046	99	DIRN	SUR	24	-68	641	0	0	16.8	1.1	16.8
41047	99	DIRN	SUR	28	-72	632	0	0	11.5	2.9	11.9
41048	99	DIRN	SUR	32	-70	632	0	0	12.9	10.0	16.3
41049	99	DIRN	SUR	28	-63	598	0	0	21.3	12.3	24.6
41051	99	DIRN	SUR	18	-65	1483	0	0	19.6	-9.4	21.8
41052	99	DIRN	SUR	18	-65	908	0	0	17.1	3.2	17.4
41053	99	DIRN	SUR	19	-66	1210	0	0	23.4	-6.9	24.4
41056	99	DIRN	SUR	18	-66	1687	0	0	18.7	1.3	18.8
41139	99	DIRN	SUR	20	-38	218	0	0	11.0	9.6	14.6
41300	99	DIRN	SUR	16	-58	659	0	0	14.7	-1.7	14.8
42013	99	DIRN	SUR	27	-83	975	0	0	17.2	-8.1	19.0

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
42022	99	DIRN	SUR	28	-84	951	0	0	15.3	-4.9	16.0
42023	99	DIRN	SUR	26	-83	978	0	0	11.2	-3.6	11.8
42036	99	DIRN	SUR	29	-85	621	0	0	17.0	-2.5	17.2
42056	99	DIRN	SUR	20	-85	659	0	0	15.5	0.0	15.5
42057	99	DIRN	SUR	17	-82	701	0	0	21.0	-0.7	21.0
42058	99	DIRN	SUR	15	-75	721	0	0	13.8	6.4	15.2
42059	99	DIRN	SUR	15	-68	723	0	0	19.7	-2.2	19.8
42060	99	DIRN	SUR	16	-63	705	0	0	10.8	0.3	10.8
42085	99	DIRN	SUR	18	-67	1656	0	0	19.9	9.8	22.2
44005	99	DIRN	SUR	43	-69	642	0	0	11.8	9.8	15.3
44007	99	DIRN	SUR	44	-70	565	0	0	19.4	5.8	20.2
44008	99	DIRN	SUR	41	-69	587	0	0	16.7	11.1	20.1
44009	99	DIRN	SUR	39	-75	547	0	0	16.9	16.0	23.3
44011	99	DIRN	SUR	41	-67	584	0	0	26.5	2.9	26.6
44013	99	DIRN	SUR	42	-71	613	0	0	13.5	0.1	13.5
44014	99	DIRN	SUR	37	-75	605	0	0	17.3	4.5	17.9
44017	99	DIRN	SUR	41	-72	646	0	0	13.3	1.7	13.4
44018	99	DIRN	SUR	42	-70	632	0	0	16.3	12.7	20.7
44020	99	DIRN	SUR	41	-70	622	0	0	13.1	7.3	15.0
44022	99	DIRN	SUR	41	-74	223	0	0	18.4	10.4	21.1
44024	99	DIRN	SUR	42	-66	677	0	0	14.4	3.8	14.9
44025	99	DIRN	SUR	40	-73	611	0	0	13.6	4.3	14.3
44027	99	DIRN	SUR	44	-67	633	0	0	14.9	6.9	16.4
44029	99	DIRN	SUR	43	-71	946	0	0	13.7	7.8	15.8
44030	99	DIRN	SUR	43	-70	574	0	0	15.3	6.8	16.7
44032	99	DIRN	SUR	44	-69	584	0	0	14.2	5.6	15.3
44033	99	DIRN	SUR	44	-69	522	0	0	13.3	1.1	13.4
44034	99	DIRN	SUR	44	-68	614	0	0	13.8	0.8	13.8
44037	99	DIRN	SUR	44	-68	432	0	0	13.6	4.9	14.4
44039	99	DIRN	SUR	41	-73	609	0	0	15.2	3.6	15.6
44041	99	DIRN	SUR	37	-77	9	0	0	13.4	-5.7	14.6
44042	99	DIRN	SUR	38	-76	692	0	0	17.9	-10.6	20.8
44043	99	DIRN	SUR	39	-76	605	0	0	14.4	-14.4	20.3
44057	99	DIRN	SUR	40	-76	171	0	0	17.1	-14.5	22.5
44058	99	DIRN	SUR	38	-76	766	0	0	15.9	-4.9	16.6
44059	99	DIRN	SUR	37	-76	131	0	0	16.7	-30.6	34.9
44060	99	DIRN	SUR	41	-72	628	0	0	17.7	4.8	18.3
44061	99	DIRN	SUR	39	-77	2	0	0	15.0	-5.4	15.9
44062	99	DIRN	SUR	39	-76	730	0	0	15.9	-9.3	18.4
44063	99	DIRN	SUR	39	-76	656	0	0	19.5	-12.0	22.9
44065	99	DIRN	SUR	40	-74	580	0	0	13.6	7.2	15.4

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
44066	99	DIRN	SUR	40	-73	293	0	0	14.4	7.8	16.4
44069	99	DIRN	SUR	41	-73	546	0	0	20.4	-3.7	20.7
44137	99	DIRN	SUR	42	-62	698	0	0	14.4	4.4	15.1
44139	99	DIRN	SUR	44	-57	667	0	0	13.7	11.1	17.6
44141	99	DIRN	SUR	43	-58	162	0	0	13.7	10.0	16.9
44150	99	DIRN	SUR	43	-64	625	0	0	15.1	5.0	15.9
44251	99	DIRN	SUR	46	-53	674	0	0	12.5	8.4	15.0
44255	99	DIRN	SUR	47	-57	773	0	0	16.1	8.9	18.4
44258	99	DIRN	SUR	45	-63	83	0	0	13.6	-0.3	13.6
45003	99	DIRN	SUR	45	-83	612	0	0	15.6	1.7	15.7
45005	99	DIRN	SUR	42	-82	591	0	0	15.7	6.5	17.0
45008	99	DIRN	SUR	44	-82	691	0	0	15.8	7.1	17.3
45012	99	DIRN	SUR	44	-77	604	0	0	17.3	7.7	18.9
45132	99	DIRN	SUR	43	-81	56	0	0	4.9	-11.0	12.1
45135	99	DIRN	SUR	44	-77	681	0	0	18.8	-18.9	26.6
45137	99	DIRN	SUR	46	-81	461	0	0	14.0	-7.8	16.0
45138	99	DIRN	SUR	50	-66	189	0	0	18.5	3.2	18.8
45139	99	DIRN	SUR	43	-80	495	0	0	19.1	-15.9	24.8
45142	99	DIRN	SUR	43	-79	579	0	0	17.2	-22.3	28.2
45143	99	DIRN	SUR	45	-81	805	0	0	15.2	-15.4	21.6
45149	99	DIRN	SUR	44	-82	907	0	0	13.4	-7.5	15.4
45151	99	DIRN	SUR	45	-79	108	0	0	14.3	-11.0	18.0
45154	99	DIRN	SUR	46	-83	27	0	0	15.1	-17.2	22.9
45159	99	DIRN	SUR	44	-79	495	0	0	19.8	-9.8	22.1
45164	99	DIRN	SUR	42	-82	32	0	0	22.0	-0.2	22.0
62001	99	DIRN	SUR	45	-5	757	0	0	17.1	10.8	20.2
62027	99	DIRN	SUR	49	-2	200	0	0	26.2	3.3	26.4
62029	99	DIRN	SUR	49	-12	1106	0	0	11.9	5.1	12.9
62081	99	DIRN	SUR	51	-13	686	0	0	11.5	9.7	15.0
62091	99	DIRN	SUR	53	-5	650	0	0	12.2	1.3	12.3
62092	99	DIRN	SUR	51	-11	673	0	0	12.3	-0.5	12.3
62093	99	DIRN	SUR	55	-10	690	0	0	11.7	-6.1	13.2
62094	99	DIRN	SUR	52	-7	668	0	0	13.9	2.4	14.1
62095	99	DIRN	SUR	53	-16	730	1	0	13.7	6.7	15.2
62103	99	DIRN	SUR	50	-3	702	0	0	18.4	2.1	18.5
62105	99	DIRN	SUR	55	-13	602	0	0	17.5	2.1	17.6
62107	99	DIRN	SUR	50	-6	1116	0	0	14.6	-0.5	14.6
62111	99	DIRN	SUR	58	0	678	0	0	13.7	1.3	13.8
62112	99	DIRN	SUR	58	0	654	0	0	13.4	-0.2	13.4
62114	99	DIRN	SUR	58	0	1107	0	0	12.7	5.0	13.7
62117	99	DIRN	SUR	58	0	677	0	0	13.8	3.0	14.1

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
62163	99	DIRN	SUR	48	-8	706	0	0	10.9	2.8	11.2
62298	99	DIRN	SUR	49	-9	675	0	0	10.1	3.8	10.8
62301	99	DIRN	SUR	52	-5	628	0	0	13.8	-6.7	15.3
62305	99	DIRN	SUR	50	0	751	0	0	12.9	4.2	13.6
62442	99	DIRN	SUR	49	-16	674	0	0	10.4	-4.5	11.3
64041	99	DIRN	SUR	61	-3	667	0	0	10.8	15.5	18.9
64046	99	DIRN	SUR	61	-4	673	0	0	14.0	-4.6	14.8

4.12 Table 24 - List of Assimilated BUFR Encoded Radiosonde Stations

ASDE02	ASDE09	ASDK02	ASDK03	ASES01	ASEU01	ASEU02	ASEU04	DBLK
01001	01004	01010	01028	01241	01400	01415	01492	02185
02365	02527	02591	02836	02935	02963	03953	06260	08001
08023	08221	08302	08430	10035	10113	10184	10238	10304
10393	10410	10618	10739	10868	10954	10962	60018	

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

ASDE01	ASDE02	ASDE03	ASDE09	ASDE09	ASDK01	ASDK02	ASDK03	ASES01
ASEU01	ASEU02	ASEU03	ASEU04	ASEU06	DBLK	41169	48811	76526
76743	89859							

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.