ECMWF Global Data Monitoring Report

October 2016

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

Contents

Summary of Revisions (in reverse order)

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

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

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

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

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

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

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

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

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

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

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

1 Introduction

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

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

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

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

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

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

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

2 Data summary - History of events

2.1 Radiosondes

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

Ident	Time	Sep	Oct	Ident	Time	Sep	Oct
17607	(12)	49	9	02365	(00)	19	30
20674	(00)	30	6	03354	(12)	13	24
20674	(12)	27	5	03882	(12)	8	20
33041	(12)	30	0	08594	(12)	4	22
41923	(12)	27	8	14430	(00)	20	31
43369	(00)	18	0	24507	(12)	14	25
74626	(00)	21	0	32540	(00)	0	27
74626	(12)	21	0	32540	(12)	0	27
74794	(12)	56	27	33008	(00)	3	16
78793	(00)	17	0	40437	(12)	18	31
78793	(12)	17	0	40706	(12)	14	29
82244	(00)	20	0	40766	(00)	13	29
82244	(12)	22	0	40800	(00)	0	30
83208	(12)	20	0	40841	(12)	7	31
96509	(00)	29	4	40875	(00)	11	30
96509	(12)	28	5	43041	(00)	11	27
-	-	-	-	43185	(12)	0	16
-	-	-	-	54511	(00)	30	41
-	-	-	-	60760	(00)	0	11
-	-	-	-	61052	(00)	4	31
-	-	-	-	61052	(12)	5	29
-	-	-	-	61641	(00)	14	31
-	-	-	-	61641	(12)	15	31
-	-	-	-	64400	(12)	0	14
-	-	-	-	64650	(00)	14	25
-	-	-	-	64650	(12)	13	26
-	-	-	-	67083	(00)	15	29
-	-	-	-	67083	(12)	16	28
-	-	-	-	67197	(00)	0	28
-	-	-	-	67197	(12)	0	27
-	-	-	-	74004	(12)	18	41
-	-	-	-	76458	(00)	11	31
-	-	-	-	76805	(00)	0	21
-	-	-	-	78583	(12)	18	31
-	-	-	-	78807	(00)	0	15
-	-	-	-	83650	(12)	0	14
-	-	-	-	83840	(00)	0	12
-	-	-	-	83840	(12)	0	13
-	-	-	-	83971	(00)	11	27
-	-	-	-	87344	(00)	16	28
-	-	-	-	87344	(12)	16	31
-	-	-	-	89009	(12)	1	30
-	-	-	-	91843	(00)	17	28

2.2 Drifting Buoys

Surface pressure observations from **1916** drifting buoys were received during the month.

3 Global monitoring statistics

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

3.1 Data Availability

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

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

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

3.2 Data Quality

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

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

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

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

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

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

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

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

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

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

3.2.1 Figure 1 - Availability - SYNOP PRESSURE

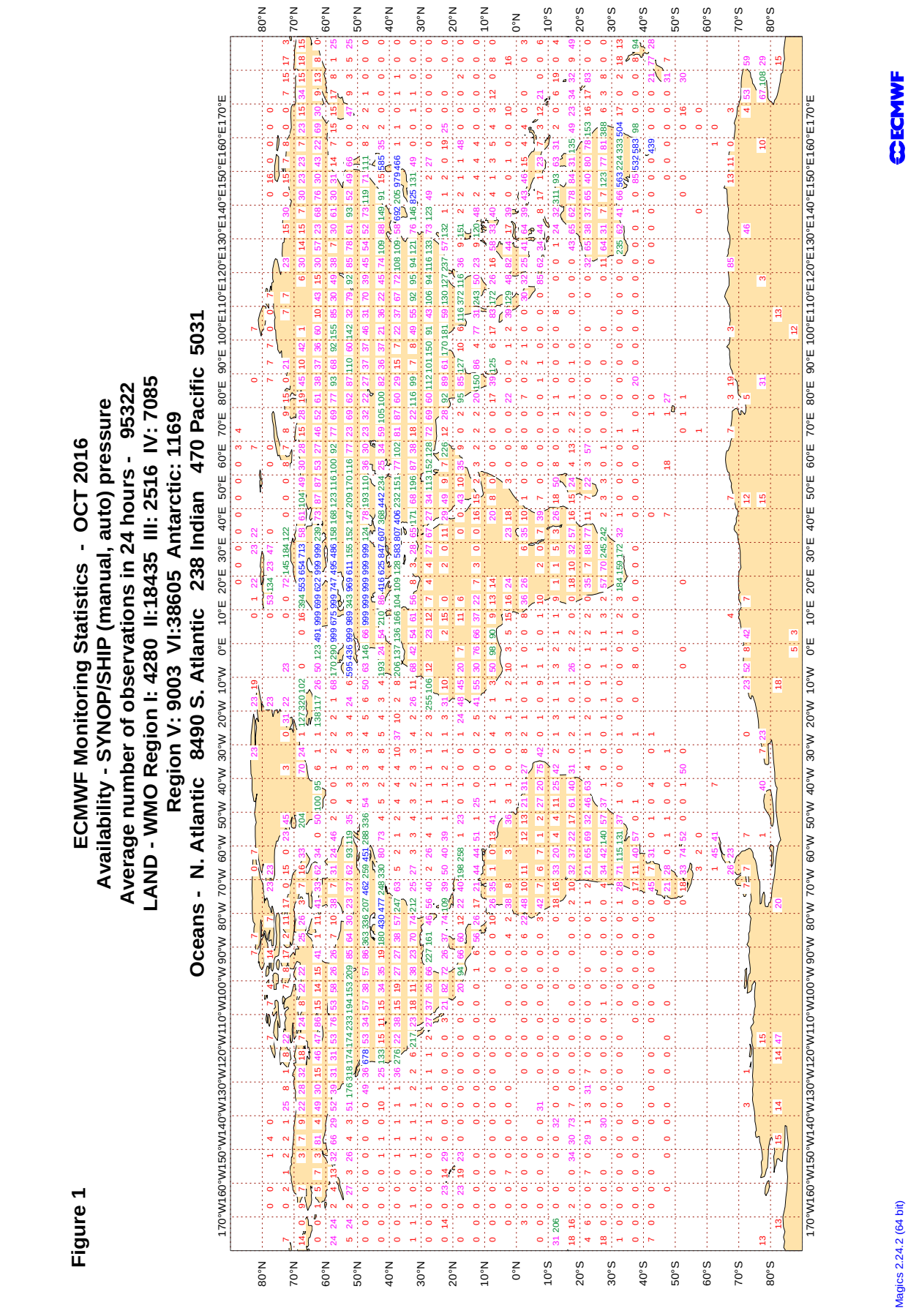


Figure 1

3.2.2 Figure 2 - Availability - DRIFTER PRESSURE

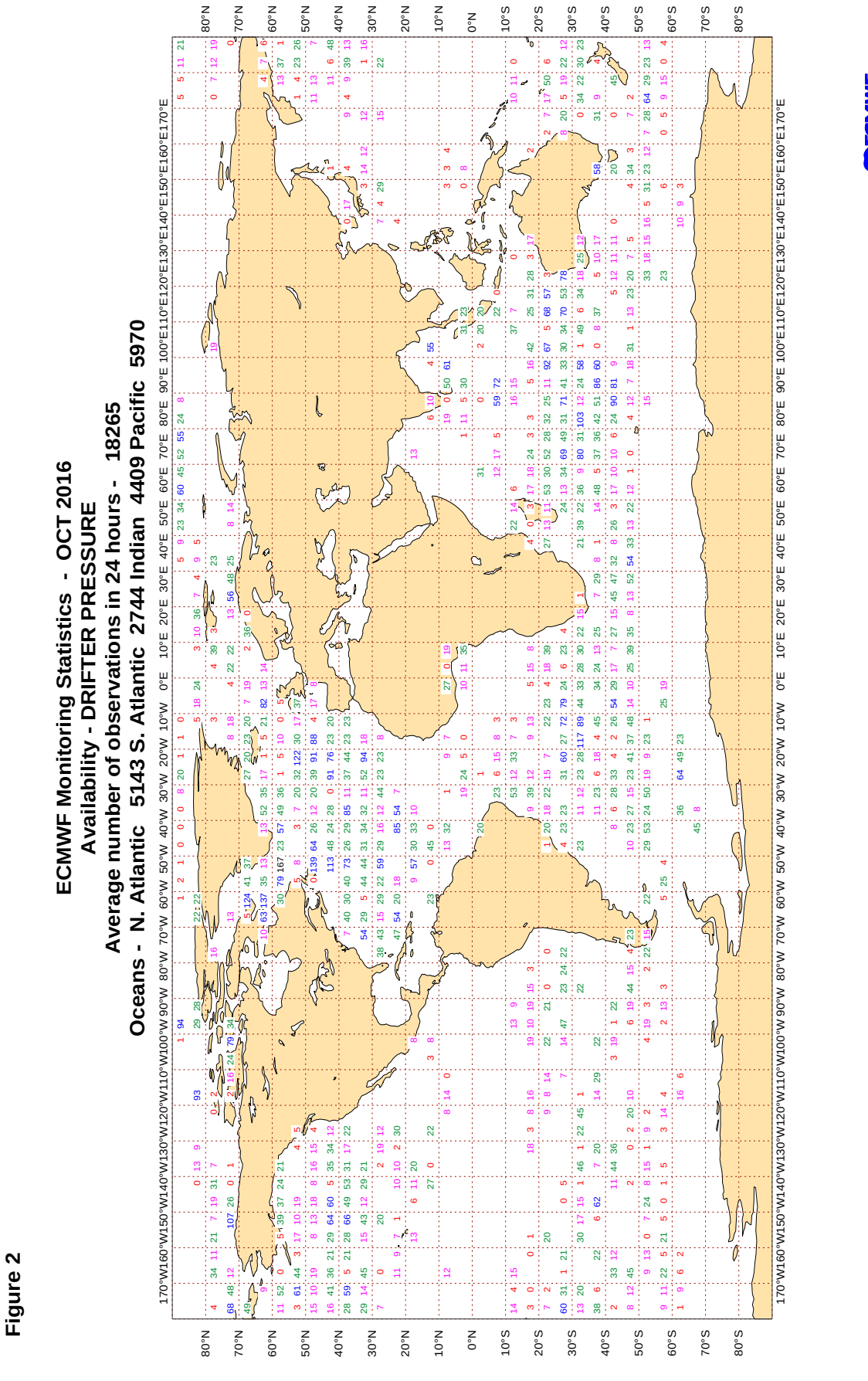


Figure 2

3.2.3 Figure 3 - Availability - TEMP 500 hPa geopotential

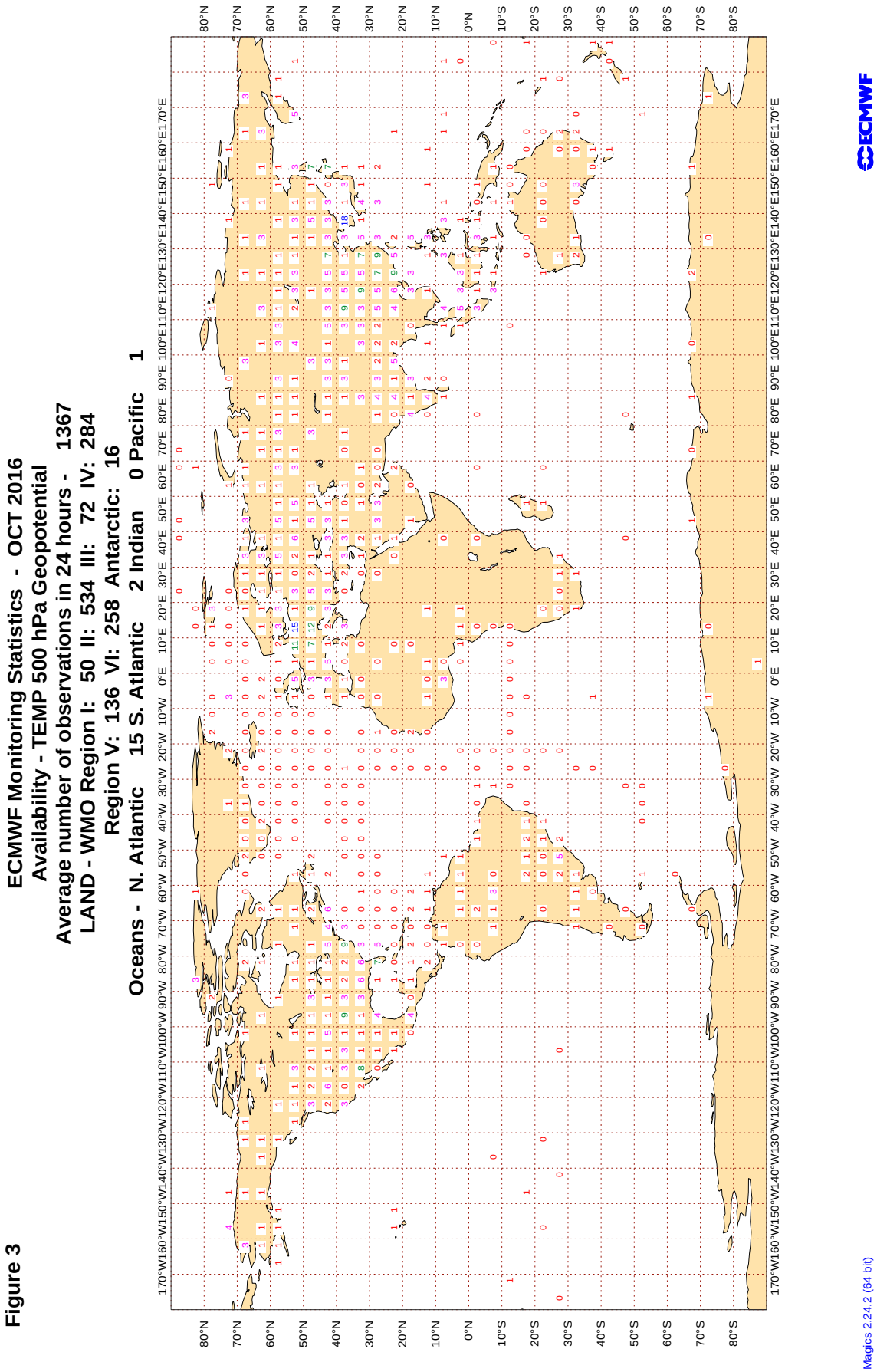


Figure 3

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

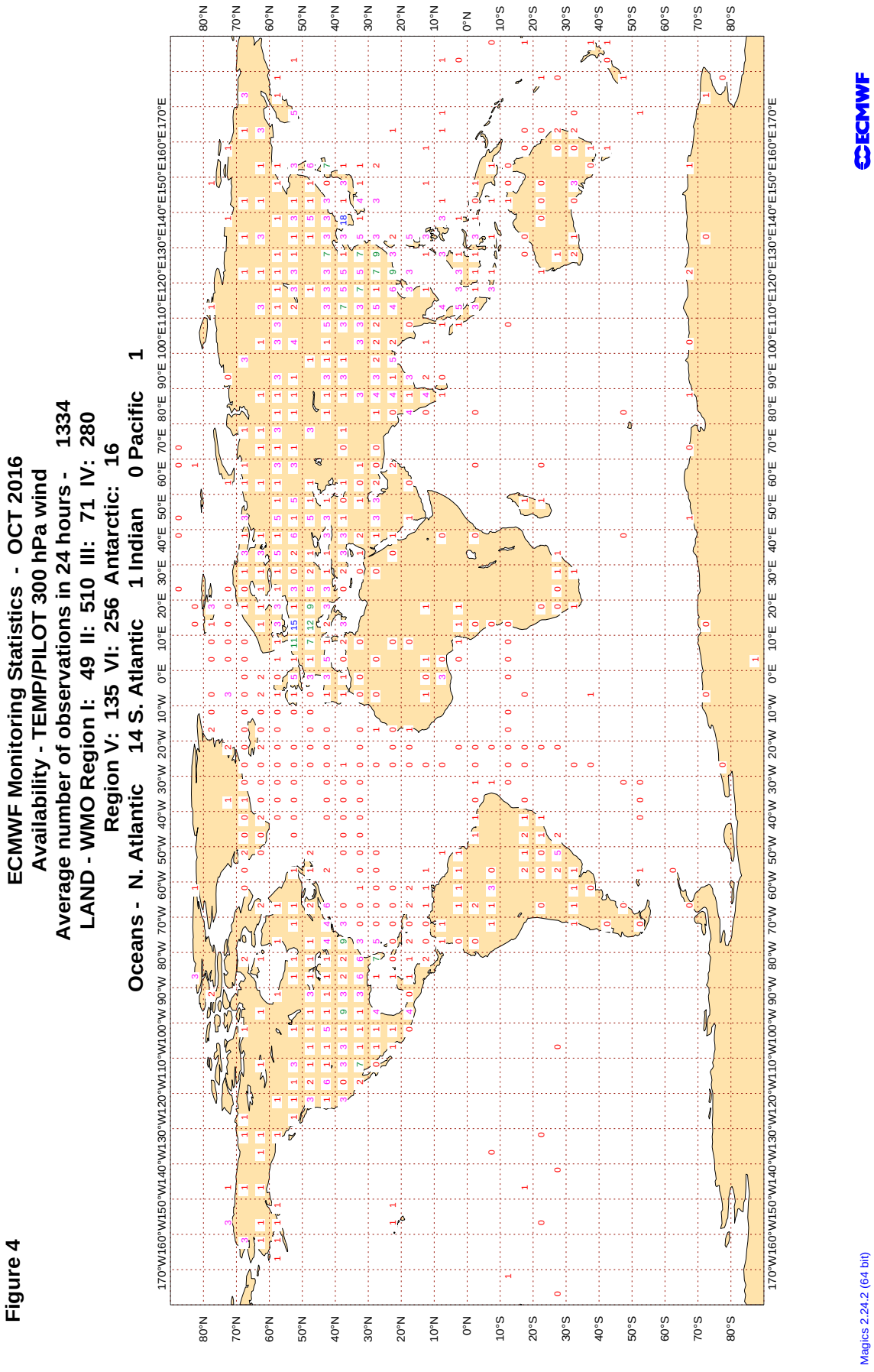


Figure 4

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

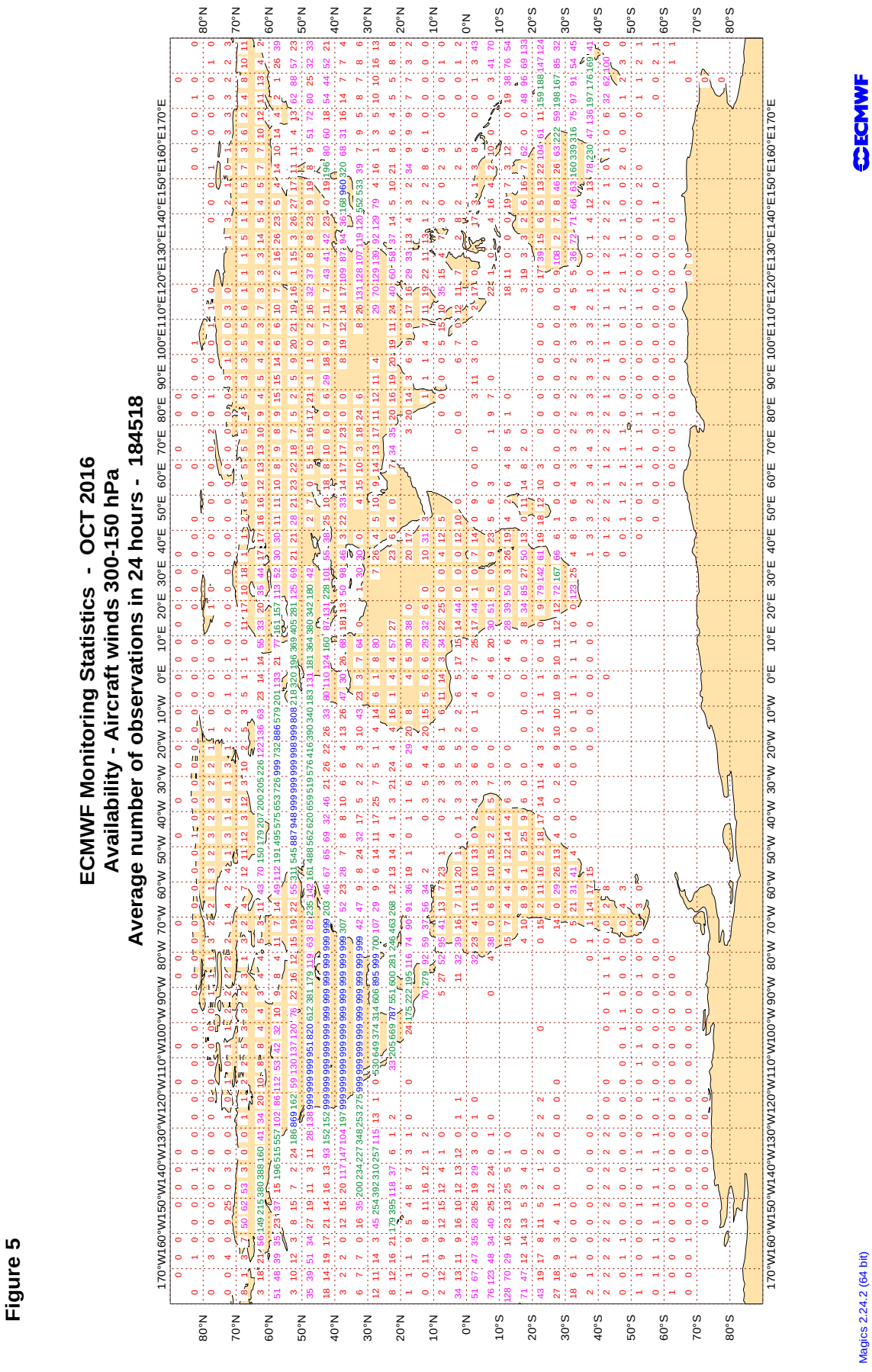


Figure 5

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

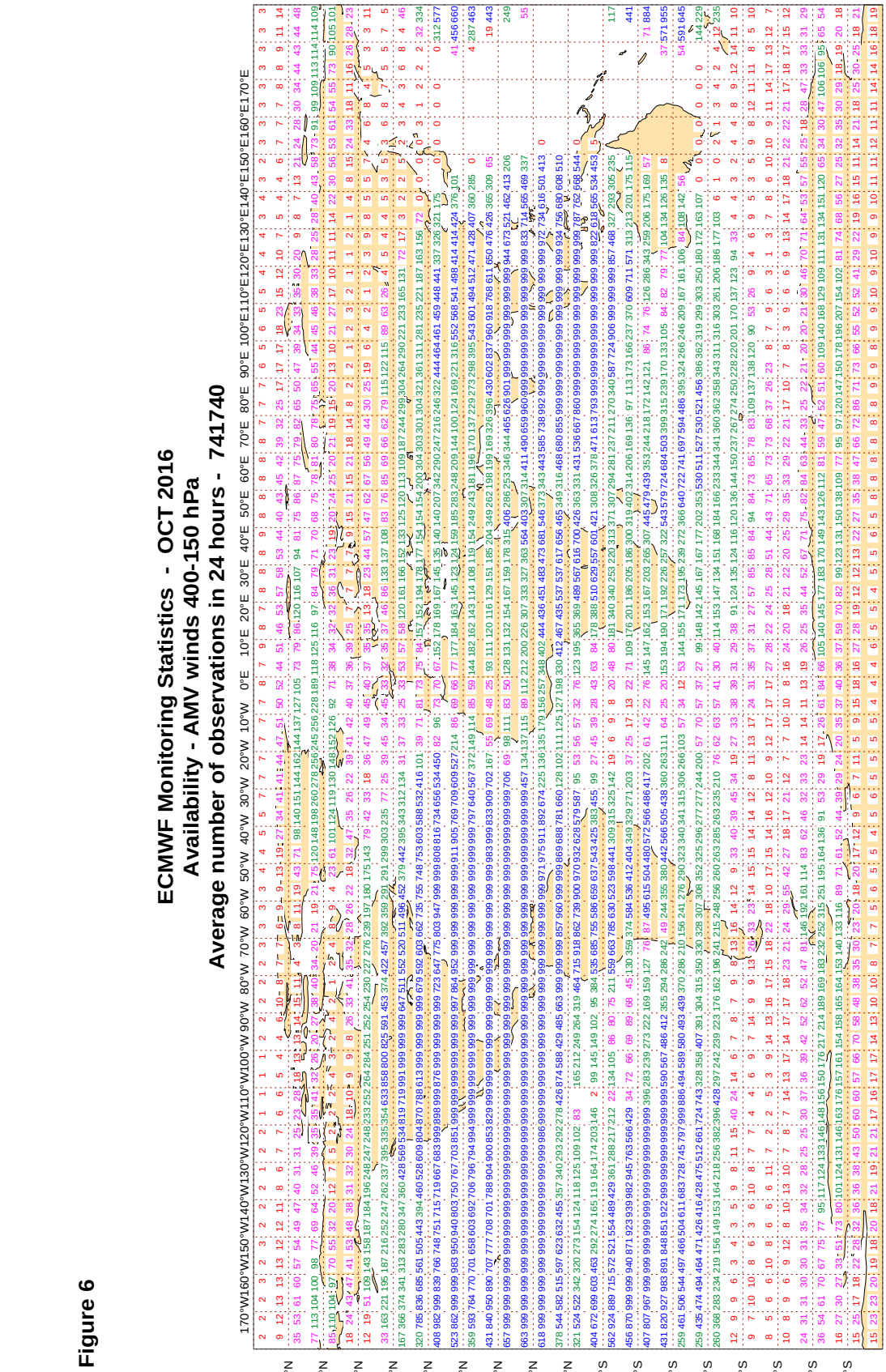
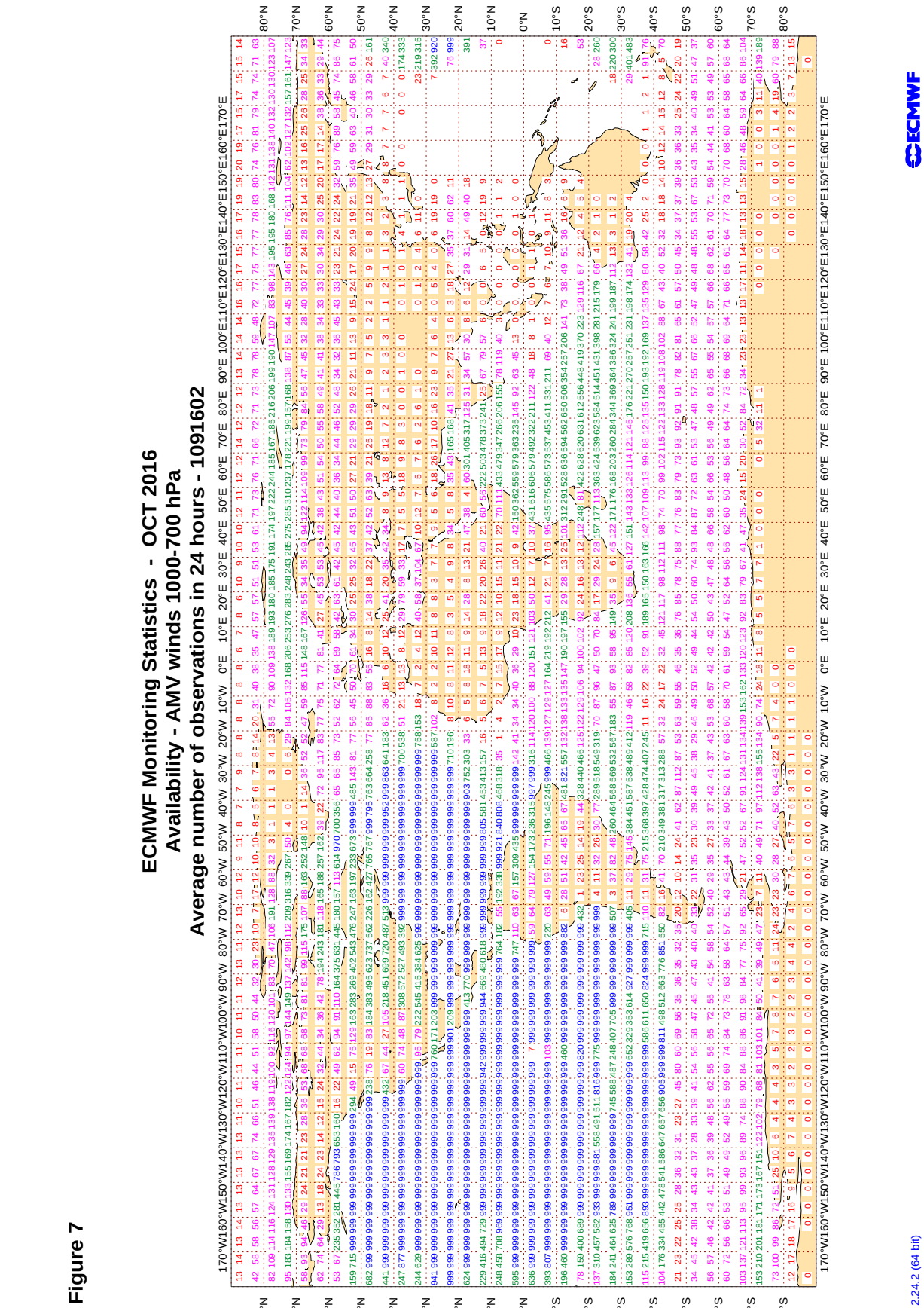


Figure 6

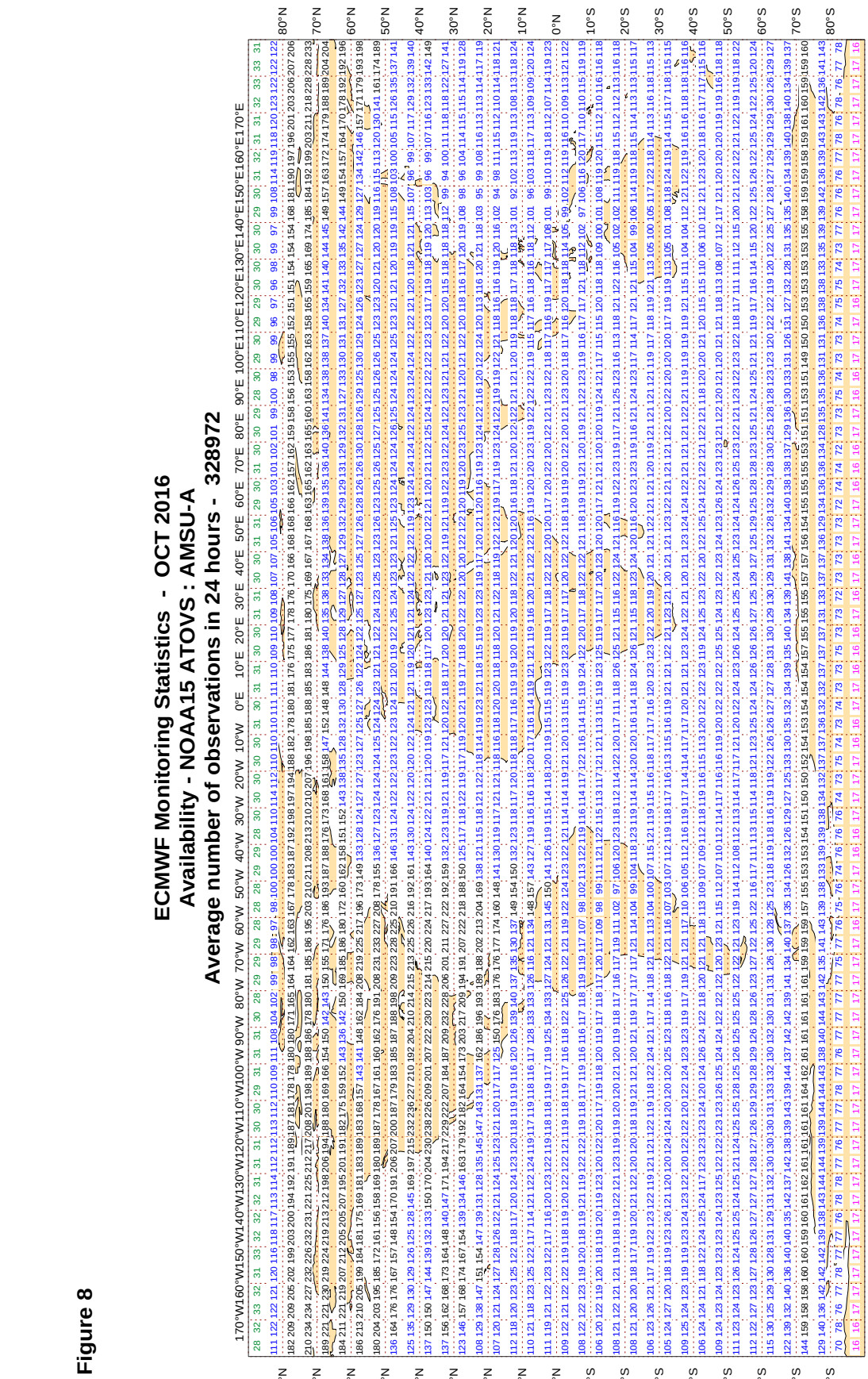
3.2.7 Figure 7 - Availability - SATOB winds 1000-700 hPa

Figure 7

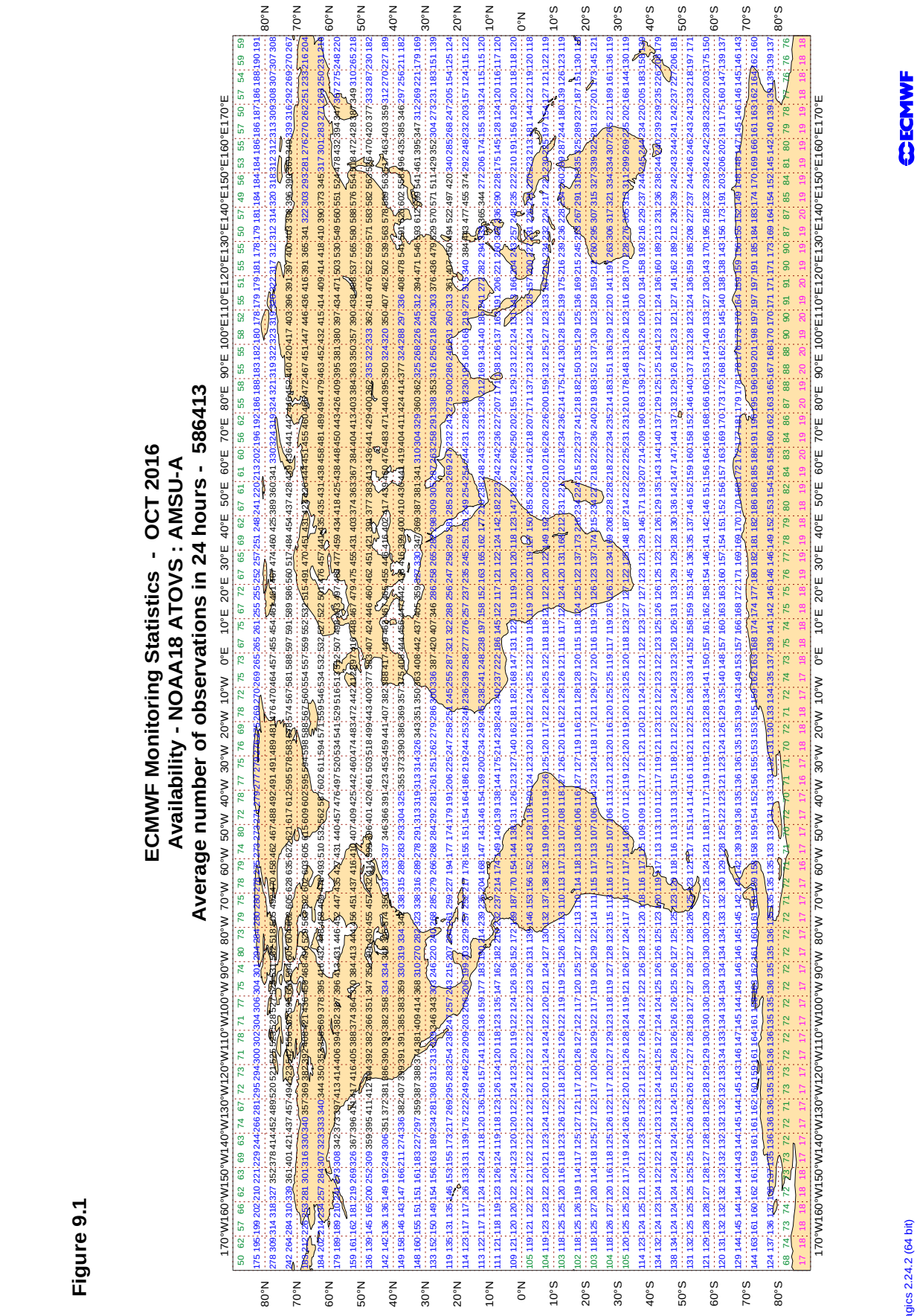


3.2.8 Figure 8 - Availability - NOAA15 ATOVS : AMSU-A

Figure 8



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



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

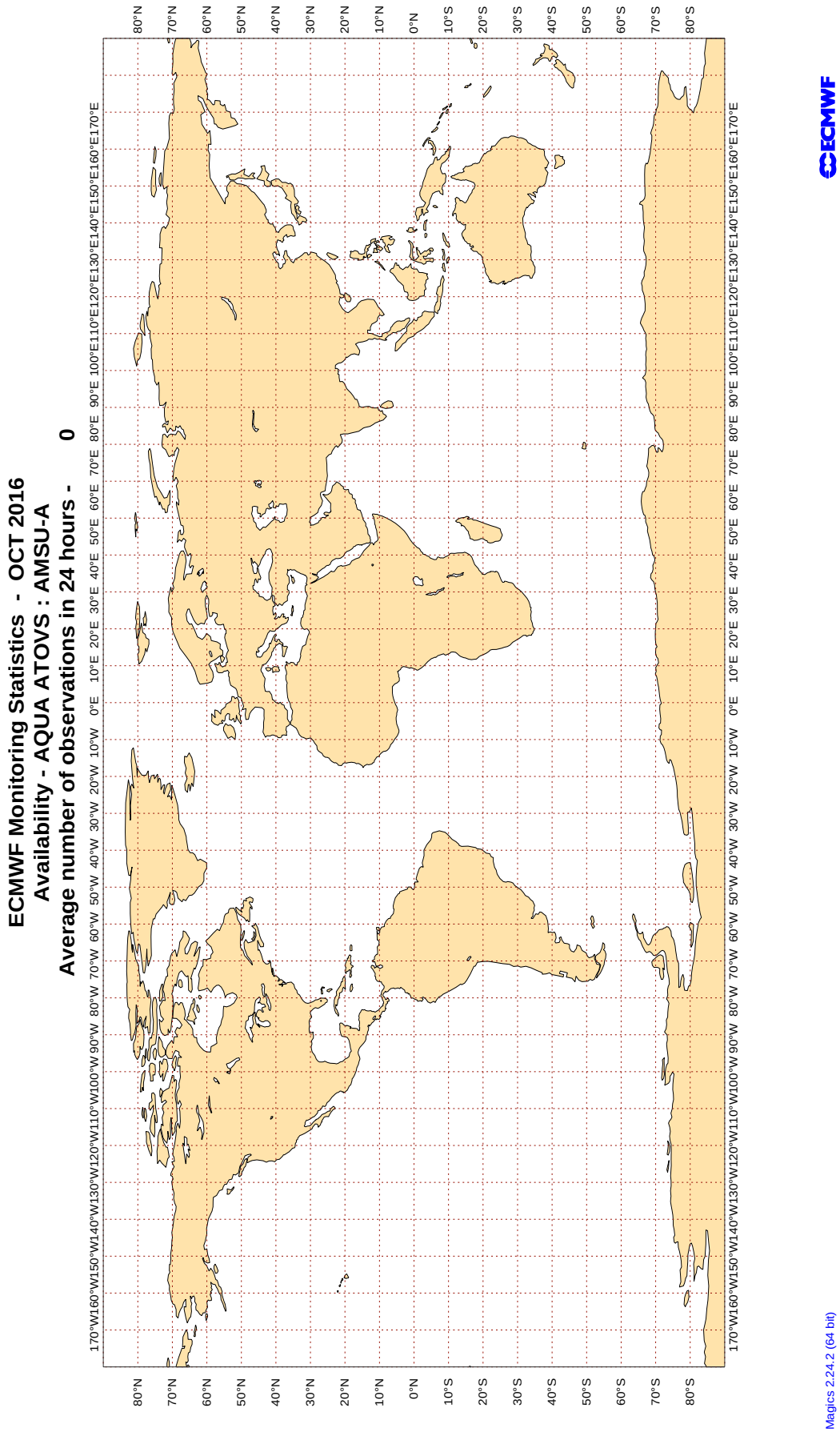
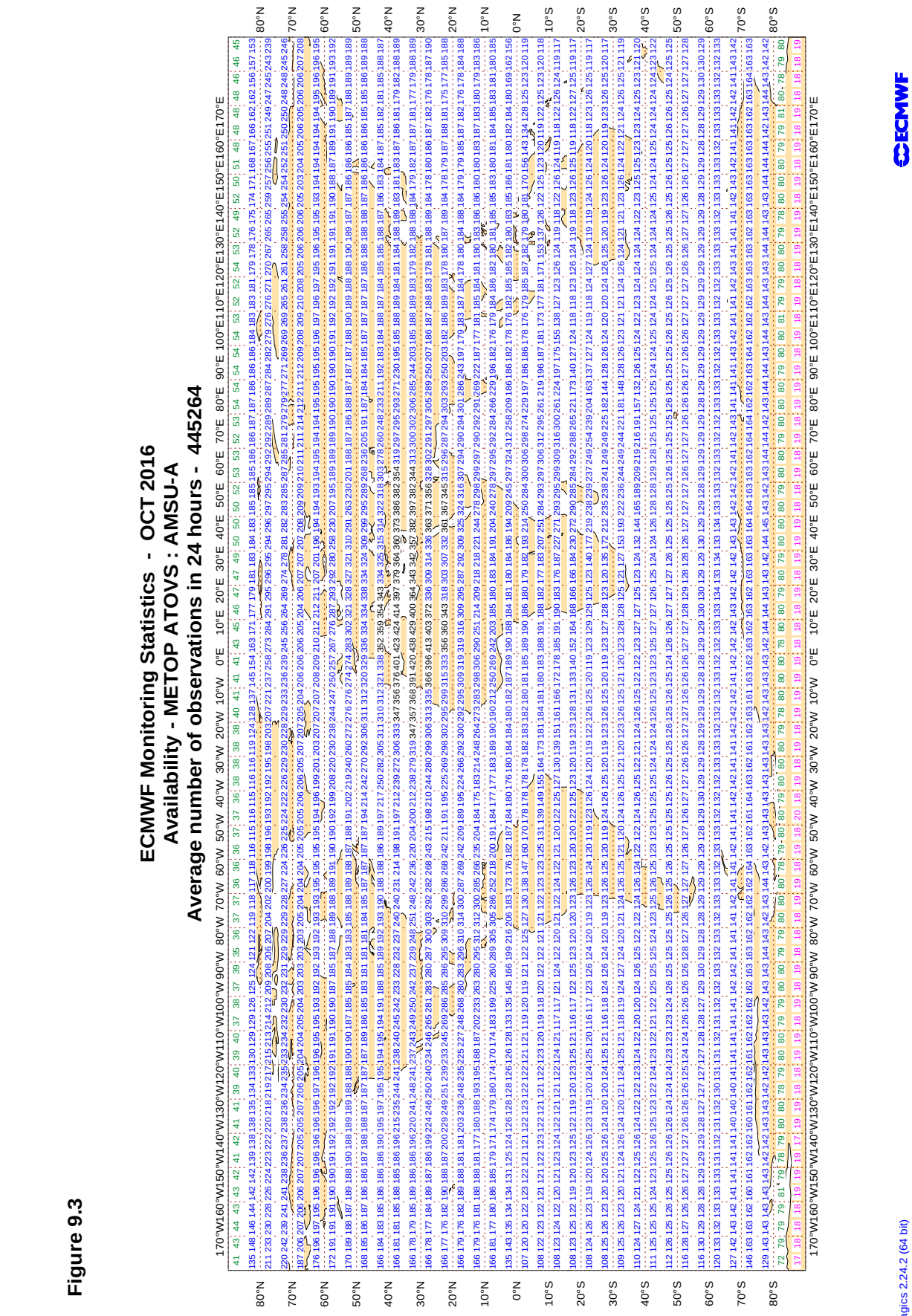


Figure 9.2

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                : OCT 2016
                    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
3ETA8	99	P	SUR	57	0	1.4	-3.2	3.5
3FAE4	99	P	SUR	61	0	2.5	4.2	4.8
3FRY7	99	P	SUR	32	0	1.5	3.5	3.8
4XIS	99	P	SUR	31	0	0.9	4.0	4.1
9V8208	99	P	SUR	23	0	2.8	3.8	4.7
A8LK5	99	P	SUR	49	1	1.8	-3.6	4.0
A8PQ8	99	P	SUR	26	0	5.5	-1.1	5.6
AVLX	99	P	SUR	25	0	1.6	10.3	10.4
C6AV5	99	P	SUR	30	0	0.8	3.4	3.5
C6BR3	99	P	SUR	46	0	1.1	7.9	8.0
C6FV4	99	P	SUR	46	0	1.0	8.9	9.0
C6NF2	99	P	SUR	30	0	0.5	3.7	3.7
C6WW4	99	P	SUR	25	1	3.2	4.1	5.2
C6YM6	99	P	SUR	59	0	1.3	5.5	5.7
C6YM7	99	P	SUR	90	0	1.3	9.9	10.0
ELPP9	99	P	SUR	44	0	0.6	4.2	4.2
ELPX7	99	P	SUR	43	0	1.4	3.5	3.8
KRAU	99	P	SUR	69	0	1.2	7.7	7.8
LAPE7	99	P	SUR	49	1	1.1	6.7	6.8
ONIK	99	P	SUR	18	0	5.3	7.6	9.2
OWDC2	99	P	SUR	23	0	3.1	5.6	6.4
OZ2049	99	P	SUR	43	0	0.8	-5.0	5.1
PBGJ	99	P	SUR	33	0	2.7	-5.7	6.3
UANA	99	P	SUR	56	35	3.7	-8.8	9.6
UASP	99	P	SUR	25	0	1.5	-3.3	3.6
UBMI9	99	P	SUR	17	0	0.6	3.7	3.8
UBMO9	99	P	SUR	17	0	0.6	3.7	3.8
UBRI5	99	P	SUR	26	0	6.2	-1.5	6.4
UBRW	99	P	SUR	81	5	4.2	-6.2	7.5
UBXS	99	P	SUR	120	7	1.6	-12.2	12.3
UCSJ	99	P	SUR	42	0	1.6	3.4	3.7
UCUD	99	P	SUR	106	0	0.6	-8.9	8.9

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
UGZM	99	P	SUR	44	0	1.1	-4.0	4.2
V7SD8	99	P	SUR	21	0	1.6	3.3	3.6
VRCY7	99	P	SUR	32	0	1.5	5.2	5.4
VRFI7	99	P	SUR	103	0	1.0	4.9	5.0
VRFU8	99	P	SUR	59	1	2.1	-8.2	8.4
VRFU9	99	P	SUR	64	0	5.4	3.1	6.2
VRGH3	99	P	SUR	50	0	1.4	4.0	4.3
VRGV9	99	P	SUR	19	0	1.5	4.6	4.8
VRID5	99	P	SUR	28	0	4.7	3.2	5.7
VRJA4	99	P	SUR	19	0	7.2	-0.7	7.2
VRJT8	99	P	SUR	48	0	2.1	5.8	6.2
VRLZ3	99	P	SUR	22	0	0.7	-5.5	5.6
VRNF7	99	P	SUR	17	0	0.7	-3.1	3.2
WAIU	99	P	SUR	50	0	2.6	-5.2	5.8
WCX8812	99	P	SUR	77	0	1.3	-3.9	4.1
WCX8884	99	P	SUR	43	0	2.8	3.2	4.2
WDG2803	99	P	SUR	16	0	2.8	8.6	9.0
WFLH	99	P	SUR	74	0	0.9	3.0	3.2
WRJP	99	P	SUR	37	1	1.2	-4.0	4.2

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

```
          LIST OF SUSPECT STATIONS        : SHIPS + FIXED MARINE PLATFORMS
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND SPEED (M/S)
                    AREA                  : GLOBAL
                    PERIOD                : OCT 2016
                    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
46181	99	SPEED	SUR	155	0	0	3.1	4.1	5.1

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                : OCT 2016
                    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
42088	99	DIRN	SUR	116	0	0	39.4	-30.9	50.0
44058	99	DIRN	SUR	48	0	0	12.0	63.6	64.7
45020	99	DIRN	SUR	71	0	0	18.5	-31.7	36.7
45165	99	DIRN	SUR	28	0	0	24.7	-35.0	42.8

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                 : OCT 2016
                    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
1600512	99	P	SUR	-46	163	23	9	2.6	12.2	12.5
16512	99	P	SUR	-46	163	24	9	2.5	12.2	12.4
2300592	99	P	SUR	8	83	2785	2401	0.3	0.5	0.6
23592	99	P	SUR	8	83	2661	2294	0.3	0.5	0.6
2600545	99	P	SUR	68	-12	733	573	5.9	-7.3	9.4
2600568	99	P	SUR	85	68	731	712	0.9	-13.8	13.9
26545	99	P	SUR	68	-12	727	566	5.9	-7.0	9.2
26568	99	P	SUR	85	68	721	702	0.7	-13.9	13.9
3100515	99	P	SUR	24	-75	578	63	5.2	4.7	7.0
31515	99	P	SUR	24	-75	546	59	5.2	4.8	7.0
4100709	99	P	SUR	32	-74	64	0	1.2	-7.8	7.9
41709	99	P	SUR	32	-74	87	0	1.3	-8.0	8.1
4401619	99	P	SUR	60	-67	154	10	1.2	12.4	12.4
4401624	99	P	SUR	61	-71	567	75	6.1	-0.0	6.1
4700509	99	P	SUR	64	-37	722	310	8.3	-2.9	8.8
4700551	99	P	SUR	49	-52	730	168	8.3	-1.1	8.4
4700567	99	P	SUR	49	-34	153	153	0.0	0.0	0.0
47509	99	P	SUR	64	-37	725	316	8.3	-2.7	8.7
47551	99	P	SUR	49	-51	728	163	8.3	-1.1	8.4
47567	99	P	SUR	49	-34	156	156	0.0	0.0	0.0
4800278	99	P	SUR	82	-168	656	225	4.9	-0.4	5.0
4800513	99	P	SUR	75	176	707	366	8.8	-3.5	9.4
4800790	99	P	SUR	75	-180	271	267	0.5	-12.3	12.3
48278	99	P	SUR	82	-168	646	218	4.9	-0.4	5.0
48513	99	P	SUR	75	176	660	344	8.8	-3.4	9.5
48790	99	P	SUR	75	-180	326	326	0.0	0.0	0.0
5301600	99	P	SUR	-4	100	1373	825	1.8	-0.3	1.8
5301601	99	P	SUR	-11	84	684	684	0.0	0.0	0.0
5600518	99	P	SUR	-32	46	729	662	3.7	-9.4	10.1
56518	99	P	SUR	-32	46	726	658	3.7	-9.5	10.2
6300923	99	P	SUR	58	-31	622	104	7.6	-2.1	7.9
63923	99	P	SUR	58	-31	636	105	7.5	-2.0	7.8

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                : OCT 2016
                    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
3200318	99	SPEED	SUR	-5	-110	44	0	0	0.8	-7.4	7.4
32318	99	SPEED	SUR	-5	-110	44	0	0	0.8	-7.7	7.8
6100002	99	SPEED	SUR	42	5	725	0	0	3.4	6.2	7.1

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

```
          LIST OF SUSPECT STATIONS         : DRIFTER
                    MONITORING CENTRE      : ECMWF
                    ELEMENT MONITORED      : WIND DIRECTION (DEGREES)
                    PERIOD                 : OCT 2016
                    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
1400041	99	DIRN	SUR	-8	55	34	0	0	71.3	-60.7	93.7
14041	99	DIRN	SUR	-8	55	22	0	0	94.4	-24.5	97.5
2300014	99	DIRN	SUR	2	67	191	0	0	23.1	21.0	31.2
23014	99	DIRN	SUR	2	67	106	0	0	21.8	21.9	30.9
23092	99	DIRN	SUR	18	90	110	0	0	102.7	25.7	105.9
23454	99	DIRN	SUR	10	73	109	0	0	138.7	-77.9	159.1
23460	99	DIRN	SUR	7	88	174	0	0	12.8	22.5	25.9
23497	99	DIRN	SUR	11	72	119	0	0	40.7	-20.5	45.6
3100051	99	DIRN	SUR	-23	-43	142	0	0	50.0	-91.3	104.1
3100053	99	DIRN	SUR	-32	-50	642	1	0	16.7	-20.8	26.6
3100231	99	DIRN	SUR	-29	-47	28	0	0	92.7	23.7	95.7
3100260	99	DIRN	SUR	-16	-38	193	0	0	159.4	37.1	163.6
3100374	99	DIRN	SUR	-25	-45	603	0	0	20.9	-25.0	32.6
3100380	99	DIRN	SUR	-20	-40	611	0	0	29.8	-31.7	43.5
3101000	99	DIRN	SUR	-24	-42	554	0	0	16.6	-23.8	29.0
31053	99	DIRN	SUR	-32	-50	317	1	0	15.6	-21.5	26.6
31260	99	DIRN	SUR	-16	-38	104	0	0	159.0	26.1	161.1
31374	99	DIRN	SUR	-25	-45	59	0	0	20.2	-23.0	30.6
31380	99	DIRN	SUR	-20	-40	322	0	0	31.5	-32.6	45.4
41057	99	DIRN	SUR	20	-71	331	0	0	26.0	-22.4	34.3
42088	99	DIRN	SUR	11	-61	526	0	0	41.6	-27.3	49.8
42090	99	DIRN	SUR	18	-70	684	0	0	29.3	-26.3	39.4
42360	99	DIRN	SUR	27	-91	171	0	0	28.9	23.7	37.4
42361	99	DIRN	SUR	28	-93	720	2	0	15.0	27.6	31.4
42362	99	DIRN	SUR	28	-91	778	0	0	12.6	26.5	29.3
42365	99	DIRN	SUR	28	-89	466	0	0	12.9	-23.5	26.8
44058	99	DIRN	SUR	38	-76	359	0	0	17.2	60.5	62.9
44062	99	DIRN	SUR	39	-76	236	0	0	25.0	-21.4	32.9
44064	99	DIRN	SUR	37	-76	120	0	0	26.2	-23.1	34.9
45020	99	DIRN	SUR	45	-86	484	0	0	18.8	-31.2	36.4
45142	99	DIRN	SUR	43	-79	553	0	0	15.6	-23.3	28.1

```
LIST OF SUSPECT STATIONS        : DRIFTER
          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
45152	99	DIRN	SUR	46	-80	158	0	0	15.5	-25.7	30.0
45165	99	DIRN	SUR	42	-83	168	0	0	23.6	-31.4	39.3
45167	99	DIRN	SUR	42	-80	945	0	0	32.3	-20.8	38.4
45168	99	DIRN	SUR	42	-86	229	0	0	17.1	-30.8	35.3
45174	99	DIRN	SUR	42	-88	440	0	0	16.4	-20.5	26.2
46118	99	DIRN	SUR	49	-123	442	0	0	62.6	13.2	64.0
46132	99	DIRN	SUR	50	-128	637	0	0	21.6	22.2	30.9
46181	99	DIRN	SUR	54	-129	30	0	0	14.9	-22.0	26.6
5100309	99	DIRN	SUR	8	-170	280	0	0	74.1	-7.5	74.5
51309	99	DIRN	SUR	8	-170	276	0	0	75.1	-11.5	76.0

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                 : OCT 2016
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


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


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

WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
04360	12	Z	1000	66	-38	12	0	2.9	43.0	43.1
04360	00	Z	925	66	-38	29	2	4.2	44.4	44.6
04417	12	Z	1000	73	-38	24	23	0.0	-93.1	93.1
04417	00	Z	1000	73	-38	27	25	4.4	-94.6	94.7
21946	12	Z	50	71	148	26	0	41.1	-137.5	143.5
31510	00	Z	250	50	127	30	0	19.3	-73.2	75.7
31510	12	Z	50	50	127	20	0	45.0	-152.3	158.8
38064	12	Z	70	45	66	27	0	76.3	114.0	137.2
42361	12	Z	50	26	78	24	0	32.6	155.0	158.4
42886	00	Z	30	22	84	26	0	19.5	189.6	190.6
43014	00	Z	30	20	75	17	0	13.3	176.5	177.0
43041	00	Z	30	19	82	22	0	14.2	168.7	169.3
43110	00	Z	30	17	73	26	0	32.8	190.9	193.7
43128	00	Z	30	17	78	25	0	43.0	182.8	187.8
43128	12	Z	50	17	78	15	0	72.4	216.5	228.3
43295	12	Z	50	13	78	18	0	10.4	179.7	180.0
43311	00	Z	30	11	73	27	0	49.6	195.3	201.5
43333	00	Z	30	12	93	29	0	22.5	193.5	194.8
43371	12	Z	70	8	77	11	0	12.0	144.4	144.9
47155	12	Z	1000	35	129	38	8	26.3	-46.8	53.7
54511	00	Z	70	40	116	40	0	106.7	68.3	126.7
65202	12	Z	100	7	3	19	18	0.0	293.3	293.3
70350	12	Z	1000	58	-152	31	0	8.3	37.9	38.8
70350	00	Z	1000	58	-152	31	0	10.2	36.8	38.2
80222	00	Z	925	5	-74	22	0	8.1	-82.3	82.7
80222	12	Z	1000	5	-74	27	0	9.7	-78.3	78.9
83362	12	Z	250	-16	-56	25	0	80.2	59.7	100.0
83566	00	Z	1000	-20	-44	29	0	14.9	-49.5	51.7
89009	12	Z	1000	-90	0	30	20	11.0	-85.9	86.6
89009	00	Z	1000	-90	0	30	20	14.8	-83.8	85.1
89625	12	Z	850	-75	123	23	16	4.3	-91.0	91.1
96147	12	Z	925	4	108	21	1	17.4	50.5	53.4
96147	00	Z	925	4	108	23	0	18.6	46.0	49.6
ASDE01	12	Z	925	39	-66	10	0	5.7	-40.9	41.3

LIST OF SUSPECT STATIONS (CONTINUED)

WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
ASDE01	00	Z	1000	40	-62	11	0	6.7	-44.2	44.7
ASEU03	00	Z	850	42	-66	14	1	42.9	-14.3	45.2

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                : OCT 2016
                    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
```

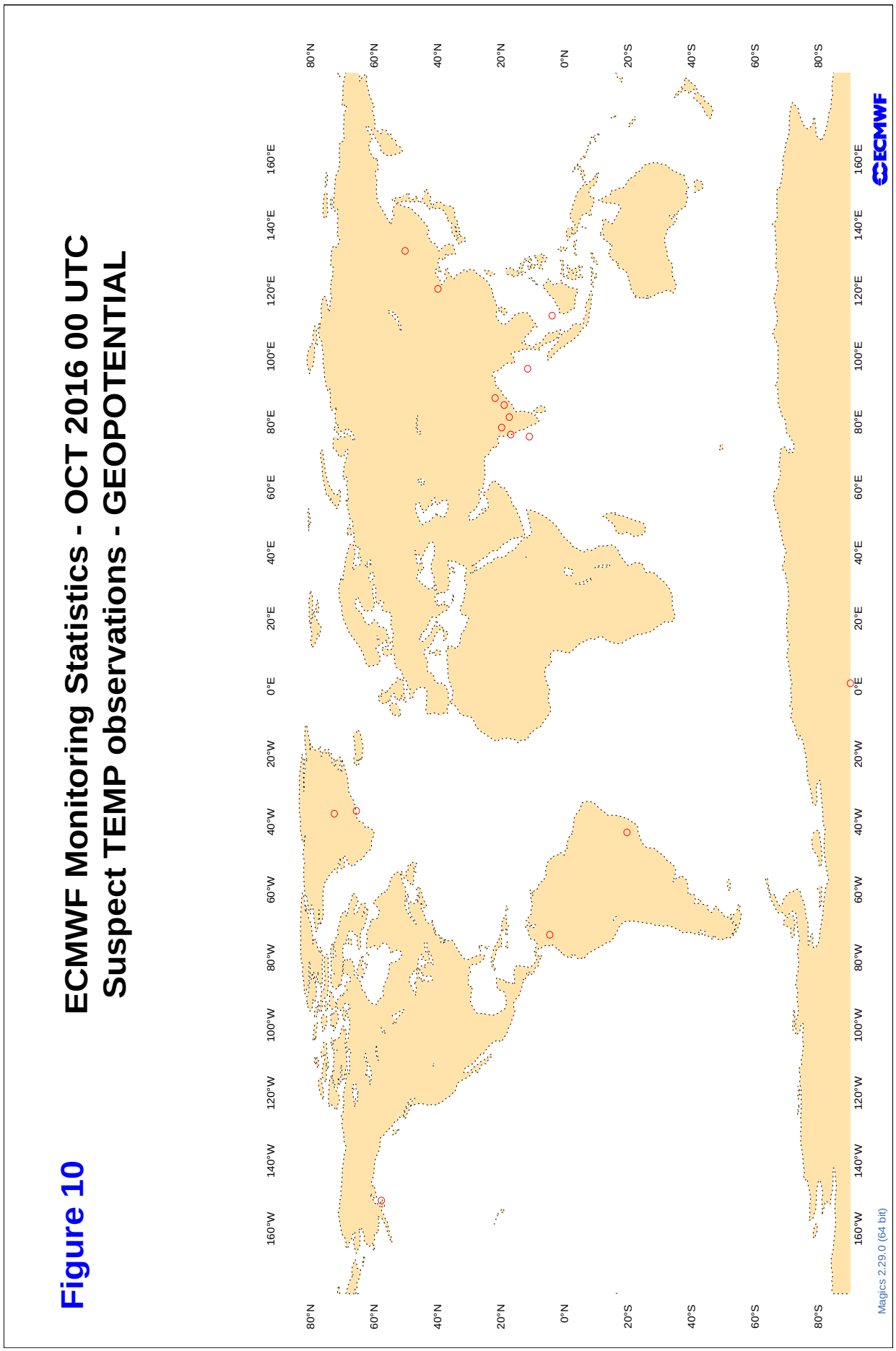
WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	UBIAS	VBIAS	RMS
54511	00	V	100	40	116	24	5	-8.0	-0.8	18.1

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

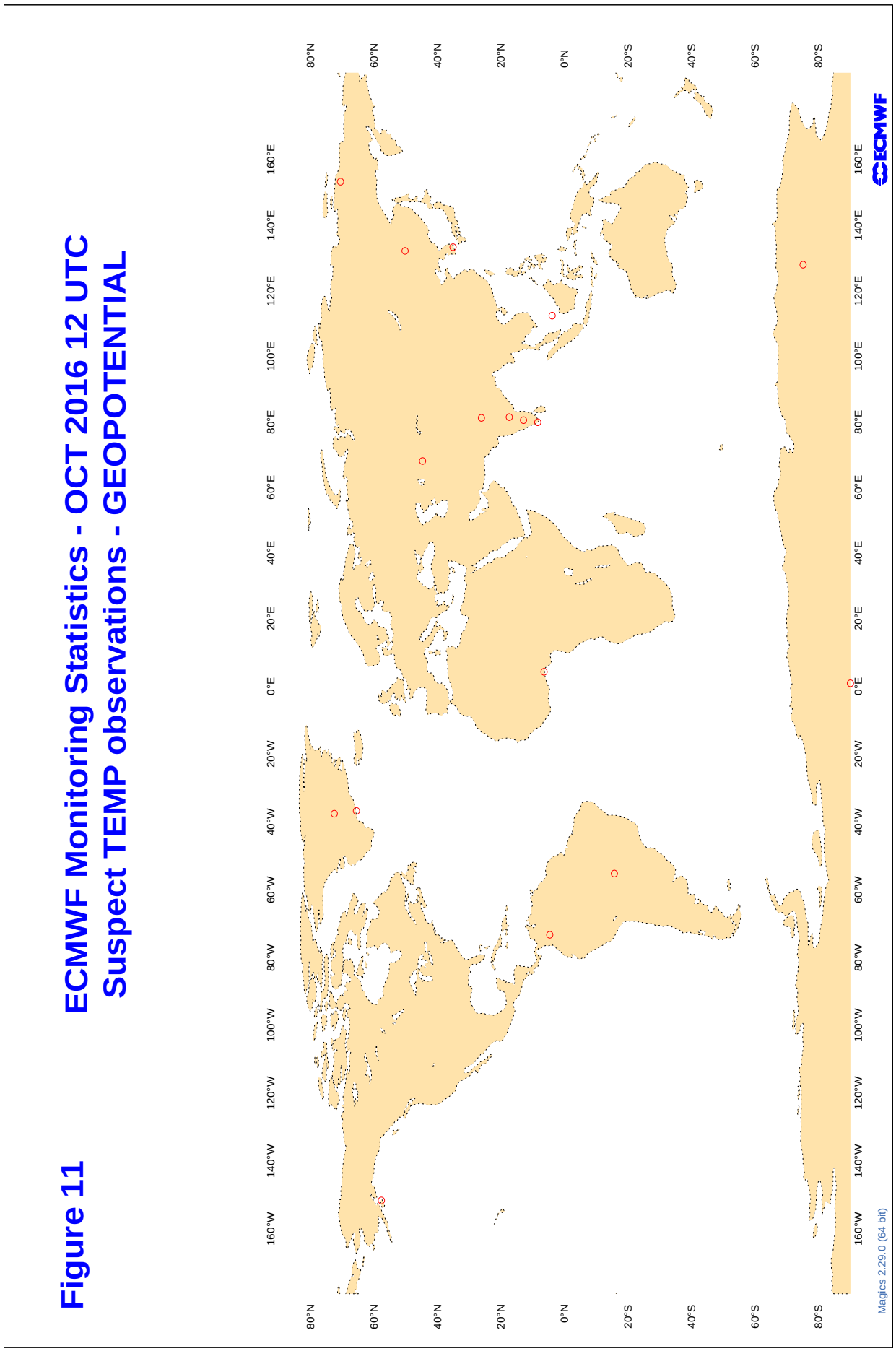
```
          LIST OF SUSPECT STATIONS        : RADIOSONDES
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND DIRECTION (DEGREES)
                    AREA                  : GLOBAL
                    PERIOD                : OCT 2016
                    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
59431	00	DD	23	108	16	-10.4	4.0	13.3

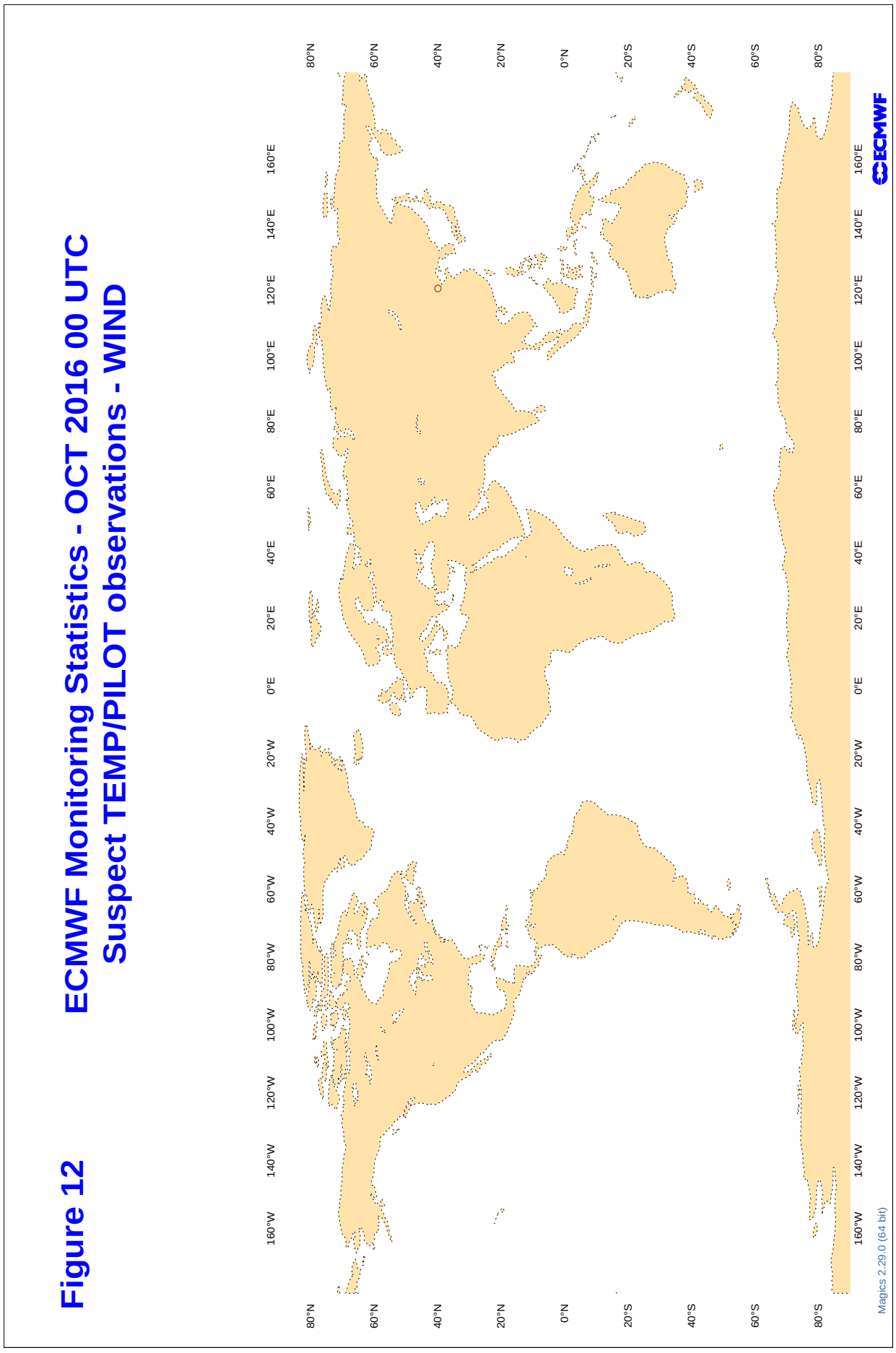
3.2.21 Figure 10 - Suspect TEMP observations - geopotential : 00 UTC



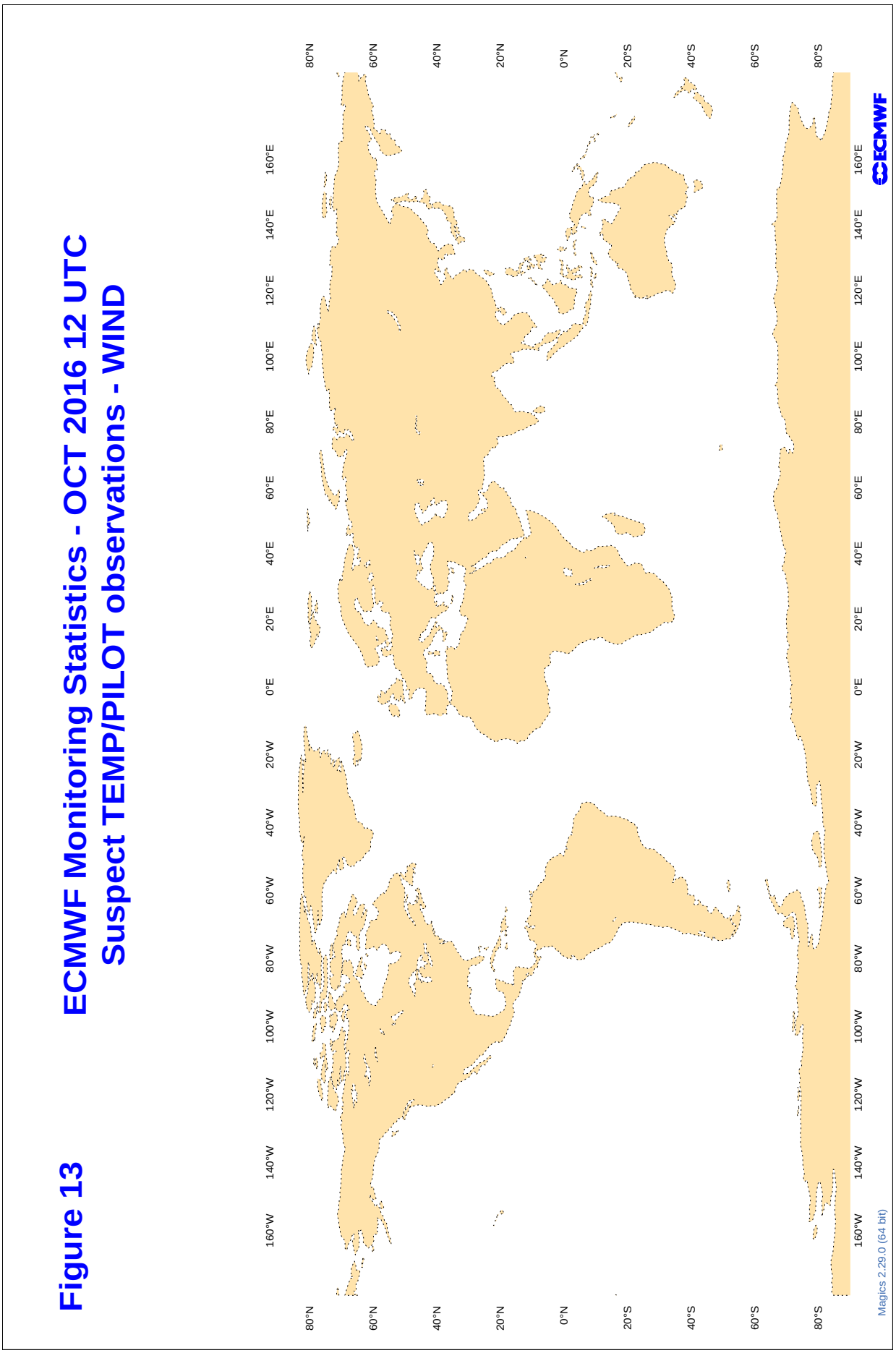
3.2.22 Figure 11 - Suspect TEMP observations - geopotential : 12 UTC



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                : OCT 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASDE01	00	Z	100	10	25.1	-24.4
ASDE01	12	Z	100	8	17.8	0.4
ASDE02	12	Z	100	17	19.8	15.8
ASDE02	00	Z	100	11	20.5	18.4
ASDE03	12	Z	100	6	20.4	19.3
ASDE03	00	Z	100	9	8.7	6.9
ASDK01	12	Z	100	19	15.6	10.4
ASDK01	00	Z	100	17	34.9	6.9
ASDK02	12	Z	100	14	13.6	8.9
ASDK02	00	Z	100	13	82.5	33.8
ASDK03	12	Z	100	2	30.9	30.6
ASDK03	00	Z	100	2	17.0	17.0
ASDK1	12	Z	100	18	15.3	5.4
ASDK1	00	Z	100	14	37.9	2.4
ASDK2	12	Z	100	12	13.4	0.4
ASDK2	00	Z	100	10	92.2	40.0
ASDK3	12	Z	100	2	31.5	30.8
ASDK3	00	Z	100	2	18.6	18.5
ASEU01	12	Z	100	12	13.7	12.7
ASEU02	12	Z	100	9	36.3	35.7
ASEU02	00	Z	100	10	27.8	25.7
ASEU03	12	Z	100	12	34.3	26.5
ASEU03	00	Z	100	10	38.4	-6.6
ASEU04	00	Z	100	5	19.4	-17.4
ASEU04	12	Z	100	9	12.5	-10.5
ASEU06	00	Z	100	8	19.2	-9.3
ASEU06	12	Z	100	9	29.1	26.9
ASFR1	00	Z	100	12	18.1	0.4
ASFR1	12	Z	100	12	12.3	10.6
ASFR2	12	Z	100	5	16.6	14.8
ASFR2	00	Z	100	2	10.4	10.4
ASFR3	12	Z	100	14	22.9	18.2
ASFR3	00	Z	100	16	13.2	8.9
ASFR4	12	Z	100	10	24.7	20.6
ASFR4	00	Z	100	11	18.8	18.4
ASUK2	12	Z	100	2	3.3	1.5
ASUK3	12	Z	100	28	33.9	-0.1
DBLK	12	Z	100	34	7.1	0.1
DBLK	00	Z	100	22	8.2	-1.8

RADIOSONDE MONITORING STATISTICS (SHIPS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
JGQH	12	Z	100	3	21.7	6.1
JGQH	00	Z	100	3	24.5	19.9

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                : OCT 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASDE01	00	V	100	9	3.5	1.7	-0.4
ASDE01	12	V	100	7	4.4	-0.4	-0.5
ASDE02	12	V	100	10	5.8	0.2	-1.1
ASDE02	00	V	100	10	3.6	1.0	-0.6
ASDE03	12	V	100	6	3.6	0.8	0.8
ASDE03	00	V	100	6	3.1	1.0	-0.3
ASDK01	12	V	100	17	2.6	-0.1	0.6
ASDK01	00	V	100	12	3.0	-0.3	0.6
ASDK02	12	V	100	13	4.7	-1.0	-1.4
ASDK02	00	V	100	12	3.5	0.2	-0.1
ASDK03	12	V	100	2	3.3	2.2	1.2
ASDK03	00	V	100	2	5.7	-4.1	0.7
ASDK1	12	V	100	17	2.4	0.5	0.0
ASDK1	00	V	100	13	3.6	0.5	0.9
ASDK2	12	V	100	12	4.5	-0.8	-1.4
ASDK2	00	V	100	10	3.2	-0.1	0.9
ASDK3	12	V	100	2	2.1	1.0	-0.1
ASDK3	00	V	100	2	4.9	-3.2	1.1
ASEU01	12	V	100	6	3.5	-0.1	1.8
ASEU02	12	V	100	8	3.6	-2.0	-0.1
ASEU02	00	V	100	8	3.6	-0.1	1.1
ASEU03	12	V	100	9	4.0	-0.7	2.5
ASEU03	00	V	100	8	3.0	-1.1	0.2
ASEU04	00	V	100	5	4.6	0.1	0.7
ASEU04	12	V	100	8	3.1	0.6	0.4
ASEU06	00	V	100	7	9.1	-3.2	4.2
ASEU06	12	V	100	5	8.9	-3.2	2.6
ASFR1	00	V	100	12	3.9	-0.4	1.9
ASFR1	12	V	100	12	3.5	1.0	-0.3
ASFR2	12	V	100	4	5.4	-2.5	-2.6
ASFR2	00	V	100	2	3.0	2.1	-1.0
ASFR3	12	V	100	14	3.9	0.4	-0.4
ASFR3	00	V	100	15	3.7	-0.7	-0.2
ASFR4	12	V	100	10	3.7	0.0	1.3
ASFR4	00	V	100	10	2.5	-0.7	0.3
ASUK2	12	V	100	2	1.3	0.7	-0.8
ASUK3	12	V	100	28	4.5	0.6	0.5
DBLK	12	V	100	20	3.1	-0.8	-0.5
DBLK	00	V	100	15	3.3	-0.1	-0.3

RADIOSONDE MONITORING STATISTICS (SHIPS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
JGQH	12	V	100	3	8.1	3.2	-3.6
JGQH	00	V	100	3	12.4	-6.8	-2.0

3.2.27 Figure 14 - SATOB Winds: 700-1000hPa

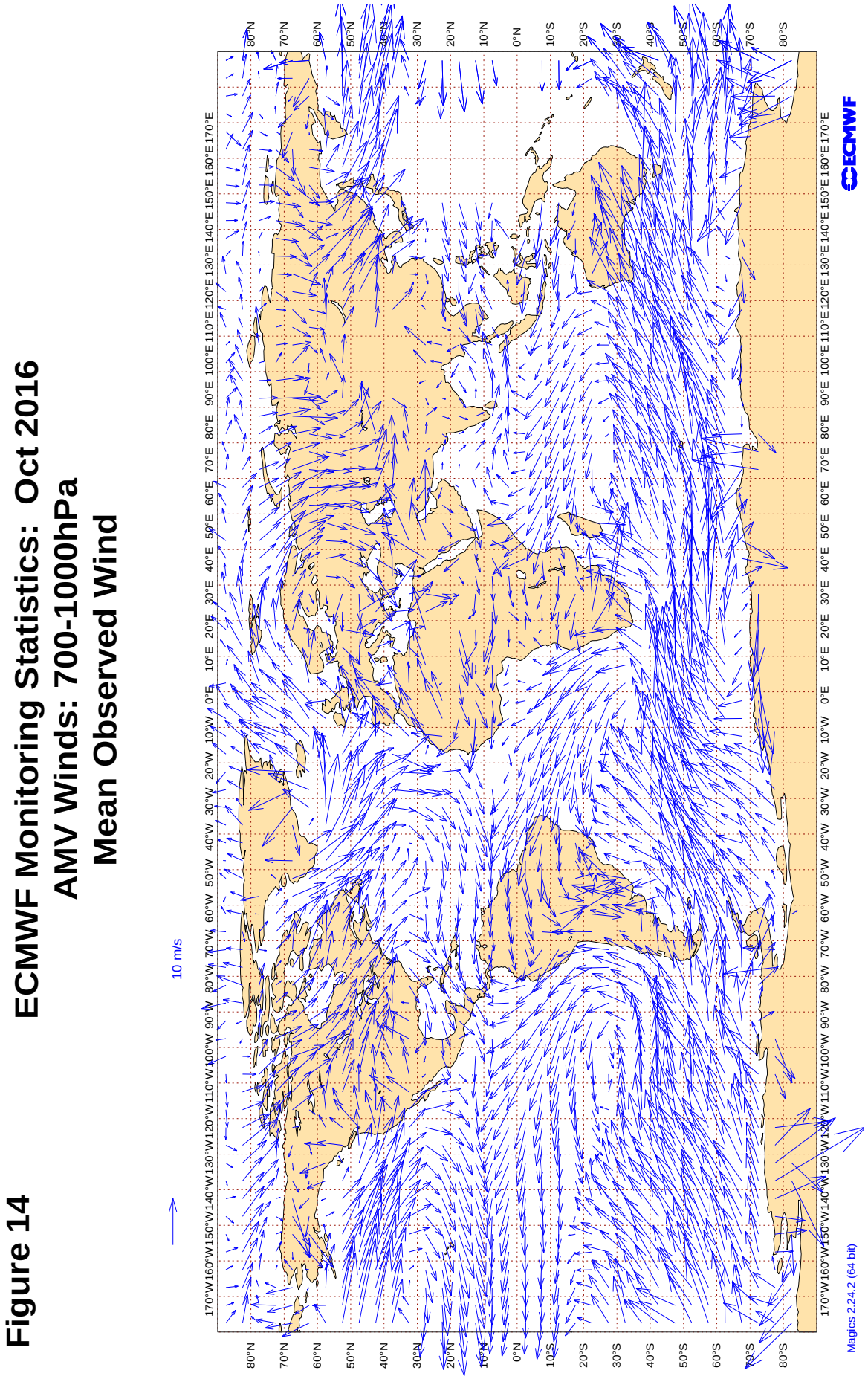


Figure 14

3.2.28 Figure 15 - SATOB Winds: 150- 400hPa

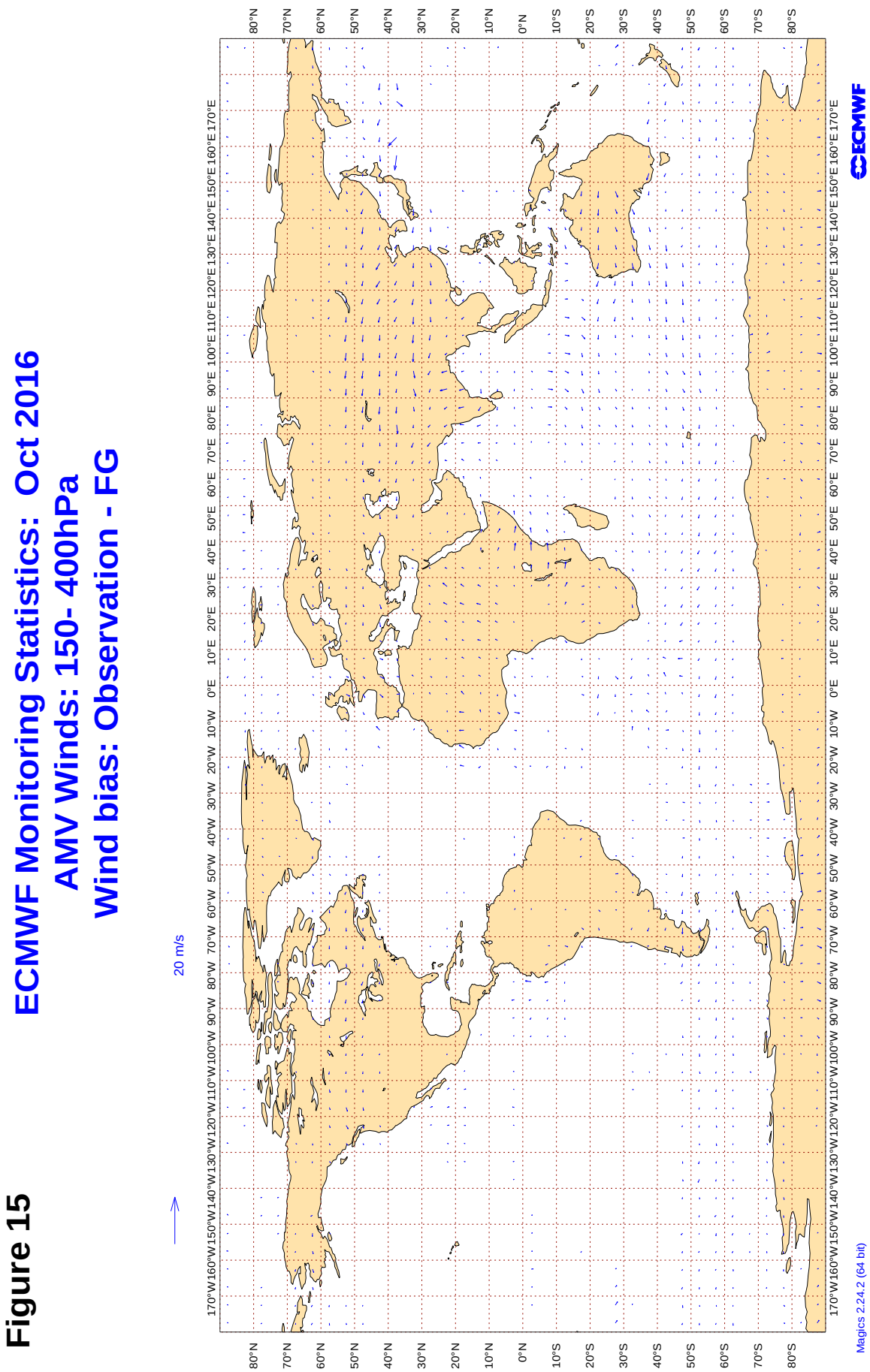


Figure 15

3.2.29 Figure 16 - SATOB Winds: 700-1000hPa

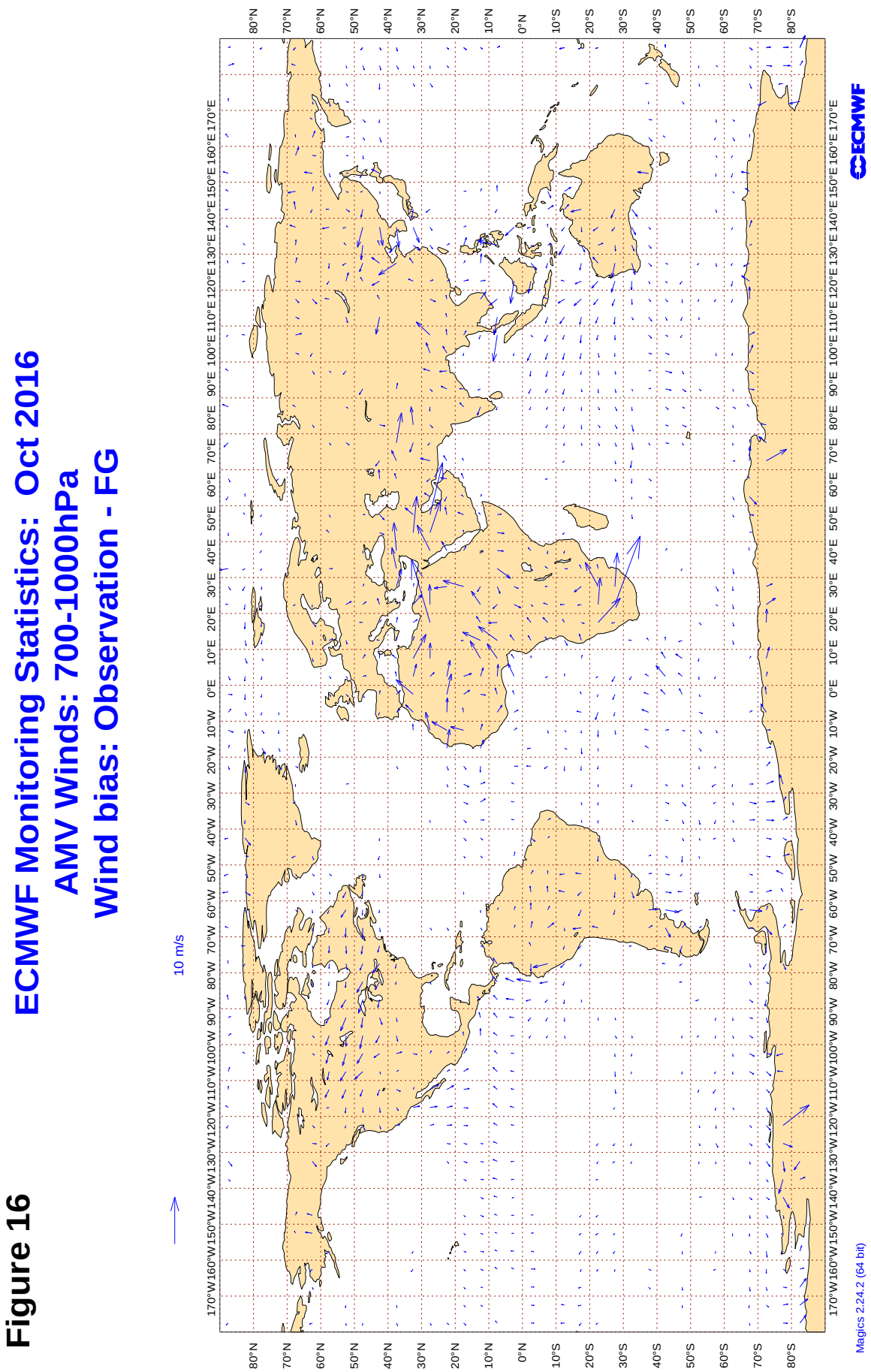


Figure 16

3.2.30 Figure 17 - SATOB Winds: 150- 400hPa

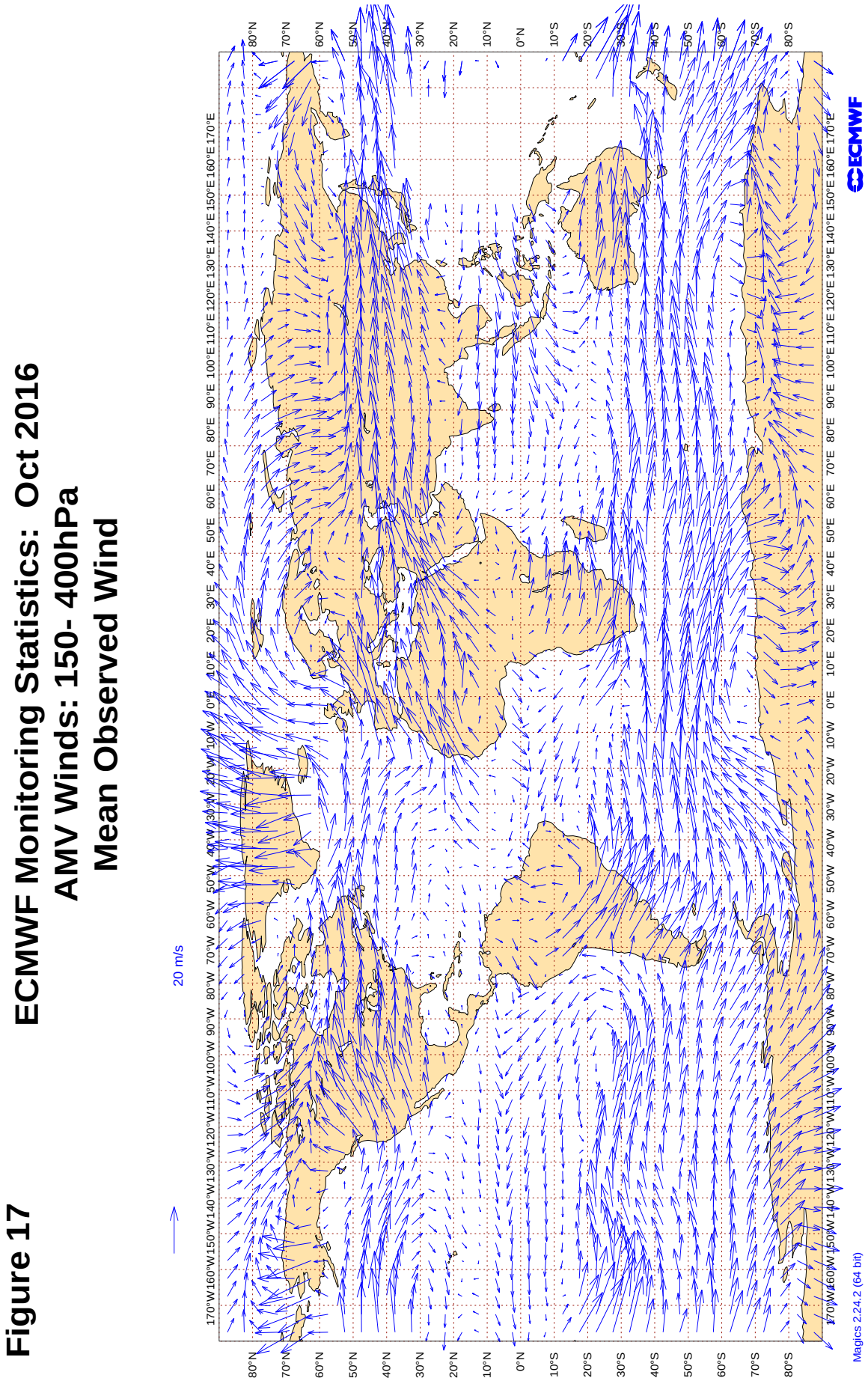


Figure 17

3.2.31 Figure 18 - AIRCRAFT Winds: 150- 300hPa

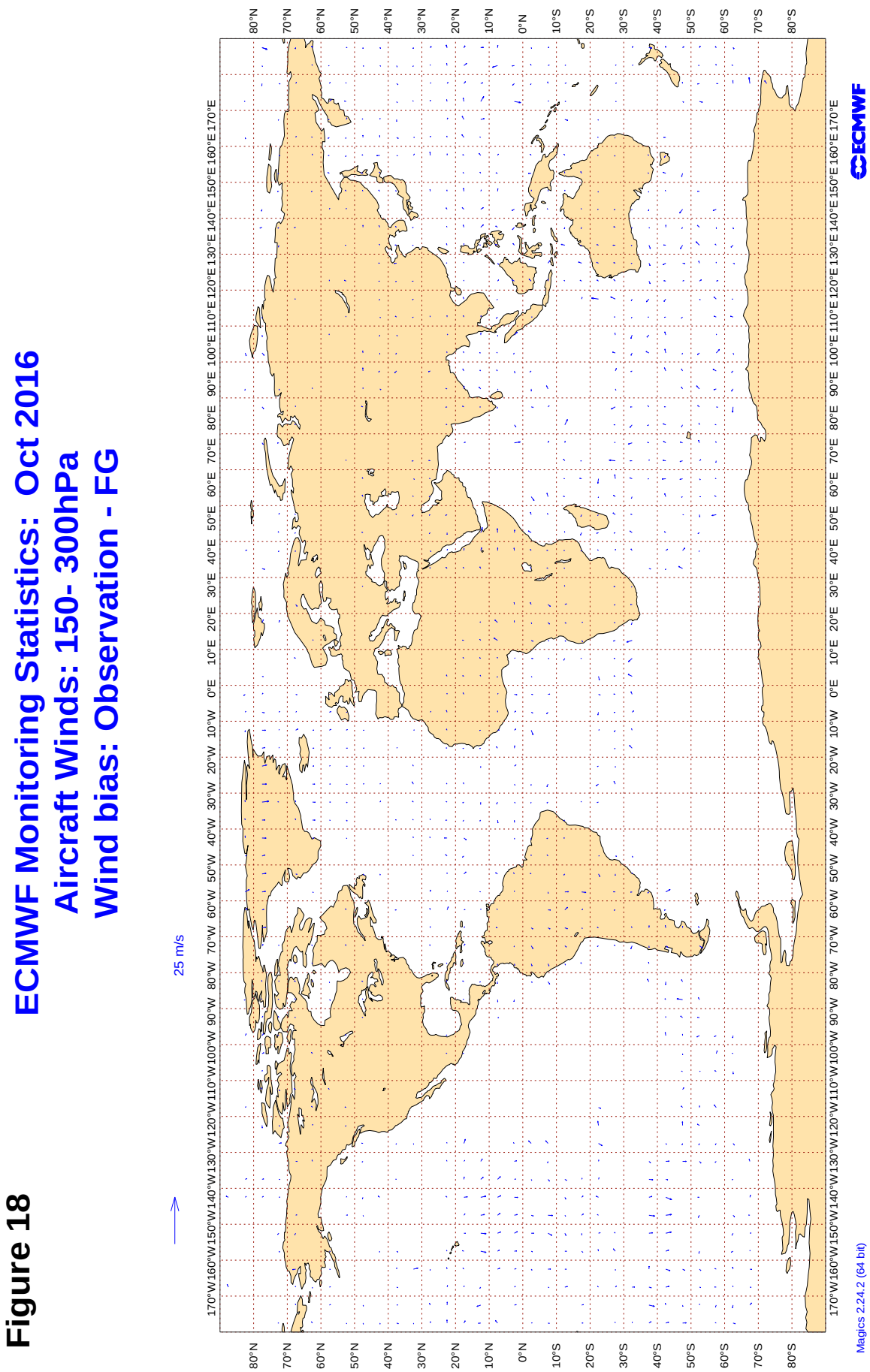


Figure 18

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 : OCT 2016
STANDARD OF COMPARISON: FIRST-GUESS FIELD

SELECTION CRITERIA: NO. OF OBS. >= 20

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

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
AAB	99	V	300-150	144	0	0	4.4	-0.1
AAL	99	V	300-150	64704	0	0	4.3	0.1
AAR	99	V	300-150	321	0	1	4.2	-1.5
AAY	99	V	300-150	85	0	0	5.3	-0.1
ABW	99	V	300-150	1083	0	0	3.9	-0.8
ABX	99	V	300-150	159	0	1	6.9	0.5
ACA	99	V	300-150	30614	5	0	6.7	0.0
ACI	99	V	300-150	2925	0	0	4.6	0.2
AEA	99	V	300-150	972	1	0	4.9	0.6
AFL	99	V	300-150	1697	0	0	3.7	0.4
AFR	99	V	300-150	31402	0	0	3.8	0.2
AHY	99	V	300-150	335	15	0	12.2	0.3
AIC	99	V	300-150	1674	4	0	6.6	0.2
AMX	99	V	300-150	2500	17	0	10.4	-0.0
ANZ	99	V	300-150	19096	4	0	5.1	0.4
AOJ	99	V	300-150	111	25	0	16.2	1.2
ASA	99	V	300-150	3638	1	0	5.1	0.2
ASL	99	V	300-150	819	0	0	3.9	-0.0
ASY	99	V	300-150	281	0	0	5.7	0.0
AUA	99	V	300-150	5813	0	0	4.3	-0.1
AVA	99	V	300-150	407	12	0	10.5	0.2
AVN	99	V	300-150	147	1	0	6.0	-0.4

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
AXM	99	V	300-150	208	1	0	6.4	-0.0
AZA	99	V	300-150	9243	0	0	4.0	0.3
AZG	99	V	300-150	199	0	0	3.7	0.1
BAW	99	V	300-150	58756	2	0	5.5	0.1
BBR	99	V	300-150	132	0	0	9.0	0.3
BEL	99	V	300-150	2948	0	0	3.7	0.3
BER	99	V	300-150	8882	0	0	3.8	0.3
BLU	99	V	300-150	50	0	0	7.1	-1.8
BMW	99	V	300-150	42	0	0	3.8	0.1
BOX	99	V	300-150	659	0	0	3.7	-0.2
BOX	99	V	300-150	81	0	0	3.4	0.6
BRK	99	V	300-150	43	0	0	7.7	2.2
CAL	99	V	300-150	355	0	0	4.5	0.8
CAO	99	V	300-150	110	0	0	3.9	0.6
CAZ	99	V	300-150	177	0	0	4.1	-0.1
CCA	99	V	300-150	1115	3	0	4.5	0.7
CEF	99	V	300-150	30	0	0	3.8	-0.2
CES	99	V	300-150	1204	0	0	3.9	0.8
CFC	99	V	300-150	284	0	0	4.0	0.1
CFG	99	V	300-150	3904	0	0	4.2	-0.2
CJT	99	V	300-150	160	0	0	4.0	-0.0
CKS	99	V	300-150	1769	0	0	4.5	-0.2
CLE	99	V	300-150	54	0	0	7.1	3.8
CLX	99	V	300-150	3649	0	0	4.1	-0.3
CMB	99	V	300-150	871	0	0	4.4	-0.1
CNV	99	V	300-150	253	0	0	4.1	0.5
COB	99	V	300-150	32	0	0	2.5	0.1
CPA	99	V	300-150	281	0	1	3.9	0.6
CPI	99	V	300-150	39	0	0	4.4	0.2
CRL	99	V	300-150	701	0	0	3.6	0.2
CRV	99	V	300-150	35	0	0	4.7	-1.1
CSN	99	V	300-150	923	9	0	7.4	0.1
DAH	99	V	300-150	733	0	0	3.9	0.3
DAL	99	V	300-150	72909	0	0	4.0	-0.0
DCS	99	V	300-150	24	0	0	4.0	0.2
DGX	99	V	300-150	66	0	0	3.7	0.5
DHK	99	V	300-150	1813	0	0	4.4	-0.2
DJT	99	V	300-150	1236	0	0	4.7	-0.1
DLH	99	V	300-150	36550	0	0	3.8	0.0
DUB	99	V	300-150	86	0	0	4.3	0.0
EDG	99	V	300-150	25	0	0	5.2	1.8
EDW	99	V	300-150	1002	0	0	3.8	0.2
EIN	99	V	300-150	15309	0	0	4.0	0.1

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
EJM	99	V	300-150	896	24	0	10.6	0.2
ELY	99	V	300-150	2384	0	0	4.2	-0.2
ETD	99	V	300-150	3582	4	0	5.2	-0.0
ETH	99	V	300-150	2039	14	0	10.8	0.1
EUW	99	V	300-150	24	0	0	3.5	0.2
EVE	99	V	300-150	29	0	0	7.0	1.5
EWG	99	V	300-150	1551	0	0	3.9	0.4
FDX	99	V	300-150	5592	0	0	4.0	0.2
FIN	99	V	300-150	945	0	0	3.7	0.2
FJI	99	V	300-150	5562	0	0	4.6	0.3
FLC	99	V	300-150	22	5	0	9.6	0.9
FWI	99	V	300-150	1209	0	0	3.5	0.2
GAF	99	V	300-150	45	0	0	2.9	1.0
GCT	99	V	300-150	39	0	0	3.6	0.6
GEC	99	V	300-150	3053	0	0	3.7	0.1
GES	99	V	300-150	49	63	0	24.3	0.6
GLO	99	V	300-150	83	4	0	9.5	-0.4
GMA	99	V	300-150	133	0	0	4.2	-0.1
GOL	99	V	300-150	47	0	0	5.8	-3.4
GTH	99	V	300-150	53	0	0	3.1	-0.1
GTI	99	V	300-150	2699	0	0	4.5	-0.4
HAL	99	V	300-150	3764	0	0	4.2	0.6
HRF	99	V	300-150	21	0	0	3.0	1.0
HZS	99	V	300-150	26	0	0	4.1	-0.3
IAM	99	V	300-150	149	0	0	3.8	0.2
IBE	99	V	300-150	3050	0	0	4.0	0.3
ICE	99	V	300-150	150	1	3	5.8	0.4
ICL	99	V	300-150	521	0	0	5.0	-0.6
ICV	99	V	300-150	319	0	0	4.9	-0.2
IFA	99	V	300-150	48	42	0	26.8	0.9
IJM	99	V	300-150	44	20	0	19.3	-0.1
ISS	99	V	300-150	253	0	0	4.3	0.2
JAF	99	V	300-150	1033	9	0	7.9	-0.0
JAI	99	V	300-150	1128	0	0	3.8	0.0
JAS	99	V	300-150	108	7	0	9.5	0.0
JBU	99	V	300-150	36	0	67	3.1	-0.0
JEF	99	V	300-150	27	0	0	3.8	0.3
JIV	99	V	300-150	23	0	0	6.5	3.6
JJA	99	V	300-150	49	0	0	5.6	0.7
JME	99	V	300-150	95	36	0	9.6	-0.1
JST	99	V	300-150	3115	8	0	7.5	0.3
KAC	99	V	300-150	501	0	0	3.7	0.3
KAI	99	V	300-150	53	2	0	7.5	0.7

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
KAL	99	V	300-150	1365	0	0	4.0	0.4
KAY	99	V	300-150	61	0	2	2.2	0.1
KCE	99	V	300-150	53	0	0	3.7	0.4
KIW	99	V	300-150	87	0	0	4.7	0.5
KLM	99	V	300-150	19430	1	0	4.4	-0.0
LAN	99	V	300-150	1727	11	0	8.8	0.4
LCO	99	V	300-150	121	0	0	4.1	0.2
LDM	99	V	300-150	120	45	0	23.3	0.1
LEA	99	V	300-150	91	0	0	3.3	-0.1
LOT	99	V	300-150	2083	21	0	14.4	0.1
LUC	99	V	300-150	136	61	0	26.7	0.5
LXA	99	V	300-150	26	73	0	31.0	0.3
LXJ	99	V	300-150	173	44	0	15.7	-0.2
MAN	99	V	300-150	33	0	3	2.5	0.1
MAS	99	V	300-150	333	0	0	4.0	0.7
MJF	99	V	300-150	21	0	5	3.9	0.6
MLM	99	V	300-150	29	76	0	30.0	-1.2
MMD	99	V	300-150	181	0	0	4.5	-0.2
MPH	99	V	300-150	632	0	0	4.2	-0.7
MSR	99	V	300-150	1064	0	0	3.8	0.1
NAX	99	V	300-150	7254	17	0	12.1	-0.1
NCA	99	V	300-150	255	0	0	4.0	-0.6
NJE	99	V	300-150	636	34	0	18.0	0.2
NOS	99	V	300-150	176	0	0	6.7	-1.0
NWS	99	V	300-150	261	0	0	4.1	0.2
OAE	99	V	300-150	196	1	1	6.5	1.2
OSD	99	V	300-150	42	0	0	3.6	1.0
PAC	99	V	300-150	228	0	0	4.9	0.5
PAL	99	V	300-150	70	6	0	6.1	0.6
PAT	99	V	300-150	46	0	0	4.5	-0.8
PIA	99	V	300-150	490	0	0	3.8	0.1
PNC	99	V	300-150	41	0	0	3.5	0.4
PVJ	99	V	300-150	23	0	0	3.3	-0.2
QFA	99	V	300-150	18120	0	0	4.5	0.3
QTR	99	V	300-150	9264	0	0	3.9	0.1
RAM	99	V	300-150	594	11	0	7.2	0.3
RCH	99	V	300-150	6445	0	0	5.0	0.0
RJA	99	V	300-150	796	19	0	12.2	0.1
ROJ	99	V	300-150	44	0	0	4.2	-0.8
ROM	99	V	300-150	31	0	0	5.8	4.8
ROU	99	V	300-150	5330	0	0	4.3	-0.2
RRR	99	V	300-150	168	0	0	3.3	0.3
RZO	99	V	300-150	44	0	11	5.2	1.4

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
SAM	99	V	300-150	230	7	0	10.4	0.3
SAS	99	V	300-150	5294	0	0	3.5	0.2
SIA	99	V	300-150	2289	0	0	3.9	0.0
SIO	99	V	300-150	66	0	0	4.3	-0.1
SJM	99	V	300-150	23	0	0	3.1	0.7
SLM	99	V	300-150	111	0	0	3.7	-0.1
SNO	99	V	300-150	23	0	0	3.5	-1.8
SOO	99	V	300-150	525	0	0	3.7	-0.0
SPA	99	V	300-150	211	0	0	3.7	0.4
SPU	99	V	300-150	114	0	0	7.4	0.2
SQC	99	V	300-150	585	0	0	4.9	-0.6
SUI	99	V	300-150	52	0	0	4.7	-0.3
SVA	99	V	300-150	3346	0	0	3.9	0.2
SVW	99	V	300-150	49	6	0	13.0	0.3
SWR	99	V	300-150	11803	0	0	3.8	0.2
SXN	99	V	300-150	73	0	0	2.8	0.2
TAM	99	V	300-150	442	0	0	3.9	0.2
TAP	99	V	300-150	997	0	0	4.5	0.6
TAR	99	V	300-150	383	0	0	3.5	-0.2
TAY	99	V	300-150	678	0	0	4.8	0.2
TCV	99	V	300-150	31	0	3	6.2	0.8
TCX	99	V	300-150	6997	0	0	3.6	0.2
TFF	99	V	300-150	32	0	0	3.8	0.8
TFL	99	V	300-150	1782	14	0	10.0	-0.0
TGM	99	V	300-150	64	0	0	4.1	0.9
THA	99	V	300-150	181	0	0	4.1	0.4
THT	99	V	300-150	3974	0	0	4.0	0.3
THY	99	V	300-150	9611	0	0	4.0	0.2
TJS	99	V	300-150	20	0	0	2.9	0.3
TMN	99	V	300-150	99	0	0	5.6	0.3
TOM	99	V	300-150	6861	15	0	10.1	0.1
TPJ	99	V	300-150	70	86	0	33.0	1.8
TRK	99	V	300-150	40	0	0	3.6	0.5
TSC	99	V	300-150	11223	0	0	3.8	0.2
TUA	99	V	300-150	35	43	0	24.0	-0.8
TWB	99	V	300-150	43	0	2	5.2	0.4
TWY	99	V	300-150	182	11	1	10.4	0.5
UAE	99	V	300-150	10219	0	0	4.0	0.1
UAL	99	V	300-150	88149	1	2	4.8	0.1
ULC	99	V	300-150	50	44	0	30.3	-0.3
UPS	99	V	300-150	4958	0	0	4.3	-0.1
VIR	99	V	300-150	26778	4	0	6.3	0.0
VJT	99	V	300-150	835	64	0	27.7	-0.1

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
VKG	99	V	300-150	208	0	0	3.6	0.2
VMP	99	V	300-150	108	44	0	14.5	0.9
VOZ	99	V	300-150	6041	0	0	4.4	0.1
VVJ	99	V	300-150	39	0	0	4.2	-0.2
WGT	99	V	300-150	196	0	0	4.3	0.6
WJA	99	V	300-150	4697	0	0	4.2	0.2
WOW	99	V	300-150	660	0	0	3.4	0.1
XAX	99	V	300-150	325	0	0	3.9	0.3
XLF	99	V	300-150	995	0	0	3.7	0.0
YZR	99	V	300-150	80	0	0	4.9	-1.4

4 EUCOS Area Monitoring Statistics

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

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

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

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RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
         LEVEL                 :  50 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : OCT 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
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WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	50	32	43.7	28.8
01001	00	Z	50	30	13.9	9.7
01028	00	Z	50	29	15.2	11.4
01028	12	Z	50	29	16.5	9.9
01400	12	Z	50	27	22.8	20.0
01400	00	Z	50	21	28.8	18.8
01415	00	Z	50	25	15.4	14.2
01415	12	Z	50	27	15.6	13.7
014154	12	Z	50	0	0.0	0.0
02365	00	Z	50	29	8.0	5.5
02365	12	Z	50	30	12.7	10.7
02591	12	Z	50	28	24.4	23.2
02591	00	Z	50	27	19.6	17.8
02836	00	Z	50	31	12.4	10.4
02836	12	Z	50	31	17.7	15.9
02963	12	Z	50	31	16.1	14.9
02963	00	Z	50	29	12.6	12.1
03005	00	Z	50	31	10.6	8.0
03005	12	Z	50	30	14.0	11.9
03238	00	Z	50	11	15.4	13.9
03238	12	Z	50	5	23.5	21.4
03808	12	Z	50	31	15.6	14.1
03808	00	Z	50	27	12.4	10.4
03918	00	Z	50	20	17.8	15.6
03918	12	Z	50	12	27.0	25.9
03953	12	Z	50	31	35.2	30.9
03953	00	Z	50	31	19.5	16.5
04018	12	Z	50	25	21.4	15.1
04018	00	Z	50	24	17.1	10.4
04220	12	Z	50	31	15.7	11.0
04220	00	Z	50	29	15.1	11.5
04270	12	Z	50	31	12.7	10.8
04270	00	Z	50	30	12.3	9.9
04320	12	Z	50	31	14.0	7.9
04320	00	Z	50	29	10.8	7.6
043204	00	Z	50	0	0.0	0.0
04339	12	Z	50	32	11.2	6.1
04339	00	Z	50	27	9.9	2.4
04360	00	Z	50	17	39.5	32.7

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
04360	12	Z	50	22	35.6	30.7
06011	12	Z	50	30	27.9	20.8
06011	00	Z	50	30	18.1	11.8
06260	12	Z	50	4	22.6	20.2
06260	00	Z	50	31	19.1	17.7
062604	12	Z	50	0	0.0	0.0
06610	12	Z	50	29	18.6	14.4
06610	00	Z	50	30	16.6	12.9
07110	12	Z	50	30	40.8	38.9
07110	00	Z	50	29	36.7	35.8
07510	00	Z	50	23	57.3	44.0
07510	12	Z	50	30	58.3	54.5
07645	12	Z	50	30	37.5	33.3
07645	00	Z	50	27	27.7	26.1
07761	00	Z	50	28	22.3	20.5
07761	12	Z	50	27	35.9	30.9
08001	12	Z	50	31	23.7	21.8
08001	00	Z	50	30	17.9	16.9
08221	00	Z	50	31	15.2	13.1
08221	12	Z	50	31	16.9	16.0
08302	12	Z	50	31	12.2	5.4
08302	00	Z	50	29	11.6	9.3
08508	00	Z	50	5	27.6	27.2
08508	12	Z	50	31	39.7	35.3
08522	12	Z	50	30	31.0	23.4
08579	00	Z	50	1	16.4	16.4
08579	12	Z	50	29	30.4	22.2
10035	12	Z	50	31	15.7	11.9
10035	00	Z	50	31	10.7	4.9
10393	00	Z	50	31	7.6	5.2
10393	12	Z	50	31	10.9	7.1
10410	00	Z	50	29	9.2	6.7
10410	12	Z	50	30	12.6	10.1
10739	00	Z	50	29	14.6	12.5
10739	12	Z	50	31	18.4	17.1
11035	12	Z	50	31	16.6	13.6
11035	00	Z	50	30	14.2	11.8
12982	00	Z	50	31	23.6	13.0
12982	12	Z	50	28	63.7	57.1
16080	00	Z	50	21	15.4	9.0
16080	12	Z	50	29	12.3	7.6
16245	00	Z	50	29	11.7	8.0
16245	12	Z	50	30	12.4	1.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16320	12	Z	50	27	14.7	11.6
16320	00	Z	50	15	19.0	18.2
16429	12	Z	50	38	8.9	3.3
16429	00	Z	50	37	11.4	9.7
16622	00	Z	50	31	30.8	24.0
16754	00	Z	50	30	29.9	26.4
17607	12	Z	50	9	12.5	-9.4
26435	00	Z	50	14	10.9	9.8
60018	00	Z	50	29	12.9	11.6
60018	12	Z	50	31	10.1	6.4
ASDE01	00	Z	50	8	40.5	-3.5
ASDE01	12	Z	50	5	37.8	35.9
ASDE03	12	Z	50	5	33.1	32.0
ASDE03	00	Z	50	5	16.5	15.3
ASDK01	12	Z	50	17	25.3	21.6
ASDK01	00	Z	50	13	45.1	16.1
ASDK02	12	Z	50	12	25.0	18.8
ASDK02	00	Z	50	9	41.0	33.3
ASDK03	12	Z	50	2	24.8	22.8
ASDK03	00	Z	50	2	216.8	-141.3
ASDK1	12	Z	50	17	22.4	16.3
ASDK1	00	Z	50	13	41.7	12.8
ASDK2	12	Z	50	12	22.6	12.7
ASDK2	00	Z	50	9	38.8	30.5
ASDK3	12	Z	50	2	29.5	26.1
ASDK3	00	Z	50	2	209.7	-139.5
ASEU01	12	Z	50	10	24.5	23.2
ASEU02	12	Z	50	7	45.7	45.5
ASEU02	00	Z	50	8	36.6	34.9
ASEU03	12	Z	50	10	61.1	46.5
ASEU03	00	Z	50	7	41.5	-2.6
ASEU04	00	Z	50	5	15.8	-12.3
ASEU04	12	Z	50	8	7.3	-1.8
ASEU06	00	Z	50	6	12.3	7.0
ASEU06	12	Z	50	8	46.0	44.1
ASFR1	00	Z	50	11	22.2	11.7
ASFR1	12	Z	50	11	25.3	22.2
ASFR2	12	Z	50	4	27.0	25.1
ASFR2	00	Z	50	2	26.2	25.7
ASFR3	12	Z	50	13	39.9	33.9
ASFR3	00	Z	50	15	22.8	18.0
ASFR4	12	Z	50	10	40.0	39.2
ASFR4	00	Z	50	10	35.6	34.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASUK2	12	Z	50	2	8.1	8.1
ASUK3	12	Z	50	27	43.2	9.6

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

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : WIND (M/S)
         LEVEL                 :  50 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : OCT 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	50	31	3.5	0.0	0.2
01001	00	V	50	29	3.3	0.8	0.0
01028	00	V	50	27	4.2	-1.6	0.3
01028	12	V	50	29	3.3	0.3	-0.1
01400	12	V	50	26	4.3	1.7	-0.1
01400	00	V	50	17	3.3	1.0	0.0
01415	00	V	50	24	3.7	0.2	0.0
01415	12	V	50	27	2.4	0.5	0.1
014154	12	V	50	0	0.0	0.0	0.0
02365	00	V	50	27	3.1	-0.8	-0.6
02365	12	V	50	30	3.6	-0.3	-1.1
02591	12	V	50	27	2.9	1.3	0.2
02591	00	V	50	26	3.6	-0.6	0.3
02836	00	V	50	29	2.9	-0.4	0.3
02836	12	V	50	31	3.1	-0.3	-0.2
02963	12	V	50	30	3.2	0.4	-0.7
02963	00	V	50	27	2.7	0.2	0.2
03005	00	V	50	30	3.6	0.5	0.1
03005	12	V	50	30	3.7	0.7	0.2
03238	00	V	50	11	4.5	1.6	-0.5
03238	12	V	50	5	4.3	0.8	-0.4
03808	12	V	50	29	3.8	0.7	0.4
03808	00	V	50	26	3.5	0.8	-0.2
03918	00	V	50	19	4.0	0.9	0.5
03918	12	V	50	11	3.8	1.0	-0.9
03953	12	V	50	31	3.5	0.7	0.0
03953	00	V	50	30	3.3	-0.5	1.0
04018	12	V	50	19	4.7	0.2	0.6
04018	00	V	50	20	3.7	0.8	-0.1
04220	12	V	50	31	3.8	0.1	0.6
04220	00	V	50	28	4.0	0.6	0.5
04270	12	V	50	30	4.8	-1.3	-0.3
04270	00	V	50	29	5.8	0.1	0.1
04320	12	V	50	30	4.3	0.2	-0.3
04320	00	V	50	28	4.0	0.2	-1.3
043204	00	V	50	0	0.0	0.0	0.0
04339	12	V	50	30	3.4	0.1	-0.1
04339	00	V	50	26	3.1	0.3	-0.1
04360	00	V	50	17	4.0	1.0	-1.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
04360	12	V	50	21	3.2	0.0	0.8
06011	12	V	50	30	3.7	0.6	-0.3
06011	00	V	50	29	3.1	-0.2	-0.3
06260	12	V	50	4	3.2	2.5	0.0
06260	00	V	50	30	3.3	-0.2	0.3
062604	12	V	50	0	0.0	0.0	0.0
06610	12	V	50	29	3.5	-0.1	0.2
06610	00	V	50	29	3.2	0.1	0.5
07110	12	V	50	30	3.2	0.3	0.6
07110	00	V	50	28	3.3	0.1	-0.8
07510	00	V	50	22	4.1	0.9	0.6
07510	12	V	50	30	3.8	1.3	0.6
07645	12	V	50	30	4.0	0.5	0.2
07645	00	V	50	26	4.1	0.4	0.3
07761	00	V	50	25	4.3	0.1	-0.1
07761	12	V	50	27	3.8	0.4	0.3
08001	12	V	50	30	3.3	0.7	0.4
08001	00	V	50	28	3.4	0.4	0.1
08221	00	V	50	28	3.6	0.7	1.2
08221	12	V	50	31	3.5	1.0	0.4
08302	12	V	50	31	4.2	1.1	0.7
08302	00	V	50	28	3.8	0.6	0.1
08508	00	V	50	2	2.6	1.3	-2.0
08508	12	V	50	29	4.0	0.3	-0.5
08522	12	V	50	29	3.6	0.7	0.3
08579	00	V	50	1	1.0	-0.8	-0.6
08579	12	V	50	29	3.0	0.3	0.3
10035	12	V	50	31	3.3	-0.8	0.2
10035	00	V	50	29	3.4	0.6	-0.1
10393	00	V	50	29	3.6	-0.3	-0.6
10393	12	V	50	31	3.5	0.2	-0.6
10410	00	V	50	28	3.8	0.0	0.7
10410	12	V	50	30	4.0	0.7	0.0
10739	00	V	50	28	3.5	0.1	0.7
10739	12	V	50	31	3.6	0.5	0.1
11035	12	V	50	31	3.2	0.6	0.0
11035	00	V	50	30	3.0	0.1	-0.7
12982	00	V	50	31	3.6	0.8	0.7
12982	12	V	50	26	4.2	-0.1	0.3
16080	00	V	50	21	3.4	0.4	-0.6
16080	12	V	50	29	3.3	0.4	0.4
16245	00	V	50	28	4.0	0.7	1.0
16245	12	V	50	30	3.4	0.6	0.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16320	12	V	50	27	4.0	0.8	0.1
16320	00	V	50	15	4.3	0.6	-0.2
16429	12	V	50	29	3.6	0.2	0.5
16429	00	V	50	28	5.1	0.6	1.8
16622	00	V	50	13	4.5	-0.5	-2.0
16754	00	V	50	30	3.3	0.1	0.1
17607	12	V	50	9	2.9	1.2	0.5
26435	00	V	50	14	3.7	0.4	0.5
60018	00	V	50	28	3.5	0.1	1.0
60018	12	V	50	31	3.7	0.7	-1.2
ASDE01	00	V	50	7	3.8	0.5	2.2
ASDE01	12	V	50	5	4.5	-2.9	-0.3
ASDE03	12	V	50	4	5.8	-1.2	-0.4
ASDE03	00	V	50	3	3.3	-1.2	-0.8
ASDK01	12	V	50	16	3.9	0.7	-0.3
ASDK01	00	V	50	12	4.3	0.6	0.9
ASDK02	12	V	50	12	4.1	0.5	0.7
ASDK02	00	V	50	8	4.5	1.3	0.2
ASDK03	12	V	50	1	1.4	-0.5	1.3
ASDK03	00	V	50	1	4.5	3.6	-2.7
ASDK1	12	V	50	16	3.7	0.2	-0.4
ASDK1	00	V	50	13	4.5	0.5	0.9
ASDK2	12	V	50	12	3.6	0.5	0.4
ASDK2	00	V	50	8	4.5	1.2	-0.3
ASDK3	12	V	50	1	0.5	0.4	0.3
ASDK3	00	V	50	1	6.8	5.7	-3.7
ASEU01	12	V	50	6	4.7	0.6	2.4
ASEU02	12	V	50	6	4.5	0.6	-0.3
ASEU02	00	V	50	8	5.9	0.0	-1.2
ASEU03	12	V	50	8	4.3	-1.7	1.5
ASEU03	00	V	50	5	2.0	-0.7	-0.2
ASEU04	00	V	50	5	4.0	-0.5	-1.4
ASEU04	12	V	50	8	4.2	0.3	-0.2
ASEU06	00	V	50	5	5.3	-0.8	-2.5
ASEU06	12	V	50	4	8.7	3.0	4.4
ASFR1	00	V	50	11	3.5	0.1	1.0
ASFR1	12	V	50	11	3.4	0.2	1.1
ASFR2	12	V	50	4	3.5	-1.7	-1.2
ASFR2	00	V	50	2	3.5	-2.6	0.0
ASFR3	12	V	50	13	4.0	0.1	0.6
ASFR3	00	V	50	15	3.3	0.1	0.2
ASFR4	12	V	50	10	4.5	2.5	0.3
ASFR4	00	V	50	10	3.3	-0.9	-0.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASUK2	12	V	50	2	3.6	2.9	1.7
ASUK3	12	V	50	27	5.0	1.3	-0.6

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                : OCT 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	100	32	32.1	16.1
01001	00	Z	100	30	9.6	0.9
01028	00	Z	100	30	9.9	0.7
01028	12	Z	100	31	10.7	1.4
01400	12	Z	100	27	13.4	8.0
01400	00	Z	100	22	21.2	8.1
01415	00	Z	100	25	5.6	4.2
01415	12	Z	100	27	7.3	4.0
014154	12	Z	100	0	0.0	0.0
02365	00	Z	100	30	6.0	-2.8
02365	12	Z	100	30	5.7	1.1
02591	12	Z	100	30	15.3	14.1
02591	00	Z	100	30	11.9	9.5
02836	00	Z	100	31	5.7	0.6
02836	12	Z	100	31	7.6	4.8
02963	12	Z	100	31	7.6	5.7
02963	00	Z	100	29	5.1	3.6
03005	00	Z	100	31	5.8	-0.5
03005	12	Z	100	31	6.3	2.7
03238	00	Z	100	11	10.0	8.3
03238	12	Z	100	5	11.3	10.6
03808	12	Z	100	31	8.1	4.8
03808	00	Z	100	28	6.4	2.6
03918	00	Z	100	20	9.0	6.6
03918	12	Z	100	12	12.9	10.6
03953	12	Z	100	31	18.9	15.8
03953	00	Z	100	31	10.1	7.3
04018	12	Z	100	28	13.8	7.9
04018	00	Z	100	26	14.0	0.5
04220	12	Z	100	31	8.0	1.5
04220	00	Z	100	30	10.6	3.5
04270	12	Z	100	31	7.5	2.6
04270	00	Z	100	31	8.3	4.5
04320	12	Z	100	31	10.4	3.1
04320	00	Z	100	30	6.7	0.2
043204	00	Z	100	0	0.0	0.0
04339	12	Z	100	33	8.5	0.0
04339	00	Z	100	30	7.3	-2.8
04360	00	Z	100	19	31.8	29.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
04360	12	Z	100	25	34.1	31.2
06011	12	Z	100	30	13.9	6.4
06011	00	Z	100	31	11.5	1.9
06260	12	Z	100	4	13.3	11.6
06260	00	Z	100	31	9.5	8.2
062604	12	Z	100	0	0.0	0.0
06610	12	Z	100	31	10.2	5.9
06610	00	Z	100	30	11.2	7.7
07110	12	Z	100	31	26.0	24.9
07110	00	Z	100	30	20.9	20.3
07510	00	Z	100	24	30.2	23.1
07510	12	Z	100	31	36.3	34.5
07645	12	Z	100	30	22.1	19.4
07645	00	Z	100	30	12.8	10.0
07761	00	Z	100	29	12.9	9.2
07761	12	Z	100	28	19.9	15.7
08001	12	Z	100	31	13.3	11.6
08001	00	Z	100	30	10.9	9.4
08221	00	Z	100	31	9.2	5.8
08221	12	Z	100	31	9.6	7.1
08302	12	Z	100	31	10.3	-5.6
08302	00	Z	100	31	5.0	-1.8
08508	00	Z	100	6	17.8	16.5
08508	12	Z	100	31	27.0	20.5
08522	12	Z	100	30	23.1	12.3
08579	00	Z	100	1	11.5	11.5
08579	12	Z	100	29	21.2	7.2
10035	12	Z	100	31	8.4	3.0
10035	00	Z	100	31	7.3	-1.9
10393	00	Z	100	31	5.4	-2.3
10393	12	Z	100	31	6.8	0.0
10410	00	Z	100	29	5.5	0.3
10410	12	Z	100	30	6.8	3.3
10739	00	Z	100	29	7.8	5.9
10739	12	Z	100	31	10.8	9.7
11035	12	Z	100	30	7.7	3.2
11035	00	Z	100	31	7.9	2.2
12982	00	Z	100	31	18.8	4.6
12982	12	Z	100	29	36.5	32.4
16080	00	Z	100	31	8.5	-1.0
16080	12	Z	100	31	8.6	-2.9
16245	00	Z	100	30	7.4	-2.7
16245	12	Z	100	31	13.1	-8.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16320	12	Z	100	29	6.7	2.7
16320	00	Z	100	30	33.0	5.4
16429	12	Z	100	39	8.9	-5.5
16429	00	Z	100	38	7.0	0.9
16622	00	Z	100	31	21.7	13.5
16754	00	Z	100	30	21.3	16.0
17607	12	Z	100	9	9.4	-6.3
26435	00	Z	100	15	5.2	-0.1
60018	00	Z	100	31	7.0	3.8
60018	12	Z	100	31	6.6	0.1
ASDE01	00	Z	100	10	25.1	-24.4
ASDE01	12	Z	100	8	17.8	0.4
ASDE03	12	Z	100	6	20.4	19.3
ASDE03	00	Z	100	9	8.7	6.9
ASDK01	12	Z	100	19	15.6	10.4
ASDK01	00	Z	100	17	34.9	6.9
ASDK02	12	Z	100	14	13.6	8.9
ASDK02	00	Z	100	13	82.5	33.8
ASDK03	12	Z	100	2	30.9	30.6
ASDK03	00	Z	100	2	17.0	17.0
ASDK1	12	Z	100	18	15.3	5.4
ASDK1	00	Z	100	14	37.9	2.4
ASDK2	12	Z	100	12	13.4	0.4
ASDK2	00	Z	100	10	92.2	40.0
ASDK3	12	Z	100	2	31.5	30.8
ASDK3	00	Z	100	2	18.6	18.5
ASEU01	12	Z	100	12	13.7	12.7
ASEU02	12	Z	100	9	36.3	35.7
ASEU02	00	Z	100	10	27.8	25.7
ASEU03	12	Z	100	12	34.3	26.5
ASEU03	00	Z	100	10	38.4	-6.6
ASEU04	00	Z	100	5	19.4	-17.4
ASEU04	12	Z	100	9	12.5	-10.5
ASEU06	00	Z	100	8	19.2	-9.3
ASEU06	12	Z	100	9	29.1	26.9
ASFR1	00	Z	100	12	18.1	0.4
ASFR1	12	Z	100	12	12.3	10.6
ASFR2	12	Z	100	5	16.6	14.8
ASFR2	00	Z	100	2	10.4	10.4
ASFR3	12	Z	100	14	22.9	18.2
ASFR3	00	Z	100	16	13.2	8.9
ASFR4	12	Z	100	10	24.7	20.6
ASFR4	00	Z	100	11	18.8	18.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASUK2	12	Z	100	2	3.3	1.5
ASUK3	12	Z	100	28	33.9	-0.1

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

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : WIND (M/S)
         LEVEL                 : 100 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : OCT 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	100	30	3.9	0.2	-0.4
01001	00	V	100	29	3.8	0.9	-0.2
01028	00	V	100	28	3.7	-0.2	-0.4
01028	12	V	100	31	3.3	-0.7	-1.0
01400	12	V	100	26	3.4	0.8	0.1
01400	00	V	100	18	2.3	-0.1	-0.1
01415	00	V	100	24	3.5	0.3	0.5
01415	12	V	100	27	2.6	0.4	-0.4
014154	12	V	100	0	0.0	0.0	0.0
02365	00	V	100	29	3.4	0.4	0.2
02365	12	V	100	30	3.3	-0.5	-0.6
02591	12	V	100	30	2.6	0.2	-0.6
02591	00	V	100	30	3.0	-0.2	0.5
02836	00	V	100	29	3.0	-0.5	0.0
02836	12	V	100	31	3.3	0.0	-0.2
02963	12	V	100	31	2.5	0.0	0.1
02963	00	V	100	28	2.5	0.3	0.5
03005	00	V	100	30	2.9	-0.5	-0.1
03005	12	V	100	31	3.4	-0.7	-0.7
03238	00	V	100	11	4.5	2.6	-1.1
03238	12	V	100	5	2.4	1.6	-0.7
03808	12	V	100	30	3.6	0.4	0.0
03808	00	V	100	27	3.5	-0.6	-1.0
03918	00	V	100	19	3.3	-0.6	-0.2
03918	12	V	100	12	2.6	1.2	0.0
03953	12	V	100	31	3.8	1.2	-0.6
03953	00	V	100	30	3.3	-0.3	-0.5
04018	12	V	100	27	5.5	0.1	-1.0
04018	00	V	100	24	4.5	1.0	0.7
04220	12	V	100	31	3.1	-0.4	0.0
04220	00	V	100	29	3.0	0.1	0.4
04270	12	V	100	30	4.1	-0.1	0.4
04270	00	V	100	30	4.6	-0.6	1.1
04320	12	V	100	31	3.8	0.0	-0.7
04320	00	V	100	29	4.3	0.3	-1.3
043204	00	V	100	0	0.0	0.0	0.0
04339	12	V	100	30	4.0	0.3	1.1
04339	00	V	100	29	4.8	0.5	1.1
04360	00	V	100	19	3.6	-0.2	-0.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
04360	12	V	100	23	2.8	-0.8	-0.5
06011	12	V	100	30	2.8	0.7	-0.4
06011	00	V	100	30	3.0	-0.2	-0.4
06260	12	V	100	4	3.1	1.1	-1.5
06260	00	V	100	30	2.9	0.1	0.1
062604	12	V	100	0	0.0	0.0	0.0
06610	12	V	100	31	3.4	0.6	0.5
06610	00	V	100	29	3.4	-0.4	-0.2
07110	12	V	100	31	2.1	0.4	0.1
07110	00	V	100	29	3.5	0.1	-0.4
07510	00	V	100	23	3.4	0.6	1.5
07510	12	V	100	29	3.1	0.9	0.5
07645	12	V	100	29	3.6	1.5	0.1
07645	00	V	100	29	3.8	-0.4	-0.6
07761	00	V	100	25	3.7	0.0	0.3
07761	12	V	100	28	4.0	0.7	0.3
08001	12	V	100	31	3.4	0.8	0.4
08001	00	V	100	28	3.7	0.4	0.6
08221	00	V	100	28	3.5	-0.6	0.6
08221	12	V	100	31	3.6	0.0	0.7
08302	12	V	100	31	3.8	1.1	-1.2
08302	00	V	100	30	3.6	0.3	-0.6
08508	00	V	100	6	3.1	0.1	0.6
08508	12	V	100	31	3.8	-0.4	0.0
08522	12	V	100	30	3.3	0.7	0.2
08579	00	V	100	1	1.0	-0.2	1.0
08579	12	V	100	29	3.3	0.8	-1.1
10035	12	V	100	31	4.1	-0.2	-0.3
10035	00	V	100	30	3.8	0.4	-0.8
10393	00	V	100	30	3.0	-0.7	-0.7
10393	12	V	100	31	2.6	0.4	0.1
10410	00	V	100	29	3.3	0.0	-0.3
10410	12	V	100	30	3.1	0.0	-0.8
10739	00	V	100	29	3.2	0.3	-0.3
10739	12	V	100	31	3.6	0.5	0.4
11035	12	V	100	30	3.4	-0.5	-0.1
11035	00	V	100	31	3.1	0.3	0.4
12982	00	V	100	31	3.7	-0.4	-0.2
12982	12	V	100	28	3.2	0.0	-0.5
16080	00	V	100	30	4.0	0.7	1.1
16080	12	V	100	31	4.0	1.1	0.1
16245	00	V	100	29	3.3	-0.6	0.6
16245	12	V	100	31	4.3	0.3	0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16320	12	V	100	29	3.3	0.0	0.0
16320	00	V	100	29	4.4	0.8	0.8
16429	12	V	100	30	3.9	0.1	0.2
16429	00	V	100	29	4.1	0.9	0.3
16622	00	V	100	15	4.5	0.2	0.4
16754	00	V	100	30	4.2	-0.1	0.5
17607	12	V	100	9	4.0	0.5	0.5
26435	00	V	100	15	2.6	0.3	-0.4
60018	00	V	100	30	3.9	0.6	-0.2
60018	12	V	100	31	4.2	0.2	0.9
ASDE01	00	V	100	9	3.5	1.7	-0.4
ASDE01	12	V	100	7	4.4	-0.4	-0.5
ASDE03	12	V	100	6	3.6	0.8	0.8
ASDE03	00	V	100	6	3.1	1.0	-0.3
ASDK01	12	V	100	17	2.6	-0.1	0.6
ASDK01	00	V	100	12	3.0	-0.3	0.6
ASDK02	12	V	100	13	4.7	-1.0	-1.4
ASDK02	00	V	100	12	3.5	0.2	-0.1
ASDK03	12	V	100	2	3.3	2.2	1.2
ASDK03	00	V	100	2	5.7	-4.1	0.7
ASDK1	12	V	100	17	2.4	0.5	0.0
ASDK1	00	V	100	13	3.6	0.5	0.9
ASDK2	12	V	100	12	4.5	-0.8	-1.4
ASDK2	00	V	100	10	3.2	-0.1	0.9
ASDK3	12	V	100	2	2.1	1.0	-0.1
ASDK3	00	V	100	2	4.9	-3.2	1.1
ASEU01	12	V	100	6	3.5	-0.1	1.8
ASEU02	12	V	100	8	3.6	-2.0	-0.1
ASEU02	00	V	100	8	3.6	-0.1	1.1
ASEU03	12	V	100	9	4.0	-0.7	2.5
ASEU03	00	V	100	8	3.0	-1.1	0.2
ASEU04	00	V	100	5	4.6	0.1	0.7
ASEU04	12	V	100	8	3.1	0.6	0.4
ASEU06	00	V	100	7	9.1	-3.2	4.2
ASEU06	12	V	100	5	8.9	-3.2	2.6
ASFR1	00	V	100	12	3.9	-0.4	1.9
ASFR1	12	V	100	12	3.5	1.0	-0.3
ASFR2	12	V	100	4	5.4	-2.5	-2.6
ASFR2	00	V	100	2	3.0	2.1	-1.0
ASFR3	12	V	100	14	3.9	0.4	-0.4
ASFR3	00	V	100	15	3.7	-0.7	-0.2
ASFR4	12	V	100	10	3.7	0.0	1.3
ASFR4	00	V	100	10	2.5	-0.7	0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASUK2	12	V	100	2	1.3	0.7	-0.8
ASUK3	12	V	100	28	4.5	0.6	0.5

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                : OCT 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	500	32	18.3	8.0
01001	00	Z	500	30	7.6	3.3
01028	00	Z	500	31	5.8	2.4
01028	12	Z	500	31	4.5	0.6
01400	12	Z	500	29	8.1	1.3
01400	00	Z	500	23	20.3	8.2
01415	00	Z	500	25	4.9	3.1
01415	12	Z	500	27	5.1	1.8
014154	12	Z	500	0	0.0	0.0
02365	00	Z	500	30	3.8	-1.1
02365	12	Z	500	30	3.0	1.0
02591	12	Z	500	30	10.3	9.2
02591	00	Z	500	30	8.8	7.8
02836	00	Z	500	31	3.9	2.0
02836	12	Z	500	31	3.4	2.0
02963	12	Z	500	31	5.0	4.1
02963	00	Z	500	31	4.5	3.9
03005	00	Z	500	31	2.9	0.7
03005	12	Z	500	31	4.4	1.0
03238	00	Z	500	11	8.5	7.4
03238	12	Z	500	5	8.3	7.5
03808	12	Z	500	33	5.4	2.4
03808	00	Z	500	28	3.7	1.8
03918	00	Z	500	20	6.6	5.7
03918	12	Z	500	12	6.4	4.9
03953	12	Z	500	31	9.0	4.9
03953	00	Z	500	31	5.1	0.4
04018	12	Z	500	30	6.3	1.7
04018	00	Z	500	27	7.8	0.4
04220	12	Z	500	31	4.6	2.8
04220	00	Z	500	31	8.4	3.0
04270	12	Z	500	32	5.7	0.4
04270	00	Z	500	31	4.6	-0.6
04320	12	Z	500	31	7.2	3.8
04320	00	Z	500	30	6.2	3.2
043204	00	Z	500	0	0.0	0.0
04339	12	Z	500	34	5.6	1.3
04339	00	Z	500	31	5.6	0.4
04360	00	Z	500	24	41.6	41.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
04360	12	Z	500	30	39.6	39.2
06011	12	Z	500	31	7.0	1.1
06011	00	Z	500	31	13.3	2.8
06260	12	Z	500	4	5.6	4.6
06260	00	Z	500	31	5.1	3.1
062604	12	Z	500	1	3.0	-3.0
06610	12	Z	500	31	4.8	3.3
06610	00	Z	500	30	6.3	5.7
07110	12	Z	500	31	10.0	8.5
07110	00	Z	500	30	9.3	7.1
07510	00	Z	500	24	10.3	9.0
07510	12	Z	500	31	14.1	12.7
07645	12	Z	500	31	9.6	6.0
07645	00	Z	500	31	6.3	2.7
07761	00	Z	500	30	4.9	-1.9
07761	12	Z	500	31	4.6	0.8
08001	12	Z	500	31	8.4	7.9
08001	00	Z	500	30	8.2	7.4
08221	00	Z	500	31	6.2	5.3
08221	12	Z	500	31	7.5	5.8
08302	12	Z	500	31	5.6	-3.0
08302	00	Z	500	31	3.2	-1.4
08508	00	Z	500	6	14.6	13.7
08508	12	Z	500	31	23.0	15.4
08522	12	Z	500	30	20.1	10.3
08579	00	Z	500	1	17.4	17.4
08579	12	Z	500	30	18.7	3.4
10035	12	Z	500	32	4.3	0.0
10035	00	Z	500	31	4.8	-1.2
10393	00	Z	500	31	3.6	-1.4
10393	12	Z	500	31	4.4	-1.6
10410	00	Z	500	29	5.4	-2.0
10410	12	Z	500	30	4.9	-1.2
10739	00	Z	500	29	7.2	6.6
10739	12	Z	500	31	7.7	6.7
11035	12	Z	500	30	4.2	0.2
11035	00	Z	500	31	5.3	1.3
12982	00	Z	500	31	14.4	3.3
12982	12	Z	500	31	8.5	5.5
16080	00	Z	500	31	6.4	-4.6
16080	12	Z	500	31	6.9	-5.9
16245	00	Z	500	31	9.2	-6.7
16245	12	Z	500	31	12.0	-11.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16320	12	Z	500	29	6.3	-2.3
16320	00	Z	500	31	8.0	5.3
16429	12	Z	500	39	7.7	-6.2
16429	00	Z	500	38	5.4	-2.9
16622	00	Z	500	31	16.0	10.1
16754	00	Z	500	30	16.8	10.6
17607	12	Z	500	9	5.4	1.9
26435	00	Z	500	15	5.1	1.4
60018	00	Z	500	31	3.4	0.7
60018	12	Z	500	31	3.6	1.3
ASDE01	00	Z	500	11	36.4	-34.5
ASDE01	12	Z	500	10	29.7	-29.2
ASDE03	12	Z	500	8	4.4	2.3
ASDE03	00	Z	500	11	3.6	-0.7
ASDK01	12	Z	500	19	10.6	6.0
ASDK01	00	Z	500	17	39.5	3.1
ASDK02	12	Z	500	16	10.9	5.7
ASDK02	00	Z	500	15	18.2	12.1
ASDK03	12	Z	500	5	20.6	19.0
ASDK03	00	Z	500	4	25.6	24.9
ASDK1	12	Z	500	18	9.4	2.4
ASDK1	00	Z	500	14	43.3	-2.7
ASDK2	12	Z	500	12	11.8	-1.7
ASDK2	00	Z	500	11	16.0	9.5
ASDK3	12	Z	500	2	27.8	27.8
ASDK3	00	Z	500	4	24.3	24.0
ASEU01	12	Z	500	12	10.1	8.7
ASEU02	12	Z	500	9	31.1	30.2
ASEU02	00	Z	500	10	29.7	28.9
ASEU03	12	Z	500	14	31.4	-2.5
ASEU03	00	Z	500	14	47.6	-17.8
ASEU04	00	Z	500	7	15.9	-11.5
ASEU04	12	Z	500	9	13.8	-12.6
ASEU06	00	Z	500	11	47.3	1.4
ASEU06	12	Z	500	13	8.2	5.3
ASFR1	00	Z	500	12	16.9	-12.0
ASFR1	12	Z	500	13	8.6	-5.1
ASFR2	12	Z	500	5	6.8	6.5
ASFR2	00	Z	500	2	8.2	8.0
ASFR3	12	Z	500	16	4.9	1.2
ASFR3	00	Z	500	17	7.6	-3.8
ASFR4	12	Z	500	12	8.8	-0.9
ASFR4	00	Z	500	13	5.3	-0.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASUK2	12	Z	500	2	2.8	1.7
ASUK3	12	Z	500	29	14.6	0.5

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

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RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : WIND (M/S)
         LEVEL                 : 500 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : OCT 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	500	31	3.4	-0.3	-0.6
01001	00	V	500	29	3.1	0.3	0.1
01028	00	V	500	28	2.3	0.6	-0.4
01028	12	V	500	31	2.2	-0.1	-0.2
01400	12	V	500	28	2.3	0.3	0.2
01400	00	V	500	22	2.6	-0.2	-0.2
01415	00	V	500	24	2.8	0.2	0.2
01415	12	V	500	27	2.9	0.2	0.6
014154	12	V	500	0	0.0	0.0	0.0
02365	00	V	500	29	2.2	0.1	0.0
02365	12	V	500	30	2.1	0.5	-0.1
02591	12	V	500	30	2.3	0.3	0.9
02591	00	V	500	30	3.0	0.3	0.0
02836	00	V	500	29	2.6	-0.3	0.5
02836	12	V	500	31	2.3	0.3	-0.3
02963	12	V	500	31	2.1	0.1	-0.6
02963	00	V	500	30	1.8	0.0	-0.1
03005	00	V	500	30	2.9	0.4	-0.2
03005	12	V	500	31	2.8	-0.3	-0.3
03238	00	V	500	11	2.0	1.0	0.8
03238	12	V	500	5	1.9	0.6	-0.6
03808	12	V	500	31	3.0	-0.5	0.0
03808	00	V	500	27	2.8	-0.3	-0.2
03918	00	V	500	19	2.4	0.1	0.5
03918	12	V	500	12	2.8	0.2	-0.5
03953	12	V	500	31	3.1	-0.3	0.1
03953	00	V	500	30	3.0	0.5	0.2
04018	12	V	500	29	2.7	0.1	0.1
04018	00	V	500	24	3.1	-0.4	0.3
04220	12	V	500	31	2.8	-0.1	0.2
04220	00	V	500	30	2.7	0.5	-0.1
04270	12	V	500	31	3.6	-0.1	1.3
04270	00	V	500	30	3.5	-0.2	0.0
04320	12	V	500	31	3.4	0.1	0.5
04320	00	V	500	29	2.9	-0.2	-0.6
043204	00	V	500	0	0.0	0.0	0.0
04339	12	V	500	31	3.0	0.4	0.2
04339	00	V	500	29	3.3	0.1	0.5
04360	00	V	500	24	4.0	1.2	0.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
04360	12	V	500	28	4.2	-0.2	0.3
06011	12	V	500	31	2.1	0.4	-0.1
06011	00	V	500	30	2.8	-0.2	-0.8
06260	12	V	500	4	1.8	0.0	0.1
06260	00	V	500	30	2.5	-0.2	0.9
062604	12	V	500	1	1.7	-0.8	-1.5
06610	12	V	500	31	4.3	0.1	1.1
06610	00	V	500	29	3.1	0.3	-0.3
07110	12	V	500	31	4.0	-0.7	0.6
07110	00	V	500	29	3.4	0.9	0.0
07510	00	V	500	23	3.1	-0.2	1.0
07510	12	V	500	31	3.4	0.9	0.3
07645	12	V	500	31	3.6	0.2	0.2
07645	00	V	500	30	2.9	0.6	0.5
07761	00	V	500	26	3.0	0.3	0.0
07761	12	V	500	30	2.9	0.5	0.8
08001	12	V	500	30	3.5	0.1	0.1
08001	00	V	500	28	2.2	0.3	0.4
08221	00	V	500	30	4.0	0.6	-0.1
08221	12	V	500	31	2.8	0.0	-0.2
08302	12	V	500	31	2.5	0.0	-0.5
08302	00	V	500	29	2.5	0.2	0.9
08508	00	V	500	6	3.0	0.5	0.0
08508	12	V	500	31	3.4	0.3	0.2
08522	12	V	500	30	2.6	0.1	-0.4
08579	00	V	500	1	2.7	-1.1	-2.5
08579	12	V	500	30	2.9	0.0	-0.4
10035	12	V	500	31	2.7	0.1	-0.1
10035	00	V	500	30	2.5	-0.2	-0.6
10393	00	V	500	30	3.3	0.0	0.5
10393	12	V	500	31	2.6	0.6	0.1
10410	00	V	500	29	3.1	0.2	0.2
10410	12	V	500	30	2.5	0.1	-0.1
10739	00	V	500	29	2.1	0.3	0.1
10739	12	V	500	31	2.4	0.1	0.1
11035	12	V	500	30	3.5	0.4	0.1
11035	00	V	500	31	2.7	0.9	0.1
12982	00	V	500	31	3.5	-0.4	-0.1
12982	12	V	500	30	2.3	-0.6	0.1
16080	00	V	500	30	2.5	0.6	-0.5
16080	12	V	500	31	2.5	0.0	0.4
16245	00	V	500	30	3.3	-0.1	0.5
16245	12	V	500	31	2.5	0.7	0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16320	12	V	500	29	2.7	0.8	0.4
16320	00	V	500	30	3.5	0.9	0.5
16429	12	V	500	30	2.8	0.7	-0.1
16429	00	V	500	29	3.7	0.9	0.3
16622	00	V	500	29	3.4	-0.4	0.2
16754	00	V	500	30	3.2	0.0	0.4
17607	12	V	500	9	2.2	0.9	0.7
26435	00	V	500	15	2.1	0.5	0.0
60018	00	V	500	30	2.8	-0.2	0.4
60018	12	V	500	31	3.2	0.4	0.1
ASDE01	00	V	500	10	2.8	-0.3	-0.2
ASDE01	12	V	500	9	1.9	0.1	-0.1
ASDE03	12	V	500	8	2.2	1.1	0.5
ASDE03	00	V	500	9	3.4	0.9	-0.3
ASDK01	12	V	500	18	2.2	0.4	0.1
ASDK01	00	V	500	13	2.9	-0.6	-0.8
ASDK02	12	V	500	14	2.2	-0.1	-0.1
ASDK02	00	V	500	13	2.4	-0.2	0.5
ASDK03	12	V	500	3	4.0	-0.5	2.8
ASDK03	00	V	500	4	1.8	0.2	0.4
ASDK1	12	V	500	18	2.9	0.1	-1.0
ASDK1	00	V	500	14	4.6	-0.1	-1.1
ASDK2	12	V	500	12	3.0	0.2	-0.7
ASDK2	00	V	500	11	2.2	0.5	0.2
ASDK3	12	V	500	2	2.0	1.8	0.3
ASDK3	00	V	500	4	4.4	1.3	0.8
ASEU01	12	V	500	9	2.4	-0.3	-0.1
ASEU02	12	V	500	8	2.5	0.7	-1.3
ASEU02	00	V	500	8	2.5	-1.0	0.3
ASEU03	12	V	500	13	3.6	0.1	0.4
ASEU03	00	V	500	13	3.4	-0.7	0.4
ASEU04	00	V	500	7	1.9	0.2	-1.0
ASEU04	12	V	500	8	3.6	1.3	1.2
ASEU06	00	V	500	11	8.7	-0.1	-0.7
ASEU06	12	V	500	12	5.6	-0.8	0.5
ASFR1	00	V	500	12	2.5	0.4	0.7
ASFR1	12	V	500	13	3.6	-1.1	0.7
ASFR2	12	V	500	4	1.9	0.0	1.0
ASFR2	00	V	500	2	2.7	-1.7	0.8
ASFR3	12	V	500	16	3.3	-0.2	-0.1
ASFR3	00	V	500	16	3.4	-0.3	1.6
ASFR4	12	V	500	12	3.9	-0.4	0.0
ASFR4	00	V	500	11	4.3	0.3	-0.9

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASUK2	12	V	500	2	3.1	2.6	1.0
ASUK3	12	V	500	29	2.9	0.5	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                : OCT 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	850	32	12.6	3.4
01001	00	Z	850	30	6.7	3.2
01028	00	Z	850	32	3.3	0.9
01028	12	Z	850	31	3.3	-0.4
01400	12	Z	850	29	6.2	-0.8
01400	00	Z	850	24	19.3	8.1
01415	00	Z	850	25	3.9	2.4
01415	12	Z	850	27	4.1	1.4
014154	12	Z	850	1	0.0	0.0
02365	00	Z	850	30	2.2	0.6
02365	12	Z	850	30	2.0	0.1
02591	12	Z	850	30	7.9	7.7
02591	00	Z	850	30	8.6	8.1
02836	00	Z	850	31	2.7	1.9
02836	12	Z	850	31	2.1	0.9
02963	12	Z	850	31	3.5	2.7
02963	00	Z	850	31	4.1	3.6
03005	00	Z	850	31	2.6	0.0
03005	12	Z	850	31	2.6	-0.7
03238	00	Z	850	11	5.7	5.0
03238	12	Z	850	5	4.6	4.1
03808	12	Z	850	35	5.1	1.7
03808	00	Z	850	28	2.2	0.9
03918	00	Z	850	20	6.1	5.7
03918	12	Z	850	12	6.0	5.3
03953	12	Z	850	31	4.1	3.2
03953	00	Z	850	31	3.8	1.8
04018	12	Z	850	30	4.3	-1.1
04018	00	Z	850	29	5.3	-0.7
04220	12	Z	850	32	3.3	2.3
04220	00	Z	850	31	8.2	4.6
04270	12	Z	850	32	4.7	0.8
04270	00	Z	850	31	4.4	0.6
04320	12	Z	850	31	3.9	1.8
04320	00	Z	850	30	4.0	1.2
043204	00	Z	850	1	9.2	9.2
04339	12	Z	850	34	3.7	0.8
04339	00	Z	850	31	6.1	1.4
04360	00	Z	850	27	44.6	44.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
04360	12	Z	850	33	43.2	43.0
06011	12	Z	850	31	3.6	2.5
06011	00	Z	850	31	10.4	4.1
06260	12	Z	850	4	2.1	-0.9
06260	00	Z	850	31	3.1	0.9
062604	12	Z	850	1	1.1	-1.1
06610	12	Z	850	31	4.1	2.2
06610	00	Z	850	31	3.8	3.3
07110	12	Z	850	31	2.5	1.5
07110	00	Z	850	30	2.4	1.1
07510	00	Z	850	24	4.0	3.2
07510	12	Z	850	31	5.7	4.5
07645	12	Z	850	32	3.7	2.0
07645	00	Z	850	31	2.9	0.1
07761	00	Z	850	29	3.8	-2.7
07761	12	Z	850	32	3.9	-2.1
08001	12	Z	850	31	5.2	4.4
08001	00	Z	850	31	6.0	5.6
08221	00	Z	850	31	4.5	3.4
08221	12	Z	850	31	2.8	1.9
08302	12	Z	850	31	3.6	-3.1
08302	00	Z	850	32	3.2	-2.4
08508	00	Z	850	6	8.0	7.4
08508	12	Z	850	31	19.5	10.8
08522	12	Z	850	30	16.8	6.2
08579	00	Z	850	1	7.6	7.6
08579	12	Z	850	30	17.8	-1.2
10035	12	Z	850	32	2.9	0.4
10035	00	Z	850	31	3.1	0.5
10393	00	Z	850	31	2.7	-1.0
10393	12	Z	850	31	2.3	-1.4
10410	00	Z	850	29	3.9	-2.6
10410	12	Z	850	30	3.7	-3.0
10739	00	Z	850	29	7.3	7.0
10739	12	Z	850	31	6.7	6.1
11035	12	Z	850	30	4.0	0.4
11035	00	Z	850	31	3.8	1.1
12982	00	Z	850	31	15.5	2.8
12982	12	Z	850	31	4.3	2.6
16080	00	Z	850	31	6.2	-4.9
16080	12	Z	850	31	7.9	-7.4
16245	00	Z	850	31	8.0	-6.2
16245	12	Z	850	31	11.8	-10.8

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16320	12	Z	850	31	7.8	-3.2
16320	00	Z	850	32	9.0	2.3
16429	12	Z	850	39	7.3	-5.6
16429	00	Z	850	38	5.2	-3.5
16622	00	Z	850	31	12.1	9.7
16754	00	Z	850	30	13.8	6.4
17607	12	Z	850	9	2.7	1.6
26435	00	Z	850	15	3.1	0.1
60018	00	Z	850	31	3.9	-3.1
60018	12	Z	850	31	3.5	-2.6
ASDE01	00	Z	850	11	41.6	-41.1
ASDE01	12	Z	850	10	40.9	-40.5
ASDE03	12	Z	850	8	3.7	-1.2
ASDE03	00	Z	850	10	4.2	-1.4
ASDK01	12	Z	850	19	7.4	5.4
ASDK01	00	Z	850	18	21.7	12.3
ASDK02	12	Z	850	16	10.7	6.6
ASDK02	00	Z	850	15	19.6	12.9
ASDK03	12	Z	850	10	24.7	23.1
ASDK03	00	Z	850	7	27.5	27.0
ASDK1	12	Z	850	18	9.5	5.7
ASDK1	00	Z	850	15	21.6	13.3
ASDK2	12	Z	850	12	11.2	2.7
ASDK2	00	Z	850	11	20.0	12.4
ASDK3	12	Z	850	2	30.8	30.5
ASDK3	00	Z	850	7	29.3	28.8
ASEU01	12	Z	850	12	6.6	3.3
ASEU02	12	Z	850	9	29.3	29.2
ASEU02	00	Z	850	10	27.1	26.9
ASEU03	12	Z	850	14	25.7	-2.4
ASEU03	00	Z	850	14	45.2	-14.3
ASEU04	00	Z	850	8	18.9	-18.0
ASEU04	12	Z	850	10	17.2	-16.3
ASEU06	00	Z	850	12	14.1	-3.2
ASEU06	12	Z	850	13	8.6	1.0
ASFR1	00	Z	850	12	9.9	-9.5
ASFR1	12	Z	850	13	10.3	-7.9
ASFR2	12	Z	850	5	7.0	5.7
ASFR2	00	Z	850	2	6.9	6.5
ASFR3	12	Z	850	17	4.9	-2.0
ASFR3	00	Z	850	17	6.2	-3.7
ASFR4	12	Z	850	12	6.7	-4.1
ASFR4	00	Z	850	13	4.7	-2.7

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASUK2	12	Z	850	2	1.8	1.7
ASUK3	12	Z	850	28	5.4	0.8

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

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : WIND (M/S)
         LEVEL                 : 850 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : OCT 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	850	31	3.9	0.6	0.1
01001	00	V	850	29	4.4	1.0	-0.4
01028	00	V	850	29	2.8	0.5	-0.5
01028	12	V	850	31	3.0	-0.2	-0.2
01400	12	V	850	29	2.2	0.2	-0.3
01400	00	V	850	23	2.3	0.3	0.0
01415	00	V	850	24	3.6	-0.3	1.0
01415	12	V	850	27	3.4	-0.3	0.3
014154	12	V	850	1	19.0	-12.8	-14.0
02365	00	V	850	29	1.5	-0.1	-0.1
02365	12	V	850	30	2.2	0.2	-0.2
02591	12	V	850	30	2.5	0.6	-0.6
02591	00	V	850	30	2.3	-0.3	-0.1
02836	00	V	850	29	1.8	0.1	0.1
02836	12	V	850	31	2.7	-0.1	-0.9
02963	12	V	850	31	2.6	0.4	-0.2
02963	00	V	850	30	2.0	-0.3	-0.1
03005	00	V	850	30	2.9	-0.3	0.1
03005	12	V	850	31	2.3	-0.1	-0.1
03238	00	V	850	11	1.7	0.2	-0.2
03238	12	V	850	5	2.7	-0.8	0.3
03808	12	V	850	31	2.4	0.3	0.0
03808	00	V	850	27	2.7	-0.1	-0.5
03918	00	V	850	19	2.6	0.6	-0.1
03918	12	V	850	12	2.3	0.2	-0.3
03953	12	V	850	31	2.9	0.3	0.1
03953	00	V	850	30	2.8	0.7	0.2
04018	12	V	850	29	3.1	0.5	-0.6
04018	00	V	850	25	2.9	0.2	-0.5
04220	12	V	850	31	2.5	0.1	0.2
04220	00	V	850	30	2.3	-0.3	0.1
04270	12	V	850	31	4.1	0.8	0.8
04270	00	V	850	30	3.5	-0.1	0.6
04320	12	V	850	31	3.9	0.2	0.9
04320	00	V	850	29	3.7	0.7	1.0
043204	00	V	850	1	5.1	-4.9	1.4
04339	12	V	850	31	4.2	-0.1	0.7
04339	00	V	850	29	4.0	0.0	0.1
04360	00	V	850	27	7.0	1.8	-1.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
04360	12	V	850	30	6.4	2.0	0.3
06011	12	V	850	31	2.2	-0.2	0.0
06011	00	V	850	30	2.8	0.1	-0.4
06260	12	V	850	4	2.2	-0.5	0.5
06260	00	V	850	30	2.3	-0.1	-0.1
062604	12	V	850	1	1.4	1.1	-0.9
06610	12	V	850	31	3.6	1.2	0.9
06610	00	V	850	30	3.3	1.3	0.4
07110	12	V	850	31	3.3	-0.2	-0.8
07110	00	V	850	29	3.6	0.0	-1.2
07510	00	V	850	23	3.4	0.2	-0.3
07510	12	V	850	31	4.0	0.9	1.3
07645	12	V	850	31	4.5	0.0	-0.5
07645	00	V	850	30	3.5	0.2	-0.5
07761	00	V	850	26	3.8	0.6	-0.7
07761	12	V	850	31	4.4	0.7	0.2
08001	12	V	850	30	2.9	0.4	-0.1
08001	00	V	850	29	3.7	0.9	0.1
08221	00	V	850	30	2.8	0.3	0.3
08221	12	V	850	31	2.2	0.0	0.1
08302	12	V	850	31	3.0	-0.1	0.3
08302	00	V	850	29	2.8	0.1	-0.8
08508	00	V	850	6	3.1	0.1	-1.7
08508	12	V	850	31	2.8	0.9	-0.1
08522	12	V	850	30	3.3	-0.4	-0.1
08579	00	V	850	1	4.1	-4.1	-0.3
08579	12	V	850	29	2.5	1.1	0.0
10035	12	V	850	31	2.4	0.3	-0.1
10035	00	V	850	30	2.2	0.3	-0.1
10393	00	V	850	30	2.7	-0.2	0.3
10393	12	V	850	31	2.1	0.2	0.0
10410	00	V	850	29	2.5	0.6	-0.5
10410	12	V	850	30	2.2	-0.2	0.3
10739	00	V	850	29	2.4	-0.2	0.0
10739	12	V	850	31	3.1	0.0	0.5
11035	12	V	850	30	2.8	0.6	-0.2
11035	00	V	850	31	2.6	0.2	0.1
12982	00	V	850	31	3.5	0.8	-0.2
12982	12	V	850	30	3.5	-0.4	-0.2
16080	00	V	850	30	2.6	-0.1	0.1
16080	12	V	850	31	2.8	0.2	-0.6
16245	00	V	850	30	3.5	0.0	0.3
16245	12	V	850	31	3.0	-0.2	-0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16320	12	V	850	30	2.6	0.3	-0.1
16320	00	V	850	30	3.7	0.4	0.3
16429	12	V	850	30	2.8	0.6	0.7
16429	00	V	850	29	3.9	-0.6	0.1
16622	00	V	850	29	3.8	-0.5	-0.3
16754	00	V	850	30	2.8	0.7	0.3
17607	12	V	850	9	2.8	0.2	0.3
26435	00	V	850	15	2.5	-0.2	-0.6
60018	00	V	850	30	3.5	-0.5	0.4
60018	12	V	850	31	3.4	-0.3	0.4
ASDE01	00	V	850	11	2.5	-0.1	0.0
ASDE01	12	V	850	9	2.4	0.7	0.3
ASDE03	12	V	850	8	3.5	-0.5	-0.9
ASDE03	00	V	850	9	2.5	-0.1	0.6
ASDK01	12	V	850	18	3.1	-0.1	1.3
ASDK01	00	V	850	14	2.8	-0.9	-0.2
ASDK02	12	V	850	14	3.1	0.4	-0.5
ASDK02	00	V	850	13	2.9	0.6	0.2
ASDK03	12	V	850	9	3.0	-0.5	1.6
ASDK03	00	V	850	7	2.4	-0.4	-0.3
ASDK1	12	V	850	18	4.0	0.5	0.9
ASDK1	00	V	850	15	3.3	-0.6	0.1
ASDK2	12	V	850	12	3.0	0.2	-0.5
ASDK2	00	V	850	11	3.6	0.0	0.3
ASDK3	12	V	850	2	6.5	-3.6	3.0
ASDK3	00	V	850	7	3.3	-0.8	0.2
ASEU01	12	V	850	10	2.8	1.1	0.7
ASEU02	12	V	850	8	2.0	0.3	-0.7
ASEU02	00	V	850	8	2.5	-0.3	-1.5
ASEU03	12	V	850	13	3.0	0.1	-0.3
ASEU03	00	V	850	13	3.5	0.0	-0.2
ASEU04	00	V	850	7	3.2	-0.7	0.3
ASEU04	12	V	850	9	3.3	1.5	1.0
ASEU06	00	V	850	9	6.0	-0.3	-0.3
ASEU06	12	V	850	13	3.1	-0.7	0.1
ASFR1	00	V	850	12	2.5	1.1	0.5
ASFR1	12	V	850	13	3.1	-0.3	-0.5
ASFR2	12	V	850	4	6.3	-2.8	-3.0
ASFR2	00	V	850	2	3.4	1.3	0.5
ASFR3	12	V	850	16	4.8	-0.4	0.1
ASFR3	00	V	850	16	2.9	-0.8	0.2
ASFR4	12	V	850	12	4.7	-0.3	-1.3
ASFR4	00	V	850	11	3.5	0.4	0.8

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASUK2	12	V	850	2	1.4	-0.4	0.9
ASUK3	12	V	850	28	3.3	-0.9	0.2

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

```
DRIFTER MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE      : ECMWF
         ELEMENT MONITORED      : SURFACE PRESSURE (HPA)
         AREA                   : 10N - 90N, 70W - 40E
         PERIOD                 : OCT 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD


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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
03380	99	P	SUR	54	0	747	0	0.3	-0.2	0.3
1300001	99	P	SUR	11	-23	720	0	0.4	-0.1	0.4
1300515	99	P	SUR	30	-54	707	0	0.3	0.1	0.3
1300572	99	P	SUR	22	-41	739	0	0.3	0.0	0.3
1300633	99	P	SUR	26	-52	737	0	0.4	-0.7	0.8
1300665	99	P	SUR	18	-46	737	0	0.4	0.2	0.5
1300868	99	P	SUR	26	-21	738	0	0.3	0.4	0.5
1300869	99	P	SUR	21	-44	737	0	0.3	0.0	0.3
1300871	99	P	SUR	23	-43	639	0	0.3	0.3	0.4
1300872	99	P	SUR	26	-51	727	0	0.3	0.3	0.4
1301500	99	P	SUR	17	-48	734	0	0.4	-0.2	0.4
1301501	99	P	SUR	21	-36	731	0	0.3	0.3	0.5
1301502	99	P	SUR	25	-39	730	0	0.3	0.4	0.5
13515	99	P	SUR	30	-54	619	0	0.3	0.1	0.3
13572	99	P	SUR	22	-41	389	0	0.3	-0.0	0.3
13633	99	P	SUR	26	-52	516	0	0.4	-0.7	0.8
13665	99	P	SUR	18	-46	740	0	0.4	0.2	0.5
13868	99	P	SUR	26	-21	740	0	0.3	0.4	0.5
13869	99	P	SUR	21	-44	740	0	0.3	0.0	0.3
13871	99	P	SUR	23	-43	642	0	0.3	0.3	0.5
13872	99	P	SUR	26	-51	729	0	0.3	0.3	0.4
2100942	99	P	SUR	27	-46	724	0	0.3	0.3	0.4
21942	99	P	SUR	27	-46	656	0	0.3	0.3	0.4
23164	99	P	SUR	32	-50	1	0	0.0	0.2	0.2
23174	99	P	SUR	32	-50	1	0	0.0	0.1	0.1
2500575	99	P	SUR	58	-56	744	0	0.4	-0.1	0.4
2500617	99	P	SUR	53	-39	510	0	0.6	0.2	0.6
2500623	99	P	SUR	90	-27	737	0	0.5	-0.1	0.5
25575	99	P	SUR	58	-55	661	0	0.4	-0.1	0.4
25617	99	P	SUR	53	-39	511	0	0.6	0.2	0.6
25623	99	P	SUR	90	-27	740	0	0.5	-0.1	0.5
2600537	99	P	SUR	74	18	734	4	3.0	0.9	3.1
2600545	99	P	SUR	68	-12	733	573	5.9	-7.3	9.4
26537	99	P	SUR	74	18	728	4	3.0	1.0	3.1
26545	99	P	SUR	68	-12	727	566	5.9	-7.0	9.2
3100863	99	P	SUR	26	-69	738	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
31863	99	P	SUR	26	-69	740	0	0.5	0.3	0.6
4100139	99	P	SUR	20	-38	351	0	0.3	-0.2	0.3
4100300	99	P	SUR	16	-57	727	0	0.4	0.3	0.5
4100506	99	P	SUR	32	-51	708	0	0.3	-0.0	0.3
4100590	99	P	SUR	39	-38	742	0	0.4	-0.3	0.5
4100594	99	P	SUR	42	-29	741	0	0.4	0.1	0.5
4100597	99	P	SUR	34	-56	738	0	0.5	-0.1	0.5
4100635	99	P	SUR	22	-64	736	0	0.5	0.2	0.5
4100706	99	P	SUR	33	-36	738	0	0.3	0.1	0.3
4100707	99	P	SUR	14	-61	735	0	0.4	-0.9	1.0
4100708	99	P	SUR	23	-66	738	0	0.4	-0.2	0.5
4100729	99	P	SUR	42	-40	737	0	0.5	0.1	0.5
4100731	99	P	SUR	30	-60	738	0	0.4	0.1	0.4
4100936	99	P	SUR	39	-41	735	1	0.4	-1.1	1.2
4100970	99	P	SUR	35	-69	738	0	0.4	0.0	0.4
4100972	99	P	SUR	41	-31	738	0	0.4	0.0	0.4
4100975	99	P	SUR	27	-47	741	0	0.4	-0.1	0.4
4101700	99	P	SUR	35	-57	738	0	0.5	0.1	0.5
4101701	99	P	SUR	30	-69	738	0	0.4	0.6	0.8
4101702	99	P	SUR	18	-39	738	0	0.3	0.3	0.5
4101703	99	P	SUR	15	-43	737	0	0.4	0.3	0.5
4101704	99	P	SUR	11	-46	738	0	0.5	0.2	0.5
4101741	99	P	SUR	21	-40	738	0	0.3	0.5	0.5
41040	99	P	SUR	15	-53	737	0	0.4	-0.7	0.8
41041	99	P	SUR	14	-46	731	0	0.5	-0.6	0.8
41043	99	P	SUR	21	-65	1170	0	0.6	0.2	0.6
41044	99	P	SUR	22	-59	1203	0	0.5	-0.3	0.6
41046	99	P	SUR	24	-69	1219	0	0.5	-0.3	0.6
41048	99	P	SUR	32	-70	774	0	0.4	-0.7	0.8
41049	99	P	SUR	28	-63	739	0	0.5	-0.1	0.5
41052	99	P	SUR	18	-65	1862	0	0.5	-1.3	1.4
41053	99	P	SUR	19	-66	180	0	0.5	-0.7	0.9
41056	99	P	SUR	18	-66	1622	0	0.5	-0.9	1.0
41139	99	P	SUR	20	-38	260	0	0.3	-0.2	0.3
41506	99	P	SUR	32	-51	615	0	0.3	-0.0	0.3
41590	99	P	SUR	39	-38	699	0	0.4	-0.3	0.5
41594	99	P	SUR	42	-29	591	0	0.4	0.1	0.5
41597	99	P	SUR	34	-56	740	0	0.5	-0.1	0.5
41635	99	P	SUR	22	-64	739	0	0.5	0.2	0.5
41706	99	P	SUR	33	-36	740	0	0.3	0.1	0.3
41707	99	P	SUR	14	-61	737	0	0.5	-0.9	1.0
41708	99	P	SUR	23	-66	740	0	0.4	-0.2	0.5
41729	99	P	SUR	42	-40	740	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
41731	99	P	SUR	30	-60	740	0	0.4	0.1	0.4
41936	99	P	SUR	39	-41	540	1	0.4	-1.1	1.2
41970	99	P	SUR	35	-69	740	0	0.4	0.0	0.4
41972	99	P	SUR	41	-31	739	0	0.4	0.0	0.4
41975	99	P	SUR	27	-47	633	0	0.4	-0.1	0.4
42059	99	P	SUR	15	-68	1183	0	0.5	0.3	0.6
42085	99	P	SUR	18	-67	1731	0	0.5	-0.8	1.0
42088	99	P	SUR	11	-61	1582	0	0.6	0.1	0.6
42090	99	P	SUR	18	-70	1914	0	0.5	-0.1	0.5
44005	99	P	SUR	43	-69	751	0	0.5	-0.2	0.6
4400510	99	P	SUR	44	-51	1541	0	0.5	0.6	0.8
4400513	99	P	SUR	54	-10	594	0	0.4	-0.1	0.5
4400515	99	P	SUR	58	-8	732	0	0.3	0.2	0.4
4400516	99	P	SUR	41	-13	423	1	0.3	0.3	0.4
4400517	99	P	SUR	31	-20	737	0	0.3	0.3	0.4
4400521	99	P	SUR	41	-30	736	0	0.4	-0.3	0.5
4400551	99	P	SUR	71	22	630	6	1.3	0.9	1.6
4400558	99	P	SUR	34	-54	420	0	0.5	0.5	0.7
4400614	99	P	SUR	50	-7	683	0	0.4	-0.0	0.4
4400624	99	P	SUR	26	-59	718	0	0.4	-0.3	0.5
4400670	99	P	SUR	44	-52	713	0	0.5	0.0	0.5
4400746	99	P	SUR	38	-23	738	0	0.4	0.4	0.6
4400761	99	P	SUR	60	-2	738	0	0.3	-0.5	0.6
4400765	99	P	SUR	51	-28	681	0	0.6	0.3	0.6
4400766	99	P	SUR	41	-24	737	0	0.5	0.1	0.5
4400768	99	P	SUR	33	-24	738	0	0.4	0.6	0.7
4400772	99	P	SUR	48	-26	736	0	0.4	-0.1	0.4
4400773	99	P	SUR	45	-6	738	0	0.3	0.6	0.7
4400775	99	P	SUR	38	-51	738	0	0.8	0.1	0.9
4400776	99	P	SUR	33	-27	738	0	0.3	0.6	0.7
4400777	99	P	SUR	44	-51	738	17	1.9	-0.2	1.9
4400778	99	P	SUR	39	-21	736	0	0.4	0.5	0.6
4400779	99	P	SUR	45	-43	737	0	0.5	0.0	0.5
44008	99	P	SUR	41	-69	217	0	0.6	-0.5	0.8
4400835	99	P	SUR	29	-40	738	0	0.3	-0.5	0.6
4400837	99	P	SUR	22	-67	738	0	0.4	-0.5	0.6
4400839	99	P	SUR	25	-34	738	0	0.4	-0.1	0.4
4400846	99	P	SUR	32	-26	735	0	0.3	0.4	0.5
4400848	99	P	SUR	28	-26	735	0	0.3	0.2	0.4
4400856	99	P	SUR	38	-37	738	0	0.4	0.5	0.7
4400857	99	P	SUR	45	-27	738	2	1.7	0.7	1.8
4400863	99	P	SUR	28	-60	738	0	0.4	-0.6	0.7
4400866	99	P	SUR	70	20	738	0	0.5	-0.4	0.6

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4400873	99	P	SUR	35	-44	189	0	0.5	0.7	0.8
4400874	99	P	SUR	35	-31	738	0	0.4	0.4	0.5
4400875	99	P	SUR	36	-38	612	16	2.6	-0.5	2.7
4400885	99	P	SUR	16	-50	737	0	0.4	-0.2	0.5
4400887	99	P	SUR	31	-45	738	0	0.3	0.0	0.3
4400889	99	P	SUR	34	-44	738	0	0.3	-0.1	0.3
4400891	99	P	SUR	33	-59	738	0	0.4	-0.5	0.6
4400896	99	P	SUR	36	-34	739	0	0.3	-0.5	0.6
4400901	99	P	SUR	49	-36	738	0	0.5	0.0	0.5
4400902	99	P	SUR	45	-20	737	0	0.5	0.4	0.7
4400904	99	P	SUR	43	-24	736	0	0.4	-0.1	0.4
44011	99	P	SUR	41	-67	744	0	0.6	-1.0	1.2
4401500	99	P	SUR	36	-64	733	0	0.4	0.4	0.6
4401501	99	P	SUR	38	-52	735	0	0.7	0.1	0.7
4401503	99	P	SUR	32	-51	737	0	0.3	0.3	0.4
4401526	99	P	SUR	37	-14	736	0	0.4	0.3	0.5
4401528	99	P	SUR	35	-59	737	0	0.6	0.2	0.6
4401529	99	P	SUR	19	-59	731	0	0.4	0.0	0.4
4401530	99	P	SUR	36	-67	731	0	0.4	-0.5	0.6
4401531	99	P	SUR	18	-54	733	0	0.4	0.5	0.7
4401533	99	P	SUR	13	-48	736	0	0.4	0.4	0.6
4401534	99	P	SUR	38	-60	730	0	0.5	-0.2	0.5
4401550	99	P	SUR	42	-39	738	0	0.5	-0.1	0.5
4401551	99	P	SUR	36	-38	717	0	1.0	0.2	1.0
4401552	99	P	SUR	35	-57	721	0	0.5	0.0	0.5
4401553	99	P	SUR	56	-45	738	0	0.5	-0.0	0.5
4401554	99	P	SUR	56	-42	732	0	0.6	0.3	0.7
4401555	99	P	SUR	48	-46	738	0	0.5	0.0	0.5
44016	99	P	SUR	61	-63	3865	0	0.5	0.2	0.5
4401601	99	P	SUR	58	-54	720	0	0.4	-0.1	0.4
4401602	99	P	SUR	56	-59	713	0	0.4	0.1	0.5
4401603	99	P	SUR	58	-49	720	0	0.4	0.1	0.4
4401604	99	P	SUR	58	-52	721	0	0.3	-0.3	0.4
4401605	99	P	SUR	57	-51	725	0	0.4	-0.3	0.5
4401606	99	P	SUR	61	-63	537	0	0.4	0.2	0.4
4401607	99	P	SUR	61	-63	544	0	0.4	0.2	0.4
4401608	99	P	SUR	66	-58	729	0	0.5	0.3	0.6
4401609	99	P	SUR	61	-63	537	0	0.4	0.3	0.5
4401610	99	P	SUR	62	-68	737	5	4.4	0.8	4.5
4401612	99	P	SUR	47	-52	714	0	0.4	0.4	0.6
4401613	99	P	SUR	61	-63	547	0	0.4	0.6	0.7
4401614	99	P	SUR	63	-70	304	0	1.7	0.1	1.7
4401616	99	P	SUR	61	-63	536	0	0.4	0.2	0.4

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4401618	99	P	SUR	69	-63	729	0	0.4	0.8	0.8
4401619	99	P	SUR	60	-67	154	10	1.2	12.4	12.4
4401620	99	P	SUR	69	-59	730	0	0.4	0.0	0.4
4401621	99	P	SUR	47	-56	16	0	0.4	-0.9	1.0
4401622	99	P	SUR	61	-69	726	0	0.4	0.3	0.5
4401625	99	P	SUR	48	-51	714	0	0.4	0.3	0.5
4401627	99	P	SUR	60	-66	718	0	0.4	0.6	0.7
4401628	99	P	SUR	61	-63	544	0	0.4	-0.2	0.5
4401629	99	P	SUR	65	-63	726	0	0.7	0.1	0.7
4401630	99	P	SUR	61	-63	548	0	0.4	-0.5	0.6
4401631	99	P	SUR	61	-63	535	0	0.4	-0.0	0.4
4401633	99	P	SUR	61	-63	535	0	0.5	0.3	0.6
4401634	99	P	SUR	48	-48	710	0	0.5	0.0	0.5
4401636	99	P	SUR	61	-63	544	0	0.4	0.5	0.6
4401637	99	P	SUR	60	-66	448	6	3.7	1.0	3.8
44018	99	P	SUR	42	-70	833	0	1.0	-0.2	1.0
44024	99	P	SUR	42	-66	970	0	0.5	-1.4	1.5
44027	99	P	SUR	44	-67	768	0	0.5	-0.2	0.5
44032	99	P	SUR	44	-69	743	0	0.4	-0.3	0.5
44033	99	P	SUR	44	-69	153	0	0.5	-0.4	0.6
44034	99	P	SUR	44	-68	585	0	0.4	0.2	0.5
44037	99	P	SUR	44	-68	605	0	0.9	-0.6	1.0
44137	99	P	SUR	42	-62	742	0	0.6	-0.3	0.6
44139	99	P	SUR	44	-57	714	0	0.5	0.1	0.5
44141	99	P	SUR	43	-58	695	0	0.7	0.2	0.7
44251	99	P	SUR	46	-53	735	0	0.5	-0.1	0.5
44255	99	P	SUR	47	-57	1107	0	0.5	0.2	0.5
44258	99	P	SUR	45	-63	725	0	0.6	-0.0	0.6
44510	99	P	SUR	44	-51	1287	0	0.5	0.6	0.8
44513	99	P	SUR	54	-10	597	0	0.4	-0.1	0.5
44515	99	P	SUR	58	-8	734	0	0.3	0.2	0.4
44516	99	P	SUR	41	-13	355	1	0.3	0.3	0.4
44517	99	P	SUR	31	-20	740	0	0.3	0.3	0.4
44521	99	P	SUR	41	-30	553	0	0.4	-0.3	0.5
44551	99	P	SUR	71	22	630	6	1.3	0.9	1.6
44558	99	P	SUR	34	-54	325	0	0.5	0.5	0.7
44614	99	P	SUR	50	-7	686	0	0.4	-0.0	0.4
44624	99	P	SUR	26	-59	720	0	0.4	-0.3	0.5
44670	99	P	SUR	44	-52	721	0	0.5	0.0	0.5
44746	99	P	SUR	38	-24	740	0	0.4	0.4	0.6
44761	99	P	SUR	60	-2	740	0	0.3	-0.5	0.6
44765	99	P	SUR	51	-28	683	0	0.6	0.3	0.6
44766	99	P	SUR	41	-24	739	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
44768	99	P	SUR	33	-24	740	0	0.4	0.6	0.7
44772	99	P	SUR	48	-26	738	0	0.4	-0.1	0.4
44773	99	P	SUR	45	-6	740	0	0.3	0.6	0.7
44775	99	P	SUR	38	-51	739	0	0.8	0.1	0.9
44776	99	P	SUR	33	-27	740	0	0.3	0.6	0.7
44777	99	P	SUR	44	-51	740	17	1.9	-0.2	1.9
44778	99	P	SUR	39	-21	738	0	0.4	0.5	0.6
44779	99	P	SUR	45	-43	739	0	0.5	-0.0	0.5
44835	99	P	SUR	29	-40	740	0	0.3	-0.5	0.6
44837	99	P	SUR	22	-67	740	0	0.4	-0.5	0.6
44839	99	P	SUR	25	-34	740	0	0.4	-0.1	0.4
44846	99	P	SUR	32	-26	738	0	0.3	0.4	0.5
44848	99	P	SUR	28	-26	738	0	0.3	0.2	0.4
44856	99	P	SUR	38	-37	740	0	0.4	0.5	0.7
44857	99	P	SUR	45	-27	740	2	1.7	0.7	1.8
44863	99	P	SUR	28	-60	740	0	0.4	-0.6	0.7
44866	99	P	SUR	70	20	740	0	0.5	-0.4	0.6
44873	99	P	SUR	35	-44	188	0	0.5	0.7	0.8
44874	99	P	SUR	35	-31	740	0	0.4	0.4	0.5
44875	99	P	SUR	36	-38	620	16	2.7	-0.5	2.8
44885	99	P	SUR	16	-50	740	0	0.4	-0.2	0.5
44887	99	P	SUR	31	-45	740	0	0.3	-0.0	0.3
44889	99	P	SUR	34	-45	740	0	0.3	-0.1	0.3
44891	99	P	SUR	33	-59	739	0	0.4	-0.5	0.6
44896	99	P	SUR	36	-34	673	0	0.3	-0.5	0.6
44901	99	P	SUR	49	-36	740	0	0.5	0.0	0.5
44902	99	P	SUR	45	-20	739	0	0.5	0.4	0.7
44904	99	P	SUR	43	-24	739	0	0.4	-0.1	0.4
45138	99	P	SUR	50	-66	740	0	0.5	-0.2	0.5
4700509	99	P	SUR	64	-37	722	310	8.3	-2.9	8.8
4700539	99	P	SUR	43	-25	710	0	0.4	0.2	0.5
4700540	99	P	SUR	53	-22	729	0	0.4	0.7	0.8
4700546	99	P	SUR	44	-52	715	0	0.5	0.4	0.6
4700549	99	P	SUR	57	-17	725	0	1.4	0.3	1.5
4700551	99	P	SUR	49	-52	730	168	8.3	-1.1	8.4
4700552	99	P	SUR	67	-63	737	0	0.3	-1.9	1.9
4700555	99	P	SUR	45	-52	703	0	0.5	0.2	0.5
4700557	99	P	SUR	48	-21	719	0	0.4	0.2	0.4
4700560	99	P	SUR	51	-22	720	0	0.4	0.4	0.6
4700562	99	P	SUR	52	-23	726	0	0.4	0.3	0.5
4700567	99	P	SUR	49	-34	153	153	0.0	0.0	0.0
4700568	99	P	SUR	49	-19	720	0	0.4	0.5	0.6
4700569	99	P	SUR	48	-23	709	0	0.4	-0.5	0.6

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4700574	99	P	SUR	42	-51	714	0	0.4	0.2	0.5
4700584	99	P	SUR	47	-27	153	0	0.7	0.1	0.7
4700589	99	P	SUR	67	-63	733	0	0.4	-2.1	2.2
4701656	99	P	SUR	80	-67	726	0	0.6	-1.7	1.8
4701657	99	P	SUR	80	-65	726	0	0.6	-1.3	1.4
47509	99	P	SUR	64	-37	725	316	8.3	-2.7	8.7
47539	99	P	SUR	43	-25	719	0	0.4	0.2	0.5
47540	99	P	SUR	53	-22	720	0	0.5	0.7	0.9
47546	99	P	SUR	44	-52	715	0	0.5	0.4	0.6
47549	99	P	SUR	57	-17	725	0	1.4	0.3	1.5
47551	99	P	SUR	49	-51	728	163	8.3	-1.1	8.4
47552	99	P	SUR	67	-63	724	0	0.4	-1.9	1.9
47555	99	P	SUR	45	-52	713	0	0.5	0.2	0.6
47557	99	P	SUR	48	-21	723	0	0.4	0.2	0.4
47560	99	P	SUR	51	-22	721	0	0.4	0.4	0.6
47562	99	P	SUR	52	-23	719	0	0.5	0.3	0.6
47567	99	P	SUR	49	-34	156	156	0.0	0.0	0.0
47568	99	P	SUR	49	-19	719	0	0.4	0.5	0.6
47569	99	P	SUR	48	-23	715	0	0.4	-0.5	0.6
47574	99	P	SUR	42	-51	719	0	0.5	0.1	0.5
47584	99	P	SUR	47	-27	156	0	0.7	0.1	0.7
47589	99	P	SUR	67	-63	726	0	0.5	-2.1	2.2
4800520	99	P	SUR	80	-11	189	0	0.5	0.2	0.5
4800600	99	P	SUR	85	-35	744	0	0.5	0.1	0.5
4800664	99	P	SUR	70	-67	634	0	2.4	1.0	2.6
48520	99	P	SUR	80	-11	180	0	0.5	0.2	0.5
48600	99	P	SUR	85	-35	703	0	0.5	0.1	0.5
6086	99	P	SUR	55	6	1	0	0.0	-0.4	0.4
6100001	99	P	SUR	43	8	673	0	0.5	-0.2	0.5
6100002	99	P	SUR	42	5	725	0	0.4	-0.0	0.4
6200091	99	P	SUR	53	-5	695	0	0.4	-0.0	0.4
6200092	99	P	SUR	51	-11	739	0	0.5	-0.2	0.5
6200093	99	P	SUR	55	-10	739	0	0.4	-0.2	0.5
6200094	99	P	SUR	52	-7	739	0	0.4	-0.1	0.4
62001	99	P	SUR	45	-5	736	0	0.4	-0.0	0.4
6200513	99	P	SUR	62	-36	738	0	2.0	-0.5	2.1
6200553	99	P	SUR	58	-30	256	28	3.9	-1.8	4.3
6200554	99	P	SUR	44	-16	737	0	0.5	0.2	0.5
6200556	99	P	SUR	32	-25	738	0	0.3	-0.4	0.5
6200558	99	P	SUR	49	-12	696	0	0.5	0.2	0.5
6200559	99	P	SUR	45	-28	738	0	0.4	0.6	0.7
6200560	99	P	SUR	20	-39	738	0	0.3	0.4	0.5
6200713	99	P	SUR	41	-45	414	0	2.1	0.2	2.1

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
6200714	99	P	SUR	44	-28	732	0	0.4	-0.4	0.5
6200940	99	P	SUR	39	-18	738	0	0.5	0.1	0.5
6200941	99	P	SUR	25	-32	738	0	0.3	-0.2	0.4
62029	99	P	SUR	49	-13	1378	0	0.8	-0.1	0.8
62030	99	P	SUR	50	-4	565	0	0.3	0.0	0.3
6203501	99	P	SUR	38	-26	274	0	0.3	0.4	0.5
6203503	99	P	SUR	33	-21	737	0	0.4	-0.1	0.4
6203504	99	P	SUR	34	-22	738	0	0.4	0.4	0.5
62050	99	P	SUR	50	-4	741	0	0.3	0.3	0.4
62082	99	P	SUR	55	6	4	0	0.2	-0.1	0.2
62086	99	P	SUR	55	6	730	0	0.4	-0.2	0.4
62095	99	P	SUR	53	-16	648	0	0.7	-0.2	0.7
62102	99	P	SUR	58	2	747	0	0.6	0.4	0.8
62103	99	P	SUR	50	-3	744	0	0.4	0.5	0.6
62104	99	P	SUR	57	1	747	0	0.4	0.3	0.5
62105	99	P	SUR	55	-13	663	0	0.4	-0.1	0.4
62107	99	P	SUR	50	-6	1449	0	0.7	0.3	0.8
62111	99	P	SUR	58	0	728	0	0.4	1.4	1.4
62112	99	P	SUR	58	0	742	0	0.4	0.3	0.5
62113	99	P	SUR	58	0	747	0	0.3	0.1	0.4
62114	99	P	SUR	58	0	1485	0	0.4	0.2	0.5
62115	99	P	SUR	58	-3	747	0	0.4	0.3	0.5
62116	99	P	SUR	58	1	674	0	0.4	0.2	0.4
62117	99	P	SUR	58	0	745	0	0.4	0.4	0.5
62118	99	P	SUR	58	1	667	0	0.4	0.6	0.7
62119	99	P	SUR	57	2	747	0	0.4	0.0	0.4
62120	99	P	SUR	56	2	743	0	0.4	-0.0	0.4
62121	99	P	SUR	54	3	748	0	0.4	0.3	0.5
62122	99	P	SUR	57	2	1485	0	0.4	0.0	0.4
62124	99	P	SUR	54	-4	747	0	0.3	0.1	0.4
62127	99	P	SUR	54	1	736	0	0.3	0.6	0.6
62128	99	P	SUR	59	1	735	0	0.3	0.1	0.3
62129	99	P	SUR	58	0	747	0	0.4	-0.0	0.4
62130	99	P	SUR	59	1	745	0	0.4	-0.0	0.4
62131	99	P	SUR	54	1	725	0	0.3	0.5	0.6
62132	99	P	SUR	56	2	745	0	0.4	0.3	0.5
62133	99	P	SUR	57	1	747	0	0.5	0.4	0.6
62134	99	P	SUR	58	1	747	0	0.3	0.3	0.4
62135	99	P	SUR	54	2	746	0	0.4	0.6	0.8
62136	99	P	SUR	54	3	746	0	0.4	0.6	0.7
62137	99	P	SUR	57	2	744	0	0.4	0.0	0.4
62138	99	P	SUR	54	0	1483	0	0.3	0.7	0.8
62139	99	P	SUR	53	2	1478	0	0.3	0.3	0.4

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62140	99	P	SUR	57	1	1485	0	0.4	0.3	0.5
62141	99	P	SUR	61	1	744	0	0.4	0.0	0.4
62143	99	P	SUR	58	2	733	0	0.4	0.5	0.6
62144	99	P	SUR	53	2	748	0	0.3	0.2	0.3
62145	99	P	SUR	53	3	1414	0	0.3	0.4	0.5
62146	99	P	SUR	57	2	735	0	0.3	0.2	0.4
62148	99	P	SUR	54	2	747	0	0.3	1.0	1.0
62149	99	P	SUR	54	1	748	0	0.3	0.7	0.8
62150	99	P	SUR	54	1	748	0	0.3	1.3	1.3
62151	99	P	SUR	57	2	1484	0	0.3	0.3	0.5
62152	99	P	SUR	57	2	748	0	0.3	0.3	0.5
62153	99	P	SUR	57	2	1481	0	0.3	0.5	0.6
62154	99	P	SUR	56	2	747	0	0.4	0.0	0.4
62155	99	P	SUR	58	1	708	0	0.3	0.3	0.5
62157	99	P	SUR	58	0	745	0	0.3	0.2	0.4
62160	99	P	SUR	57	2	1485	0	0.4	0.5	0.7
62161	99	P	SUR	58	1	79	1	1.5	1.1	1.9
62162	99	P	SUR	57	1	744	0	0.3	0.2	0.4
62163	99	P	SUR	48	-8	734	0	0.4	0.3	0.5
62164	99	P	SUR	57	1	698	0	0.3	0.3	0.4
62165	99	P	SUR	54	1	747	0	0.3	0.5	0.6
62167	99	P	SUR	53	2	1483	0	0.3	0.4	0.5
62168	99	P	SUR	58	1	747	0	0.3	0.2	0.3
62170	99	P	SUR	51	2	738	0	0.5	-0.0	0.5
62296	99	P	SUR	53	2	747	0	0.3	0.1	0.3
62297	99	P	SUR	59	2	1483	0	0.3	0.1	0.4
62302	99	P	SUR	61	-2	747	0	0.5	-0.1	0.5
62304	99	P	SUR	51	2	713	3	0.4	0.1	0.4
62305	99	P	SUR	50	0	562	0	0.4	0.2	0.4
62513	99	P	SUR	62	-36	740	0	2.0	-0.5	2.1
62553	99	P	SUR	58	-30	277	28	4.0	-2.2	4.6
62554	99	P	SUR	44	-16	740	0	0.5	0.2	0.5
62556	99	P	SUR	32	-25	740	0	0.3	-0.4	0.5
62558	99	P	SUR	49	-12	698	0	0.5	0.2	0.5
62559	99	P	SUR	45	-28	740	0	0.4	0.6	0.7
62560	99	P	SUR	20	-39	740	0	0.3	0.4	0.5
62713	99	P	SUR	41	-45	419	0	2.2	0.3	2.2
62714	99	P	SUR	44	-28	734	0	0.4	-0.4	0.5
62940	99	P	SUR	39	-18	740	0	0.5	0.1	0.5
62941	99	P	SUR	25	-32	740	0	0.3	-0.2	0.4
6300561	99	P	SUR	75	9	740	0	0.4	0.2	0.4
6300646	99	P	SUR	70	8	737	0	0.6	1.0	1.1
6300923	99	P	SUR	58	-31	622	104	7.6	-2.1	7.9

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
6301550	99	P	SUR	73	28	738	0	0.4	0.5	0.7
6301551	99	P	SUR	76	31	736	0	0.4	0.4	0.5
63055	99	P	SUR	61	2	746	0	0.4	-0.1	0.4
63056	99	P	SUR	60	2	747	0	0.4	0.3	0.5
63057	99	P	SUR	59	2	746	0	0.4	-0.0	0.4
63058	99	P	SUR	53	2	2235	0	0.3	0.3	0.5
63059	99	P	SUR	58	-1	746	0	0.3	0.5	0.6
63101	99	P	SUR	61	1	747	0	0.5	0.1	0.5
63102	99	P	SUR	61	1	746	0	0.4	0.1	0.4
63103	99	P	SUR	61	1	747	0	0.3	0.2	0.3
63104	99	P	SUR	61	2	747	0	0.4	0.1	0.4
63105	99	P	SUR	61	2	747	0	0.4	0.0	0.4
63108	99	P	SUR	61	2	746	0	0.4	-0.2	0.4
63109	99	P	SUR	60	2	747	0	0.4	-0.2	0.4
63110	99	P	SUR	60	2	747	0	0.4	-0.1	0.4
63111	99	P	SUR	61	2	1426	0	0.4	-0.2	0.5
63112	99	P	SUR	61	1	747	0	0.3	-0.3	0.4
63115	99	P	SUR	62	1	747	0	0.3	-0.1	0.3
63117	99	P	SUR	61	1	1484	0	0.5	0.4	0.6
63118	99	P	SUR	62	1	738	0	0.4	-0.2	0.5
63119	99	P	SUR	56	2	48	0	0.7	0.6	0.9
63120	99	P	SUR	54	2	742	0	0.3	0.5	0.5
63561	99	P	SUR	75	9	689	0	0.4	0.2	0.4
63646	99	P	SUR	70	8	740	0	0.6	1.0	1.1
63923	99	P	SUR	58	-31	636	105	7.5	-2.0	7.8
6400476	99	P	SUR	83	8	372	0	0.5	-0.3	0.6
6400519	99	P	SUR	74	-3	737	9	1.4	0.4	1.4
6400523	99	P	SUR	74	16	187	0	0.6	0.3	0.7
6400524	99	P	SUR	67	13	738	0	0.5	0.7	0.9
6400526	99	P	SUR	65	-57	700	0	0.5	0.2	0.5
6400528	99	P	SUR	71	22	737	0	0.3	0.3	0.5
6400530	99	P	SUR	80	15	737	0	0.6	0.1	0.6
6400547	99	P	SUR	71	7	736	0	0.6	0.3	0.7
6400551	99	P	SUR	59	-41	738	0	0.5	-0.3	0.6
6400553	99	P	SUR	73	2	737	0	0.4	0.1	0.4
6400560	99	P	SUR	66	-22	639	0	0.5	-0.1	0.5
6400562	99	P	SUR	61	-41	738	0	1.8	-0.0	1.8
6400666	99	P	SUR	68	-19	738	0	0.5	0.7	0.9
6400694	99	P	SUR	57	-33	292	14	2.7	-1.5	3.1
6400757	99	P	SUR	83	-11	727	0	0.5	-0.5	0.7
6400760	99	P	SUR	83	8	126	0	0.6	-0.4	0.7
6400973	99	P	SUR	82	14	731	0	0.5	-0.1	0.5
6401500	99	P	SUR	66	-29	738	0	0.8	0.3	0.8

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
6401550	99	P	SUR	61	-9	738	0	0.3	0.5	0.6
6401551	99	P	SUR	60	-23	738	0	1.0	0.9	1.4
6401552	99	P	SUR	62	-37	738	0	0.7	0.9	1.1
6401553	99	P	SUR	62	-19	445	0	0.4	-0.1	0.4
6401554	99	P	SUR	62	-10	737	0	0.3	0.1	0.3
64041	99	P	SUR	61	-3	748	0	0.4	-0.1	0.4
64045	99	P	SUR	59	-12	1467	0	0.4	-0.0	0.4
64046	99	P	SUR	61	-4	728	0	0.3	0.1	0.3
64476	99	P	SUR	83	8	371	0	0.5	-0.4	0.6
64519	99	P	SUR	74	-3	739	9	1.4	0.4	1.4
64523	99	P	SUR	74	16	187	0	0.6	0.3	0.7
64524	99	P	SUR	67	13	740	0	0.5	0.7	0.8
64526	99	P	SUR	65	-57	702	0	0.5	0.2	0.5
64528	99	P	SUR	71	22	740	0	0.3	0.3	0.5
64530	99	P	SUR	80	15	740	0	0.6	0.1	0.6
64547	99	P	SUR	71	7	740	0	0.6	0.3	0.7
64551	99	P	SUR	59	-41	741	0	0.5	-0.3	0.6
64553	99	P	SUR	73	2	740	0	0.4	0.1	0.4
64560	99	P	SUR	66	-22	640	0	0.5	-0.1	0.5
64562	99	P	SUR	61	-41	740	0	1.8	-0.0	1.8
64666	99	P	SUR	68	-18	740	0	0.5	0.8	0.9
64694	99	P	SUR	57	-33	292	14	2.7	-1.5	3.1
64757	99	P	SUR	83	-11	725	0	0.5	-0.5	0.7
64760	99	P	SUR	83	8	124	0	0.6	-0.5	0.8
64973	99	P	SUR	82	14	727	0	0.5	-0.1	0.5
6500514	99	P	SUR	53	-26	738	0	0.5	0.1	0.5
6500515	99	P	SUR	59	-40	738	2	1.0	-0.2	1.0
6500519	99	P	SUR	64	-3	738	0	0.5	0.8	0.9
6500596	99	P	SUR	63	-13	729	0	0.4	0.7	0.8
6500599	99	P	SUR	62	-6	738	0	0.4	0.5	0.6
6500602	99	P	SUR	53	-36	738	0	0.5	0.5	0.7
6500603	99	P	SUR	68	-54	474	0	0.4	0.0	0.4
6501551	99	P	SUR	58	-52	738	0	0.4	-0.2	0.4
6501552	99	P	SUR	58	-53	738	0	0.4	0.3	0.5
6501553	99	P	SUR	58	-55	738	0	0.4	0.2	0.5
6501555	99	P	SUR	65	-52	739	0	0.4	-0.3	0.5
6501556	99	P	SUR	60	-52	737	0	0.4	0.2	0.4
6501557	99	P	SUR	59	-34	738	0	0.6	0.3	0.7
6501558	99	P	SUR	61	-57	737	0	0.3	0.2	0.4
65514	99	P	SUR	53	-26	740	0	0.5	0.1	0.5
65515	99	P	SUR	59	-40	740	2	1.0	-0.2	1.0
65519	99	P	SUR	64	-3	740	0	0.5	0.8	0.9
65596	99	P	SUR	63	-14	731	0	0.5	0.7	0.9

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
65599	99	P	SUR	62	-6	740	0	0.4	0.5	0.6
65602	99	P	SUR	53	-36	740	0	0.5	0.5	0.7
65603	99	P	SUR	68	-54	474	0	0.4	0.0	0.4

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                : OCT 2016
                   STANDARD OF COMPARISON: FIRST-GUESS FIELD


TIME = 99 => AVERAGE OF ALL OBSERVATIONS


GROSS ERROR LIMIT FOR VECTOR WIND = 25 M/S
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WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
1300001	99	SPEED	SUR	11	-23	720	0	0	1.2	0.5	1.3
1300002	99	SPEED	SUR	20	-23	370	0	0	1.1	-0.1	1.1
13002	99	SPEED	SUR	20	-23	277	0	0	1.0	-0.0	1.0
23164	99	SPEED	SUR	32	-50	1	1	0	0.0	20.3	20.3
23174	99	SPEED	SUR	32	-50	1	1	0	0.0	24.0	24.0
4100026	99	SPEED	SUR	12	-38	342	0	0	1.3	0.2	1.3
4100139	99	SPEED	SUR	20	-38	351	0	0	1.1	-0.3	1.1
4100300	99	SPEED	SUR	16	-57	727	0	0	1.0	-0.3	1.1
41026	99	SPEED	SUR	11	-38	106	0	0	1.4	0.4	1.5
41040	99	SPEED	SUR	15	-53	737	0	0	1.1	-0.1	1.1
41041	99	SPEED	SUR	14	-46	731	0	0	1.4	0.0	1.4
41043	99	SPEED	SUR	21	-65	1176	0	0	1.6	0.0	1.6
41044	99	SPEED	SUR	22	-59	1203	0	0	1.3	0.2	1.3
41046	99	SPEED	SUR	24	-69	1219	0	0	1.6	0.0	1.6
41048	99	SPEED	SUR	32	-70	774	0	0	1.0	0.1	1.0
41049	99	SPEED	SUR	28	-63	739	0	0	1.7	-0.3	1.7
41052	99	SPEED	SUR	18	-65	1862	0	0	1.2	-0.3	1.2
41053	99	SPEED	SUR	19	-66	180	0	0	1.4	-0.0	1.4
41056	99	SPEED	SUR	18	-66	1622	0	0	1.2	-0.5	1.3
41139	99	SPEED	SUR	20	-38	260	0	0	1.1	-0.2	1.1
42059	99	SPEED	SUR	15	-68	1185	0	0	1.2	0.3	1.2
42085	99	SPEED	SUR	18	-67	1732	0	0	1.5	0.2	1.5
42088	99	SPEED	SUR	11	-61	1582	0	0	1.3	-2.3	2.7
42090	99	SPEED	SUR	18	-70	1914	0	0	1.4	0.1	1.4
44005	99	SPEED	SUR	43	-69	751	0	0	1.3	0.1	1.3
44018	99	SPEED	SUR	42	-70	833	0	0	2.1	0.2	2.1
44024	99	SPEED	SUR	42	-66	974	2	0	1.5	0.1	1.5
44027	99	SPEED	SUR	44	-67	768	0	0	1.3	0.5	1.4
44032	99	SPEED	SUR	44	-69	743	0	0	1.5	0.1	1.5
44033	99	SPEED	SUR	44	-69	716	0	0	1.4	0.1	1.4
44034	99	SPEED	SUR	44	-68	585	0	0	1.4	-0.3	1.4
44037	99	SPEED	SUR	44	-68	654	0	0	1.2	0.3	1.3
44137	99	SPEED	SUR	42	-62	746	0	0	1.3	0.1	1.3
44139	99	SPEED	SUR	44	-57	721	0	0	1.6	-0.6	1.7

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
44141	99	SPEED	SUR	43	-58	695	0	0	1.6	0.2	1.6
44251	99	SPEED	SUR	46	-53	736	0	0	1.6	-0.2	1.6
44255	99	SPEED	SUR	47	-57	1116	0	0	1.5	0.2	1.5
44258	99	SPEED	SUR	45	-63	729	0	0	1.4	0.3	1.4
45138	99	SPEED	SUR	50	-66	740	0	0	1.6	0.4	1.7
6086	99	SPEED	SUR	55	6	1	0	0	0.0	0.6	0.6
6100001	99	SPEED	SUR	43	8	694	0	0	2.0	-0.5	2.1
6100002	99	SPEED	SUR	42	5	725	0	0	3.4	6.2	7.1
6200091	99	SPEED	SUR	53	-5	695	1	0	1.1	0.1	1.1
6200092	99	SPEED	SUR	51	-11	739	0	0	1.2	-0.2	1.2
6200093	99	SPEED	SUR	55	-10	739	0	0	1.0	-0.0	1.0
6200094	99	SPEED	SUR	52	-7	739	0	0	1.1	-0.0	1.1
62001	99	SPEED	SUR	45	-5	736	0	0	1.1	0.8	1.4
62029	99	SPEED	SUR	49	-13	1378	0	0	1.2	0.4	1.3
62050	99	SPEED	SUR	50	-4	721	0	0	1.1	0.5	1.2
62082	99	SPEED	SUR	55	6	4	0	0	0.4	1.3	1.4
62086	99	SPEED	SUR	55	6	738	0	0	1.4	0.6	1.5
62095	99	SPEED	SUR	53	-16	680	0	0	1.6	0.6	1.7
62102	99	SPEED	SUR	58	2	747	0	0	1.4	0.0	1.4
62103	99	SPEED	SUR	50	-3	730	0	0	1.5	1.3	2.0
62104	99	SPEED	SUR	57	1	747	0	0	1.3	-1.1	1.7
62105	99	SPEED	SUR	55	-13	431	0	0	1.2	0.5	1.3
62107	99	SPEED	SUR	50	-6	1449	0	0	1.5	1.3	2.0
62111	99	SPEED	SUR	58	0	709	0	0	1.2	0.0	1.2
62112	99	SPEED	SUR	58	0	742	0	0	2.4	-1.9	3.0
62113	99	SPEED	SUR	58	0	747	0	0	1.3	0.1	1.3
62114	99	SPEED	SUR	58	0	1485	0	0	1.3	0.2	1.3
62117	99	SPEED	SUR	58	0	745	0	0	1.1	-0.3	1.1
62118	99	SPEED	SUR	58	1	747	0	0	1.3	0.2	1.3
62119	99	SPEED	SUR	57	2	747	0	0	2.0	-1.5	2.5
62120	99	SPEED	SUR	56	2	743	0	0	1.2	-0.4	1.2
62121	99	SPEED	SUR	54	3	747	0	0	1.5	-0.4	1.5
62122	99	SPEED	SUR	57	2	1485	0	0	1.4	-0.0	1.4
62128	99	SPEED	SUR	59	1	735	0	0	1.3	0.1	1.3
62129	99	SPEED	SUR	58	0	735	0	0	1.6	-0.9	1.8
62131	99	SPEED	SUR	54	1	725	0	0	2.7	-2.7	3.8
62132	99	SPEED	SUR	56	2	745	0	0	1.7	-1.8	2.4
62133	99	SPEED	SUR	57	1	747	0	0	1.4	-0.4	1.5
62134	99	SPEED	SUR	58	1	747	0	0	1.2	-0.3	1.2
62140	99	SPEED	SUR	57	1	1442	0	0	1.2	-0.5	1.3
62143	99	SPEED	SUR	58	2	733	0	0	1.9	-1.2	2.2

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
62144	99	SPEED	SUR	53	2	748	0	0	1.4	-0.8	1.6
62145	99	SPEED	SUR	53	3	1418	0	0	1.3	-0.4	1.4
62146	99	SPEED	SUR	57	2	734	0	0	1.7	-1.0	2.0
62148	99	SPEED	SUR	54	2	747	0	0	1.2	-0.5	1.3
62149	99	SPEED	SUR	54	1	748	0	0	1.3	-0.3	1.3
62150	99	SPEED	SUR	54	1	748	0	0	2.0	-1.2	2.3
62152	99	SPEED	SUR	57	2	748	0	0	2.7	-2.9	4.0
62153	99	SPEED	SUR	57	2	1481	0	0	2.4	-1.4	2.8
62154	99	SPEED	SUR	56	2	747	0	0	1.5	-1.1	1.8
62155	99	SPEED	SUR	58	1	708	0	0	1.2	-0.3	1.3
62163	99	SPEED	SUR	48	-8	734	0	0	1.1	0.2	1.2
62164	99	SPEED	SUR	57	1	718	0	0	1.5	-1.5	2.2
62165	99	SPEED	SUR	54	1	747	0	0	2.3	-1.7	2.9
62170	99	SPEED	SUR	51	2	738	0	0	1.5	1.3	2.0
62304	99	SPEED	SUR	51	2	710	0	0	1.5	1.2	2.0
62305	99	SPEED	SUR	50	0	820	0	0	1.4	1.5	2.0
63055	99	SPEED	SUR	61	2	746	0	0	1.2	-0.6	1.4
63056	99	SPEED	SUR	60	2	747	0	0	1.3	-0.3	1.3
63057	99	SPEED	SUR	59	2	746	0	0	1.5	0.0	1.5
63058	99	SPEED	SUR	53	2	1489	0	0	1.2	-0.5	1.3
63101	99	SPEED	SUR	61	1	743	0	0	1.8	-0.3	1.9
63103	99	SPEED	SUR	61	1	747	0	0	1.4	-0.4	1.5
63104	99	SPEED	SUR	61	2	747	0	0	1.2	-0.4	1.2
63105	99	SPEED	SUR	61	2	747	0	0	1.3	-0.1	1.3
63106	99	SPEED	SUR	61	2	747	0	0	1.2	-0.1	1.2
63108	99	SPEED	SUR	61	2	746	0	0	1.5	-0.2	1.5
63109	99	SPEED	SUR	60	2	746	0	0	1.4	-0.2	1.4
63110	99	SPEED	SUR	60	2	747	0	0	1.5	-0.2	1.5
63112	99	SPEED	SUR	61	1	747	0	0	1.1	-0.6	1.3
63113	99	SPEED	SUR	61	2	747	0	0	1.2	-0.4	1.3
63115	99	SPEED	SUR	62	1	747	0	0	1.2	-0.4	1.3
63117	99	SPEED	SUR	61	1	1484	0	0	1.3	-0.3	1.3
63119	99	SPEED	SUR	56	2	48	0	0	2.2	-0.9	2.3
64041	99	SPEED	SUR	61	-3	748	0	0	1.1	-0.3	1.2
64045	99	SPEED	SUR	59	-12	1467	0	0	1.0	0.5	1.1
64046	99	SPEED	SUR	61	-4	728	0	0	1.2	0.4	1.3
66021	99	SPEED	SUR	55	14	685	0	0	1.4	0.6	1.5
66022	99	SPEED	SUR	54	14	494	0	0	2.1	-0.6	2.2
66024	99	SPEED	SUR	55	13	727	0	0	1.5	0.5	1.6

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                : OCT 2016
                   STANDARD OF COMPARISON: FIRST-GUESS FIELD


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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
1300001	99	DIRN	SUR	11	-23	494	0	0	19.7	6.9	20.8
1300002	99	DIRN	SUR	20	-23	318	0	0	10.6	5.2	11.8
13002	99	DIRN	SUR	20	-23	242	0	0	13.3	5.3	14.3
23164	99	DIRN	SUR	32	-50	1	1	0	0.0	115.4	115.4
23174	99	DIRN	SUR	32	-50	1	1	0	0.0	127.1	127.1
4100026	99	DIRN	SUR	12	-38	261	0	0	16.2	-2.0	16.3
4100139	99	DIRN	SUR	20	-38	313	0	0	13.1	-4.3	13.8
41002	99	DIRN	SUR	32	-75	593	0	0	22.8	5.8	23.5
4100300	99	DIRN	SUR	16	-57	624	0	0	15.6	2.6	15.8
41004	99	DIRN	SUR	33	-79	689	0	0	20.7	11.0	23.4
41008	99	DIRN	SUR	31	-81	149	1	0	23.8	3.0	24.0
41009	99	DIRN	SUR	29	-80	121	0	0	29.6	3.2	29.7
41013	99	DIRN	SUR	33	-78	983	0	0	16.3	12.6	20.6
41024	99	DIRN	SUR	34	-79	545	0	0	18.0	-3.8	18.3
41025	99	DIRN	SUR	35	-75	632	0	0	18.3	2.6	18.5
41026	99	DIRN	SUR	11	-38	72	0	0	16.0	-2.5	16.2
41029	99	DIRN	SUR	33	-80	593	1	0	15.9	0.5	15.9
41033	99	DIRN	SUR	32	-80	150	1	0	26.8	-0.5	26.8
41037	99	DIRN	SUR	34	-77	620	0	0	15.1	8.5	17.3
41038	99	DIRN	SUR	34	-78	597	0	0	13.1	-2.9	13.5
41040	99	DIRN	SUR	15	-53	556	0	0	18.0	3.8	18.5
41041	99	DIRN	SUR	14	-46	610	0	0	16.2	6.4	17.5
41043	99	DIRN	SUR	21	-65	923	0	0	26.6	5.9	27.3
41044	99	DIRN	SUR	22	-59	1057	0	0	16.4	3.3	16.7
41046	99	DIRN	SUR	24	-69	1054	0	0	20.8	9.9	23.0
41047	99	DIRN	SUR	28	-72	1103	0	0	11.1	4.8	12.1
41048	99	DIRN	SUR	32	-70	675	0	0	12.5	10.0	16.0
41049	99	DIRN	SUR	28	-63	719	0	0	19.8	9.7	22.0
41052	99	DIRN	SUR	18	-65	1451	0	0	20.3	0.1	20.3
41053	99	DIRN	SUR	19	-66	10	0	0	55.3	20.8	59.0
41056	99	DIRN	SUR	18	-66	1178	0	0	23.7	0.5	23.7
41057	99	DIRN	SUR	20	-71	331	0	0	26.0	-22.4	34.3

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
41064	99	DIRN	SUR	34	-77	475	0	0	58.3	8.1	58.8
41139	99	DIRN	SUR	20	-38	225	0	0	12.6	-4.2	13.3
42013	99	DIRN	SUR	27	-83	293	0	0	19.2	-0.8	19.2
42022	99	DIRN	SUR	28	-84	1283	0	0	14.5	-1.5	14.6
42023	99	DIRN	SUR	26	-83	1077	0	0	15.2	4.8	16.0
42036	99	DIRN	SUR	29	-85	703	0	0	12.9	-2.2	13.0
42056	99	DIRN	SUR	20	-85	959	0	0	16.0	4.9	16.7
42058	99	DIRN	SUR	15	-75	599	2	0	22.4	4.5	22.8
42059	99	DIRN	SUR	15	-68	1090	0	0	14.0	0.7	14.0
42085	99	DIRN	SUR	18	-67	945	0	0	29.9	9.0	31.2
42088	99	DIRN	SUR	11	-61	526	0	0	41.6	-27.3	49.8
42089	99	DIRN	SUR	20	-80	1618	0	0	18.1	1.8	18.2
42090	99	DIRN	SUR	18	-70	684	0	0	29.3	-26.3	39.4
44005	99	DIRN	SUR	43	-69	615	0	0	17.5	12.1	21.3
44007	99	DIRN	SUR	44	-70	601	0	0	18.7	8.9	20.7
44013	99	DIRN	SUR	42	-71	615	0	0	14.6	10.0	17.8
44014	99	DIRN	SUR	37	-75	626	0	0	14.8	5.7	15.8
44017	99	DIRN	SUR	41	-72	562	0	0	15.9	9.1	18.3
44018	99	DIRN	SUR	42	-70	647	0	0	23.2	7.3	24.3
44020	99	DIRN	SUR	41	-70	233	0	0	14.6	7.7	16.5
44022	99	DIRN	SUR	41	-74	363	0	0	15.5	10.9	18.9
44024	99	DIRN	SUR	42	-66	829	2	0	19.5	5.9	20.4
44025	99	DIRN	SUR	40	-73	676	0	0	16.4	2.6	16.6
44027	99	DIRN	SUR	44	-67	644	0	0	15.2	6.7	16.6
44029	99	DIRN	SUR	43	-71	924	0	0	15.7	4.8	16.4
44030	99	DIRN	SUR	43	-70	585	0	0	17.9	3.0	18.2
44032	99	DIRN	SUR	44	-69	597	0	0	14.7	3.9	15.2
44033	99	DIRN	SUR	44	-69	568	0	0	14.8	0.3	14.8
44034	99	DIRN	SUR	44	-68	440	0	0	12.5	4.2	13.2
44037	99	DIRN	SUR	44	-68	553	0	0	14.9	4.1	15.4
44039	99	DIRN	SUR	41	-73	340	0	0	20.3	4.1	20.7
44041	99	DIRN	SUR	37	-77	269	0	0	14.4	8.0	16.5
44042	99	DIRN	SUR	38	-76	803	0	0	17.9	-8.3	19.8
44043	99	DIRN	SUR	39	-76	838	0	0	18.3	-12.5	22.1
44057	99	DIRN	SUR	40	-76	450	0	0	19.0	-9.5	21.3
44058	99	DIRN	SUR	38	-76	359	0	0	17.2	60.5	62.9
44061	99	DIRN	SUR	39	-77	259	0	0	17.3	-7.1	18.7
44062	99	DIRN	SUR	39	-76	236	0	0	25.0	-21.4	32.9
44063	99	DIRN	SUR	39	-76	770	0	0	21.5	-11.0	24.2
44064	99	DIRN	SUR	37	-76	120	0	0	26.2	-23.1	34.9
44065	99	DIRN	SUR	40	-74	594	0	0	14.4	4.8	15.1

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
44069	99	DIRN	SUR	41	-73	562	0	0	27.4	5.6	28.0
44072	99	DIRN	SUR	37	-76	937	0	0	17.2	-11.4	20.7
44137	99	DIRN	SUR	42	-62	717	0	0	13.7	-2.0	13.8
44139	99	DIRN	SUR	44	-57	565	0	0	15.1	8.6	17.4
44141	99	DIRN	SUR	43	-58	608	0	0	15.4	7.3	17.0
44251	99	DIRN	SUR	46	-53	598	0	0	13.8	8.5	16.2
44255	99	DIRN	SUR	47	-57	1022	0	0	14.2	5.4	15.2
44258	99	DIRN	SUR	45	-63	547	0	0	15.6	3.2	15.9
45003	99	DIRN	SUR	45	-83	662	0	0	18.1	-0.5	18.2
45005	99	DIRN	SUR	42	-82	1037	0	0	14.2	5.1	15.1
45008	99	DIRN	SUR	44	-82	1066	0	0	16.7	2.9	17.0
45012	99	DIRN	SUR	44	-77	661	0	0	21.0	7.6	22.3
45132	99	DIRN	SUR	43	-81	612	0	0	16.7	-16.1	23.2
45135	99	DIRN	SUR	44	-77	314	0	0	17.0	-18.4	25.1
45137	99	DIRN	SUR	46	-81	644	0	0	16.6	-14.6	22.1
45138	99	DIRN	SUR	50	-66	601	0	0	16.7	-0.1	16.7
45139	99	DIRN	SUR	43	-80	537	0	0	16.3	-19.6	25.5
45142	99	DIRN	SUR	43	-79	553	0	0	15.6	-23.3	28.1
45143	99	DIRN	SUR	45	-81	979	0	0	16.0	-19.9	25.5
45147	99	DIRN	SUR	42	-83	476	0	0	19.5	0.4	19.5
45149	99	DIRN	SUR	44	-82	467	0	0	20.1	-9.0	22.0
45151	99	DIRN	SUR	45	-79	575	0	0	16.8	5.8	17.8
45152	99	DIRN	SUR	46	-80	158	0	0	15.5	-25.7	30.0
45154	99	DIRN	SUR	46	-83	814	0	0	17.6	-15.0	23.2
45159	99	DIRN	SUR	44	-79	563	0	0	23.7	-12.3	26.7
45162	99	DIRN	SUR	45	-83	47	0	0	26.5	-3.3	26.7
45163	99	DIRN	SUR	44	-84	81	0	0	13.6	1.2	13.6
45164	99	DIRN	SUR	42	-82	552	0	0	23.8	-10.5	26.0
45165	99	DIRN	SUR	42	-83	168	0	0	23.6	-31.4	39.3
45167	99	DIRN	SUR	42	-80	945	0	0	32.3	-20.8	38.4
45169	99	DIRN	SUR	42	-82	664	0	0	14.8	2.3	15.0
45175	99	DIRN	SUR	46	-85	818	0	0	43.9	-10.6	45.1
45176	99	DIRN	SUR	42	-82	665	0	0	24.3	-9.4	26.1
6200091	99	DIRN	SUR	53	-5	593	1	0	12.1	4.5	12.8
6200092	99	DIRN	SUR	51	-11	661	0	0	19.5	8.8	21.3
6200093	99	DIRN	SUR	55	-10	667	0	0	9.6	-1.8	9.8
6200094	99	DIRN	SUR	52	-7	646	0	0	10.9	4.3	11.8
62001	99	DIRN	SUR	45	-5	602	0	0	14.4	4.0	14.9
62029	99	DIRN	SUR	49	-13	1121	0	0	15.1	6.9	16.6
62050	99	DIRN	SUR	50	-4	639	0	0	16.6	2.2	16.8
62095	99	DIRN	SUR	53	-16	653	0	0	20.1	6.6	21.2

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
62103	99	DIRN	SUR	50	-3	666	0	0	19.7	9.1	21.7
62105	99	DIRN	SUR	55	-13	406	0	0	13.7	3.6	14.2
62107	99	DIRN	SUR	50	-6	1344	0	0	16.9	6.1	18.0
62111	99	DIRN	SUR	58	0	602	0	0	16.9	3.8	17.4
62112	99	DIRN	SUR	58	0	518	0	0	11.8	3.9	12.4
62114	99	DIRN	SUR	58	0	1282	0	0	10.4	1.2	10.5
62117	99	DIRN	SUR	58	0	657	0	0	10.7	5.0	11.8
62163	99	DIRN	SUR	48	-8	672	0	0	18.0	-0.1	18.0
62305	99	DIRN	SUR	50	0	765	0	0	14.5	2.6	14.7
64041	99	DIRN	SUR	61	-3	666	0	0	11.3	9.2	14.5
64045	99	DIRN	SUR	59	-12	1419	0	0	10.1	5.7	11.6
64046	99	DIRN	SUR	61	-4	648	0	0	11.2	-4.1	12.0

4.12 Table 24 - List of Assimilated BUFR Encoded Radiosonde Stations

ASDE01	ASDE02	ASDE03	ASDK01	ASDK02	ASDK03	ASEU01	ASEU02	ASEU03
ASEU04	ASEU06	ASFR1	ASFR2	ASFR3	ASFR4	DBLK	01001	01004
01010	01028	01241	01400	01415	01492	02185	02365	02527
02591	02836	02935	02963	03005	03354	03808	03882	03918
03953	06260	06610	08001	08023	08190	08221	08302	08430
10035	10113	10141	10184	10238	10304	10393	10410	10548
10618	10739	10868	10954	10962	16080	16245	16320	16429
16546	33008	43599	47155	60018	61901	89002	89564	89571
89611	93112	93417	93817	93844	93997	94120	94150	94170
94203	94294	94299	94302	94312	94326	94332	94374	94403
94430	94461	94510	94578	94610	94637	94638	94653	94659
94672	94711	94767	94776	94802	94821	94866	94910	94975
94995	94996	94998	95527					

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

10141 33008 47155 76903 94653

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.