



# ECMWF Global Data Monitoring Report

**July 2015**

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

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### Summary of Revisions (in reverse order)

- Revision 28 (June 18) - Monitoring of SYNOP and SYNOP-SHIPs now includes BUFR encoded observations for those which were assimilated as well as for those without TAC counterpart.
- Revision 27 (Mar 15) - Monitoring of Radiosondes and ASAPs now includes BUFR encoded observations for those which were assimilated as well as for those without TAC counterpart. Tables 24 and 25 are also added to show the identifiers of these BUFR observations separately.
- Revision 26 (Feb 15) - Selection criteria for SHIPs are modified as per SOT-7/Doc.9.1.1. Different criteria applied to Manual and Automatic SHIPs.
- Revision 25 (Dec 14) - Coverage chart for ATOVS AMSU-A for NOAA\_16 removed
- Revision 24 (Aug 06) - North Atlantic Monitoring statistics replaced by EUCOS Area Monitoring Statistics (tables 13 to 23). Airep tables removed from this section.
- Revision 23 (Dec 00) - Coverage charts for NOAA\_14 MSU replaced by ATOVS AMSU-A for NOAA\_16.
- Revision 22 (Aug 99) - Coverage charts for TOVS thickness 300-100 hPa replaced by (A) TOVS AMSU-A and MSU (NOAA\_15 and NOAA\_14).
- Revision 21 (May 99) - Monitoring statistics ceased for NOAA\_11 as satellite is no more available.
- Revision 20 (Sep 98) - Changes to tables and annex to remove all mention about data usage. Two more levels (50 and 850 hPa) added to the COSNA statistics for Sondes.
- Revision 19 (Jul 98) - From June 29th, 1998 ECMWF model assimilates temperature data instead of geopotential from radiosondes. As a consequence the number of used geopotential data drops to zero in tables 7, 10, 13 and 15.
- Revision 18 (Apr 98) - Changes to tables and annex to introduce the usage of accepted numbers and observations instead of percentage 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	Jun	Jul	Ident	Time	Jun	Jul
01001	(00)	30	0	08190	(00)	20	31
01010	(00)	30	0	10954	(12)	33	60
01028	(00)	30	0	11240	(00)	8	25
01241	(00)	25	0	12120	(00)	11	31
01400	(00)	23	2	12120	(12)	12	31
01415	(00)	28	0	28951	(00)	17	30
02185	(00)	34	0	28951	(12)	18	31
02365	(00)	38	0	29839	(00)	17	31
02527	(00)	42	2	29839	(12)	18	30
02591	(00)	36	0	33837	(00)	16	29
03953	(00)	30	2	40265	(00)	6	30
06260	(00)	28	0	42182	(12)	0	14
08001	(00)	25	0	42971	(00)	13	29
08023	(00)	27	1	64650	(00)	5	22
08160	(00)	28	0	64650	(12)	3	16
08221	(00)	30	0	68424	(00)	17	31
08302	(00)	30	0	74626	(00)	5	62
08430	(00)	30	0	74626	(12)	16	31
17516	(00)	29	0	76225	(00)	0	19
24343	(00)	20	0	76458	(00)	0	31
24343	(12)	20	0	76612	(00)	0	12
26702	(00)	30	9	76654	(00)	0	27
26702	(12)	30	10	78397	(00)	0	14
30554	(00)	30	10	78583	(00)	0	16
42809	(00)	30	3	78866	(00)	0	15
48407	(00)	29	2	78954	(00)	0	17
48568	(00)	27	6	80001	(12)	11	27
60018	(00)	30	1	82193	(00)	19	30
63741	(00)	20	0	82244	(00)	12	30
76394	(00)	23	0	82244	(12)	12	26
76394	(12)	23	0	82281	(00)	12	30
78486	(12)	29	1	82983	(12)	19	30
82107	(12)	16	0	87155	(12)	14	29
83208	(12)	13	0	87418	(12)	0	16
-	-	-	-	98223	(12)	0	30

## 2.2 Drifting Buoys

Surface pressure observations from **1515** 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

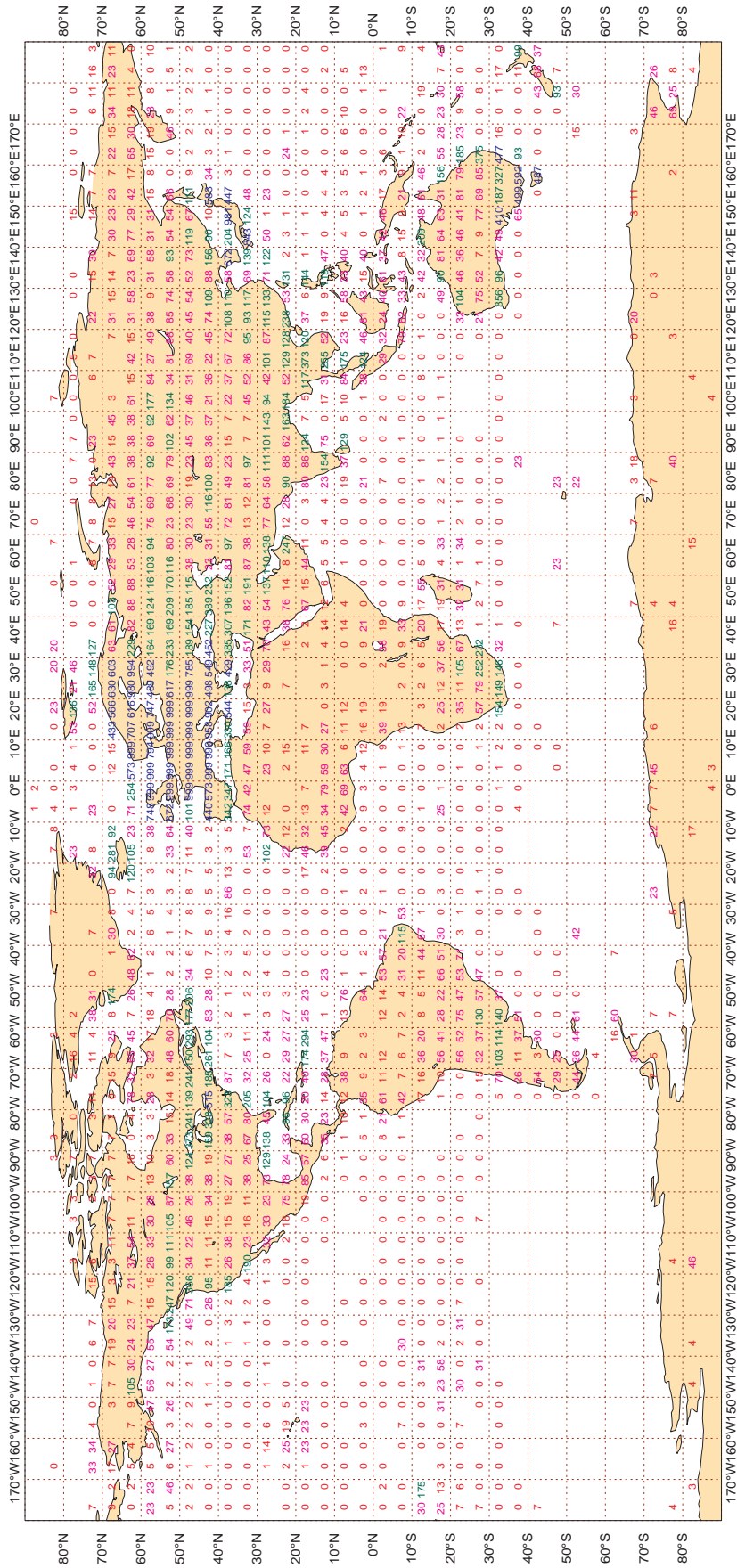
Table 12 provides quality statistics of aircraft wind observations stratified by airline carrier.



3.2.1 Figure 1 - Availability - SYNOP PRESSURE

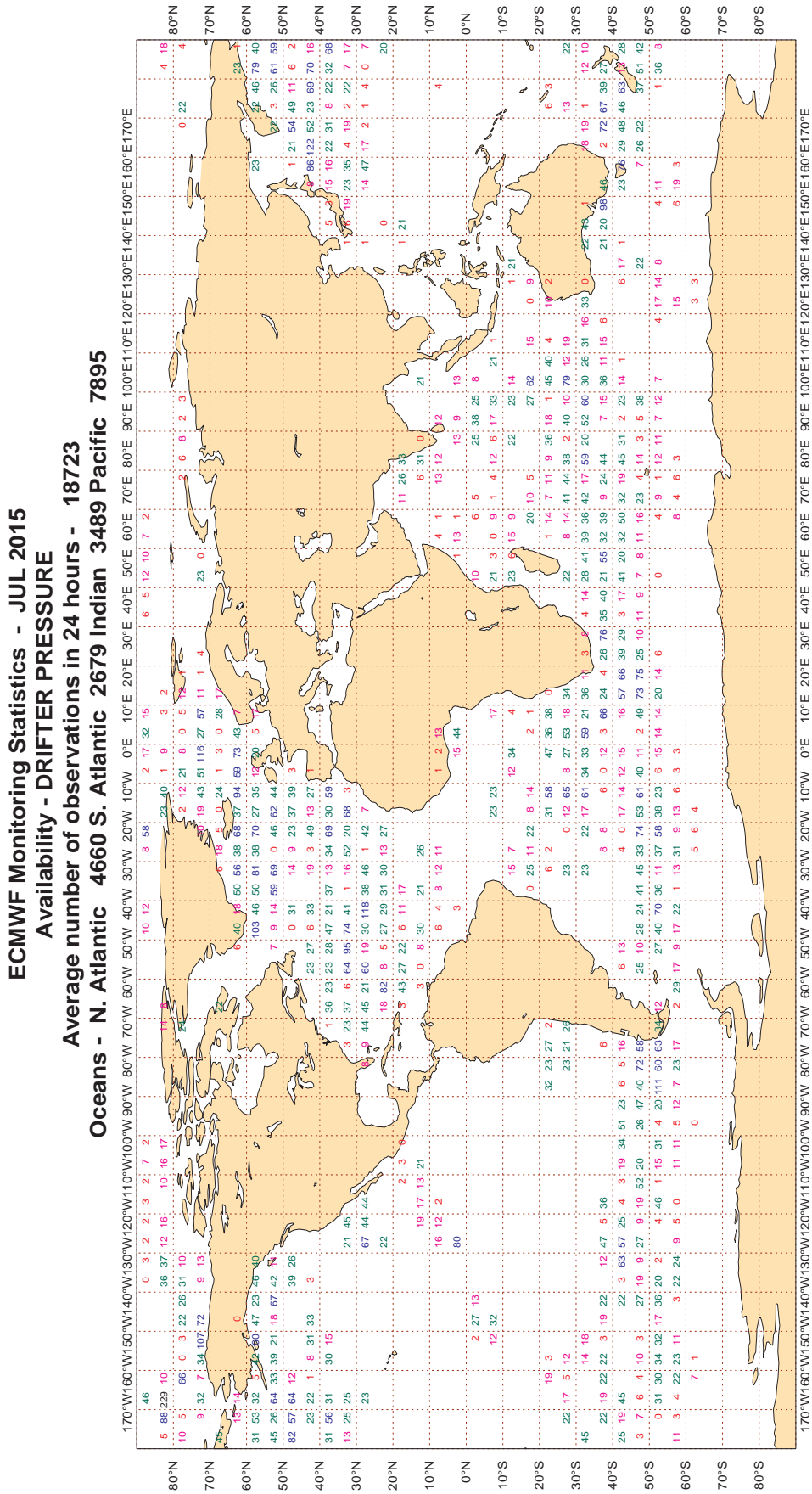
Figure 1

ECMWF Monitoring Statistics - JUL 2015  
 Availability - SYNOP/SHIP (manual, auto) pressure  
 Average number of observations in 24 hours - 115975  
 LAND - WMO Region I: 3999 II:18465 III: 3014 IV: 4802  
 Region V: 8890 VI:62658 Antarctic: 707  
 Oceans - N. Atlantic 8524 S. Atlantic 145 Indian 377 Pacific 4395



3.2.2 Figure 2 - Availability - DRIFTER PRESSURE

Figure 2



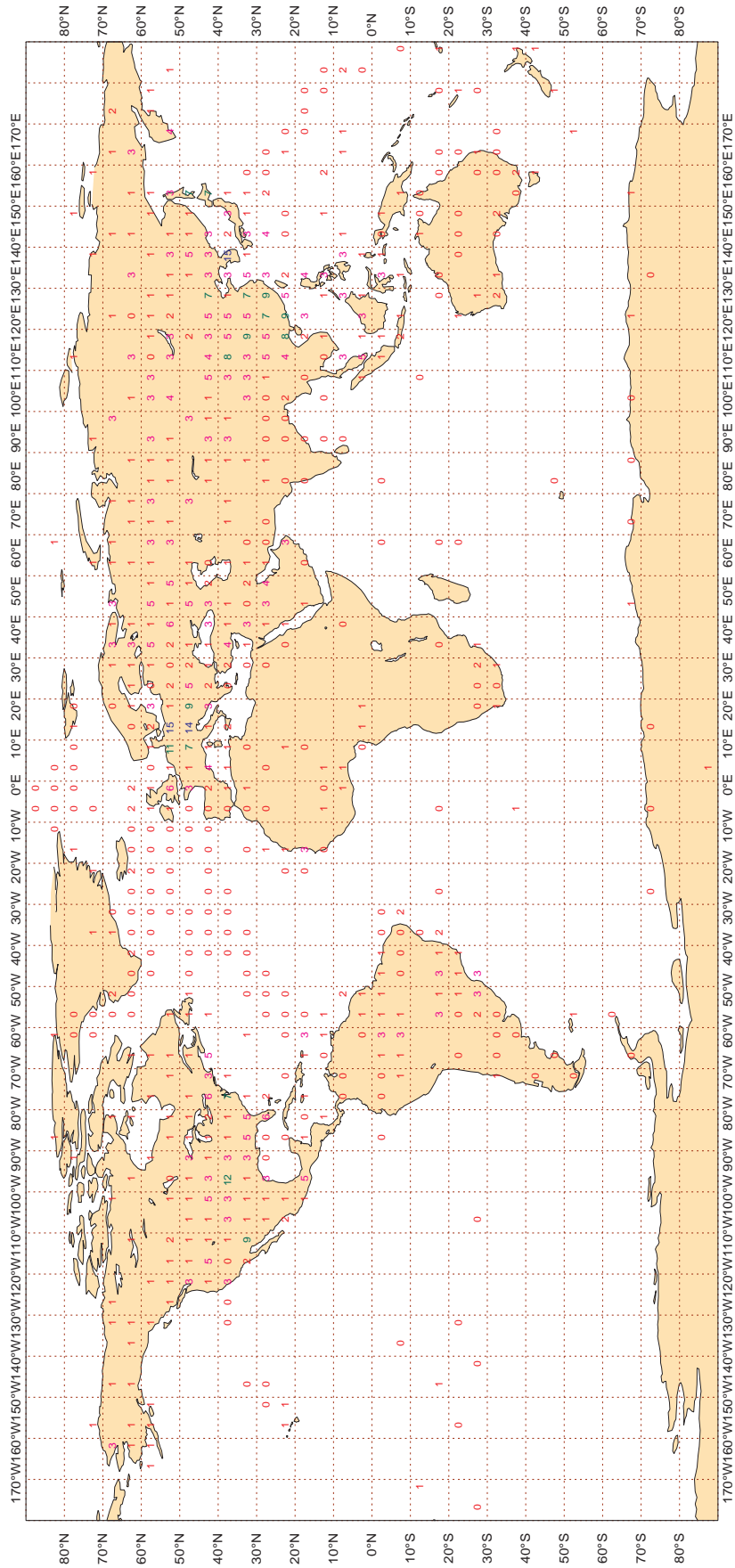
Magics 2.18.4 (64 bit)



3.2.3 Figure 3 - Availability - TEMP 500 hPa geopotential

Figure 3

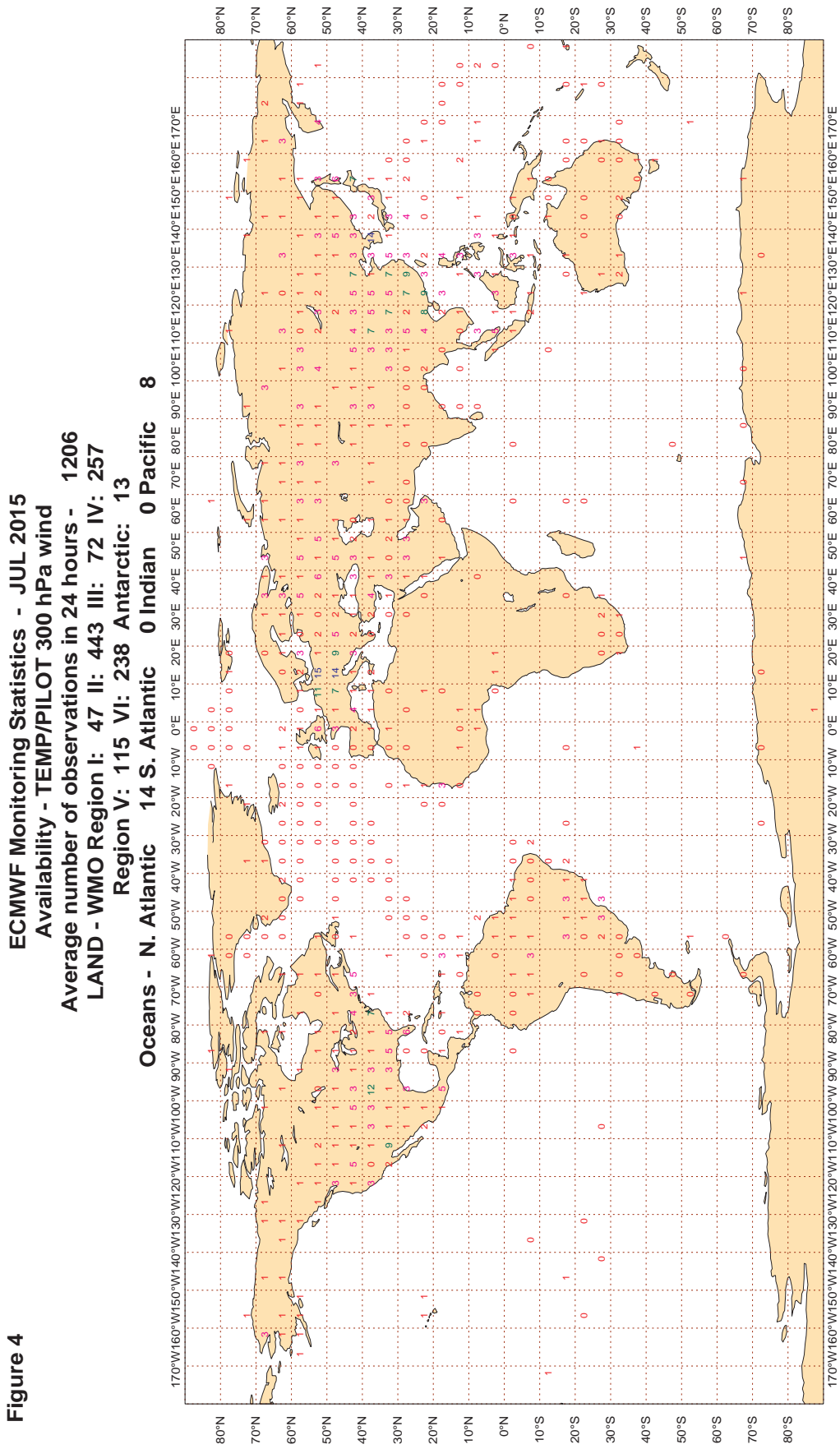
ECMWF Monitoring Statistics - JUL 2015  
 Availability - TEMP 500 hPa Geopotential  
 Average number of observations in 24 hours - 1251  
 LAND - WMO Region I: 48 II: 463 III: 76 IV: 264  
 Region V: 123 VI: 241 Antarctic: 13  
 Oceans - N. Atlantic 16 S. Atlantic 0 Indian 0 Pacific 8



Magics 2.18.4 (64 bit)



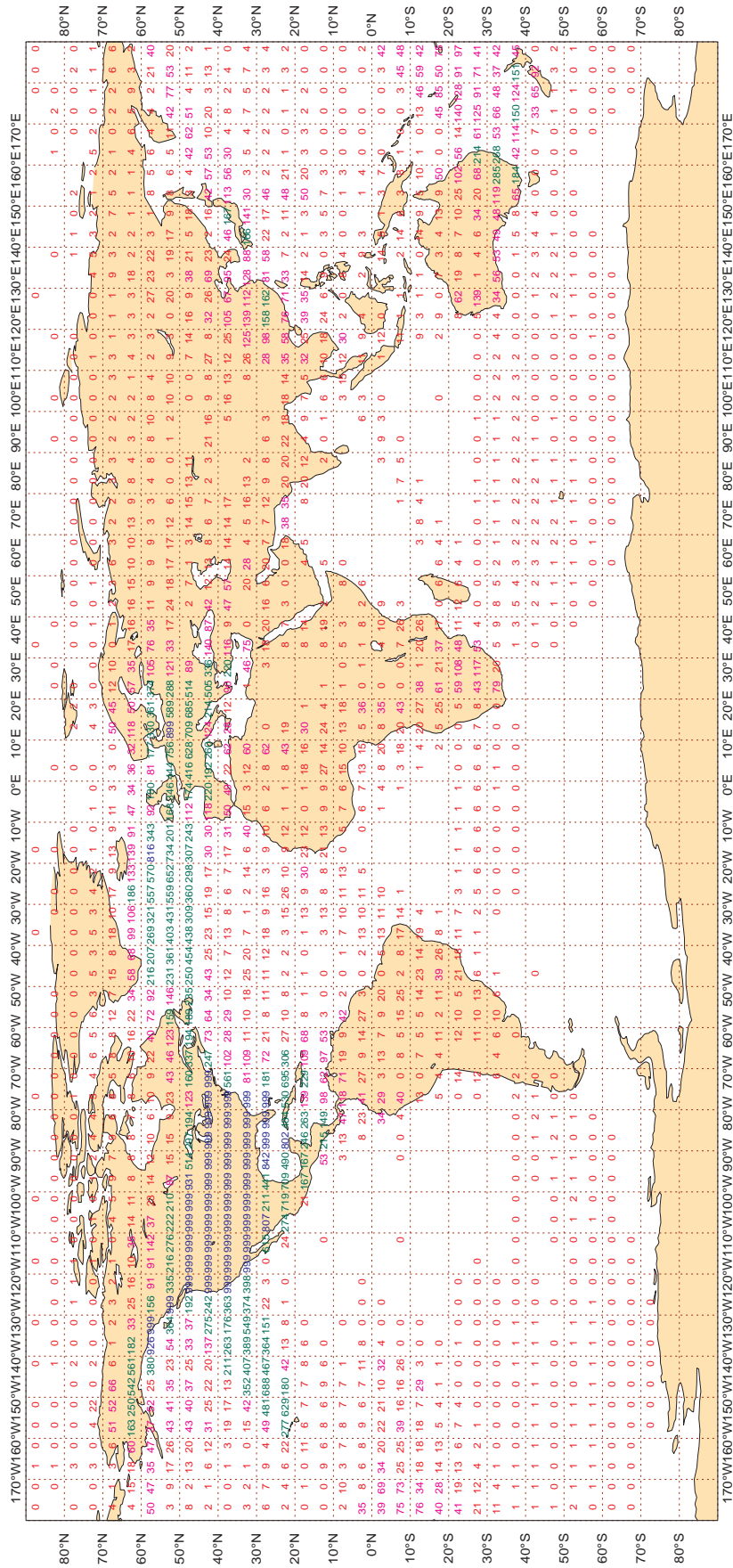
3.2.4 Figure 4 - Availability - TEMP/PILOT 300 hPa wind



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

Figure 5

ECMWF Monitoring Statistics - JUL 2015  
Availability - Aircraft winds 300-150 hPa  
Average number of observations in 24 hours - 237960

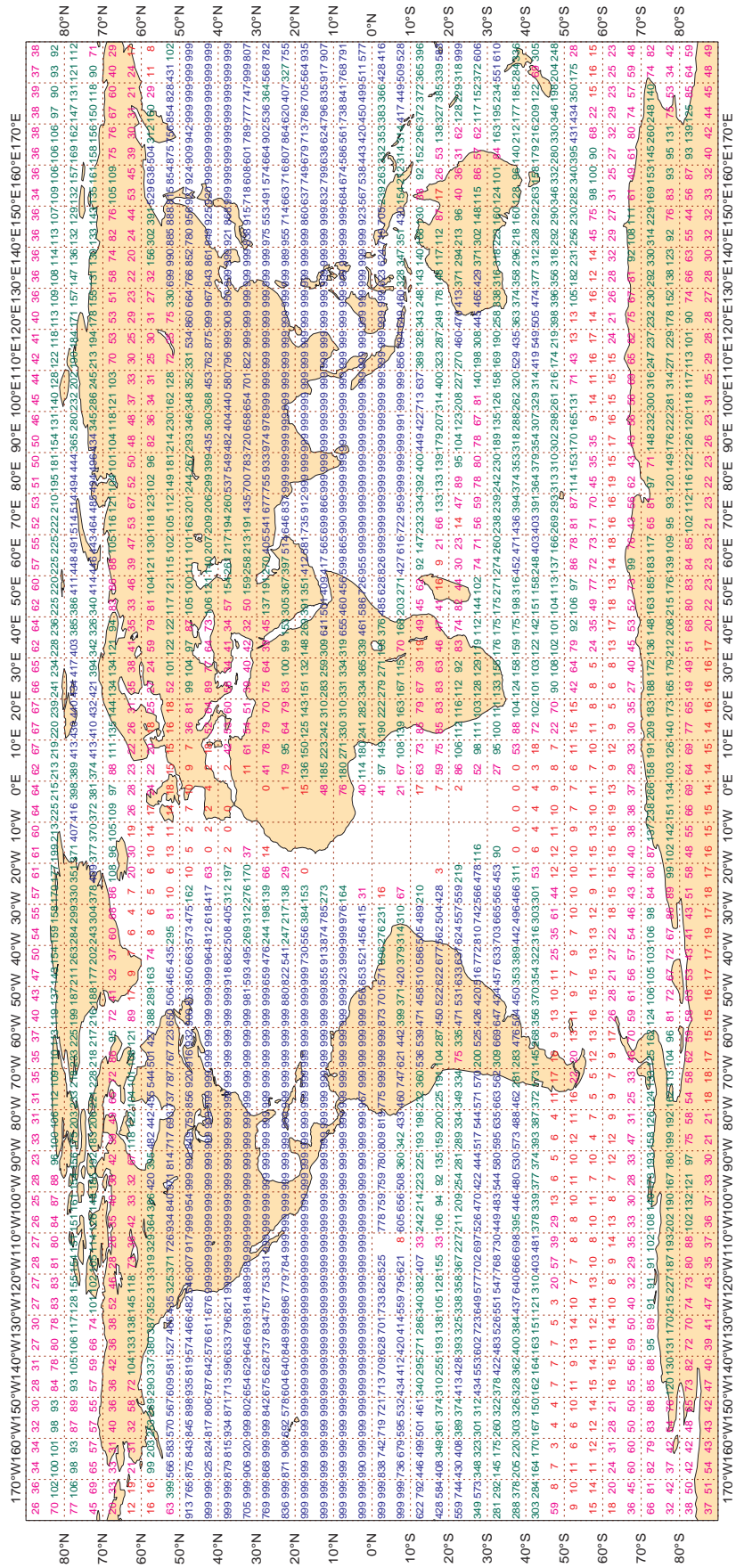




3.2.6 Figure 6 - Availability - SATOB winds 400-150 hPa

Figure 6

ECMWF Monitoring Statistics - JUL 2015  
Availability - AMV winds 400-150 hPa  
Average number of observations in 24 hours - 1026236



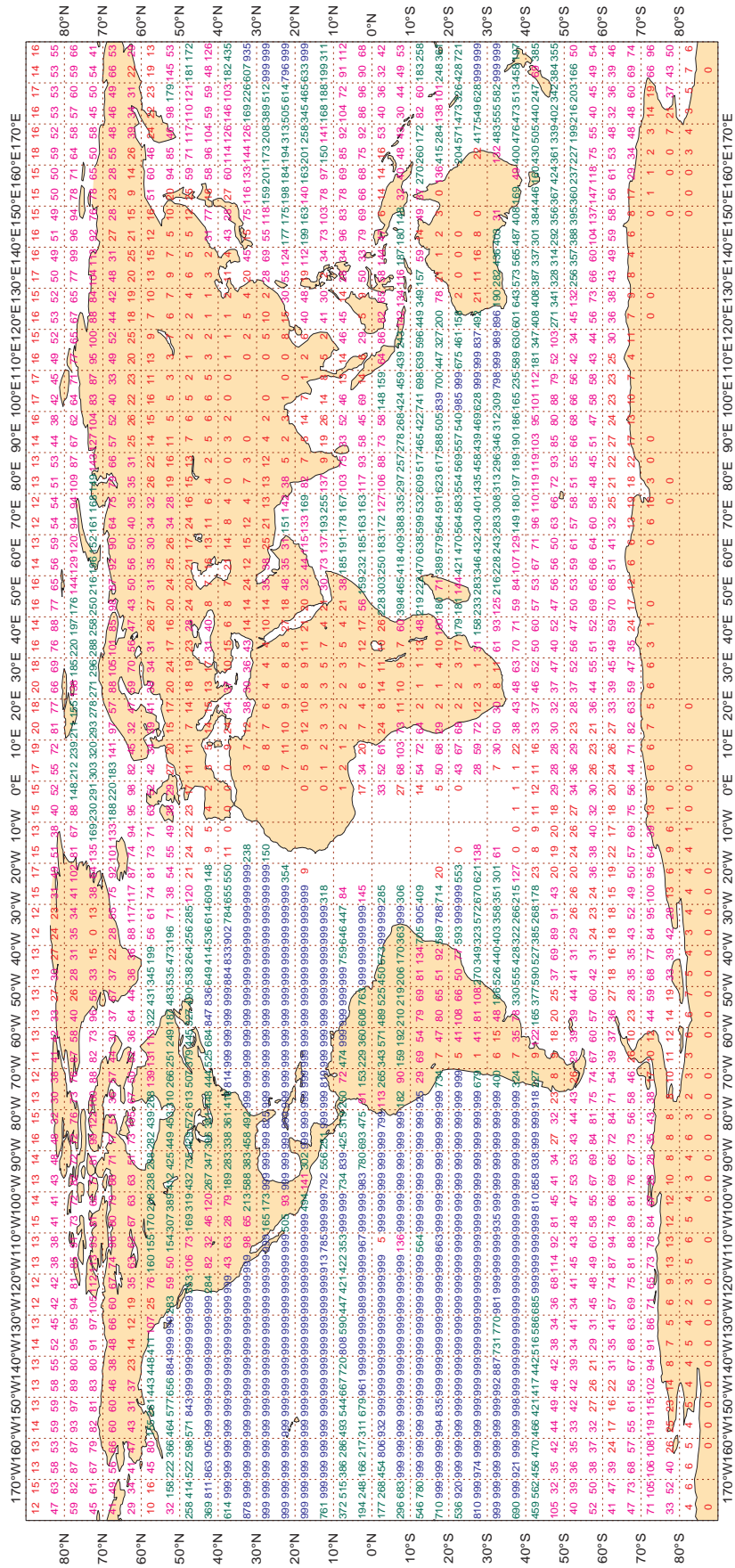
Magics 2.18.4 (64 bit)



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

Figure 7

ECMWF Monitoring Statistics - JUL 2015  
Availability - AMV winds 1000-700 hPa  
Average number of observations in 24 hours - 1157210



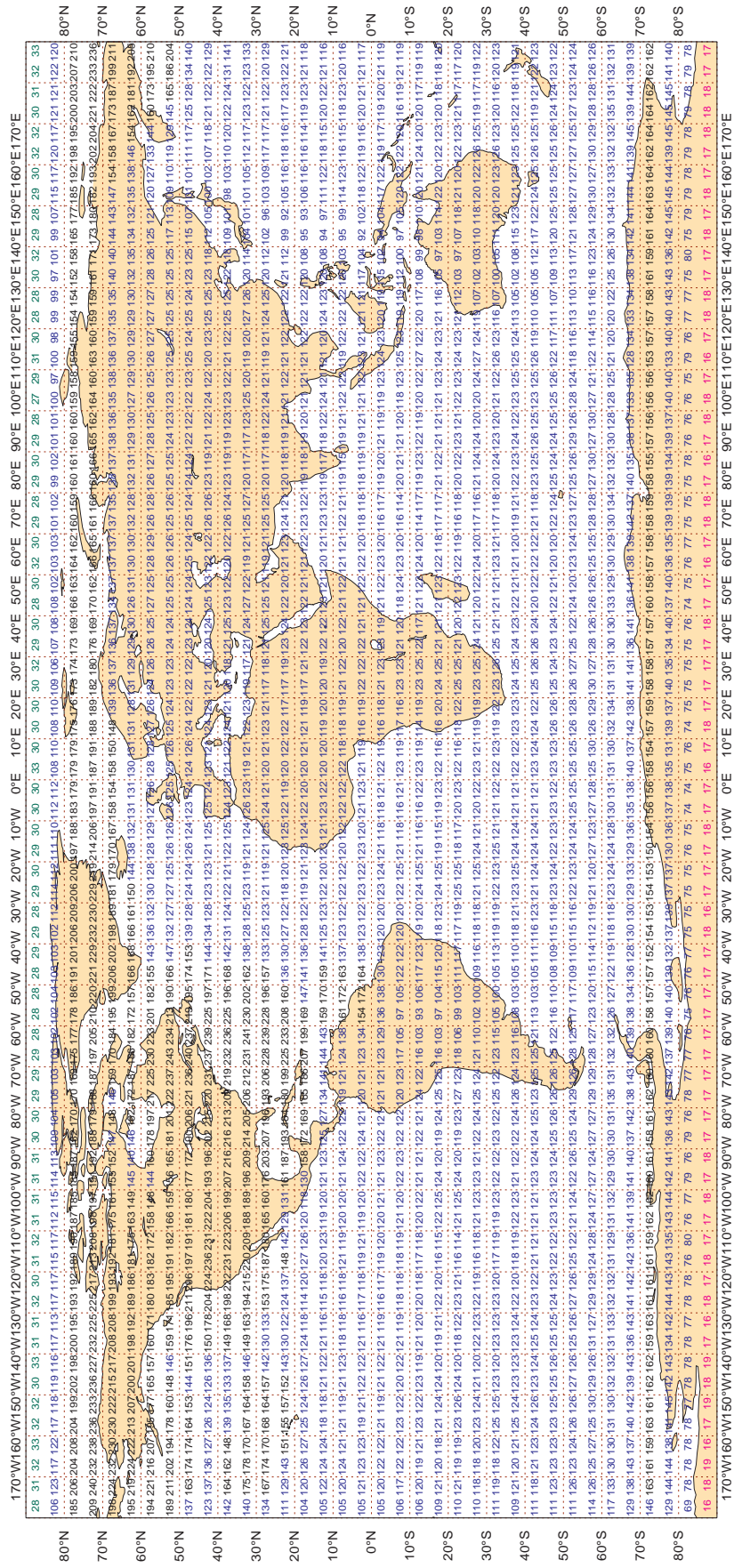
Magics 2.18.4 (64 bit)



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

Figure 8

ECMWF Monitoring Statistics - JUL 2015  
Availability - NOAA15 ATOVS : AMSU-A  
Average number of observations in 24 hours - 333038



Magics 2.18.4 (64 bit)

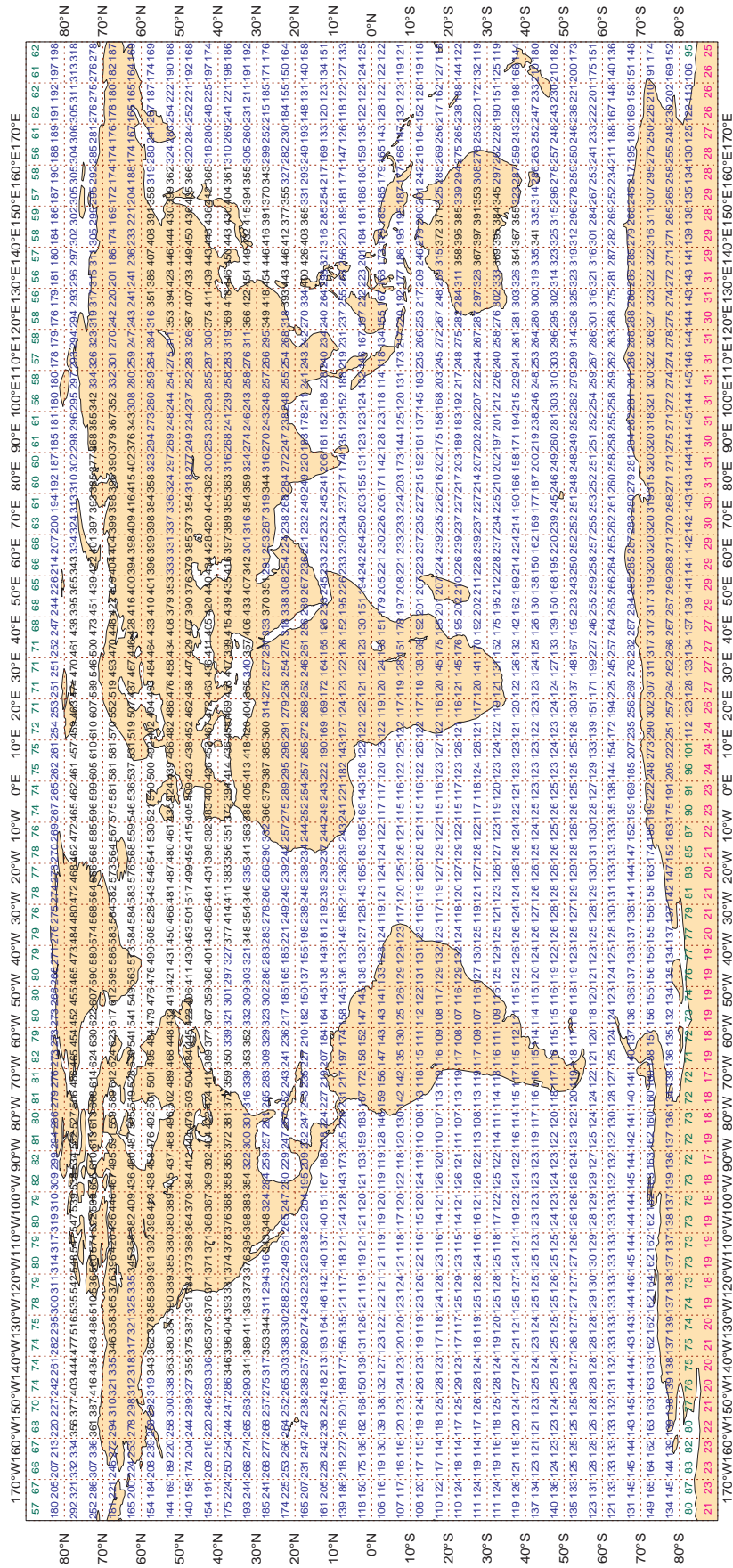




### 3.2.9 Figure 9.1 - Availability - NOAA18 ATOVS : AMSU-A

Figure 9.1

ECMWF Monitoring Statistics - JUL 2015  
 Availability - NOAA18 ATOVS : AMSU-A  
 Average number of observations in 24 hours - 607324



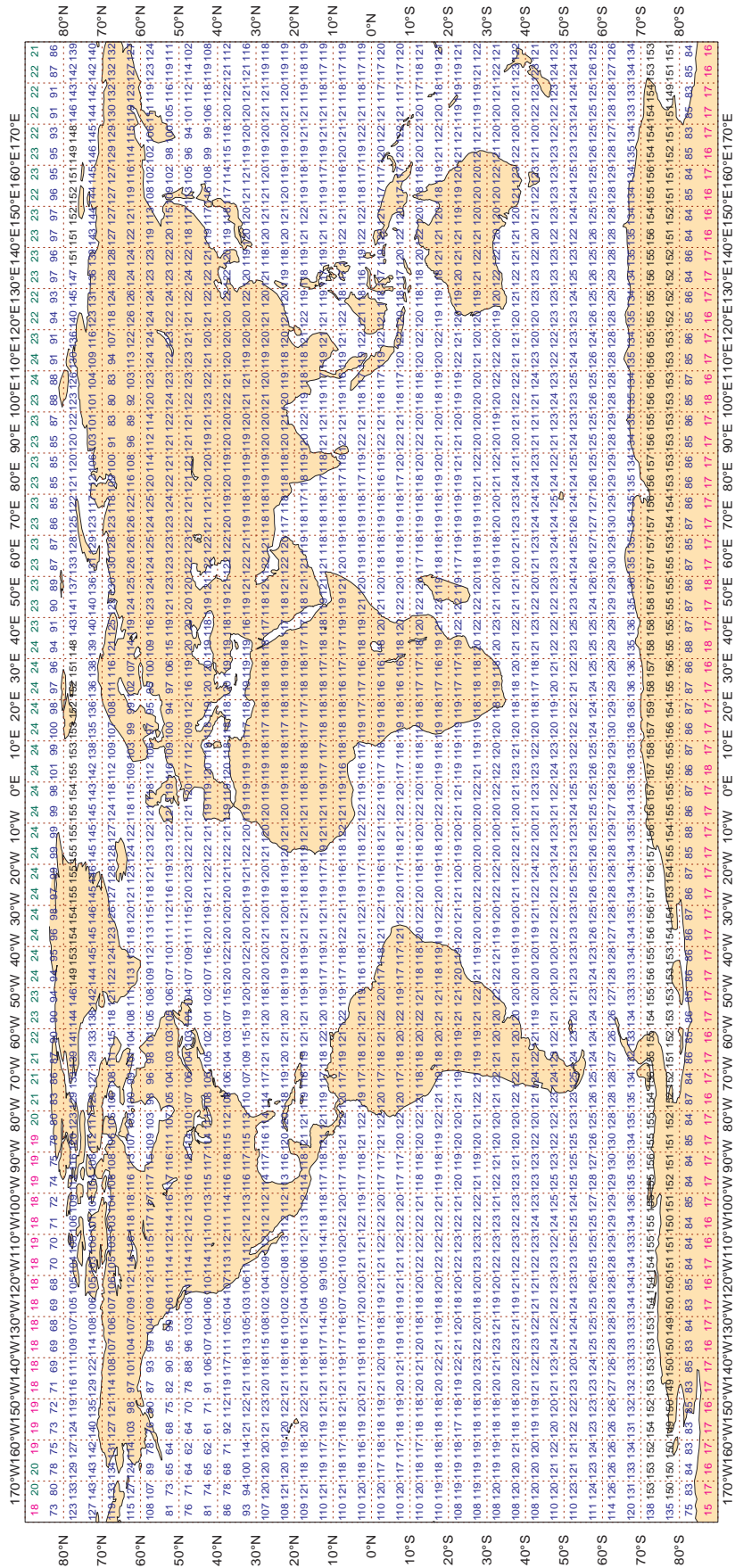
Magics 2.18.4 (64 bit)



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

Figure 9.2

ECMWF Monitoring Statistics - JUL 2015  
Availability - AQUA ATOVS : AMSU-A  
Average number of observations in 24 hours - 297167



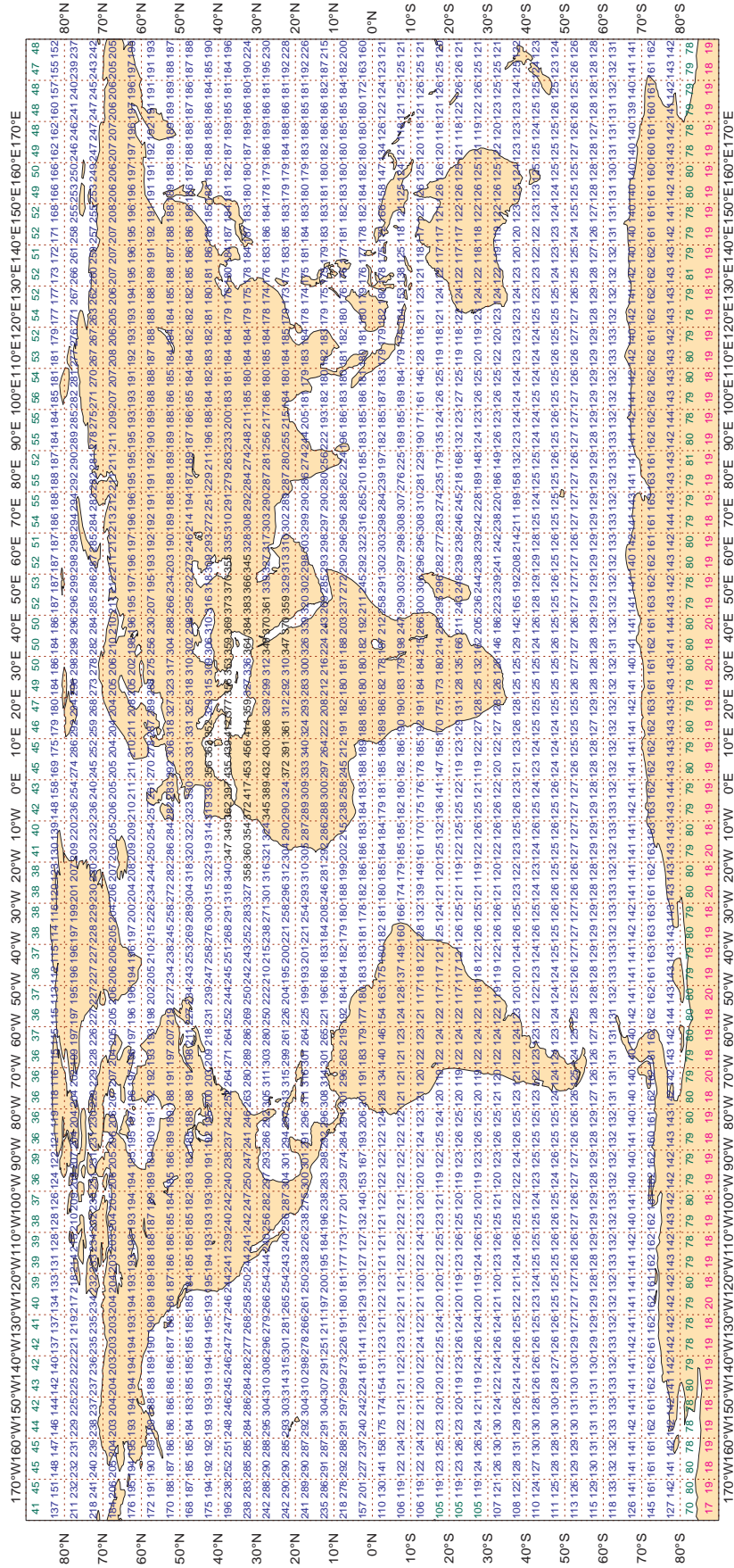
Magics 2.18.4 (64 bit)



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

Figure 9.3

ECMWF Monitoring Statistics - JUL 2015  
Availability - METOP ATOVS : AMSU-A  
Average number of observations in 24 hours - 454249



Magics 2.18.4 (64 bit)



**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 : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

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

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	SD	BIAS	RMS
C6XC2	99	P	SUR	21	0	1.2	3.3	3.5
ELPP9	99	P	SUR	16	0	1.1	-3.0	3.2
UFJC	99	P	SUR	15	0	1.2	3.7	3.9

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

LIST OF SUSPECT STATIONS : SHIPS + FIXED MARINE PLATFORMS  
 MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND SPEED (M/S)  
 AREA : GLOBAL  
 PERIOD : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

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

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
46181	99	SPEED	SUR	35	0	0	2.3	4.8	5.4



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

LIST OF SUSPECT STATIONS : SHIPS + FIXED MARINE PLATFORMS  
 MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND DIRECTION (DEGREES)  
 AREA : GLOBAL  
 PERIOD : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

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

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
45026	99	DIRN	SUR	16	0	0	23.2	-33.5	40.8
45139	99	DIRN	SUR	17	0	0	16.9	-31.9	36.1
45168	99	DIRN	SUR	32	0	0	21.4	31.6	38.2

**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 : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

TIME = 99 => AVERAGE OF ALL OBSERVATIONS

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
21533	99	P	SUR	42	142	72	48	0.4	0.1	0.5
48627	99	P	SUR	0	0	154	122	2.7	3.5	4.4
48638	99	P	SUR	71	-153	214	54	7.2	2.3	7.5
48784	99	P	SUR	77	-163	181	27	9.1	1.6	9.3
64532	99	P	SUR	55	-45	217	105	0.8	1.2	1.5
64534	99	P	SUR	61	-34	495	291	1.5	0.5	1.5

**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 : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

TIME = 99 => AVERAGE OF ALL OBSERVATIONS

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
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### 3.2.17 Table 6 - Suspect drifters: Wind direction (degrees)

LIST OF SUSPECT STATIONS : DRIFTER  
 MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND DIRECTION (DEGREES)  
 PERIOD : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

TIME = 99 => AVERAGE OF ALL OBSERVATIONS

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
23004	99	DIRN	SUR	0	90	94	0	0	43.9	20.1	48.3
23099	99	DIRN	SUR	13	80	70	0	0	20.0	53.5	57.2
23454	99	DIRN	SUR	10	72	64	0	0	137.6	-52.1	147.2
23460	99	DIRN	SUR	7	88	76	4	0	169.0	38.1	173.2
23491	99	DIRN	SUR	12	93	49	0	0	12.9	40.3	42.3
23492	99	DIRN	SUR	11	72	33	0	0	56.1	134.9	146.1
23497	99	DIRN	SUR	11	72	53	0	0	127.5	106.4	166.0
31053	99	DIRN	SUR	-32	-50	167	0	0	38.9	51.9	64.9
31374	99	DIRN	SUR	-25	-45	159	0	0	54.3	-48.2	72.7
52073	99	DIRN	SUR	5	137	56	0	0	132.1	-90.0	159.8
53040	99	DIRN	SUR	-8	95	201	0	0	158.7	42.5	164.3
53056	99	DIRN	SUR	-5	95	172	0	0	168.1	12.1	168.6

**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 : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

ONLY THE WORST LEVEL IS SHOWN (WITH UNWEIGHTED RMS)

WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
22271	12	Z	70	68	44	25	0	93.2	90.8	130.1
22543	12	Z	50	65	41	28	0	95.6	119.2	152.8
33041	12	Z	250	52	31	29	0	46.5	-65.8	80.6
33393	00	Z	200	50	24	12	0	32.2	82.1	88.2
33658	00	Z	200	48	26	13	0	25.8	81.1	85.1
33791	12	Z	150	48	33	24	0	46.3	-99.1	109.4
40417	00	Z	1000	26	50	22	0	2.8	39.0	39.1
40417	12	Z	925	26	50	20	0	0.0	41.6	41.6
40430	00	Z	850	25	40	30	0	0.0	42.8	42.8
40430	12	Z	925	25	40	30	0	5.9	42.7	43.1
41977	00	Z	925	22	92	10	0	37.4	-27.4	46.4
42410	00	Z	500	26	92	26	0	43.4	-35.6	56.1
43003	00	Z	700	19	73	25	0	18.5	-50.2	53.5
43150	00	Z	30	18	83	11	0	15.3	195.0	195.6
43279	00	Z	30	13	80	20	0	51.3	196.0	202.6
76405	12	Z	400	24	-110	28	1	71.8	62.4	95.1
76679	00	Z	1000	19	-99	30	13	9.9	-82.1	82.7
89592	00	Z	100	-67	93	28	1	83.1	-116.0	142.7
91680	00	Z	1000	-18	177	30	0	3.5	30.0	30.2
91680	12	Z	1000	-18	177	29	0	3.4	28.6	28.8
96147	12	Z	925	4	108	31	2	15.3	50.0	52.3
96147	00	Z	925	4	108	27	2	15.2	48.8	51.1
96481	00	Z	30	4	118	22	0	126.5	159.9	203.9
ASEU03	00	Z	250	43	-59	11	1	94.1	120.9	153.2
ASEU03	12	Z	200	42	-67	13	3	90.7	138.7	165.7

**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 : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

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

WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	UBIAS	VBIAS	RMS
22820	12	V	300	62	34	31	0	4.1	4.1	15.4
31977	12	V	100	43	132	14	0	12.0	-1.1	15.2

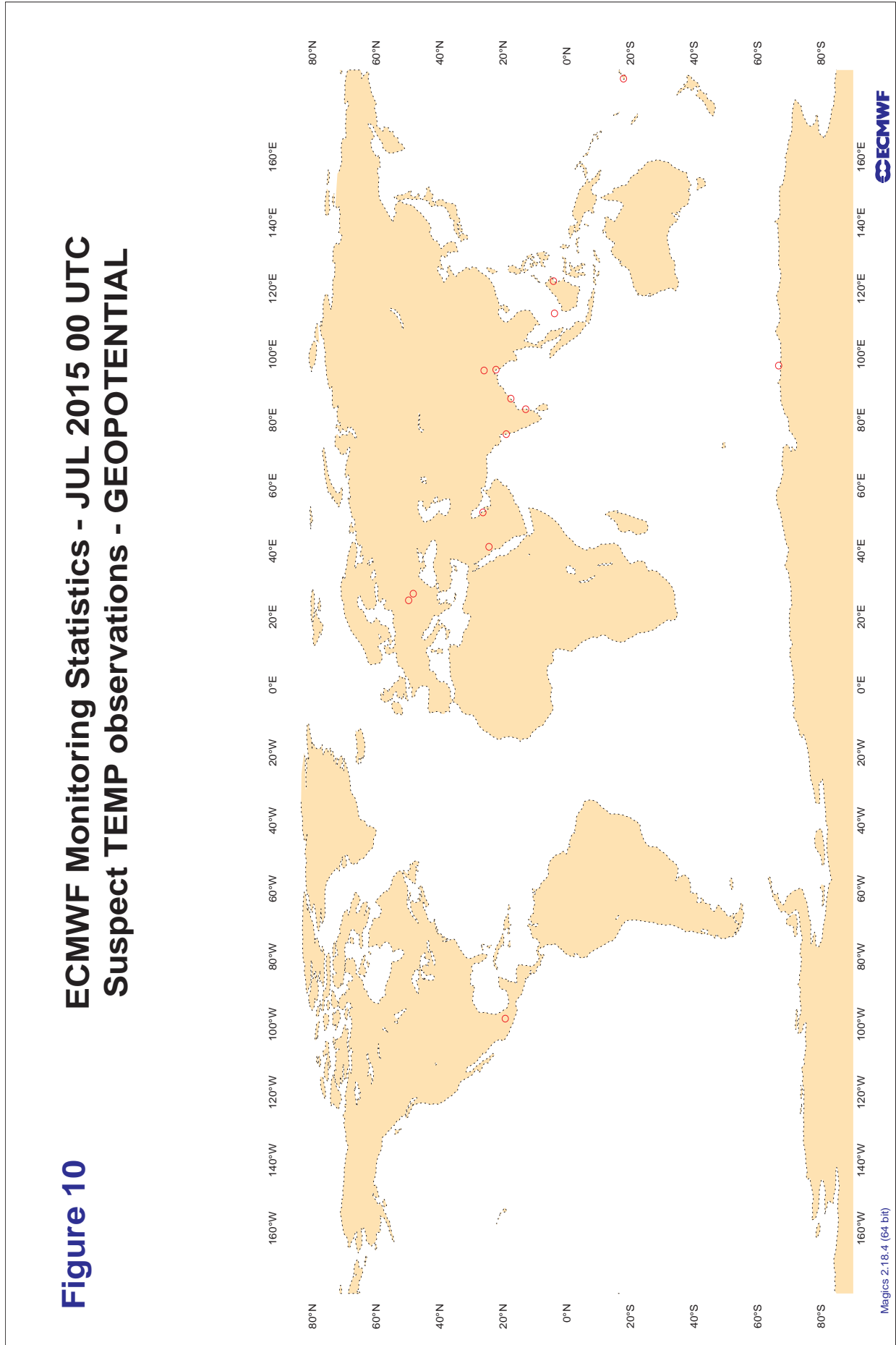
**3.2.20 Table 9 - Suspect radiosondes: Wind direction (degrees)**

LIST OF SUSPECT STATIONS : RADIOSONDES  
 MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND DIRECTION (DEGREES)  
 AREA : GLOBAL  
 PERIOD : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

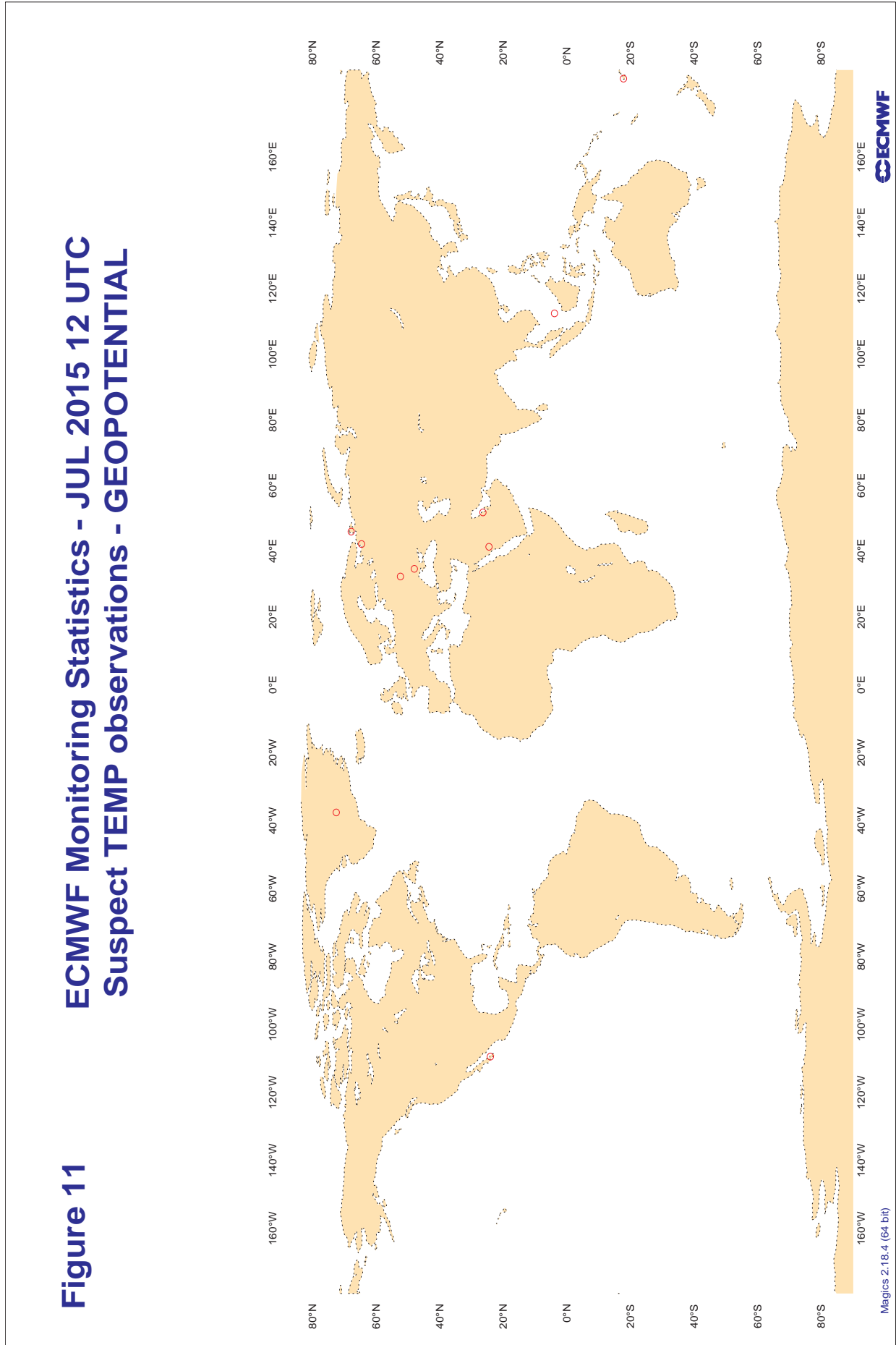
SELECTION CRITERIA: OBSERVED/FORECAST WIND SPEEDS  $\geq$  5 M/S  
 NO. OF OBSERVATIONS  $\geq$  5, AND,  
 ABSOLUTE BIAS  $\geq$  10 DEGREES, WITH  
 STANDARD DEVIATION  $<$  30 DEGREES, AND,  
 VERTICAL SPREAD  $<$  10 DEGREES  
 (AVERAGE BETWEEN 500 AND 150 HPA)

WMO IDENT	OBS TIME	ELM	LAT	LONG	NUM OBS	BIAS	MAX SPREAD	SD
54342	12	DD	42	124	28	14.7	5.0	11.6
54342	00	DD	42	124	27	14.3	2.1	10.8

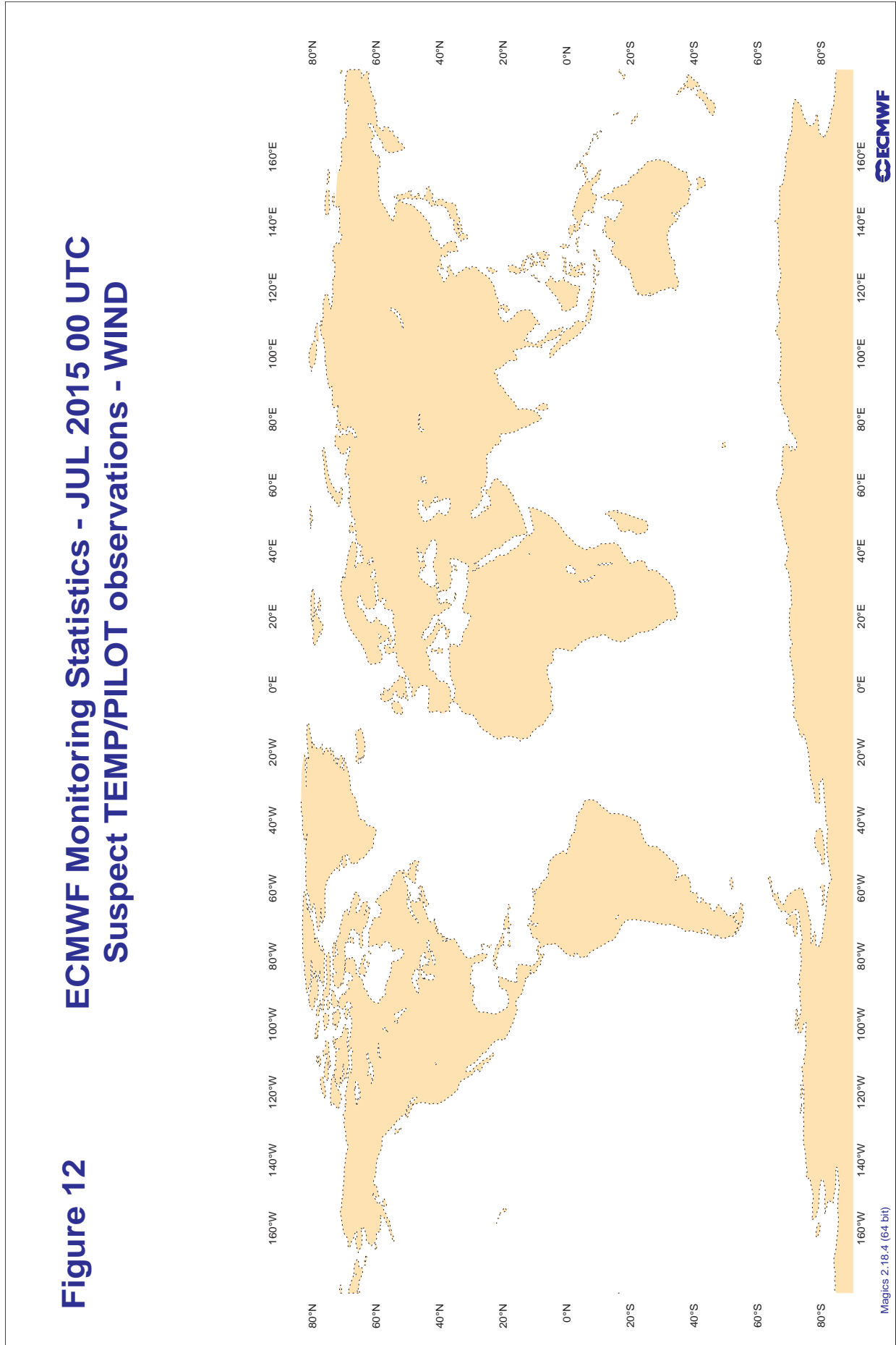
3.2.21 Figure 10 - Suspect TEMP observations - geopotential : 00 UTC



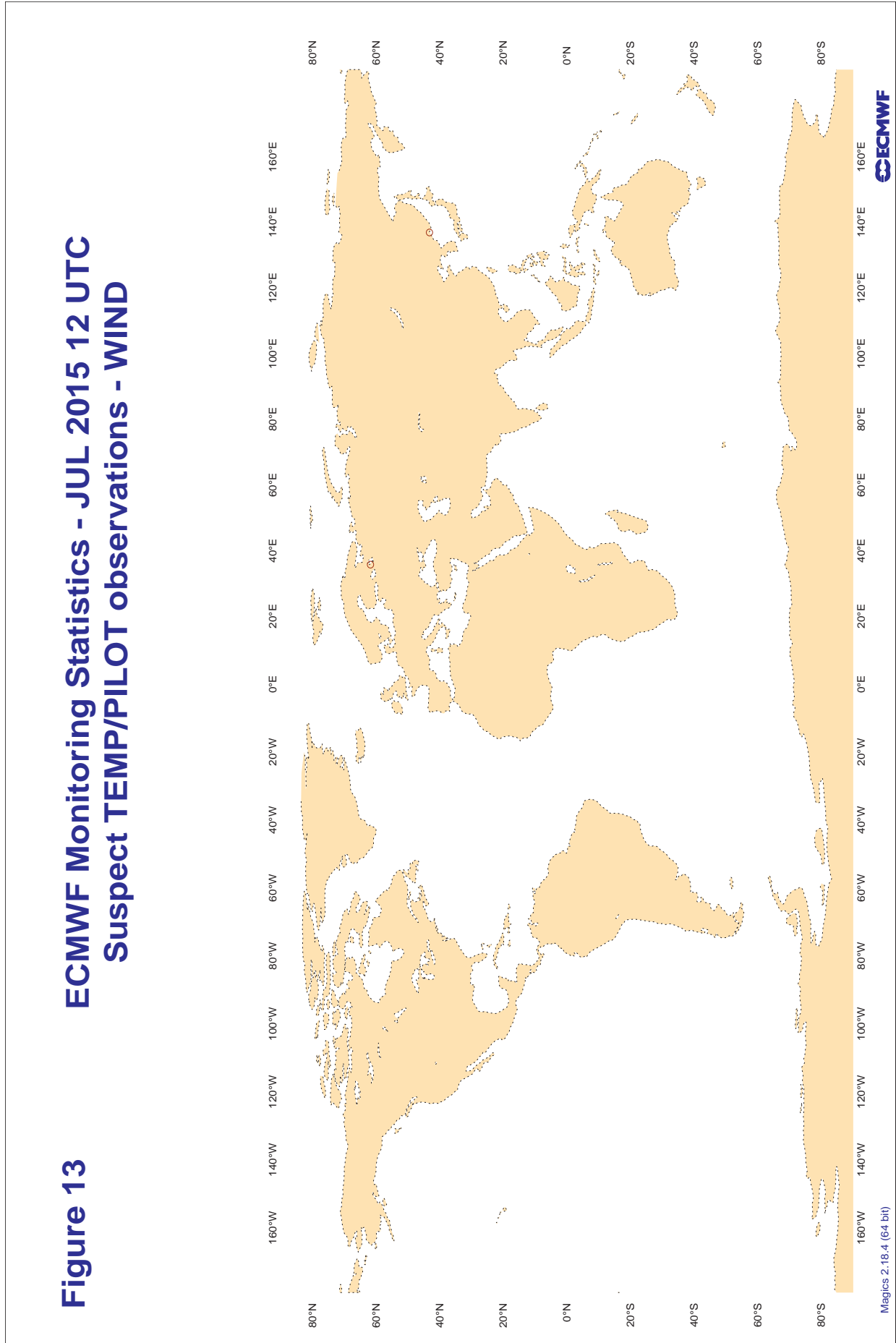
3.2.22 Figure 11 - Suspect TEMP observations - geopotential : 12 UTC



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



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





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

#### RADIOSONDE MONITORING STATISTICS (SHIPS)

MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : GEOPOTENTIAL HEIGHT (METRES)  
 LEVEL : 100 HPA  
 AREA : GLOBAL  
 PERIOD : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
AALUAA	12	Z	100	6	6.8	-1.9
AALUAA	00	Z	100	2	0.0	0.0
AALUMO	12	Z	100	16	5.9	-2.5
ALADDA	12	Z	100	0	0.0	0.0
ALADDA	00	Z	100	0	0.0	0.0
ASDE01	12	Z	100	11	23.0	18.6
ASDE01	00	Z	100	11	14.5	1.2
ASDE02	12	Z	100	4	11.7	8.2
ASDE03	12	Z	100	8	36.2	35.3
ASDE03	00	Z	100	12	64.1	30.4
ASDE09	12	Z	100	3	17.7	15.1
ASDK01	12	Z	100	8	15.1	11.4
ASDK01	00	Z	100	8	9.5	5.5
ASDK02	12	Z	100	13	9.1	8.0
ASDK02	00	Z	100	13	8.3	6.5
ASDK03	12	Z	100	12	26.4	26.0
ASDK03	00	Z	100	12	20.4	19.6
ASDK1	12	Z	100	8	15.3	12.0
ASDK1	00	Z	100	8	10.2	6.1
ASDK2	12	Z	100	13	9.6	8.0
ASDK2	00	Z	100	11	9.3	8.0
ASDK3	00	Z	100	12	19.2	18.2
ASDK3	12	Z	100	12	27.6	27.2
ASES01	12	Z	100	22	19.1	17.2
ASEU01	12	Z	100	9	32.3	30.9
ASEU01	00	Z	100	4	30.4	28.6
ASEU02	00	Z	100	4	43.0	42.8
ASEU02	12	Z	100	7	46.2	18.7
ASEU03	12	Z	100	15	162.5	134.7
ASEU03	00	Z	100	11	153.3	123.3
ASEU04	12	Z	100	7	8.2	0.9
ASEU04	00	Z	100	6	7.2	-2.8
ASEU06	12	Z	100	10	23.4	17.5
ASEU06	00	Z	100	7	10.7	7.4
ASFR1	12	Z	100	15	16.0	9.7
ASFR1	00	Z	100	15	15.0	10.3
ASFR2	12	Z	100	7	8.3	2.2
ASFR2	00	Z	100	8	11.6	6.6
ASFR3	12	Z	100	9	8.9	4.2

RADIOSONDE MONITORING STATISTICS (SHIPS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASFR3	00	Z	100	12	9.7	6.1
ASFR4	12	Z	100	13	15.8	11.0
ASFR4	00	Z	100	11	16.1	11.9
BREWS	00	Z	100	23	23.5	20.0
DBLK	12	Z	100	28	10.1	7.8
ELLIS	12	Z	100	0	0.0	0.0
ELLIS	00	Z	100	16	14.2	-0.9
EWO	12	Z	100	0	0.0	0.0
GREEN	00	Z	100	14	12.3	10.9
GREEN	12	Z	100	1	25.0	25.0
HESS	12	Z	100	1	10.5	10.5
HESS	00	Z	100	12	11.7	5.5
JGQH	12	Z	100	7	9.2	6.7
JGQH	00	Z	100	7	16.7	13.0
MIND	12	Z	100	0	0.0	0.0
MIND	00	Z	100	23	30.7	28.3
MUREN	00	Z	100	20	12.7	12.5
UFT5	00	Z	100	27	12.0	10.0

### 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 : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

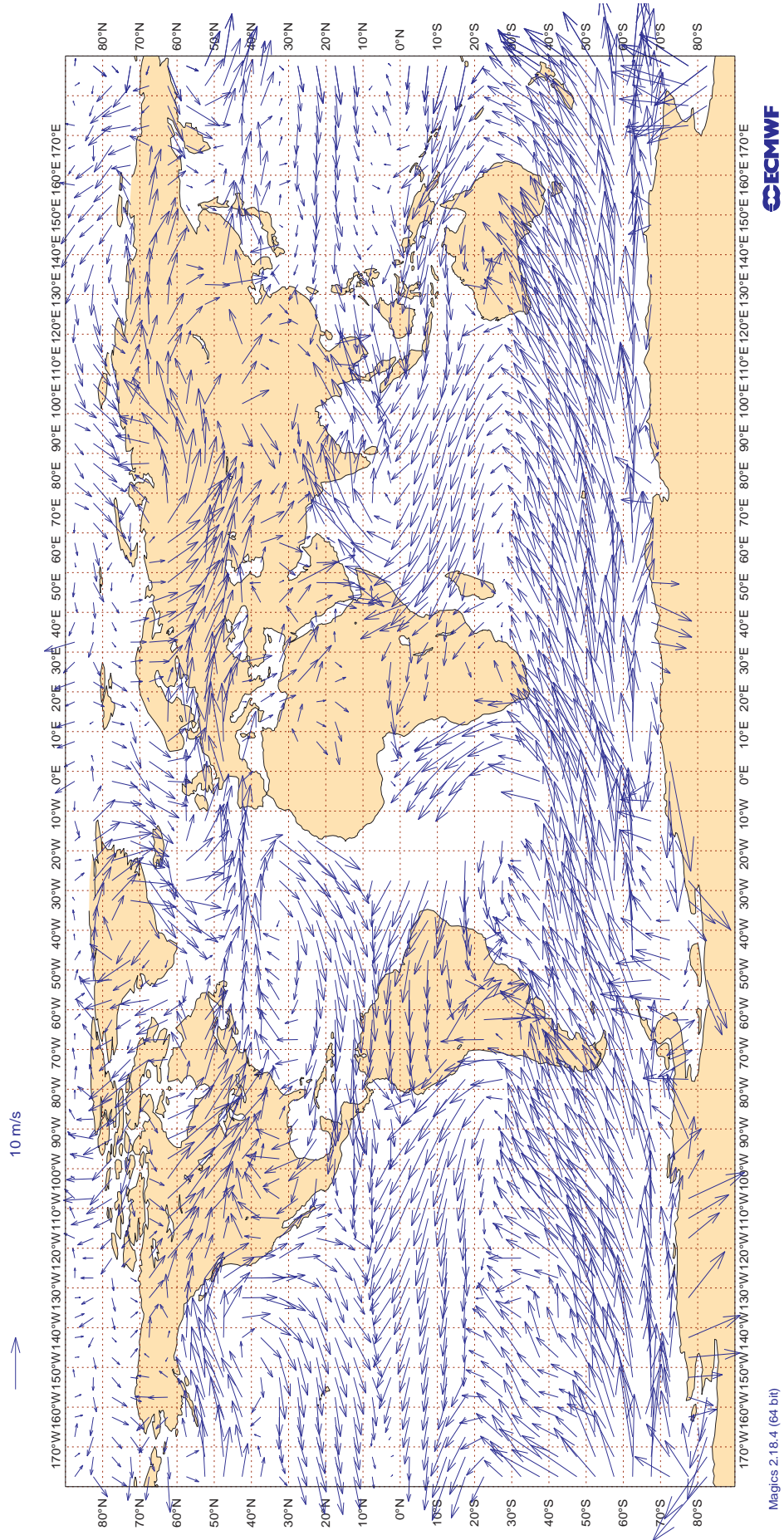
WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
AALUAA	12	V	100	5	4.5	-0.6	-0.7
AALUAA	00	V	100	1	0.9	0.5	-0.8
AALUMO	12	V	100	6	2.4	-0.2	-1.0
ALADDA	12	V	100	0	0.0	0.0	0.0
ALADDA	00	V	100	0	0.0	0.0	0.0
ASDE01	12	V	100	11	3.1	-0.6	-0.7
ASDE01	00	V	100	9	2.7	-0.4	0.4
ASDE02	12	V	100	4	3.2	-0.8	-0.6
ASDE03	12	V	100	8	3.0	-1.5	0.8
ASDE03	00	V	100	12	3.4	-1.7	0.8
ASDE09	12	V	100	3	2.2	-0.8	-1.3
ASDK01	12	V	100	8	2.6	0.6	0.0
ASDK01	00	V	100	7	2.3	0.7	0.1
ASDK02	12	V	100	13	2.8	0.5	0.9
ASDK02	00	V	100	12	2.2	-0.6	0.4
ASDK03	12	V	100	12	2.6	0.9	-0.1
ASDK03	00	V	100	12	2.9	0.4	1.2
ASDK1	12	V	100	8	2.6	0.4	-0.3
ASDK1	00	V	100	7	2.4	0.7	0.1
ASDK2	12	V	100	13	2.6	0.7	0.6
ASDK2	00	V	100	11	2.3	-0.4	0.4
ASDK3	00	V	100	12	3.1	0.6	1.2
ASDK3	12	V	100	12	2.5	0.9	-0.1
ASES01	12	V	100	21	4.7	0.4	0.4
ASEU01	12	V	100	8	2.9	-0.3	-0.2
ASEU01	00	V	100	4	2.0	-1.3	-0.1
ASEU02	00	V	100	4	4.5	0.8	3.2
ASEU02	12	V	100	7	3.6	-0.3	-1.3
ASEU03	12	V	100	12	3.7	-0.5	2.0
ASEU03	00	V	100	11	3.7	-2.0	0.4
ASEU04	12	V	100	7	2.6	0.6	-0.9
ASEU04	00	V	100	5	2.9	-0.3	-0.4
ASEU06	12	V	100	7	3.1	0.5	0.8
ASEU06	00	V	100	7	4.6	0.8	-0.9
ASFR1	12	V	100	15	3.0	-0.6	0.1
ASFR1	00	V	100	15	3.5	0.4	0.5
ASFR2	12	V	100	7	3.2	-0.1	-0.2
ASFR2	00	V	100	8	2.8	-0.3	-0.7
ASFR3	12	V	100	8	2.8	0.6	-0.3

RADIOSONDE MONITORING STATISTICS (SHIPS)  
(CONTINUED)

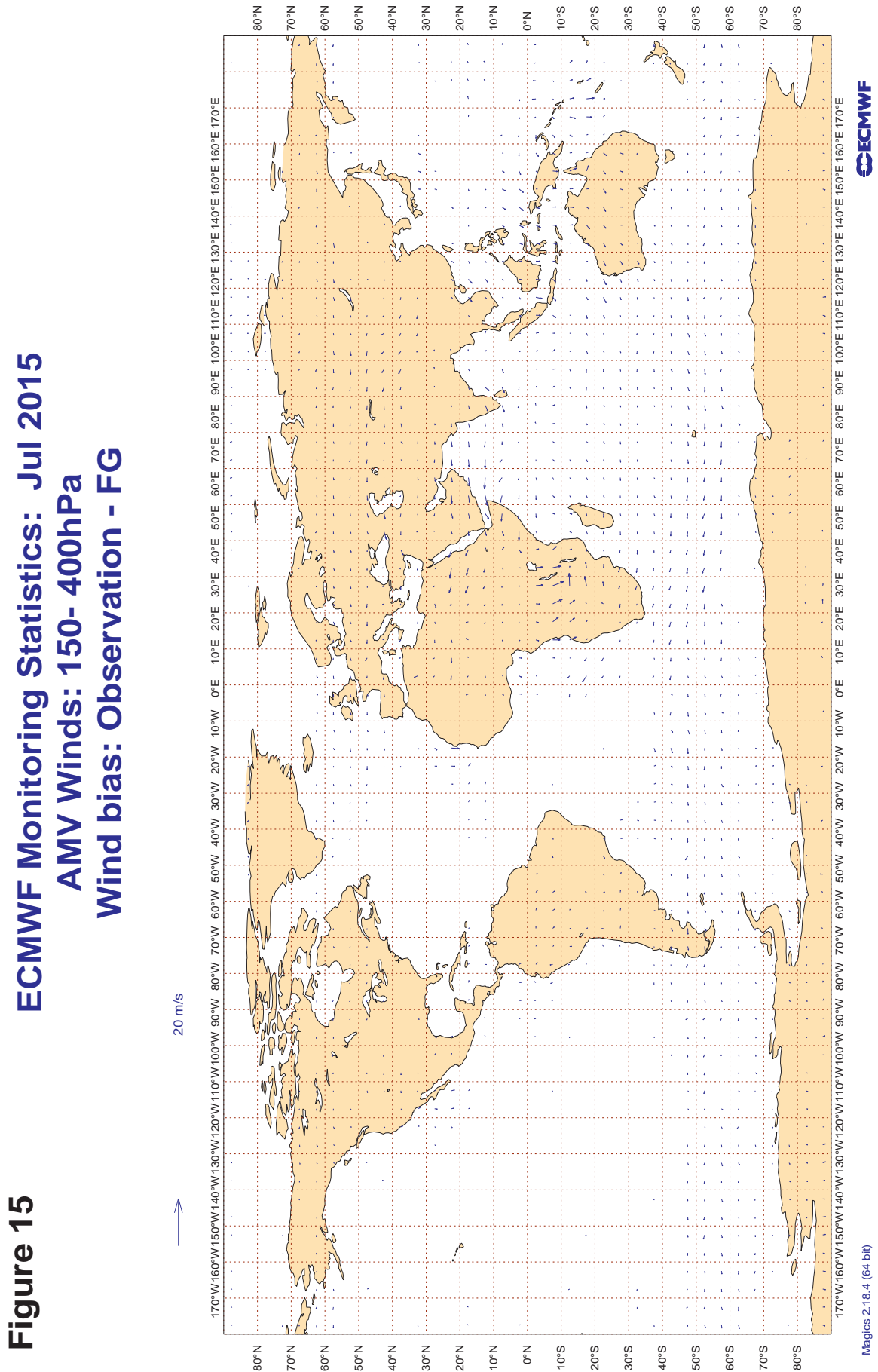
WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASFR3	00	V	100	12	3.0	-1.0	0.0
ASFR4	12	V	100	12	2.5	0.7	0.9
ASFR4	00	V	100	11	3.7	-0.5	-1.4
BREWS	00	V	100	14	4.9	0.3	-0.8
DBLK	12	V	100	24	1.8	-0.1	-0.2
ELLIS	12	V	100	0	0.0	0.0	0.0
ELLIS	00	V	100	10	4.9	-0.7	-0.4
EWO	12	V	100	0	0.0	0.0	0.0
GREEN	00	V	100	9	4.0	0.1	-0.4
GREEN	12	V	100	1	2.1	-0.1	-2.1
HESS	12	V	100	1	4.6	0.1	-4.6
HESS	00	V	100	8	5.5	-0.1	-2.0
JGQH	12	V	100	7	6.0	-0.7	-0.8
JGQH	00	V	100	7	4.5	0.1	1.3
MIND	12	V	100	0	0.0	0.0	0.0
MIND	00	V	100	14	7.9	-1.9	-0.1
MUREN	00	V	100	3	2.3	-1.6	-0.2
UFT5	00	V	100	26	2.4	-0.4	0.6

3.2.27 Figure 14 - SATOB Winds: 700-1000hPa

**Figure 14**  
**ECMWF Monitoring Statistics: Jul 2015**  
**AMV Winds: 700-1000hPa**  
**Mean Observed Wind**

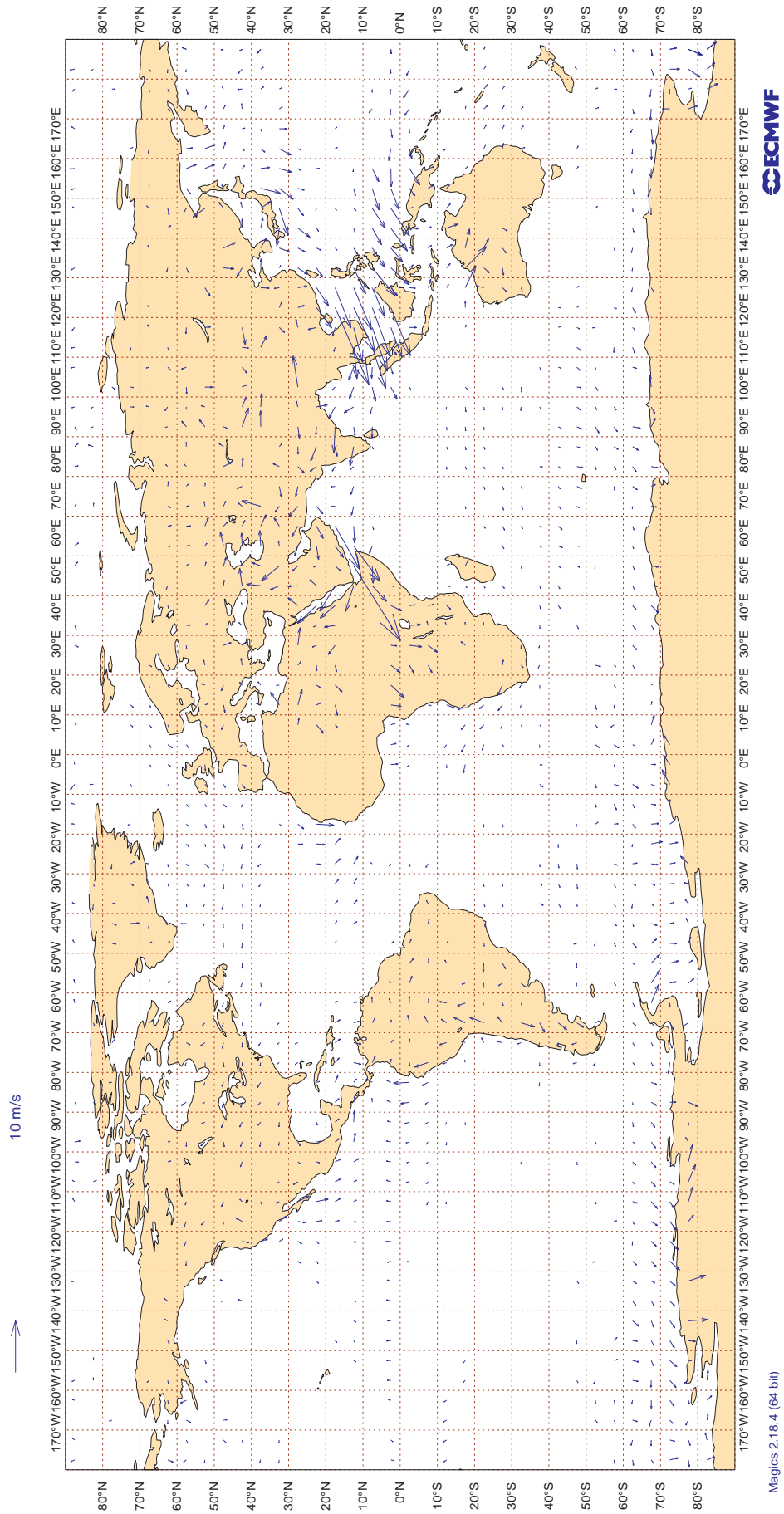


3.2.28 Figure 15 - SATOB Winds: 150- 400hPa



3.2.29 Figure 16 - SATOB Winds: 700-1000hPa

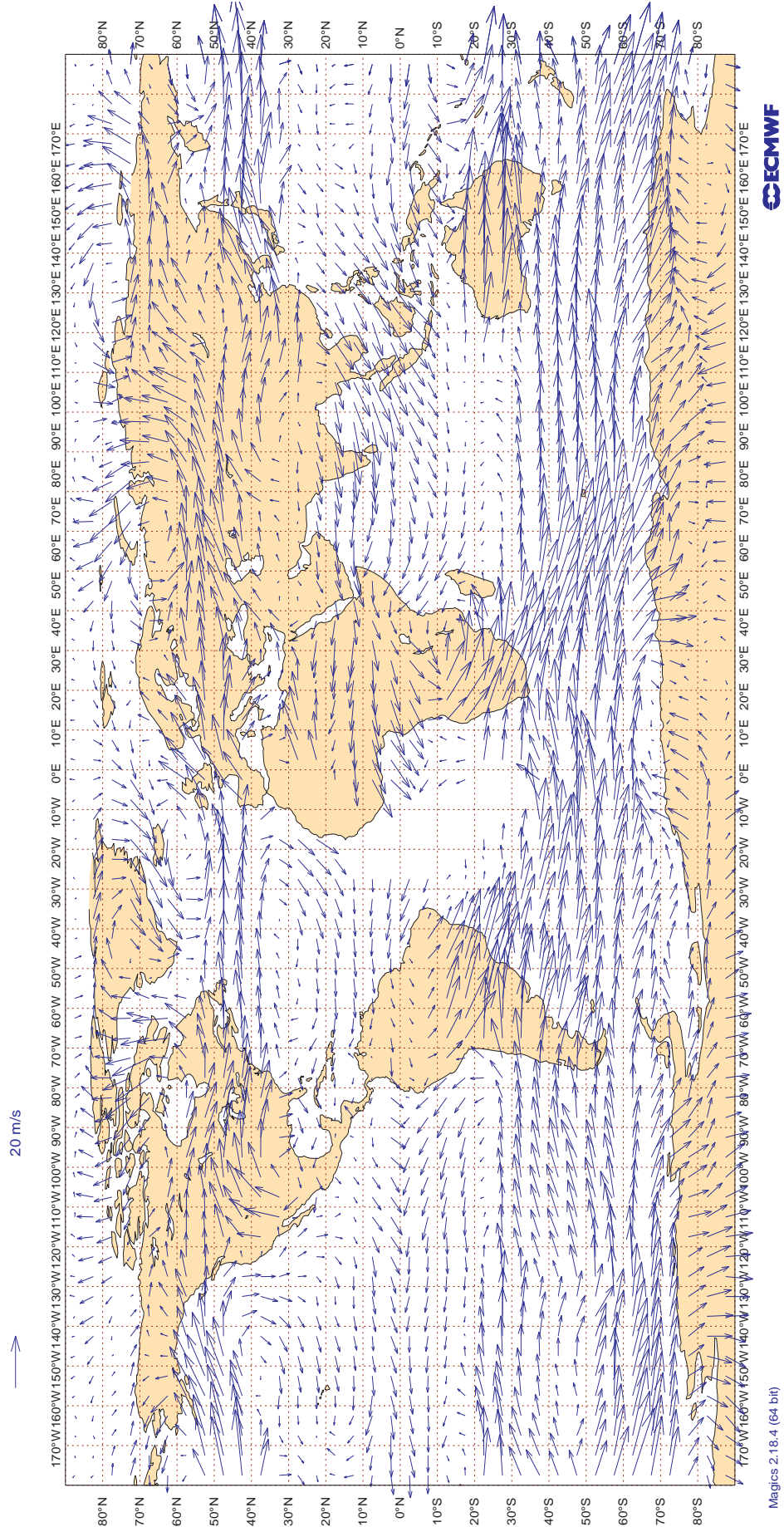
**Figure 16**  
**ECMWF Monitoring Statistics: Jul 2015**  
**AMV Winds: 700-1000hPa**  
**Wind bias: Observation - FG**





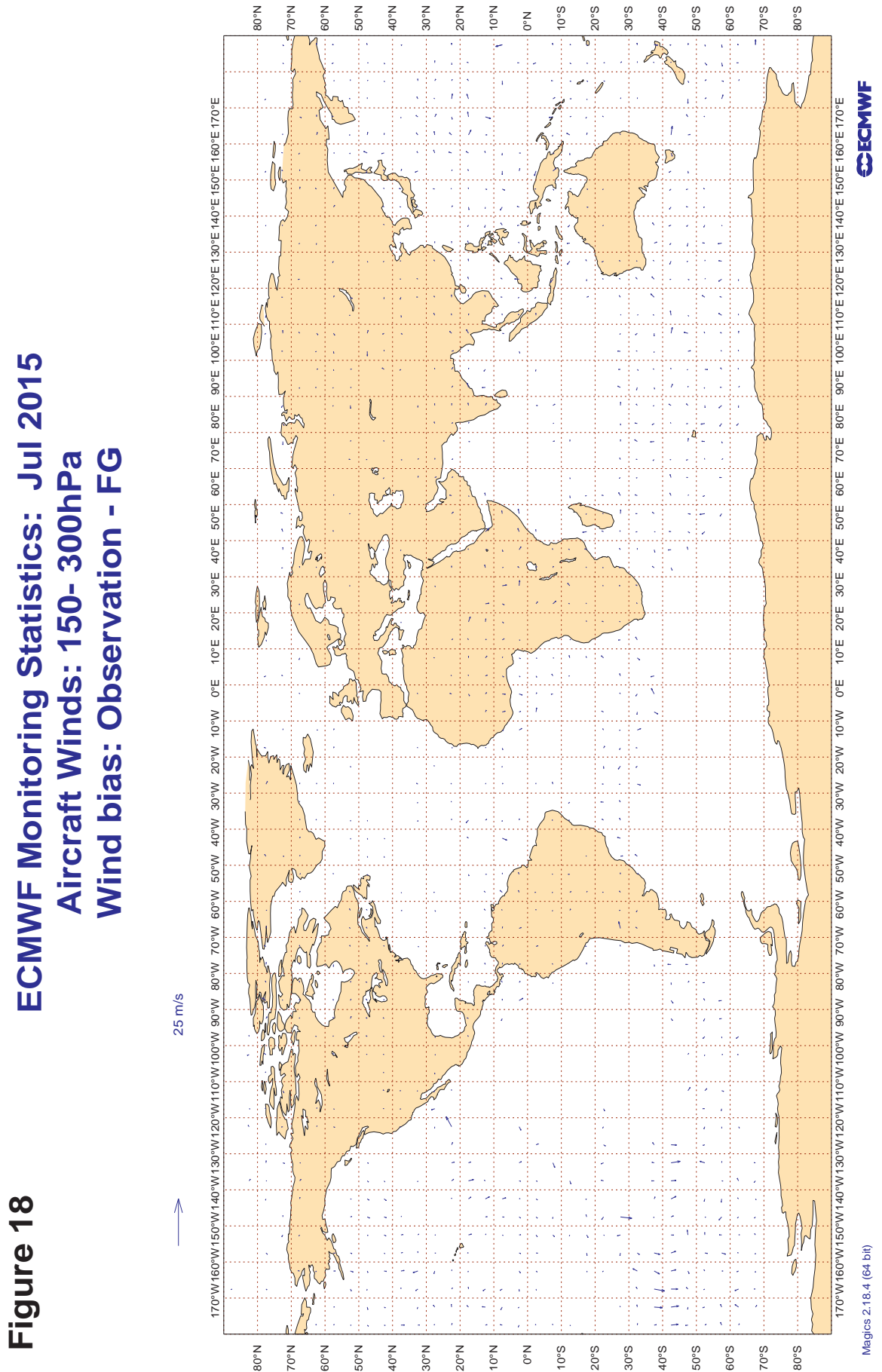
3.2.30 Figure 17 - SATOB Winds: 150- 400hPa

**Figure 17**  
**ECMWF Monitoring Statistics: Jul 2015**  
**AMV Winds: 150- 400hPa**  
**Mean Observed Wind**





3.2.31 Figure 18 - AIRCRAFT Winds: 150- 300hPa



**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 : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

SELECTION CRITERIA: NO. OF OBS. &gt;= 20

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

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
AAL	99	V	300-150	8567	0	0	4.0	-0.2
AAY	99	V	300-150	342	0	0	4.5	-0.3
ABW	99	V	300-150	49	0	0	3.2	-0.8
ABX	99	V	300-150	43	0	0	8.2	0.5
ACA	99	V	300-150	2706	1	0	4.4	-0.4
ACI	99	V	300-150	1118	0	0	3.7	0.0
AFL	99	V	300-150	325	0	0	2.8	0.3
AFR	99	V	300-150	3051	0	0	3.6	0.3
AIC	99	V	300-150	583	0	0	3.4	0.0
AMX	99	V	300-150	307	6	0	10.4	0.4
ANA	99	V	300-150	39	0	0	3.6	-0.1
ANZ	99	V	300-150	4144	0	0	4.5	0.4
AOJ	99	V	300-150	21	0	0	2.5	0.8
ASA	99	V	300-150	2876	0	0	4.3	0.2
ASY	99	V	300-150	342	0	0	4.5	-0.2
AUA	99	V	300-150	1273	0	0	4.0	-0.9
AVN	99	V	300-150	85	4	0	5.9	0.5
AXM	99	V	300-150	47	0	0	6.5	0.0
AZA	99	V	300-150	866	0	0	3.8	0.8
BAW	99	V	300-150	3719	0	0	4.2	-0.2
BEL	99	V	300-150	441	0	0	3.7	-0.1
BER	99	V	300-150	1390	0	0	3.6	0.8
BOX	99	V	300-150	53	0	0	3.1	0.0
CAL	99	V	300-150	50	0	0	3.0	0.7
CFG	99	V	300-150	340	0	0	3.9	-0.8
CGS	99	V	300-150	26	23	0	17.7	1.0
CKS	99	V	300-150	326	0	0	3.5	0.1
CLX	99	V	300-150	301	0	0	3.4	-0.4
CMB	99	V	300-150	21	0	0	3.1	0.8
CRL	99	V	300-150	134	0	0	3.8	0.5
CSN	99	V	300-150	219	0	0	4.0	0.7
DAH	99	V	300-150	235	0	0	3.6	0.6

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS  
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
DAL	99	V	300-150	11078	0	0	4.0	-0.5
DHK	99	V	300-150	198	0	0	4.0	-0.2
DLH	99	V	300-150	5336	0	0	3.6	-0.1
EDW	99	V	300-150	20	0	0	4.4	0.4
EIN	99	V	300-150	1454	0	0	3.5	-0.3
EJM	99	V	300-150	93	11	0	10.0	-0.4
ELY	99	V	300-150	432	0	0	3.6	-0.4
ETD	99	V	300-150	727	0	0	3.5	0.4
ETH	99	V	300-150	24	0	0	2.9	0.3
FDX	99	V	300-150	1354	0	0	3.5	0.2
FIN	99	V	300-150	252	0	0	2.5	0.3
FJI	99	V	300-150	1655	0	0	4.1	-0.4
FWI	99	V	300-150	68	1	0	5.6	1.1
GEC	99	V	300-150	361	0	0	2.9	0.0
GLO	99	V	300-150	28	0	0	10.9	1.8
GTI	99	V	300-150	229	0	0	3.3	-0.5
HAL	99	V	300-150	488	0	0	5.1	1.2
IAF	99	V	300-150	27	0	0	2.3	-0.6
IBE	99	V	300-150	147	0	0	4.0	1.0
JAF	99	V	300-150	92	5	0	5.4	-0.2
JAI	99	V	300-150	445	0	0	3.4	0.5
JST	99	V	300-150	1120	1	0	7.0	0.7
KAI	99	V	300-150	36	0	0	4.8	1.4
KAL	99	V	300-150	677	0	0	4.2	1.0
KLM	99	V	300-150	2286	0	0	3.4	-0.2
LAE	99	V	300-150	20	0	0	4.7	0.9
LAN	99	V	300-150	109	0	0	4.8	-0.4
LOT	99	V	300-150	179	2	0	6.1	-0.4
MAS	99	V	300-150	96	0	0	3.3	0.4
MMD	99	V	300-150	41	0	0	2.9	-0.6
MMN	99	V	300-150	25	0	0	4.2	0.1
MSR	99	V	300-150	286	0	0	3.4	0.2
NAX	99	V	300-150	136	0	0	6.1	0.0
NCA	99	V	300-150	39	0	0	4.3	-0.2
OAE	99	V	300-150	119	0	0	4.4	0.6
PAC	99	V	300-150	29	0	0	5.6	-1.8
PIN	99	V	300-150	71	0	0	4.8	1.2
QAF	99	V	300-150	37	0	0	4.2	0.4
QFA	99	V	300-150	2342	0	0	3.9	-0.2
QTR	99	V	300-150	303	0	0	3.1	0.2
RCH	99	V	300-150	697	0	0	4.6	-0.8
RJA	99	V	300-150	30	7	0	10.8	0.0
ROU	99	V	300-150	1032	0	0	4.0	-1.1

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS  
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
RRR	99	V	300-150	35	0	0	2.9	0.6
SAM	99	V	300-150	97	0	0	3.0	0.8
SAS	99	V	300-150	1009	0	0	2.8	0.0
SIA	99	V	300-150	369	0	0	3.8	0.3
SLM	99	V	300-150	28	0	0	3.4	-0.3
SQC	99	V	300-150	46	0	0	4.1	0.0
SVA	99	V	300-150	379	0	0	3.5	0.2
SWR	99	V	300-150	1064	0	0	3.8	0.7
TAM	99	V	300-150	98	1	0	6.9	0.8
TAP	99	V	300-150	30	0	0	4.9	1.4
TAY	99	V	300-150	112	0	0	4.2	0.1
TCV	99	V	300-150	36	0	0	5.7	-0.6
TCX	99	V	300-150	588	0	0	3.6	0.9
TFL	99	V	300-150	118	3	0	4.6	-0.6
THA	99	V	300-150	129	0	0	3.6	0.3
THT	99	V	300-150	392	0	0	3.8	0.8
THY	99	V	300-150	391	0	0	3.3	0.2
TOM	99	V	300-150	901	6	0	6.4	-0.3
TSC	99	V	300-150	1041	0	0	3.6	0.3
TSO	99	V	300-150	316	0	0	3.3	0.4
UAE	99	V	300-150	1177	0	0	3.6	-0.2
UAL	99	V	300-150	14195	0	0	4.1	-0.3
UPS	99	V	300-150	1036	0	0	4.2	0.2
VHC	99	V	300-150	21	33	5	16.8	0.4
VHF	99	V	300-150	60	37	0	19.4	-0.5
VHL	99	V	300-150	56	88	0	15.2	0.7
VHV	99	V	300-150	21	14	0	19.4	0.6
VIR	99	V	300-150	2016	0	0	3.9	0.1
VJT	99	V	300-150	44	70	0	21.5	0.6
VOZ	99	V	300-150	1317	0	0	3.9	0.5
VPB	99	V	300-150	35	29	0	14.5	0.3
VPC	99	V	300-150	24	25	0	2.6	0.0
WJA	99	V	300-150	246	0	0	3.7	-0.2
XLF	99	V	300-150	81	0	0	3.1	0.1

## 4 EUCOS Area Monitoring Statistics

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

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

Tables 21-23 provides quality statistics of pressure and wind for all DRIFTER reports received in the area 10°N - 90°N, 70°W - 40°E. The statistics are in the same form as tables 4-6.

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

RADIOSONDE MONITORING STATISTICS (EUCOS)

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	00	Z	50	0	0.0	0.0
01001	12	Z	50	30	13.9	11.3
01028	00	Z	50	0	0.0	0.0
01028	12	Z	50	28	16.7	12.7
01400	00	Z	50	2	28.3	27.6
01400	12	Z	50	27	25.0	17.4
01415	12	Z	50	30	17.2	15.7
01415	00	Z	50	0	0.0	0.0
02365	00	Z	50	0	0.0	0.0
02365	12	Z	50	30	8.7	2.5
02591	00	Z	50	0	0.0	0.0
02591	12	Z	50	36	22.9	21.1
02836	12	Z	50	31	18.9	14.5
02836	00	Z	50	31	16.1	13.8
02963	12	Z	50	31	13.4	10.5
02963	00	Z	50	29	14.0	12.5
03005	12	Z	50	31	11.3	7.5
03005	00	Z	50	31	8.7	6.2
03238	00	Z	50	28	17.7	13.4
03238	12	Z	50	8	20.3	18.2
03808	00	Z	50	28	10.5	4.1
03808	12	Z	50	31	10.4	6.0
03918	00	Z	50	28	12.7	10.0
03918	12	Z	50	13	19.8	16.4
03953	12	Z	50	28	18.2	15.0
03953	00	Z	50	0	0.0	0.0
04018	00	Z	50	28	15.5	11.9
04018	12	Z	50	30	12.9	8.9
04220	12	Z	50	28	16.4	8.0
04220	00	Z	50	29	15.7	6.9
04270	12	Z	50	29	18.2	15.0
04270	00	Z	50	31	10.2	7.0
04320	12	Z	50	31	27.9	22.1
04320	00	Z	50	31	15.1	6.1
04339	00	Z	50	29	26.6	23.6
04339	12	Z	50	31	21.3	16.2
04360	00	Z	50	23	11.1	8.9
04360	12	Z	50	25	17.9	13.3
06011	00	Z	50	20	29.3	-10.3

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	50	15	22.8	14.2
06260	00	Z	50	0	0.0	0.0
06260	12	Z	50	9	17.9	15.5
06610	00	Z	50	31	22.6	13.8
06610	12	Z	50	31	21.4	15.8
07110	12	Z	50	24	37.6	31.0
07110	00	Z	50	24	17.9	11.0
07510	12	Z	50	16	34.1	24.2
07510	00	Z	50	17	13.5	10.1
07645	12	Z	50	13	10.9	0.9
07645	00	Z	50	12	5.4	1.7
07761	12	Z	50	16	14.0	2.0
07761	00	Z	50	12	10.4	5.2
08001	00	Z	50	0	0.0	0.0
08001	12	Z	50	30	27.4	18.4
08221	00	Z	50	0	0.0	0.0
08221	12	Z	50	28	17.1	12.8
08302	00	Z	50	0	0.0	0.0
08302	12	Z	50	28	8.4	4.7
08508	12	Z	50	27	29.1	26.8
08522	12	Z	50	31	14.8	11.9
08579	12	Z	50	31	18.8	15.4
10035	12	Z	50	31	11.8	8.4
10035	00	Z	50	31	12.9	9.5
10393	00	Z	50	30	10.6	7.4
10393	12	Z	50	31	8.6	4.6
10410	12	Z	50	30	8.9	5.9
10410	00	Z	50	29	9.3	7.6
10739	12	Z	50	31	16.9	14.2
10739	00	Z	50	31	14.3	11.8
11035	00	Z	50	30	30.7	26.3
11035	12	Z	50	29	35.0	30.6
12982	00	Z	50	30	15.2	11.5
12982	12	Z	50	30	35.0	33.4
16044	12	Z	50	31	15.0	4.4
16044	00	Z	50	31	14.0	9.5
16080	00	Z	50	30	12.1	8.5
16080	12	Z	50	31	10.0	2.2
16245	12	Z	50	31	35.5	-7.8
16245	00	Z	50	30	12.2	8.9
16320	00	Z	50	31	10.6	5.6
16320	12	Z	50	30	13.1	-3.3
16429	12	Z	50	27	9.8	-2.3

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	00	Z	50	27	30.1	1.7
16622	00	Z	50	28	45.0	44.3
16754	00	Z	50	29	35.0	33.2
17607	12	Z	50	22	22.8	-21.7
26435	00	Z	50	14	18.0	16.3
60018	00	Z	50	1	5.4	5.4
60018	12	Z	50	30	9.6	5.8
ASDE01	12	Z	50	10	36.4	32.6
ASDE01	00	Z	50	9	18.9	4.6
ASDE02	12	Z	50	4	23.7	19.2
ASDE03	12	Z	50	7	51.2	49.9
ASDE03	00	Z	50	7	79.3	40.7
ASDE09	12	Z	50	3	32.8	30.9
ASDK01	12	Z	50	8	17.3	14.4
ASDK01	00	Z	50	7	13.3	11.2
ASDK02	12	Z	50	13	16.2	15.2
ASDK02	00	Z	50	11	12.7	12.0
ASDK03	12	Z	50	0	0.0	0.0
ASDK03	00	Z	50	0	0.0	0.0
ASDK1	12	Z	50	8	18.4	15.1
ASDK1	00	Z	50	6	14.8	11.9
ASDK2	12	Z	50	13	15.7	14.5
ASDK2	00	Z	50	11	13.5	12.0
ASDK3	00	Z	50	11	25.6	24.8
ASDK3	12	Z	50	12	32.1	31.8
ASES01	12	Z	50	21	25.8	23.0
ASEU01	12	Z	50	9	47.1	45.0
ASEU01	00	Z	50	4	46.1	43.4
ASEU02	00	Z	50	4	46.8	43.4
ASEU02	12	Z	50	7	51.0	28.9
ASEU03	12	Z	50	12	193.2	172.9
ASEU03	00	Z	50	11	161.7	131.9
ASEU04	12	Z	50	5	13.4	7.7
ASEU04	00	Z	50	6	9.3	0.9
ASEU06	12	Z	50	9	38.6	35.6
ASEU06	00	Z	50	7	16.0	12.5
ASFR1	12	Z	50	14	24.1	19.0
ASFR1	00	Z	50	14	24.0	17.7
ASFR2	12	Z	50	7	10.8	2.6
ASFR2	00	Z	50	7	11.1	6.3
ASFR3	12	Z	50	10	14.2	6.5
ASFR3	00	Z	50	10	16.2	12.4
ASFR4	12	Z	50	11	21.7	17.8



RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASFR4	00	Z	50	10	24.1	21.4
DBLK	12	Z	50	25	18.9	16.4
ELLIS	12	Z	50	0	0.0	0.0
ELLIS	00	Z	50	12	17.7	4.2
EWO	12	Z	50	0	0.0	0.0
GREEN	00	Z	50	10	16.3	11.9
GREEN	12	Z	50	1	20.3	20.3
HESS	12	Z	50	0	0.0	0.0
HESS	00	Z	50	9	15.3	13.1
MIND	12	Z	50	0	0.0	0.0
MIND	00	Z	50	13	33.4	31.0
UFT5	00	Z	50	26	20.5	18.8

**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 : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	00	V	50	0	0.0	0.0	0.0
01001	12	V	50	30	2.9	-0.3	-0.3
01028	00	V	50	0	0.0	0.0	0.0
01028	12	V	50	28	2.6	0.1	-0.7
01400	00	V	50	2	1.3	0.9	0.3
01400	12	V	50	25	3.3	-0.4	0.3
01415	12	V	50	30	2.4	-0.1	-0.1
01415	00	V	50	0	0.0	0.0	0.0
02365	00	V	50	0	0.0	0.0	0.0
02365	12	V	50	26	2.5	0.7	-0.3
02591	00	V	50	0	0.0	0.0	0.0
02591	12	V	50	27	2.9	0.1	0.0
02836	12	V	50	31	2.3	-0.7	-0.3
02836	00	V	50	31	2.2	0.2	0.3
02963	12	V	50	31	2.9	0.1	0.0
02963	00	V	50	29	2.8	-0.3	-0.2
03005	12	V	50	31	2.8	0.6	-0.6
03005	00	V	50	29	3.0	1.1	-0.7
03238	00	V	50	28	2.8	0.5	0.0
03238	12	V	50	8	3.1	-0.1	1.1
03808	00	V	50	25	2.9	-0.3	-0.1
03808	12	V	50	31	3.9	0.0	-0.1
03918	00	V	50	27	3.7	0.1	0.1
03918	12	V	50	13	3.3	-0.2	0.0
03953	12	V	50	27	2.9	0.2	0.2
03953	00	V	50	0	0.0	0.0	0.0
04018	00	V	50	26	2.7	0.2	0.0
04018	12	V	50	29	2.8	0.2	-0.4
04220	12	V	50	28	2.1	-0.2	0.5
04220	00	V	50	28	2.0	0.1	0.3
04270	12	V	50	29	2.6	0.2	0.2
04270	00	V	50	30	2.4	-0.1	-0.1
04320	12	V	50	31	2.3	0.0	0.6
04320	00	V	50	30	1.9	0.0	0.2
04339	00	V	50	27	2.9	0.6	0.4
04339	12	V	50	31	2.7	0.4	0.5
04360	00	V	50	22	2.1	-0.1	-0.5
04360	12	V	50	25	2.8	-0.5	-0.2
06011	00	V	50	20	2.3	0.7	-0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	50	15	2.2	0.7	-0.1
06260	00	V	50	0	0.0	0.0	0.0
06260	12	V	50	9	3.2	-0.2	0.0
06610	00	V	50	30	3.0	-0.6	0.4
06610	12	V	50	31	3.3	0.0	0.8
07110	12	V	50	24	3.2	0.2	-0.6
07110	00	V	50	20	4.1	0.4	-0.8
07510	12	V	50	16	3.8	-0.3	0.5
07510	00	V	50	14	3.4	-0.4	-0.7
07645	12	V	50	12	3.3	-0.5	0.1
07645	00	V	50	12	3.6	-0.9	1.0
07761	12	V	50	16	3.3	0.0	0.2
07761	00	V	50	12	3.1	-0.5	1.3
08001	00	V	50	0	0.0	0.0	0.0
08001	12	V	50	28	3.8	0.7	0.7
08221	00	V	50	0	0.0	0.0	0.0
08221	12	V	50	28	3.0	0.3	-0.1
08302	00	V	50	0	0.0	0.0	0.0
08302	12	V	50	28	2.8	0.1	0.4
08508	12	V	50	26	2.7	0.0	0.5
08522	12	V	50	31	3.2	0.3	-0.4
08579	12	V	50	30	3.5	0.6	-0.2
10035	12	V	50	31	3.1	0.6	0.0
10035	00	V	50	29	3.1	0.8	-0.1
10393	00	V	50	30	2.4	0.6	-0.1
10393	12	V	50	31	2.9	0.2	0.0
10410	12	V	50	30	2.8	0.5	0.2
10410	00	V	50	28	2.9	0.6	0.7
10739	12	V	50	31	2.6	0.2	0.7
10739	00	V	50	30	2.9	0.3	0.0
11035	00	V	50	30	2.8	-0.1	-0.1
11035	12	V	50	29	2.5	0.4	0.0
12982	00	V	50	29	2.8	0.5	0.3
12982	12	V	50	30	3.2	1.0	-0.6
16044	12	V	50	31	2.6	0.9	-0.1
16044	00	V	50	29	3.2	0.4	0.4
16080	00	V	50	29	3.7	-0.2	1.1
16080	12	V	50	31	3.3	1.0	0.7
16245	12	V	50	31	3.3	0.5	0.7
16245	00	V	50	29	2.8	0.9	1.2
16320	00	V	50	29	3.4	1.3	0.2
16320	12	V	50	30	3.8	1.7	-0.3
16429	12	V	50	27	3.5	1.6	-0.6

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	00	V	50	26	3.8	0.4	0.5
16622	00	V	50	13	2.8	-0.1	0.4
16754	00	V	50	28	4.8	1.0	-1.0
17607	12	V	50	21	3.7	0.3	-0.1
26435	00	V	50	14	2.6	-0.3	0.0
60018	00	V	50	1	5.2	-1.1	-5.1
60018	12	V	50	29	4.4	0.4	1.3
ASDE01	12	V	50	10	4.3	1.2	-0.7
ASDE01	00	V	50	9	2.0	0.0	1.2
ASDE02	12	V	50	4	2.5	-1.0	-0.8
ASDE03	12	V	50	6	3.5	0.3	-0.3
ASDE03	00	V	50	7	4.0	-0.1	-1.6
ASDE09	12	V	50	3	2.8	-1.6	0.2
ASDK01	12	V	50	8	3.4	0.1	1.3
ASDK01	00	V	50	7	2.8	-0.9	-0.5
ASDK02	12	V	50	13	2.5	0.2	1.4
ASDK02	00	V	50	10	2.1	0.0	0.7
ASDK03	12	V	50	0	0.0	0.0	0.0
ASDK03	00	V	50	0	0.0	0.0	0.0
ASDK1	12	V	50	8	3.1	0.2	1.3
ASDK1	00	V	50	6	2.7	-0.4	-0.5
ASDK2	12	V	50	13	2.6	0.2	1.1
ASDK2	00	V	50	10	2.2	0.0	0.5
ASDK3	00	V	50	11	2.1	-0.3	0.6
ASDK3	12	V	50	12	3.4	-1.1	-0.5
ASES01	12	V	50	21	5.3	-0.5	1.5
ASEU01	12	V	50	7	2.3	0.0	0.2
ASEU01	00	V	50	4	3.4	-2.0	-1.5
ASEU02	00	V	50	4	3.1	-0.3	1.3
ASEU02	12	V	50	6	3.2	-1.3	0.8
ASEU03	12	V	50	12	3.7	-0.3	1.0
ASEU03	00	V	50	7	6.3	1.8	1.5
ASEU04	12	V	50	5	3.0	0.7	1.0
ASEU04	00	V	50	5	2.7	0.0	0.0
ASEU06	12	V	50	7	2.8	0.4	0.9
ASEU06	00	V	50	7	2.4	-0.1	0.0
ASFR1	12	V	50	14	4.4	-1.0	0.2
ASFR1	00	V	50	14	3.8	-1.7	-0.2
ASFR2	12	V	50	7	2.9	-0.4	-0.9
ASFR2	00	V	50	7	3.2	0.6	0.3
ASFR3	12	V	50	10	3.1	0.7	1.5
ASFR3	00	V	50	10	3.0	-1.4	-0.7
ASFR4	12	V	50	11	2.7	0.5	-0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASFR4	00	V	50	10	3.8	-0.4	-1.6
DBLK	12	V	50	24	2.6	-0.1	-0.6
ELLIS	12	V	50	0	0.0	0.0	0.0
ELLIS	00	V	50	9	3.2	-0.2	0.9
EWO	12	V	50	0	0.0	0.0	0.0
GREEN	00	V	50	7	3.2	0.7	-0.2
GREEN	12	V	50	1	0.6	-0.5	0.4
HESS	12	V	50	0	0.0	0.0	0.0
HESS	00	V	50	7	4.4	-0.2	0.0
MIND	12	V	50	0	0.0	0.0	0.0
MIND	00	V	50	10	4.6	1.0	-2.0
UFT5	00	V	50	26	2.3	0.1	-0.3

### 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 : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	00	Z	100	0	0.0	0.0
01001	12	Z	100	30	6.6	2.9
01028	00	Z	100	0	0.0	0.0
01028	12	Z	100	30	8.4	4.6
01400	00	Z	100	2	15.4	14.7
01400	12	Z	100	27	16.9	7.5
01415	12	Z	100	31	9.5	6.4
01415	00	Z	100	0	0.0	0.0
02365	00	Z	100	0	0.0	0.0
02365	12	Z	100	32	6.1	-2.4
02591	00	Z	100	0	0.0	0.0
02591	12	Z	100	37	13.3	12.4
02836	12	Z	100	31	8.7	4.9
02836	00	Z	100	31	8.3	5.8
02963	12	Z	100	31	7.6	2.2
02963	00	Z	100	29	8.6	7.0
03005	12	Z	100	31	6.1	-1.1
03005	00	Z	100	31	5.6	-1.2
03238	00	Z	100	29	9.7	5.9
03238	12	Z	100	8	8.5	2.8
03808	00	Z	100	29	6.5	-2.1
03808	12	Z	100	31	5.9	-2.6
03918	00	Z	100	29	7.8	3.2
03918	12	Z	100	13	11.6	8.4
03953	12	Z	100	31	13.1	9.3
03953	00	Z	100	2	7.2	7.2
04018	00	Z	100	30	9.9	6.6
04018	12	Z	100	31	9.3	4.8
04220	12	Z	100	31	11.5	1.3
04220	00	Z	100	31	10.6	2.6
04270	12	Z	100	29	10.9	7.9
04270	00	Z	100	31	7.3	2.1
04320	12	Z	100	31	17.0	11.6
04320	00	Z	100	31	11.7	3.4
04339	00	Z	100	29	17.6	14.1
04339	12	Z	100	30	13.2	7.8
04360	00	Z	100	26	8.4	5.3
04360	12	Z	100	27	12.2	10.3
06011	00	Z	100	21	18.7	-11.4

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	100	21	14.6	-1.0
06260	00	Z	100	0	0.0	0.0
06260	12	Z	100	10	10.4	8.1
06610	00	Z	100	31	16.6	10.0
06610	12	Z	100	31	12.8	7.3
07110	12	Z	100	27	21.6	18.6
07110	00	Z	100	25	8.9	3.3
07510	12	Z	100	22	16.8	9.9
07510	00	Z	100	24	7.3	0.6
07645	12	Z	100	23	8.6	-4.2
07645	00	Z	100	18	6.9	-4.4
07761	12	Z	100	26	12.4	-4.8
07761	00	Z	100	23	10.2	-6.1
08001	00	Z	100	0	0.0	0.0
08001	12	Z	100	30	20.5	11.5
08221	00	Z	100	0	0.0	0.0
08221	12	Z	100	31	10.6	6.6
08302	00	Z	100	0	0.0	0.0
08302	12	Z	100	28	6.2	-1.2
08508	12	Z	100	28	20.6	18.1
08522	12	Z	100	31	11.5	8.2
08579	12	Z	100	31	11.1	6.2
10035	12	Z	100	31	5.2	-1.4
10035	00	Z	100	33	8.1	2.1
10393	00	Z	100	30	6.2	-0.2
10393	12	Z	100	31	7.1	-3.3
10410	12	Z	100	30	5.0	-1.5
10410	00	Z	100	29	4.0	1.2
10739	12	Z	100	31	8.8	5.4
10739	00	Z	100	31	8.0	4.1
11035	00	Z	100	31	24.0	20.9
11035	12	Z	100	31	23.1	19.5
12982	00	Z	100	30	9.7	5.2
12982	12	Z	100	31	21.3	19.3
16044	12	Z	100	30	10.3	-2.2
16044	00	Z	100	31	9.6	6.5
16080	00	Z	100	30	7.0	1.3
16080	12	Z	100	31	9.0	-5.5
16245	12	Z	100	31	36.3	-12.7
16245	00	Z	100	30	7.1	1.6
16320	00	Z	100	31	7.8	4.1
16320	12	Z	100	31	11.4	-7.3
16429	12	Z	100	30	10.1	-5.6

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	00	Z	100	30	37.0	-3.4
16622	00	Z	100	29	33.9	33.1
16754	00	Z	100	30	25.0	22.2
17607	12	Z	100	46	21.4	-20.1
26435	00	Z	100	15	8.7	7.3
60018	00	Z	100	1	13.1	13.1
60018	12	Z	100	31	6.6	3.1
ASDE01	12	Z	100	11	23.0	18.6
ASDE01	00	Z	100	11	14.5	1.2
ASDE02	12	Z	100	4	11.7	8.2
ASDE03	12	Z	100	8	36.2	35.3
ASDE03	00	Z	100	12	64.1	30.4
ASDE09	12	Z	100	3	17.7	15.1
ASDK01	12	Z	100	8	15.1	11.4
ASDK01	00	Z	100	8	9.5	5.5
ASDK02	12	Z	100	13	9.1	8.0
ASDK02	00	Z	100	13	8.3	6.5
ASDK03	12	Z	100	12	26.4	26.0
ASDK03	00	Z	100	12	20.4	19.6
ASDK1	12	Z	100	8	15.3	12.0
ASDK1	00	Z	100	8	10.2	6.1
ASDK2	12	Z	100	13	9.6	8.0
ASDK2	00	Z	100	11	9.3	8.0
ASDK3	00	Z	100	12	19.2	18.2
ASDK3	12	Z	100	12	27.6	27.2
ASES01	12	Z	100	22	19.1	17.2
ASEU01	12	Z	100	9	32.3	30.9
ASEU01	00	Z	100	4	30.4	28.6
ASEU02	00	Z	100	4	43.0	42.8
ASEU02	12	Z	100	7	46.2	18.7
ASEU03	12	Z	100	15	162.5	134.7
ASEU03	00	Z	100	11	153.3	123.3
ASEU04	12	Z	100	7	8.2	0.9
ASEU04	00	Z	100	6	7.2	-2.8
ASEU06	12	Z	100	10	23.4	17.5
ASEU06	00	Z	100	7	10.7	7.4
ASFR1	12	Z	100	15	16.0	9.7
ASFR1	00	Z	100	15	15.0	10.3
ASFR2	12	Z	100	7	8.3	2.2
ASFR2	00	Z	100	8	11.6	6.6
ASFR3	12	Z	100	9	8.9	4.2
ASFR3	00	Z	100	12	9.7	6.1
ASFR4	12	Z	100	13	15.8	11.0



RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASFR4	00	Z	100	11	16.1	11.9
DBLK	12	Z	100	28	10.1	7.8
ELLIS	12	Z	100	0	0.0	0.0
ELLIS	00	Z	100	16	14.2	-0.9
EWO	12	Z	100	0	0.0	0.0
GREEN	00	Z	100	14	12.3	10.9
GREEN	12	Z	100	1	25.0	25.0
HESS	12	Z	100	1	10.5	10.5
HESS	00	Z	100	12	11.7	5.5
MIND	12	Z	100	0	0.0	0.0
MIND	00	Z	100	23	30.7	28.3
UFT5	00	Z	100	27	12.0	10.0

**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 : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	00	V	100	0	0.0	0.0	0.0
01001	12	V	100	30	2.2	0.3	0.1
01028	00	V	100	0	0.0	0.0	0.0
01028	12	V	100	30	2.5	0.1	-0.5
01400	00	V	100	2	1.2	0.2	-0.3
01400	12	V	100	26	3.1	0.6	0.4
01415	12	V	100	30	3.0	0.6	-1.0
01415	00	V	100	0	0.0	0.0	0.0
02365	00	V	100	0	0.0	0.0	0.0
02365	12	V	100	27	3.0	0.3	0.0
02591	00	V	100	0	0.0	0.0	0.0
02591	12	V	100	29	3.3	0.1	-0.5
02836	12	V	100	31	2.8	0.6	0.6
02836	00	V	100	31	2.3	0.0	0.6
02963	12	V	100	31	2.3	0.2	-0.2
02963	00	V	100	29	3.0	0.1	-0.4
03005	12	V	100	31	2.7	0.2	0.2
03005	00	V	100	29	2.5	0.2	0.1
03238	00	V	100	29	4.2	-0.1	0.7
03238	12	V	100	8	2.9	-0.3	-0.3
03808	00	V	100	26	3.6	0.5	1.0
03808	12	V	100	31	3.1	0.4	-0.4
03918	00	V	100	28	4.2	0.1	0.3
03918	12	V	100	13	3.6	-0.6	-0.1
03953	12	V	100	31	3.0	-0.4	-0.1
03953	00	V	100	1	5.7	4.9	2.9
04018	00	V	100	27	2.9	-0.2	-0.1
04018	12	V	100	31	2.8	-0.1	0.8
04220	12	V	100	31	2.1	-0.1	0.3
04220	00	V	100	30	2.3	-0.3	0.3
04270	12	V	100	29	2.3	0.6	0.3
04270	00	V	100	30	2.3	-0.1	0.1
04320	12	V	100	31	2.2	-0.2	-0.1
04320	00	V	100	30	2.1	0.0	-0.1
04339	00	V	100	27	2.3	0.2	0.1
04339	12	V	100	30	2.4	0.1	0.4
04360	00	V	100	25	3.1	0.5	-0.1
04360	12	V	100	27	2.1	0.0	0.3
06011	00	V	100	21	2.4	0.3	0.0

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	100	21	3.0	0.5	0.4
06260	00	V	100	0	0.0	0.0	0.0
06260	12	V	100	9	3.8	0.8	1.1
06610	00	V	100	30	4.0	0.4	0.3
06610	12	V	100	31	4.2	0.0	-0.3
07110	12	V	100	27	3.5	0.0	-0.4
07110	00	V	100	21	3.2	0.9	1.2
07510	12	V	100	21	3.1	0.5	0.8
07510	00	V	100	18	3.2	-0.7	0.7
07645	12	V	100	23	3.9	0.0	0.2
07645	00	V	100	16	3.5	0.5	0.1
07761	12	V	100	16	3.9	0.9	0.9
07761	00	V	100	13	4.7	1.0	-1.3
08001	00	V	100	0	0.0	0.0	0.0
08001	12	V	100	29	3.8	0.0	-0.2
08221	00	V	100	0	0.0	0.0	0.0
08221	12	V	100	31	3.8	0.4	1.0
08302	00	V	100	0	0.0	0.0	0.0
08302	12	V	100	28	2.8	-0.4	0.7
08508	12	V	100	28	2.9	0.1	0.3
08522	12	V	100	31	3.5	0.8	0.3
08579	12	V	100	31	3.3	-0.4	-0.2
10035	12	V	100	31	2.8	0.5	0.5
10035	00	V	100	29	3.5	-1.1	-0.5
10393	00	V	100	30	3.5	0.1	-0.4
10393	12	V	100	31	3.2	-0.1	-0.1
10410	12	V	100	30	2.9	-0.1	0.3
10410	00	V	100	28	3.5	-0.1	-0.4
10739	12	V	100	31	3.9	-0.5	-0.9
10739	00	V	100	30	3.9	0.3	-0.9
11035	00	V	100	31	3.9	1.1	-0.5
11035	12	V	100	31	3.3	-0.6	0.1
12982	00	V	100	29	2.8	0.6	0.3
12982	12	V	100	31	3.2	-0.2	-0.5
16044	12	V	100	30	3.6	0.2	0.0
16044	00	V	100	30	4.1	1.2	1.2
16080	00	V	100	29	3.8	0.3	-0.2
16080	12	V	100	31	3.5	0.6	-0.2
16245	12	V	100	31	2.9	-0.3	0.4
16245	00	V	100	29	2.8	0.5	-0.3
16320	00	V	100	29	3.5	0.7	-0.2
16320	12	V	100	31	3.0	0.8	0.2
16429	12	V	100	29	3.3	0.3	0.6

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	00	V	100	28	3.3	0.6	0.9
16622	00	V	100	15	3.1	0.0	-0.9
16754	00	V	100	30	3.7	-1.0	0.6
17607	12	V	100	23	3.0	-0.2	-0.3
26435	00	V	100	15	2.5	-0.3	-0.1
60018	00	V	100	1	4.6	-4.6	0.2
60018	12	V	100	30	4.9	0.5	-0.4
ASDE01	12	V	100	11	3.1	-0.6	-0.7
ASDE01	00	V	100	9	2.7	-0.4	0.4
ASDE02	12	V	100	4	3.2	-0.8	-0.6
ASDE03	12	V	100	8	3.0	-1.5	0.8
ASDE03	00	V	100	12	3.4	-1.7	0.8
ASDE09	12	V	100	3	2.2	-0.8	-1.3
ASDK01	12	V	100	8	2.6	0.6	0.0
ASDK01	00	V	100	7	2.3	0.7	0.1
ASDK02	12	V	100	13	2.8	0.5	0.9
ASDK02	00	V	100	12	2.2	-0.6	0.4
ASDK03	12	V	100	12	2.6	0.9	-0.1
ASDK03	00	V	100	12	2.9	0.4	1.2
ASDK1	12	V	100	8	2.6	0.4	-0.3
ASDK1	00	V	100	7	2.4	0.7	0.1
ASDK2	12	V	100	13	2.6	0.7	0.6
ASDK2	00	V	100	11	2.3	-0.4	0.4
ASDK3	00	V	100	12	3.1	0.6	1.2
ASDK3	12	V	100	12	2.5	0.9	-0.1
ASES01	12	V	100	21	4.7	0.4	0.4
ASEU01	12	V	100	8	2.9	-0.3	-0.2
ASEU01	00	V	100	4	2.0	-1.3	-0.1
ASEU02	00	V	100	4	4.5	0.8	3.2
ASEU02	12	V	100	7	3.6	-0.3	-1.3
ASEU03	12	V	100	12	3.7	-0.5	2.0
ASEU03	00	V	100	11	3.7	-2.0	0.4
ASEU04	12	V	100	7	2.6	0.6	-0.9
ASEU04	00	V	100	5	2.9	-0.3	-0.4
ASEU06	12	V	100	7	3.1	0.5	0.8
ASEU06	00	V	100	7	4.6	0.8	-0.9
ASFR1	12	V	100	15	3.0	-0.6	0.1
ASFR1	00	V	100	15	3.5	0.4	0.5
ASFR2	12	V	100	7	3.2	-0.1	-0.2
ASFR2	00	V	100	8	2.8	-0.3	-0.7
ASFR3	12	V	100	8	2.8	0.6	-0.3
ASFR3	00	V	100	12	3.0	-1.0	0.0
ASFR4	12	V	100	12	2.5	0.7	0.9

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASFR4	00	V	100	11	3.7	-0.5	-1.4
DBLK	12	V	100	24	1.8	-0.1	-0.2
ELLIS	12	V	100	0	0.0	0.0	0.0
ELLIS	00	V	100	10	4.9	-0.7	-0.4
EWO	12	V	100	0	0.0	0.0	0.0
GREEN	00	V	100	9	4.0	0.1	-0.4
GREEN	12	V	100	1	2.1	-0.1	-2.1
HESS	12	V	100	1	4.6	0.1	-4.6
HESS	00	V	100	8	5.5	-0.1	-2.0
MIND	12	V	100	0	0.0	0.0	0.0
MIND	00	V	100	14	7.9	-1.9	-0.1
UFT5	00	V	100	26	2.4	-0.4	0.6

#### 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 : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	00	Z	500	0	0.0	0.0
01001	12	Z	500	30	4.8	1.1
01028	00	Z	500	0	0.0	0.0
01028	12	Z	500	31	4.0	2.1
01400	00	Z	500	2	5.8	5.2
01400	12	Z	500	27	14.6	2.8
01415	12	Z	500	31	4.6	3.1
01415	00	Z	500	0	0.0	0.0
02365	00	Z	500	0	0.0	0.0
02365	12	Z	500	32	3.3	-1.3
02591	00	Z	500	0	0.0	0.0
02591	12	Z	500	37	10.3	9.8
02836	12	Z	500	31	5.2	3.2
02836	00	Z	500	31	5.8	4.8
02963	12	Z	500	31	7.1	0.0
02963	00	Z	500	31	7.7	6.0
03005	12	Z	500	31	5.6	-1.7
03005	00	Z	500	31	4.6	-1.2
03238	00	Z	500	30	8.2	7.1
03238	12	Z	500	8	3.9	1.7
03808	00	Z	500	34	5.5	1.0
03808	12	Z	500	31	5.7	0.1
03918	00	Z	500	29	5.4	3.7
03918	12	Z	500	13	5.9	2.7
03953	12	Z	500	31	7.7	4.4
03953	00	Z	500	2	7.5	7.5
04018	00	Z	500	30	6.4	4.6
04018	12	Z	500	31	5.0	2.2
04220	12	Z	500	31	7.5	-0.2
04220	00	Z	500	31	5.0	1.6
04270	12	Z	500	31	5.9	0.2
04270	00	Z	500	31	4.7	-0.9
04320	12	Z	500	31	7.8	6.5
04320	00	Z	500	31	8.1	4.7
04339	00	Z	500	31	5.8	2.4
04339	12	Z	500	30	4.5	0.7
04360	00	Z	500	29	6.2	3.7
04360	12	Z	500	28	6.9	4.9
06011	00	Z	500	30	5.5	-1.6

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	500	29	13.7	0.2
06260	00	Z	500	0	0.0	0.0
06260	12	Z	500	10	4.7	4.1
06610	00	Z	500	31	9.2	8.2
06610	12	Z	500	31	6.9	4.9
07110	12	Z	500	31	7.5	4.8
07110	00	Z	500	31	8.8	0.0
07510	12	Z	500	30	5.9	2.6
07510	00	Z	500	32	6.4	-2.7
07645	12	Z	500	26	5.6	-0.3
07645	00	Z	500	23	5.0	-2.2
07761	12	Z	500	30	3.9	1.0
07761	00	Z	500	29	5.5	-2.5
08001	00	Z	500	0	0.0	0.0
08001	12	Z	500	30	19.4	10.7
08221	00	Z	500	0	0.0	0.0
08221	12	Z	500	31	7.7	7.1
08302	00	Z	500	0	0.0	0.0
08302	12	Z	500	28	3.2	1.3
08508	12	Z	500	29	15.4	13.0
08522	12	Z	500	31	7.4	6.3
08579	12	Z	500	31	6.5	3.9
10035	12	Z	500	32	4.0	-1.0
10035	00	Z	500	33	7.0	0.3
10393	00	Z	500	30	4.8	-2.5
10393	12	Z	500	31	5.1	-4.2
10410	12	Z	500	30	3.3	-1.3
10410	00	Z	500	29	3.0	0.2
10739	12	Z	500	31	8.2	7.4
10739	00	Z	500	31	7.6	6.8
11035	00	Z	500	31	15.3	13.7
11035	12	Z	500	33	13.4	10.7
12982	00	Z	500	30	7.1	2.3
12982	12	Z	500	31	7.1	4.5
16044	12	Z	500	30	6.9	-4.3
16044	00	Z	500	31	5.0	-0.7
16080	00	Z	500	30	4.5	1.4
16080	12	Z	500	31	7.2	-0.8
16245	12	Z	500	31	7.6	-5.9
16245	00	Z	500	30	8.1	-4.2
16320	00	Z	500	31	6.4	-2.4
16320	12	Z	500	31	8.0	-5.6
16429	12	Z	500	32	8.4	-4.4

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	00	Z	500	31	27.5	-5.1
16622	00	Z	500	31	20.7	20.0
16754	00	Z	500	30	14.8	12.0
17607	12	Z	500	46	4.9	0.7
26435	00	Z	500	15	5.2	3.4
60018	00	Z	500	1	3.5	3.5
60018	12	Z	500	31	2.9	1.8
ASDE01	12	Z	500	11	13.7	-3.5
ASDE01	00	Z	500	11	11.6	-6.0
ASDE02	12	Z	500	4	2.8	1.4
ASDE03	12	Z	500	11	9.1	6.4
ASDE03	00	Z	500	13	11.6	0.7
ASDE09	12	Z	500	3	5.6	3.4
ASDK01	12	Z	500	9	10.7	6.3
ASDK01	00	Z	500	9	8.7	8.5
ASDK02	12	Z	500	15	5.1	4.0
ASDK02	00	Z	500	13	5.1	4.0
ASDK03	12	Z	500	13	24.3	23.6
ASDK03	00	Z	500	12	20.4	19.6
ASDK1	12	Z	500	9	11.0	4.7
ASDK1	00	Z	500	9	9.9	9.0
ASDK2	12	Z	500	15	4.5	2.2
ASDK2	00	Z	500	12	6.7	5.0
ASDK3	00	Z	500	12	20.6	19.5
ASDK3	12	Z	500	13	24.3	23.2
ASES01	12	Z	500	22	9.7	9.0
ASEU01	12	Z	500	9	17.4	17.3
ASEU01	00	Z	500	4	16.9	16.3
ASEU02	00	Z	500	4	38.4	38.2
ASEU02	12	Z	500	7	34.4	15.5
ASEU03	12	Z	500	15	31.3	25.9
ASEU03	00	Z	500	11	35.2	29.2
ASEU04	12	Z	500	7	11.2	-7.3
ASEU04	00	Z	500	6	11.6	-9.0
ASEU06	12	Z	500	11	9.1	4.9
ASEU06	00	Z	500	8	7.2	-0.4
ASFR1	12	Z	500	15	7.9	-2.0
ASFR1	00	Z	500	16	10.4	-6.0
ASFR2	12	Z	500	12	5.9	1.0
ASFR2	00	Z	500	9	6.7	1.0
ASFR3	12	Z	500	12	6.4	4.8
ASFR3	00	Z	500	13	5.4	-2.0
ASFR4	12	Z	500	15	7.7	2.2



RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASFR4	00	Z	500	13	4.6	0.3
DBLK	12	Z	500	28	7.0	1.6
ELLIS	12	Z	500	2	8.7	-8.1
ELLIS	00	Z	500	17	14.4	-3.6
EWO	12	Z	500	19	11.0	7.3
GREEN	00	Z	500	20	10.5	6.9
GREEN	12	Z	500	1	8.7	8.7
HESS	12	Z	500	1	5.0	5.0
HESS	00	Z	500	19	6.3	3.3
MIND	12	Z	500	1	12.0	12.0
MIND	00	Z	500	24	22.9	21.8
UFT5	00	Z	500	26	6.4	5.3

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

## RADIOSONDE MONITORING STATISTICS (EUCOS)

MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND (M/S)  
 LEVEL : 500 HPA  
 AREA : 0 - 90N, 100W - 40E  
 PERIOD : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	00	V	500	0	0.0	0.0	0.0
01001	12	V	500	30	2.3	-0.2	-0.1
01028	00	V	500	0	0.0	0.0	0.0
01028	12	V	500	31	2.1	-0.1	0.3
01400	00	V	500	2	3.4	0.2	-0.7
01400	12	V	500	27	3.2	-0.2	0.2
01415	12	V	500	30	2.8	0.4	-0.4
01415	00	V	500	0	0.0	0.0	0.0
02365	00	V	500	0	0.0	0.0	0.0
02365	12	V	500	27	3.0	-0.1	-0.2
02591	00	V	500	0	0.0	0.0	0.0
02591	12	V	500	29	3.4	-0.4	-0.5
02836	12	V	500	31	2.4	0.2	-0.1
02836	00	V	500	31	2.4	0.1	-0.2
02963	12	V	500	31	2.4	0.2	-0.1
02963	00	V	500	31	2.3	0.0	-0.2
03005	12	V	500	31	3.4	0.0	0.0
03005	00	V	500	29	3.8	0.3	0.2
03238	00	V	500	30	3.1	0.6	-0.5
03238	12	V	500	8	2.7	-1.6	0.5
03808	00	V	500	28	3.0	0.0	-0.4
03808	12	V	500	31	4.0	0.6	0.8
03918	00	V	500	28	3.1	0.3	1.0
03918	12	V	500	13	2.5	-0.2	0.4
03953	12	V	500	31	3.0	-0.8	-0.1
03953	00	V	500	1	3.1	2.5	-1.8
04018	00	V	500	27	2.4	-0.2	-0.2
04018	12	V	500	31	2.3	-0.5	0.1
04220	12	V	500	31	2.3	0.0	0.0
04220	00	V	500	30	2.3	0.6	0.0
04270	12	V	500	31	2.2	-0.4	0.0
04270	00	V	500	30	2.8	-1.0	-0.1
04320	12	V	500	31	2.7	-0.3	0.0
04320	00	V	500	30	2.3	0.2	-0.6
04339	00	V	500	29	2.1	-0.2	-0.4
04339	12	V	500	30	2.6	-0.4	0.4
04360	00	V	500	28	2.1	0.3	0.4
04360	12	V	500	28	2.7	-0.4	0.7
06011	00	V	500	29	3.5	-0.5	0.0

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	500	29	2.4	-0.3	0.2
06260	00	V	500	0	0.0	0.0	0.0
06260	12	V	500	9	2.5	0.5	0.1
06610	00	V	500	30	3.0	0.7	0.3
06610	12	V	500	31	2.7	1.2	-0.3
07110	12	V	500	31	4.8	-0.8	-0.5
07110	00	V	500	27	3.2	-0.5	0.4
07510	12	V	500	29	2.9	0.6	0.4
07510	00	V	500	26	2.7	-0.5	-0.5
07645	12	V	500	25	3.1	0.9	0.3
07645	00	V	500	23	3.4	0.6	0.3
07761	12	V	500	30	3.2	1.2	-0.4
07761	00	V	500	25	2.6	0.4	-0.1
08001	00	V	500	0	0.0	0.0	0.0
08001	12	V	500	29	1.8	-0.1	-0.5
08221	00	V	500	0	0.0	0.0	0.0
08221	12	V	500	31	2.2	0.1	0.3
08302	00	V	500	0	0.0	0.0	0.0
08302	12	V	500	28	2.5	-0.3	0.7
08508	12	V	500	29	2.8	0.6	-0.2
08522	12	V	500	31	2.2	-0.3	-0.7
08579	12	V	500	31	2.3	0.5	-0.1
10035	12	V	500	31	2.9	0.2	-0.2
10035	00	V	500	30	2.3	-0.2	-0.4
10393	00	V	500	30	2.8	0.0	0.8
10393	12	V	500	31	2.3	0.7	0.2
10410	12	V	500	30	2.7	0.4	-0.3
10410	00	V	500	28	2.5	0.0	0.3
10739	12	V	500	31	2.8	1.2	-0.4
10739	00	V	500	30	2.6	0.8	-0.6
11035	00	V	500	31	3.6	-0.4	0.2
11035	12	V	500	31	2.9	0.3	-0.1
12982	00	V	500	29	3.5	0.4	-0.2
12982	12	V	500	31	3.1	0.2	0.3
16044	12	V	500	30	2.7	1.2	0.0
16044	00	V	500	30	3.5	0.4	-0.2
16080	00	V	500	29	2.9	1.1	-0.4
16080	12	V	500	31	2.5	0.5	-0.9
16245	12	V	500	31	2.1	-0.1	0.0
16245	00	V	500	29	2.3	0.0	-0.4
16320	00	V	500	29	2.2	0.8	-0.3
16320	12	V	500	31	2.2	0.1	-0.2
16429	12	V	500	31	2.1	0.0	0.1

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	00	V	500	29	2.1	0.1	0.1
16622	00	V	500	18	2.7	0.0	-0.1
16754	00	V	500	30	2.6	0.0	-0.1
17607	12	V	500	23	2.4	0.5	-0.1
26435	00	V	500	15	2.1	-0.1	0.2
60018	00	V	500	1	1.8	-1.6	-0.8
60018	12	V	500	30	2.4	-0.6	-0.5
ASDE01	12	V	500	11	2.7	0.8	0.0
ASDE01	00	V	500	10	2.3	0.1	-0.9
ASDE02	12	V	500	4	3.0	2.1	-0.4
ASDE03	12	V	500	11	2.1	0.0	0.6
ASDE03	00	V	500	13	3.0	0.9	-0.1
ASDE09	12	V	500	3	2.2	-0.1	-1.2
ASDK01	12	V	500	9	2.3	-1.0	-0.3
ASDK01	00	V	500	9	2.1	-0.1	0.1
ASDK02	12	V	500	15	1.8	0.1	0.3
ASDK02	00	V	500	12	1.3	0.0	-0.2
ASDK03	12	V	500	13	2.8	0.2	-0.4
ASDK03	00	V	500	12	2.8	0.3	0.0
ASDK1	12	V	500	9	2.7	-1.2	-0.4
ASDK1	00	V	500	9	2.6	-0.2	-0.2
ASDK2	12	V	500	15	1.7	-0.1	0.2
ASDK2	00	V	500	12	1.8	0.2	0.0
ASDK3	00	V	500	12	2.6	0.3	-0.1
ASDK3	12	V	500	13	2.8	0.1	-0.5
ASES01	12	V	500	21	3.1	-0.6	-1.1
ASEU01	12	V	500	9	2.3	0.2	0.8
ASEU01	00	V	500	4	1.6	-0.7	0.4
ASEU02	00	V	500	4	2.0	-0.8	0.5
ASEU02	12	V	500	7	2.0	-0.2	-0.2
ASEU03	12	V	500	15	4.1	0.7	0.3
ASEU03	00	V	500	11	5.2	-1.1	1.5
ASEU04	12	V	500	7	2.4	-1.3	-0.5
ASEU04	00	V	500	5	2.3	0.4	1.5
ASEU06	12	V	500	9	3.3	-0.8	-0.7
ASEU06	00	V	500	8	2.3	-1.1	-0.1
ASFR1	12	V	500	15	2.5	-0.3	0.3
ASFR1	00	V	500	16	2.5	0.6	0.1
ASFR2	12	V	500	12	3.4	0.1	1.5
ASFR2	00	V	500	9	2.8	1.4	0.3
ASFR3	12	V	500	12	3.2	-0.1	-1.1
ASFR3	00	V	500	13	3.4	-0.3	-0.4
ASFR4	12	V	500	15	3.0	0.1	0.7

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASFR4	00	V	500	13	3.2	-0.4	-0.4
DBLK	12	V	500	25	2.7	0.1	-0.6
ELLIS	12	V	500	1	4.2	1.0	4.1
ELLIS	00	V	500	11	2.4	-0.2	-0.1
EWO	12	V	500	19	3.0	-0.5	-0.2
GREEN	00	V	500	11	2.8	0.4	0.8
GREEN	12	V	500	1	4.1	3.0	2.8
HESS	12	V	500	1	3.5	3.4	-0.6
HESS	00	V	500	11	3.2	0.4	-1.2
MIND	12	V	500	1	3.7	-1.6	3.3
MIND	00	V	500	13	3.1	0.1	0.1
UFT5	00	V	500	26	1.9	-0.4	-0.3

#### 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 : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	00	Z	850	0	0.0	0.0
01001	12	Z	850	31	3.6	-0.9
01028	00	Z	850	0	0.0	0.0
01028	12	Z	850	31	4.2	-0.3
01400	00	Z	850	2	5.7	5.7
01400	12	Z	850	27	14.4	0.1
01415	12	Z	850	31	3.6	3.2
01415	00	Z	850	0	0.0	0.0
02365	00	Z	850	0	0.0	0.0
02365	12	Z	850	32	2.3	0.4
02591	00	Z	850	0	0.0	0.0
02591	12	Z	850	37	9.6	9.4
02836	12	Z	850	31	3.1	2.2
02836	00	Z	850	31	3.8	2.9
02963	12	Z	850	31	4.9	4.3
02963	00	Z	850	31	5.7	4.9
03005	12	Z	850	31	3.5	-1.6
03005	00	Z	850	31	2.9	-1.0
03238	00	Z	850	31	5.8	5.6
03238	12	Z	850	8	5.8	5.5
03808	00	Z	850	34	2.6	1.0
03808	12	Z	850	31	2.4	-0.8
03918	00	Z	850	29	4.8	4.0
03918	12	Z	850	13	4.6	4.5
03953	12	Z	850	31	8.5	4.7
03953	00	Z	850	2	3.3	3.3
04018	00	Z	850	30	2.3	1.8
04018	12	Z	850	31	2.3	0.6
04220	12	Z	850	31	3.7	1.4
04220	00	Z	850	31	4.7	2.9
04270	12	Z	850	31	3.5	0.4
04270	00	Z	850	31	2.3	0.6
04320	12	Z	850	31	8.4	8.0
04320	00	Z	850	31	9.0	8.5
04339	00	Z	850	31	2.5	0.3
04339	12	Z	850	30	2.8	-0.5
04360	00	Z	850	30	3.3	1.8
04360	12	Z	850	30	3.3	2.1
06011	00	Z	850	30	3.0	1.7

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	850	31	3.9	1.9
06260	00	Z	850	0	0.0	0.0
06260	12	Z	850	10	1.8	1.0
06610	00	Z	850	31	5.6	4.9
06610	12	Z	850	31	4.0	3.5
07110	12	Z	850	31	2.6	1.1
07110	00	Z	850	31	3.1	2.2
07510	12	Z	850	34	3.0	-1.8
07510	00	Z	850	36	3.2	-2.1
07645	12	Z	850	26	2.8	-1.2
07645	00	Z	850	23	4.0	-2.3
07761	12	Z	850	34	1.9	-0.1
07761	00	Z	850	31	3.2	-0.4
08001	00	Z	850	0	0.0	0.0
08001	12	Z	850	30	17.7	7.5
08221	00	Z	850	0	0.0	0.0
08221	12	Z	850	31	2.8	2.4
08302	00	Z	850	0	0.0	0.0
08302	12	Z	850	28	2.8	-1.2
08508	12	Z	850	29	12.0	8.5
08522	12	Z	850	31	3.3	3.0
08579	12	Z	850	31	3.2	1.7
10035	12	Z	850	32	3.2	0.8
10035	00	Z	850	33	6.2	1.9
10393	00	Z	850	30	3.9	-2.1
10393	12	Z	850	31	3.4	-2.9
10410	12	Z	850	30	3.1	-1.9
10410	00	Z	850	30	3.5	-2.5
10739	12	Z	850	31	8.0	7.6
10739	00	Z	850	31	7.7	7.4
11035	00	Z	850	31	12.3	10.6
11035	12	Z	850	33	12.1	10.5
12982	00	Z	850	30	5.0	3.8
12982	12	Z	850	31	7.9	6.8
16044	12	Z	850	31	5.8	-3.2
16044	00	Z	850	31	4.0	-1.7
16080	00	Z	850	31	4.2	0.9
16080	12	Z	850	31	5.6	-1.7
16245	12	Z	850	31	9.5	-8.1
16245	00	Z	850	30	8.9	-6.4
16320	00	Z	850	31	6.7	-4.2
16320	12	Z	850	31	7.7	-6.4
16429	12	Z	850	32	7.1	-5.6

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	00	Z	850	31	6.6	-1.7
16622	00	Z	850	31	13.8	13.3
16754	00	Z	850	30	13.3	10.8
17607	12	Z	850	46	2.4	0.5
26435	00	Z	850	15	5.2	4.4
60018	00	Z	850	1	1.8	-1.8
60018	12	Z	850	31	3.2	-2.1
ASDE01	12	Z	850	11	14.0	-9.0
ASDE01	00	Z	850	11	11.3	-6.5
ASDE02	12	Z	850	4	2.9	-2.5
ASDE03	12	Z	850	12	4.9	-1.2
ASDE03	00	Z	850	13	6.6	-2.0
ASDE09	12	Z	850	4	7.5	3.1
ASDK01	12	Z	850	9	12.2	7.2
ASDK01	00	Z	850	9	9.0	8.0
ASDK02	12	Z	850	15	2.9	2.1
ASDK02	00	Z	850	14	4.8	3.2
ASDK03	12	Z	850	13	24.1	23.5
ASDK03	00	Z	850	12	21.9	21.1
ASDK1	12	Z	850	9	12.3	7.3
ASDK1	00	Z	850	9	9.8	8.8
ASDK2	12	Z	850	15	2.5	1.6
ASDK2	00	Z	850	13	4.2	3.1
ASDK3	00	Z	850	12	21.9	21.1
ASDK3	12	Z	850	13	23.6	22.9
ASES01	12	Z	850	23	4.7	3.6
ASEU01	12	Z	850	9	11.8	11.4
ASEU01	00	Z	850	4	9.8	9.3
ASEU02	00	Z	850	4	30.8	30.6
ASEU02	12	Z	850	7	23.8	16.1
ASEU03	12	Z	850	15	29.8	20.0
ASEU03	00	Z	850	11	30.5	24.4
ASEU04	12	Z	850	7	14.1	-12.6
ASEU04	00	Z	850	7	13.9	-12.8
ASEU06	12	Z	850	11	7.7	2.2
ASEU06	00	Z	850	8	7.0	3.0
ASFR1	12	Z	850	15	7.6	-6.9
ASFR1	00	Z	850	16	9.4	-8.9
ASFR2	12	Z	850	12	6.6	-1.9
ASFR2	00	Z	850	9	5.1	2.8
ASFR3	12	Z	850	12	3.1	-1.1
ASFR3	00	Z	850	13	3.5	-1.7
ASFR4	12	Z	850	15	8.3	-7.1



RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASFR4	00	Z	850	14	6.4	-5.1
DBLK	12	Z	850	28	4.8	1.7
ELLIS	12	Z	850	2	10.0	-9.9
ELLIS	00	Z	850	17	14.3	-8.8
EWO	12	Z	850	19	7.2	2.4
GREEN	00	Z	850	21	6.8	2.6
GREEN	12	Z	850	1	8.9	8.9
HESS	12	Z	850	1	2.1	2.1
HESS	00	Z	850	19	4.8	-0.5
MIND	12	Z	850	1	5.6	-5.6
MIND	00	Z	850	25	15.1	13.8
UFT5	00	Z	850	26	6.0	4.7

**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 : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	00	V	850	0	0.0	0.0	0.0
01001	12	V	850	31	3.5	-0.3	0.4
01028	00	V	850	0	0.0	0.0	0.0
01028	12	V	850	31	2.6	0.2	0.1
01400	00	V	850	2	5.4	0.9	4.6
01400	12	V	850	27	2.3	0.1	-0.4
01415	12	V	850	30	2.6	0.1	0.3
01415	00	V	850	0	0.0	0.0	0.0
02365	00	V	850	0	0.0	0.0	0.0
02365	12	V	850	27	2.8	0.0	0.6
02591	00	V	850	0	0.0	0.0	0.0
02591	12	V	850	29	2.9	-0.1	-0.2
02836	12	V	850	31	2.8	0.9	-0.2
02836	00	V	850	31	1.9	0.1	-0.3
02963	12	V	850	31	2.6	-0.1	0.7
02963	00	V	850	31	2.6	-0.6	0.0
03005	12	V	850	31	2.8	0.3	0.0
03005	00	V	850	29	2.4	0.6	0.3
03238	00	V	850	30	2.6	0.7	0.1
03238	12	V	850	8	2.2	1.0	0.0
03808	00	V	850	28	2.8	0.6	-0.2
03808	12	V	850	31	3.3	0.0	0.3
03918	00	V	850	28	2.8	-0.5	-0.5
03918	12	V	850	13	2.6	0.7	0.1
03953	12	V	850	31	3.0	0.4	-0.4
03953	00	V	850	1	3.0	-2.0	-2.3
04018	00	V	850	27	3.3	-0.4	1.3
04018	12	V	850	31	3.2	-0.1	-0.4
04220	12	V	850	31	2.8	0.2	0.1
04220	00	V	850	30	3.0	-0.3	0.5
04270	12	V	850	31	2.3	0.2	-0.1
04270	00	V	850	30	3.1	-0.9	-0.3
04320	12	V	850	31	2.5	-0.1	-0.1
04320	00	V	850	30	2.7	-0.6	-0.8
04339	00	V	850	29	3.2	-0.3	-0.7
04339	12	V	850	30	3.3	0.0	-0.5
04360	00	V	850	29	3.3	0.8	-0.1
04360	12	V	850	30	3.1	0.5	0.3
06011	00	V	850	29	3.1	0.4	-0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	850	31	2.2	-0.4	0.1
06260	00	V	850	0	0.0	0.0	0.0
06260	12	V	850	9	2.3	0.8	0.4
06610	00	V	850	30	3.8	0.7	-0.1
06610	12	V	850	31	3.7	1.5	0.8
07110	12	V	850	31	3.4	0.2	-0.6
07110	00	V	850	27	2.7	0.7	0.0
07510	12	V	850	30	4.1	0.2	0.4
07510	00	V	850	29	4.0	-0.3	0.8
07645	12	V	850	25	3.1	-0.3	1.3
07645	00	V	850	23	4.5	0.4	0.7
07761	12	V	850	31	3.9	0.0	0.5
07761	00	V	850	27	3.9	-0.6	-1.1
08001	00	V	850	0	0.0	0.0	0.0
08001	12	V	850	29	2.1	0.3	-0.5
08221	00	V	850	0	0.0	0.0	0.0
08221	12	V	850	31	2.5	0.5	0.1
08302	00	V	850	0	0.0	0.0	0.0
08302	12	V	850	28	2.4	0.4	0.0
08508	12	V	850	29	2.6	0.7	0.0
08522	12	V	850	31	3.0	-0.6	0.1
08579	12	V	850	30	2.3	0.5	-0.5
10035	12	V	850	31	2.8	0.2	0.1
10035	00	V	850	30	2.4	0.6	0.3
10393	00	V	850	30	3.1	0.6	0.3
10393	12	V	850	31	2.4	0.4	0.0
10410	12	V	850	30	2.2	0.3	-0.1
10410	00	V	850	29	2.9	1.2	-0.4
10739	12	V	850	31	2.5	0.1	1.0
10739	00	V	850	30	3.3	0.9	0.4
11035	00	V	850	31	3.1	0.8	-0.5
11035	12	V	850	31	3.5	1.4	-0.5
12982	00	V	850	29	3.4	0.4	-1.0
12982	12	V	850	31	2.6	-0.3	0.8
16044	12	V	850	31	2.9	0.3	0.0
16044	00	V	850	30	3.5	0.7	0.5
16080	00	V	850	30	3.5	0.1	-1.2
16080	12	V	850	31	2.9	0.8	-0.3
16245	12	V	850	31	3.0	0.0	0.1
16245	00	V	850	29	2.8	0.7	0.0
16320	00	V	850	29	2.1	-0.2	-0.2
16320	12	V	850	31	2.1	0.4	-0.2
16429	12	V	850	31	2.2	0.1	0.8

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	00	V	850	29	2.2	-0.4	-0.2
16622	00	V	850	18	4.1	-0.4	-1.7
16754	00	V	850	30	2.6	0.8	0.6
17607	12	V	850	23	3.3	0.0	0.5
26435	00	V	850	15	3.0	-0.7	-0.6
60018	00	V	850	1	1.5	0.5	-1.4
60018	12	V	850	30	3.0	1.1	-0.5
ASDE01	12	V	850	11	3.8	0.3	1.3
ASDE01	00	V	850	10	3.7	0.1	0.8
ASDE02	12	V	850	4	2.4	0.0	-0.9
ASDE03	12	V	850	12	3.3	-0.8	-0.7
ASDE03	00	V	850	13	3.5	0.9	0.1
ASDE09	12	V	850	4	2.2	-0.2	0.0
ASDK01	12	V	850	9	3.2	-0.6	-0.8
ASDK01	00	V	850	9	1.9	-0.5	0.0
ASDK02	12	V	850	15	2.8	-0.5	0.1
ASDK02	00	V	850	13	2.9	-0.5	0.5
ASDK03	12	V	850	13	2.8	-0.7	-0.3
ASDK03	00	V	850	12	2.9	-0.1	-0.6
ASDK1	12	V	850	9	3.2	-0.5	-0.9
ASDK1	00	V	850	9	2.1	-0.4	0.1
ASDK2	12	V	850	15	2.8	-0.4	0.0
ASDK2	00	V	850	13	3.0	-0.1	0.1
ASDK3	00	V	850	12	2.9	-0.1	-0.7
ASDK3	12	V	850	13	3.0	-0.7	-0.3
ASES01	12	V	850	22	2.9	-0.1	0.2
ASEU01	12	V	850	9	2.8	-0.5	0.2
ASEU01	00	V	850	4	2.3	-0.4	-1.2
ASEU02	00	V	850	4	4.0	0.6	0.1
ASEU02	12	V	850	7	1.4	0.2	-0.6
ASEU03	12	V	850	15	4.0	1.7	0.6
ASEU03	00	V	850	11	4.7	-2.0	1.1
ASEU04	12	V	850	7	3.2	0.5	-0.6
ASEU04	00	V	850	6	4.4	-0.6	0.2
ASEU06	12	V	850	9	2.6	-0.2	0.3
ASEU06	00	V	850	8	3.2	-0.6	-0.1
ASFR1	12	V	850	15	3.3	0.1	0.0
ASFR1	00	V	850	16	3.3	0.4	1.0
ASFR2	12	V	850	12	3.0	1.3	-0.9
ASFR2	00	V	850	9	3.0	1.1	0.0
ASFR3	12	V	850	12	3.1	-0.8	-0.6
ASFR3	00	V	850	13	2.5	-0.1	-0.6
ASFR4	12	V	850	15	2.9	-0.4	0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASFR4	00	V	850	14	2.9	0.3	1.0
DBLK	12	V	850	25	3.0	-0.1	-0.4
ELLIS	12	V	850	1	4.4	4.3	0.9
ELLIS	00	V	850	11	3.8	-1.5	-1.0
EWO	12	V	850	19	2.6	0.1	0.3
GREEN	00	V	850	12	3.7	-1.0	0.3
GREEN	12	V	850	1	2.4	0.0	-2.4
HESS	12	V	850	1	1.3	1.2	-0.6
HESS	00	V	850	11	5.7	-1.0	-2.3
MIND	12	V	850	1	6.6	5.8	3.1
MIND	00	V	850	14	3.9	-1.8	-1.2
UFT5	00	V	850	26	2.9	0.3	-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 : JUL 2015  
 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
13001	99	P	SUR	12	-23	109	0	0.4	-0.1	0.4
13008	99	P	SUR	15	-38	90	0	0.2	0.0	0.3
13515	99	P	SUR	23	-42	199	0	0.2	0.4	0.4
13517	99	P	SUR	14	-38	193	0	0.3	0.2	0.3
13519	99	P	SUR	19	-36	212	0	1.0	0.1	1.0
13523	99	P	SUR	13	-60	200	0	0.3	0.4	0.5
13531	99	P	SUR	13	-47	201	0	0.3	-0.3	0.4
13569	99	P	SUR	27	-31	184	0	0.2	0.2	0.3
13570	99	P	SUR	35	-22	212	0	0.3	0.7	0.7
13572	99	P	SUR	32	-28	217	0	0.3	0.2	0.3
13633	99	P	SUR	34	-30	216	0	0.2	-0.3	0.4
13659	99	P	SUR	32	-50	217	0	0.9	0.0	0.9
13660	99	P	SUR	29	-45	217	0	0.8	-0.3	0.8
13661	99	P	SUR	12	-27	216	0	0.3	-0.5	0.6
13662	99	P	SUR	28	-48	217	0	0.2	0.1	0.2
13869	99	P	SUR	21	-36	217	0	0.2	0.3	0.3
13870	99	P	SUR	31	-17	217	0	0.5	0.4	0.7
13871	99	P	SUR	24	-29	215	0	0.4	0.8	0.9
13872	99	P	SUR	24	-21	217	0	0.5	0.3	0.6
21942	99	P	SUR	27	-34	208	0	0.2	0.5	0.5
25540	99	P	SUR	83	-15	217	0	0.3	-0.3	0.4
25575	99	P	SUR	84	-18	217	0	1.6	-0.5	1.6
25617	99	P	SUR	85	-25	217	0	0.4	-0.6	0.7
25618	99	P	SUR	87	7	217	0	0.3	0.0	0.3
25620	99	P	SUR	85	1	217	0	0.3	-0.3	0.4
25652	99	P	SUR	81	14	113	0	0.4	-0.5	0.6
26537	99	P	SUR	74	3	216	0	0.3	-0.2	0.3
31515	99	P	SUR	19	-61	199	0	0.2	0.3	0.4
31717	99	P	SUR	20	-64	217	0	0.3	0.2	0.3
31863	99	P	SUR	19	-56	217	0	0.5	0.5	0.7
41139	99	P	SUR	20	-38	132	0	0.2	-0.1	0.2
41564	99	P	SUR	30	-32	193	0	0.3	0.5	0.6
41580	99	P	SUR	21	-46	214	0	0.2	0.5	0.6
41590	99	P	SUR	25	-69	216	0	0.3	0.0	0.3
41591	99	P	SUR	19	-52	213	0	0.2	0.2	0.3
41594	99	P	SUR	24	-55	216	0	0.2	0.4	0.5

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
41596	99	P	SUR	22	-64	217	0	0.2	0.1	0.3
41597	99	P	SUR	24	-61	217	0	0.3	0.4	0.5
41600	99	P	SUR	19	-60	216	0	0.3	0.7	0.7
41632	99	P	SUR	25	-64	217	0	0.3	0.1	0.3
41635	99	P	SUR	20	-41	106	0	0.2	0.5	0.6
41637	99	P	SUR	14	-46	84	0	0.2	0.4	0.4
41638	99	P	SUR	16	-44	105	0	0.2	0.0	0.2
41705	99	P	SUR	34	-56	217	0	0.3	-0.1	0.3
41706	99	P	SUR	29	-59	217	0	0.3	0.1	0.3
41707	99	P	SUR	12	-47	99	0	0.3	0.0	0.3
41711	99	P	SUR	33	-46	217	0	0.3	0.1	0.3
41729	99	P	SUR	34	-68	217	0	0.4	-0.1	0.4
41731	99	P	SUR	28	-56	217	0	0.3	0.3	0.4
41739	99	P	SUR	36	-70	217	0	0.5	-0.6	0.8
41933	99	P	SUR	37	-38	216	0	0.3	0.0	0.3
41936	99	P	SUR	31	-52	217	0	0.3	-0.7	0.7
41969	99	P	SUR	26	-57	216	0	0.3	-0.3	0.4
41970	99	P	SUR	29	-63	216	0	0.3	0.2	0.4
41971	99	P	SUR	40	-17	216	0	0.3	0.2	0.3
41972	99	P	SUR	30	-48	214	0	0.2	0.2	0.3
41975	99	P	SUR	36	-37	217	0	0.2	0.2	0.3
44505	99	P	SUR	38	-15	385	0	0.3	0.0	0.3
44513	99	P	SUR	48	-20	217	0	0.3	0.2	0.4
44515	99	P	SUR	43	-54	217	0	0.5	-0.1	0.5
44516	99	P	SUR	34	-69	204	0	0.5	0.1	0.5
44517	99	P	SUR	47	-34	217	0	0.4	0.2	0.4
44519	99	P	SUR	56	-39	217	0	0.3	-0.2	0.3
44546	99	P	SUR	25	-39	217	0	0.2	0.1	0.2
44547	99	P	SUR	59	-23	217	0	0.4	0.1	0.4
44548	99	P	SUR	56	-30	217	0	0.3	0.2	0.3
44549	99	P	SUR	52	-17	217	0	0.9	0.1	0.9
44550	99	P	SUR	57	-10	217	0	0.3	0.1	0.3
44551	99	P	SUR	61	-14	217	0	0.3	0.3	0.4
44557	99	P	SUR	38	-56	78	0	0.4	0.4	0.6
44558	99	P	SUR	32	-43	217	0	0.2	0.7	0.8
44559	99	P	SUR	40	-44	97	0	0.4	-0.1	0.4
44560	99	P	SUR	51	-22	151	0	0.3	0.7	0.8
44601	99	P	SUR	53	-22	216	0	0.6	-0.6	0.8
44606	99	P	SUR	52	-20	217	0	0.5	-0.1	0.5
44608	99	P	SUR	44	-24	217	0	0.3	0.1	0.3
44609	99	P	SUR	49	-24	216	0	0.4	0.1	0.4
44613	99	P	SUR	30	-23	217	0	0.3	0.0	0.3
44614	99	P	SUR	52	-18	217	0	0.4	-0.3	0.5

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
44620	99	P	SUR	58	-23	217	0	0.3	0.3	0.5
44621	99	P	SUR	60	-2	217	0	0.3	0.6	0.7
44622	99	P	SUR	57	-7	49	0	0.3	-0.2	0.4
44623	99	P	SUR	58	-33	217	0	0.3	-0.1	0.3
44624	99	P	SUR	25	-24	216	0	0.3	0.1	0.3
44625	99	P	SUR	62	-19	207	0	0.3	0.4	0.5
44670	99	P	SUR	54	-53	70	0	0.3	0.3	0.4
44725	99	P	SUR	32	-55	217	0	0.4	0.0	0.4
44739	99	P	SUR	39	-47	216	0	0.5	0.4	0.7
44740	99	P	SUR	30	-51	216	0	0.2	-0.2	0.3
44744	99	P	SUR	40	-51	15	0	0.1	-0.1	0.2
44760	99	P	SUR	57	-43	153	0	0.3	-0.2	0.3
44761	99	P	SUR	53	-34	217	0	0.3	-0.3	0.4
44762	99	P	SUR	49	-46	216	0	0.5	0.2	0.5
44763	99	P	SUR	56	-34	176	0	0.2	0.2	0.3
44764	99	P	SUR	52	-36	217	0	0.3	-0.2	0.4
44768	99	P	SUR	44	-60	217	0	0.4	0.0	0.4
44769	99	P	SUR	36	-57	217	0	0.4	-0.1	0.4
44770	99	P	SUR	56	-34	197	0	0.3	-0.2	0.3
44771	99	P	SUR	53	-35	196	0	0.3	-0.2	0.3
44773	99	P	SUR	28	-67	200	0	0.3	0.0	0.3
44774	99	P	SUR	39	-53	217	0	0.4	0.0	0.4
44775	99	P	SUR	36	-69	217	0	0.4	0.2	0.4
44776	99	P	SUR	42	-44	217	0	0.4	0.4	0.6
44778	99	P	SUR	35	-52	217	0	0.3	0.2	0.4
44835	99	P	SUR	41	-21	217	0	0.3	-0.2	0.3
44836	99	P	SUR	56	-22	217	0	0.3	0.0	0.3
44837	99	P	SUR	32	-18	216	0	0.3	0.1	0.3
44839	99	P	SUR	35	-22	216	0	0.2	0.1	0.3
44846	99	P	SUR	35	-31	217	0	0.3	0.6	0.7
44847	99	P	SUR	45	-13	217	0	0.3	0.4	0.5
44848	99	P	SUR	41	-34	217	0	0.3	0.3	0.4
44863	99	P	SUR	27	-43	216	0	0.2	-0.2	0.3
44866	99	P	SUR	58	-15	218	0	0.3	-0.2	0.4
44867	99	P	SUR	58	-28	217	0	0.3	-0.3	0.4
44868	99	P	SUR	29	-43	217	0	0.5	-0.2	0.5
44871	99	P	SUR	47	-16	217	0	0.4	0.0	0.4
44872	99	P	SUR	55	-22	217	0	0.3	-0.4	0.5
44877	99	P	SUR	36	-21	217	0	0.2	0.0	0.2
44878	99	P	SUR	45	-13	216	0	0.3	0.1	0.3
44880	99	P	SUR	46	-42	210	0	0.5	-0.3	0.6
44885	99	P	SUR	38	-25	217	0	0.2	0.1	0.3
44887	99	P	SUR	36	-40	216	0	0.3	0.1	0.3



DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
44888	99	P	SUR	44	-22	217	0	0.3	-0.3	0.4
44889	99	P	SUR	34	-49	216	0	0.2	0.1	0.3
44890	99	P	SUR	31	-59	216	0	0.3	0.1	0.3
44891	99	P	SUR	25	-35	217	0	0.2	0.2	0.3
44892	99	P	SUR	49	-14	216	0	0.4	-0.2	0.4
44896	99	P	SUR	28	-43	217	0	0.2	-0.1	0.2
47503	99	P	SUR	67	-29	218	0	0.3	0.3	0.4
47509	99	P	SUR	87	-46	215	0	0.3	-0.2	0.4
47585	99	P	SUR	68	-67	216	0	0.5	-0.3	0.5
47586	99	P	SUR	51	-40	216	0	0.4	0.0	0.4
48506	99	P	SUR	84	-67	216	0	0.4	-0.3	0.5
48568	99	P	SUR	60	-48	216	0	0.3	-0.2	0.4
48597	99	P	SUR	82	-15	182	0	0.4	-0.1	0.4
48679	99	P	SUR	85	-22	187	0	0.4	0.3	0.5
48778	99	P	SUR	72	-21	181	0	2.1	-1.0	2.3
48779	99	P	SUR	59	-45	216	0	3.8	-3.2	5.0
62091	99	P	SUR	53	-5	217	0	0.4	-0.1	0.4
62092	99	P	SUR	51	-11	217	0	0.3	0.0	0.3
62093	99	P	SUR	55	-10	217	3	0.3	0.3	0.4
62094	99	P	SUR	52	-7	217	0	0.4	-0.1	0.4
62513	99	P	SUR	59	-31	217	0	0.3	0.1	0.3
62514	99	P	SUR	71	-1	217	0	0.3	-0.2	0.4
62516	99	P	SUR	21	-33	217	0	0.2	0.5	0.6
62538	99	P	SUR	62	-6	125	0	1.7	0.1	1.7
62539	99	P	SUR	57	-18	217	0	0.3	0.0	0.3
62552	99	P	SUR	49	-15	217	0	0.3	0.0	0.3
62553	99	P	SUR	76	-7	217	0	0.4	-0.2	0.4
62681	99	P	SUR	29	-19	217	0	0.3	0.1	0.3
62695	99	P	SUR	26	-40	217	0	0.2	0.4	0.5
62713	99	P	SUR	31	-55	212	0	0.3	-0.2	0.3
62714	99	P	SUR	31	-58	214	0	0.3	-0.2	0.3
62940	99	P	SUR	38	-30	216	0	0.2	0.3	0.3
62941	99	P	SUR	33	-22	216	0	0.2	0.1	0.2
63546	99	P	SUR	65	-11	216	0	1.0	-0.5	1.1
63560	99	P	SUR	73	-3	217	0	0.3	-0.4	0.5
63561	99	P	SUR	73	-3	217	0	0.3	0.0	0.3
63640	99	P	SUR	71	40	217	0	0.3	0.0	0.3
63644	99	P	SUR	71	23	48	3	3.5	-0.7	3.5
63923	99	P	SUR	87	6	216	0	4.1	-3.5	5.4
64517	99	P	SUR	58	4	216	0	0.4	0.5	0.6
64518	99	P	SUR	62	2	216	0	0.3	0.0	0.3
64519	99	P	SUR	67	7	217	0	0.3	0.2	0.4
64520	99	P	SUR	68	-10	188	18	2.5	-1.1	2.8

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
64521	99	P	SUR	70	1	217	0	0.3	-0.3	0.4
64522	99	P	SUR	73	10	185	0	0.3	-0.1	0.3
64523	99	P	SUR	64	-2	217	0	0.3	0.2	0.4
64524	99	P	SUR	66	10	214	0	0.3	-0.2	0.4
64525	99	P	SUR	70	-7	217	0	0.3	0.0	0.3
64526	99	P	SUR	63	-22	217	0	0.3	0.3	0.5
64527	99	P	SUR	63	-25	217	0	0.3	0.6	0.7
64528	99	P	SUR	64	-10	217	0	0.3	0.2	0.4
64529	99	P	SUR	58	-36	217	0	0.9	-0.3	0.9
64530	99	P	SUR	64	-8	217	0	0.4	0.2	0.4
64532	99	P	SUR	55	-45	217	105	0.8	1.2	1.5
64534	99	P	SUR	61	-34	495	291	1.5	0.5	1.5
64535	99	P	SUR	64	-40	189	0	0.3	0.2	0.4
64537	99	P	SUR	87	-3	92	0	0.4	-0.4	0.5
64538	99	P	SUR	87	-24	216	0	0.4	0.0	0.4
64546	99	P	SUR	60	-38	216	0	0.3	0.6	0.7
64547	99	P	SUR	64	-6	217	0	0.3	0.1	0.3
64549	99	P	SUR	62	-11	217	0	0.3	0.0	0.3
64550	99	P	SUR	63	-31	217	0	0.4	0.0	0.4
64551	99	P	SUR	64	-34	217	0	0.4	-0.1	0.4
64552	99	P	SUR	60	-30	211	0	0.2	0.0	0.3
64606	99	P	SUR	63	0	217	0	0.4	0.6	0.7
64613	99	P	SUR	75	-11	217	0	0.3	-0.2	0.4
64614	99	P	SUR	60	-14	217	0	0.3	0.2	0.4
64615	99	P	SUR	74	-10	217	0	0.3	0.3	0.4
64620	99	P	SUR	64	-15	217	0	0.3	0.1	0.3
64621	99	P	SUR	63	-23	204	0	0.3	0.2	0.3
64622	99	P	SUR	71	7	217	0	0.3	0.0	0.3
64623	99	P	SUR	74	-3	217	0	0.2	-0.6	0.6
64665	99	P	SUR	79	-2	194	0	0.3	0.0	0.3
64666	99	P	SUR	74	14	217	0	0.3	0.2	0.4
64667	99	P	SUR	61	-1	217	0	0.4	-0.2	0.4
64668	99	P	SUR	73	-5	217	0	0.2	0.0	0.3
64692	99	P	SUR	71	5	217	0	0.3	0.3	0.4
65514	99	P	SUR	59	-44	29	0	0.3	0.3	0.4
65596	99	P	SUR	57	-45	212	0	0.3	0.6	0.7
65599	99	P	SUR	57	-49	217	0	0.3	0.3	0.4
65600	99	P	SUR	60	-49	217	0	0.4	-0.2	0.4
65601	99	P	SUR	58	-47	217	0	0.3	0.1	0.3
65602	99	P	SUR	57	-49	217	0	0.3	-0.1	0.3

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

## DRIFTER MONITORING STATISTICS (EUCOS)

MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND SPEED (M/S)  
 AREA : 10N - 90N, 70W - 40E  
 PERIOD : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

TIME = 99 => AVERAGE OF ALL OBSERVATIONS

GROSS ERROR LIMIT FOR VECTOR WIND = 25 M/S

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
13001	99	SPEED	SUR	12	-23	109	0	0	1.7	0.8	1.8
13002	99	SPEED	SUR	20	-23	98	0	0	0.9	0.2	0.9
13008	99	SPEED	SUR	15	-38	90	0	0	0.8	0.0	0.8
41026	99	SPEED	SUR	11	-38	83	0	0	1.5	0.8	1.7
41139	99	SPEED	SUR	20	-38	132	0	0	0.9	-0.3	0.9
62091	99	SPEED	SUR	53	-5	217	0	0	1.5	-0.4	1.6
62092	99	SPEED	SUR	51	-11	217	0	0	1.0	-0.2	1.0
62093	99	SPEED	SUR	55	-10	217	0	0	1.1	-0.2	1.1
62094	99	SPEED	SUR	52	-7	217	0	0	1.0	0.0	1.0

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

## DRIFTER MONITORING STATISTICS (EUCOS)

MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND DIRECTION (DEGREES)  
 AREA : 10N - 90N, 70W - 40E  
 PERIOD : JUL 2015  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
13001	99	DIRN	SUR	12	-23	57	0	0	25.4	-1.0	25.4
13002	99	DIRN	SUR	20	-23	97	0	0	10.7	2.5	11.0
13008	99	DIRN	SUR	15	-38	90	0	0	11.6	-3.4	12.1
41026	99	DIRN	SUR	11	-38	69	0	0	13.1	3.7	13.7
41139	99	DIRN	SUR	20	-38	131	0	0	7.6	14.0	15.9
62091	99	DIRN	SUR	53	-5	172	0	0	15.2	5.5	16.1
62092	99	DIRN	SUR	51	-11	200	0	0	11.8	-1.8	12.0
62093	99	DIRN	SUR	55	-10	178	0	0	12.9	-2.6	13.1
62094	99	DIRN	SUR	52	-7	200	0	0	10.2	3.9	10.9

**4.12 Table 24 - List of Assimilated BUFR Encoded Radiosonde Stations**

ASDE02	ASDE09	ASDK01	ASDK02	ASDK03	ASES01	ASEU01	ASEU02	ASEU04
DBLK	01001	01004	01010	01028	01241	01400	01415	01492
02185	02365	02527	02591	03953	06260	08001	08023	08160
08221	08302	08430	10035	10113	10184	10238	10304	10393
10410	10618	10739	10868	10954	10962	60018		

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

ASDE01	ASDE02	ASDE03	ASDE09	ASDE09	ASDK01	ASDK02	ASDK03	ASES01
ASEU01	ASEU02	ASEU03	ASEU04	ASEU06	DALANZAD		DBLK	Dalanzad
MUREN	Muren	ULAANBAA		ULAANGOM		Ulaan-Ba		Ulaan-Go
17516	48811	76526						

## 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  $\text{ms}^{-1}$  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	$35\text{ms}^{-1}$
925	$35\text{ms}^{-1}$
850	$35\text{ms}^{-1}$
700	$40\text{ms}^{-1}$
500	$45\text{ms}^{-1}$
400	$50\text{ms}^{-1}$
300	$60\text{ms}^{-1}$
250	$60\text{ms}^{-1}$
200	$50\text{ms}^{-1}$
150	$50\text{ms}^{-1}$
100	$45\text{ms}^{-1}$



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.