ECMWF Global Data Monitoring Report

June 2015

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

Contents

Summary of Revisions (in reverse order)

Revision 28 (June 18) – Monitoring of SYNOP and SYNOP-SHIPs now includes BUFR encoded observations for those which were assimilated as well as for those without TAC counterpart.

Revision 27 (Mar 13) – Monitoring of Radiosondes and ASAPs now includes BUFR encoded observations for those which were assimilated as well as for those without TAC counterpart.
Tables 24 and 25 are also added to show the identifiers of these BUFR observations separately.

Revision 26 (Feb 15) – Selection criteria for SHIPs are modified as per SOT-7/Doc.9.1.1.
Different criteria applied to Manual and Automatic SHIPs.

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

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

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

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

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

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

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

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

1 Introduction

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

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

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

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

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

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

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

2 Data summary - History of events

2.1 Radiosondes

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

Ident	Time	May	Jun	Ident	Time	May	Jun
03005	(00)	57	31	27595	(00)	0	25
03005	(12)	56	30	27595	(12)	0	25
03808	(00)	59	33	28661	(12)	19	30
03808	(12)	61	33	41256	(12)	0	24
03882	(00)	57	31	60096	(12)	9	29
12120	(00)	31	11	60155	(00)	12	25
12120	(12)	31	12	74626	(12)	0	16
29839	(00)	29	17	74646	(00)	26	43
30309	(00)	30	0	78897	(00)	0	26
30309	(12)	29	0	80001	(12)	0	11
38507	(12)	24	0	82765	(12)	0	21
40265	(00)	31	6	83612	(00)	9	29
42101	(00)	30	18	83612	(12)	11	30
43333	(00)	26	0	84132	(12)	0	20
48565	(00)	12	0	86218	(12)	1	25
64458	(00)	21	0	-	-	-	-
64458	(12)	22	0	-	-	-	-
68098	(12)	25	0	-	-	-	-
68110	(12)	17	0	-	-	-	-
82022	(00)	19	6	-	-	-	-
82022	(12)	20	7	-	-	-	-
82107	(12)	30	16	-	-	-	-
83208	(12)	30	13	-	-	-	-
87155	(12)	28	14	-	-	-	-
87344	(12)	11	0	-	-	-	-
98223	(12)	18	0	-	-	-	-

2.2 Drifting Buoys

Surface pressure observations from **1512** 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

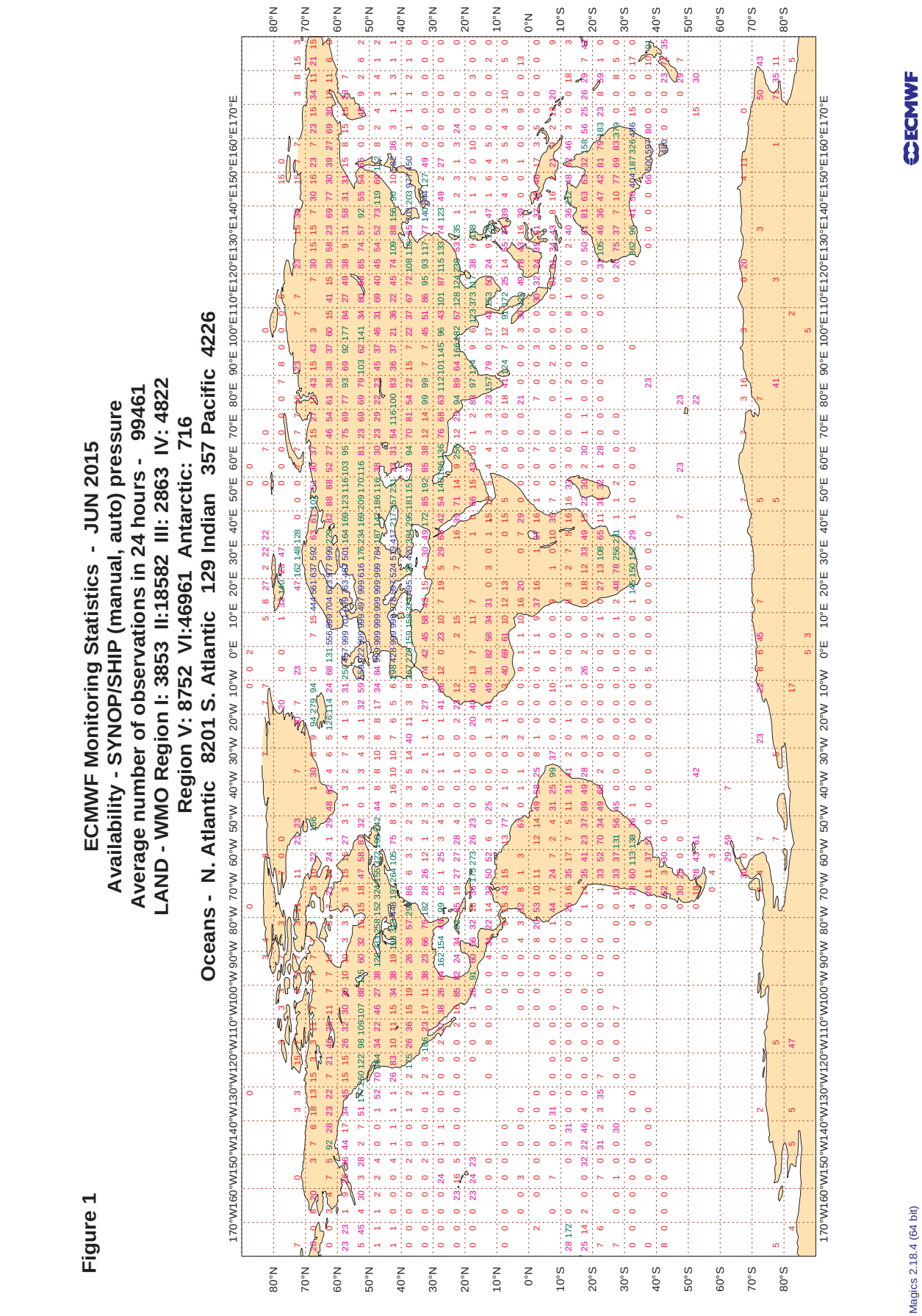


Figure 1

3.2.2 Figure 2 - Availability - DRIFTER PRESSURE

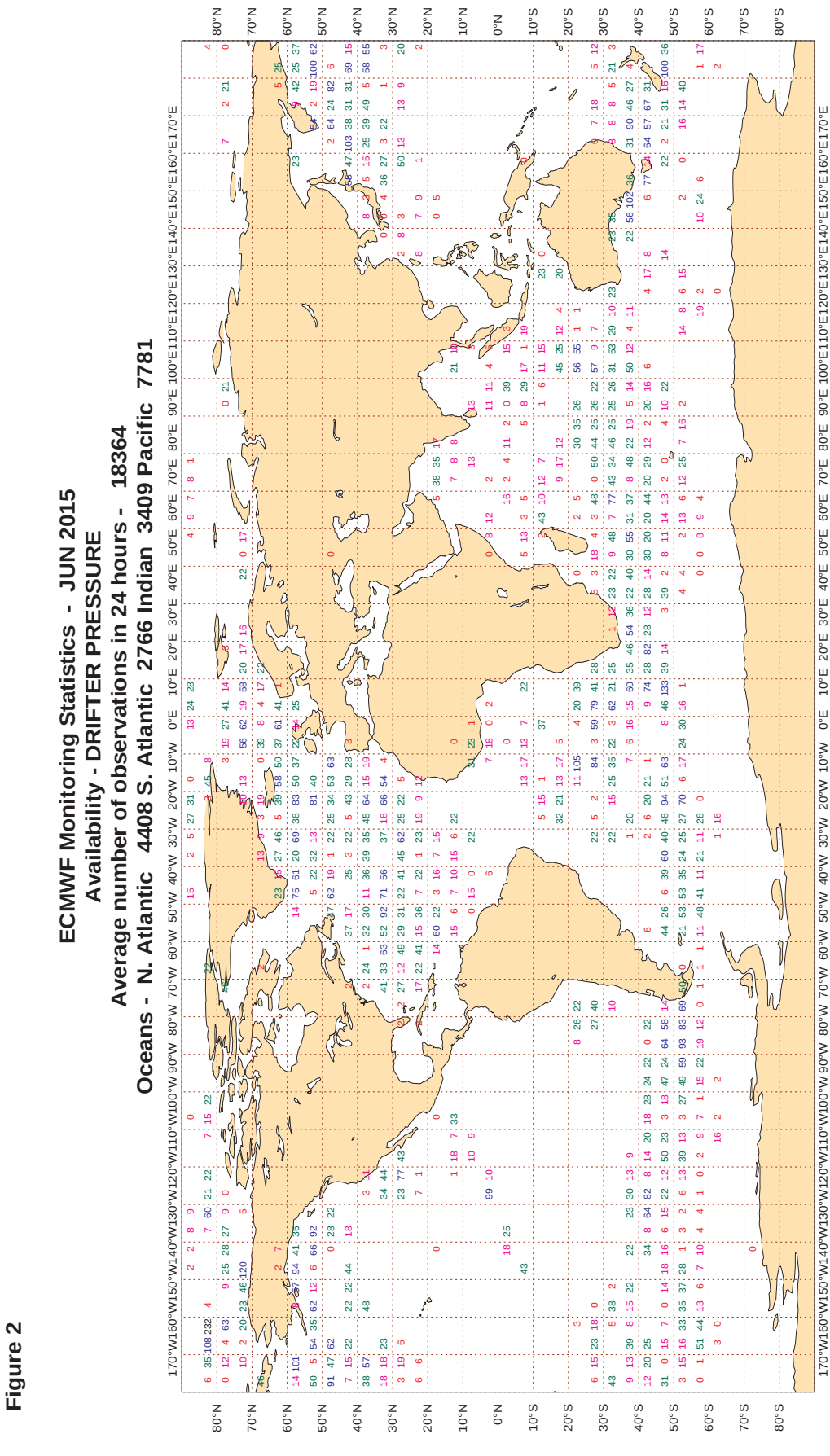


Figure 2

3.2.3 Figure 3 - Availability - TEMP 500 hPa geopotential

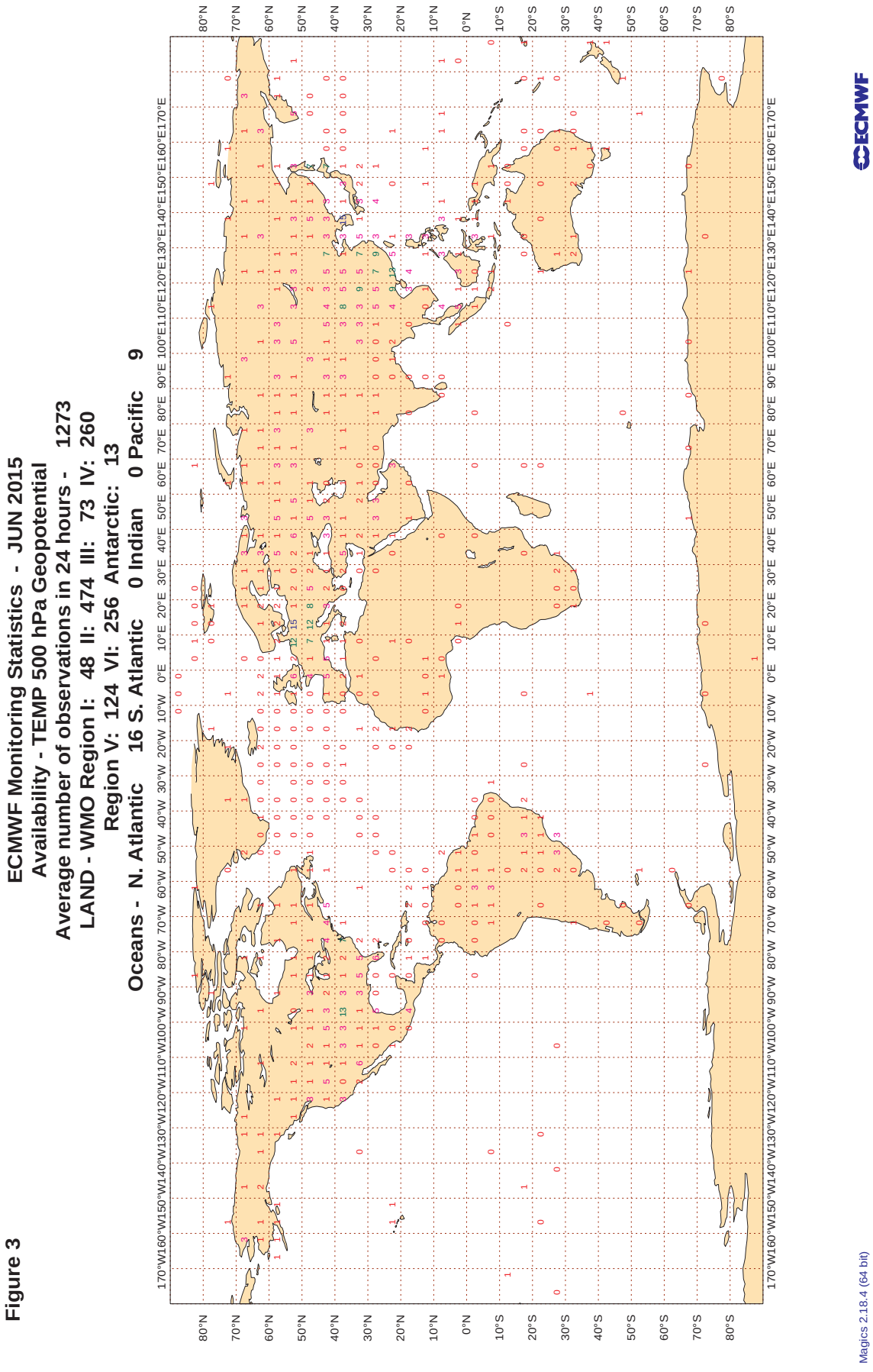


Figure 3

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

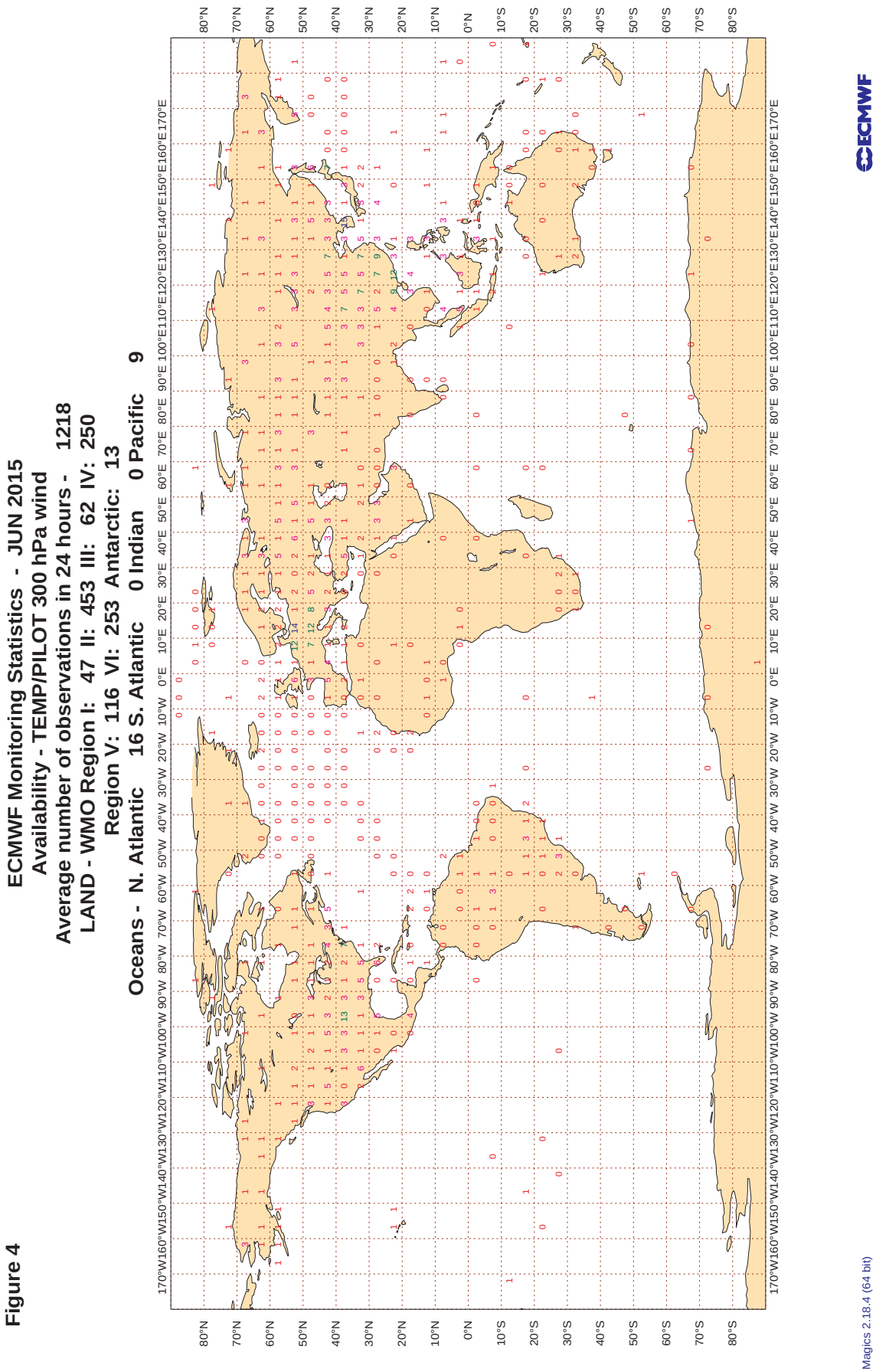


Figure 4

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

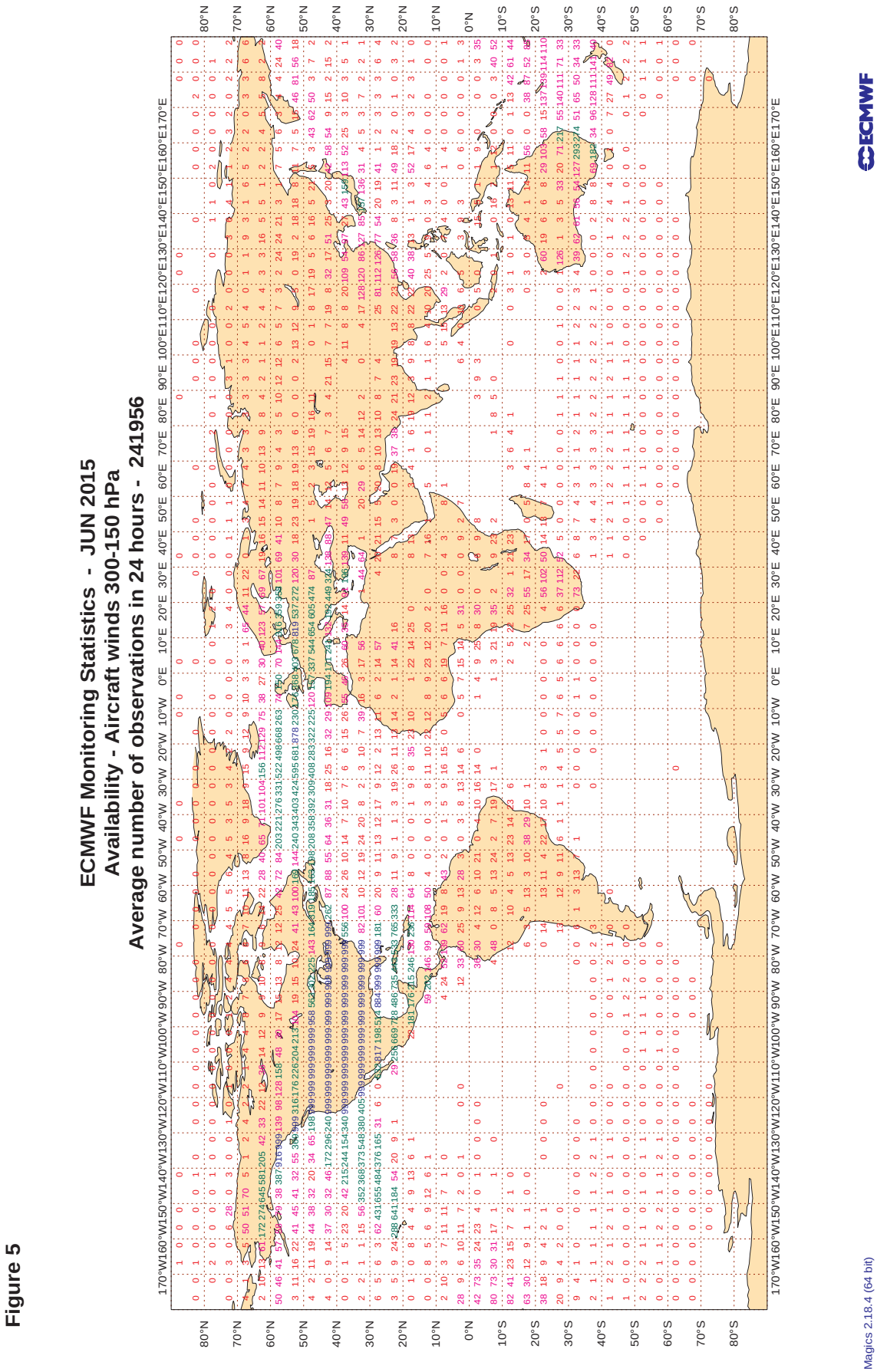
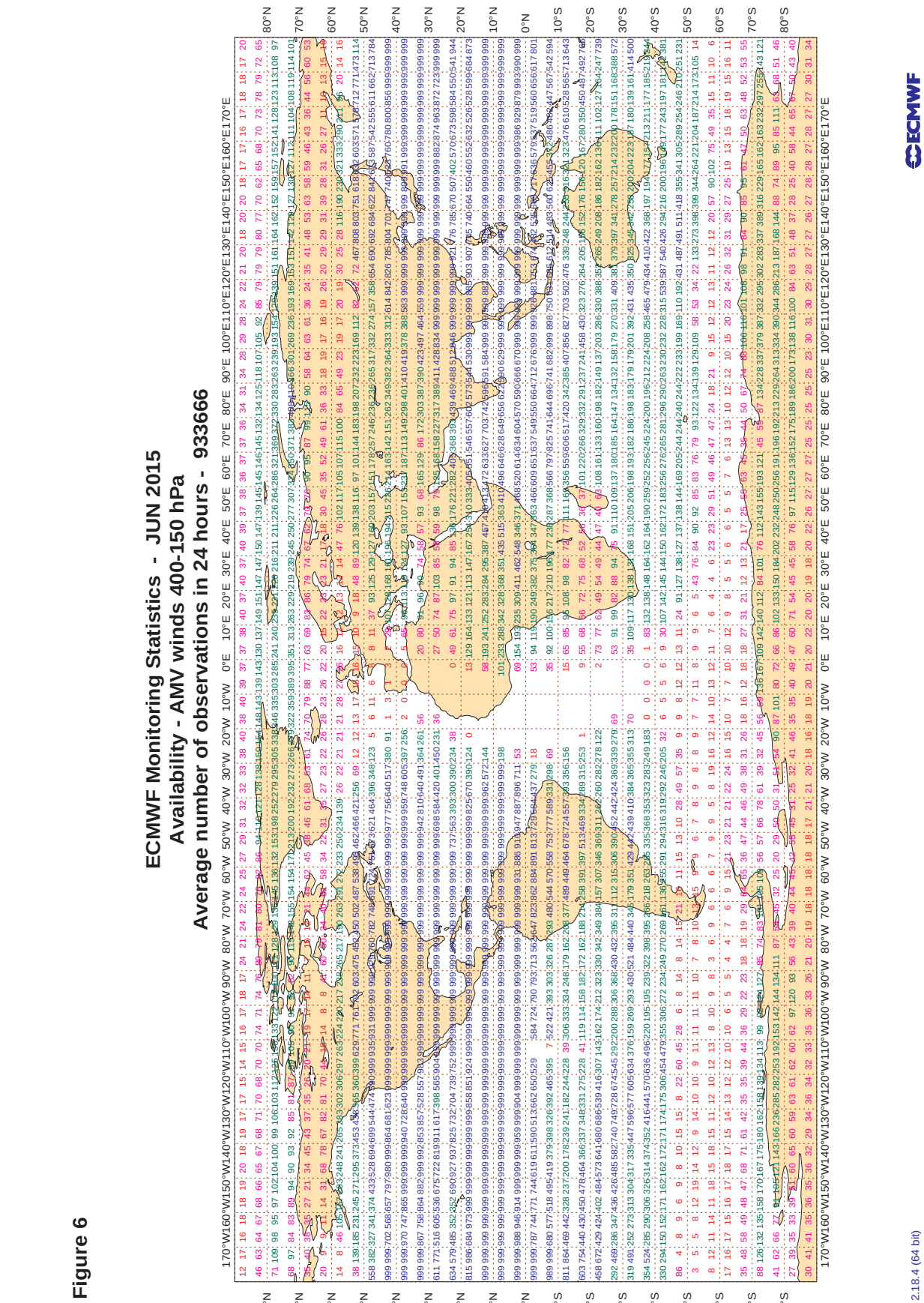


Figure 5

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

Figure 6



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

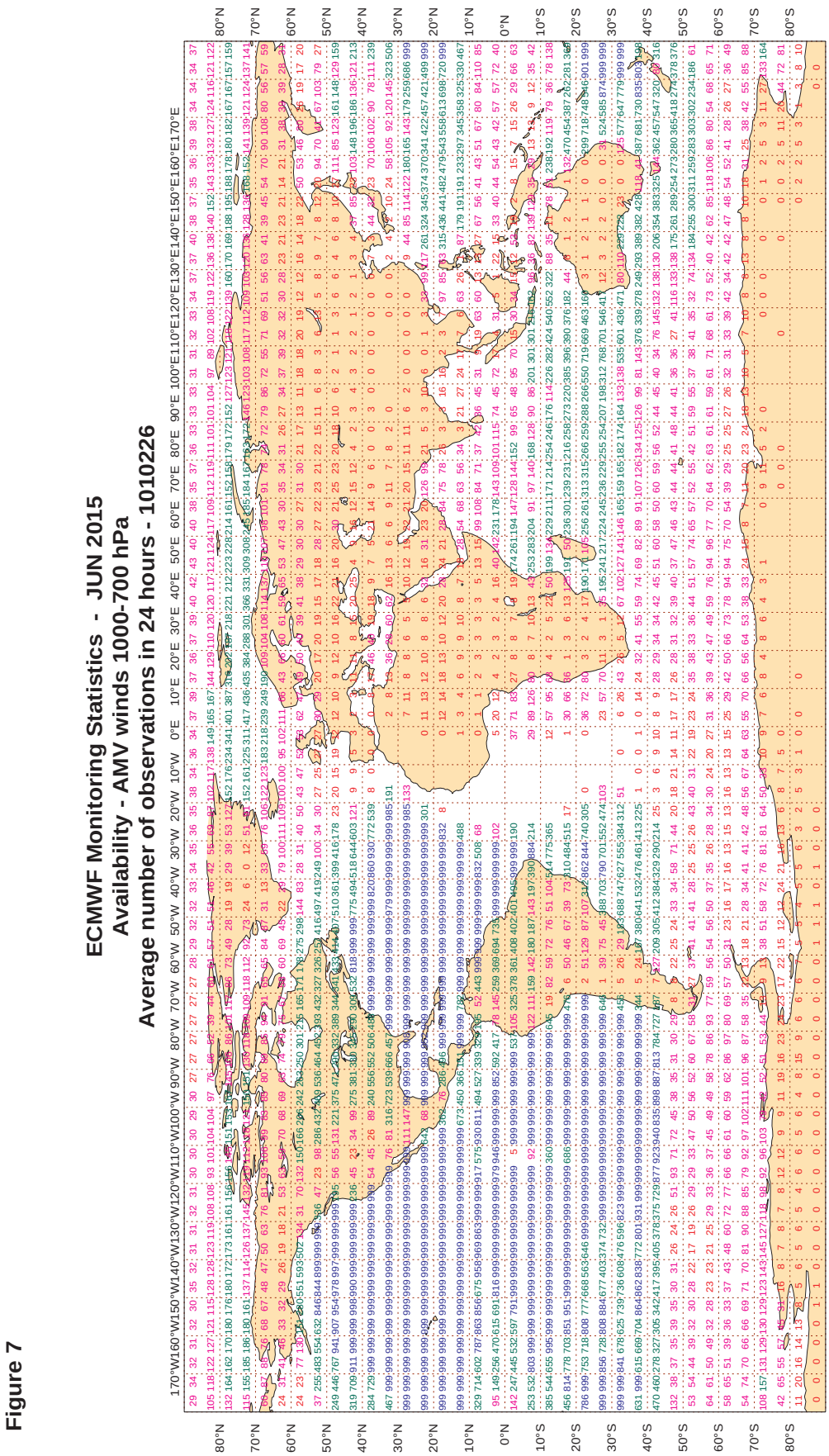
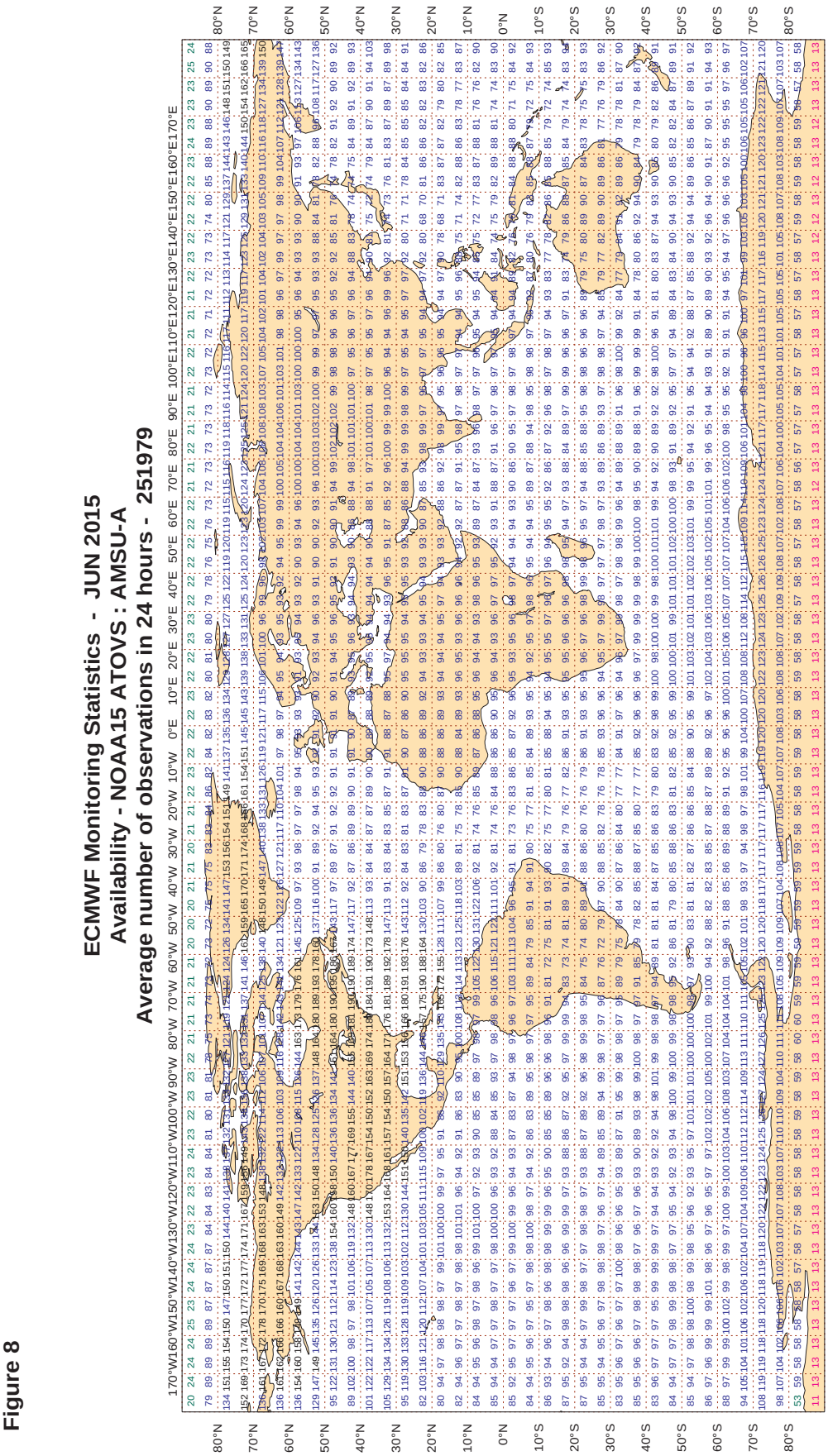


Figure 7

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



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

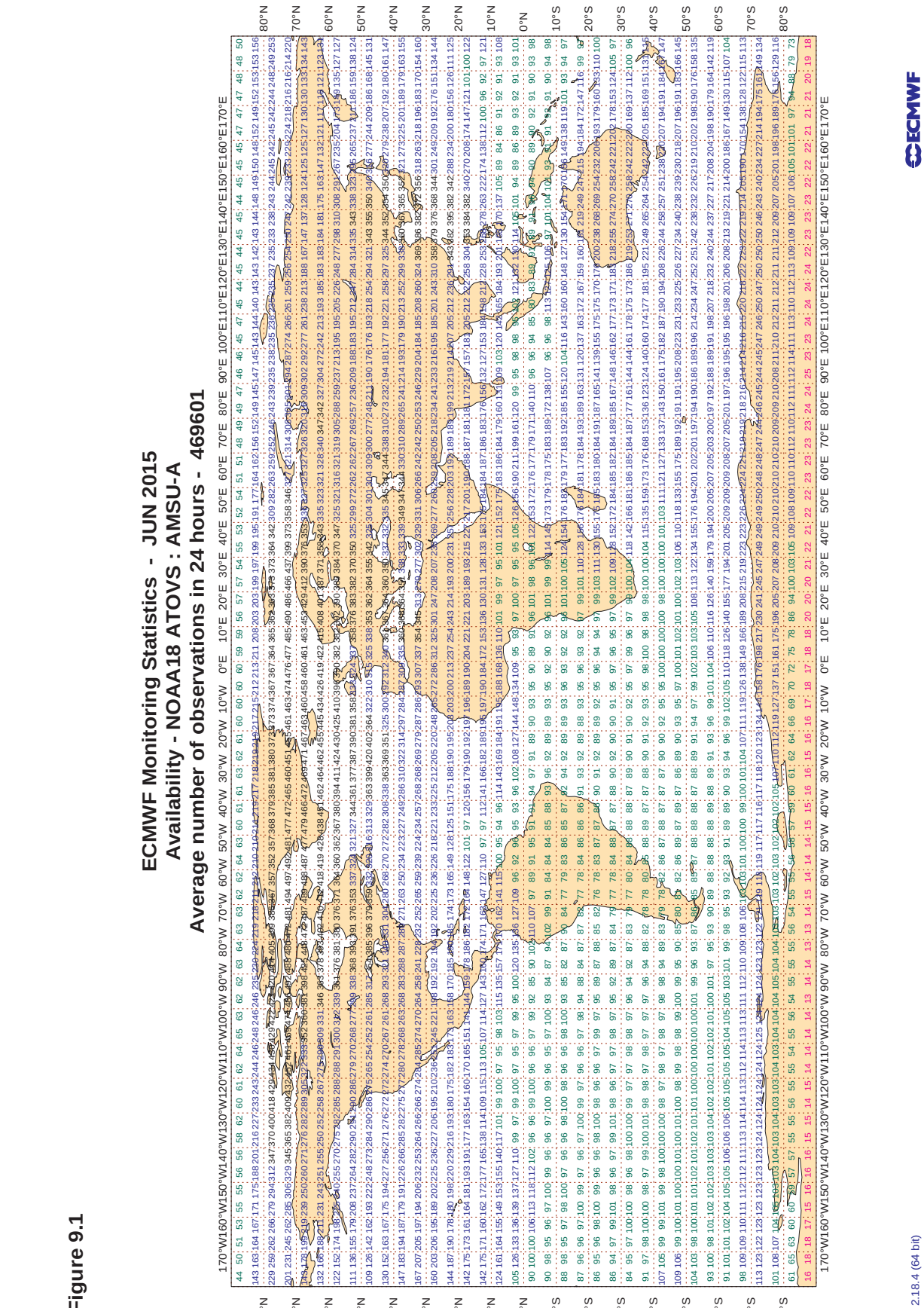


Figure 9.1

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

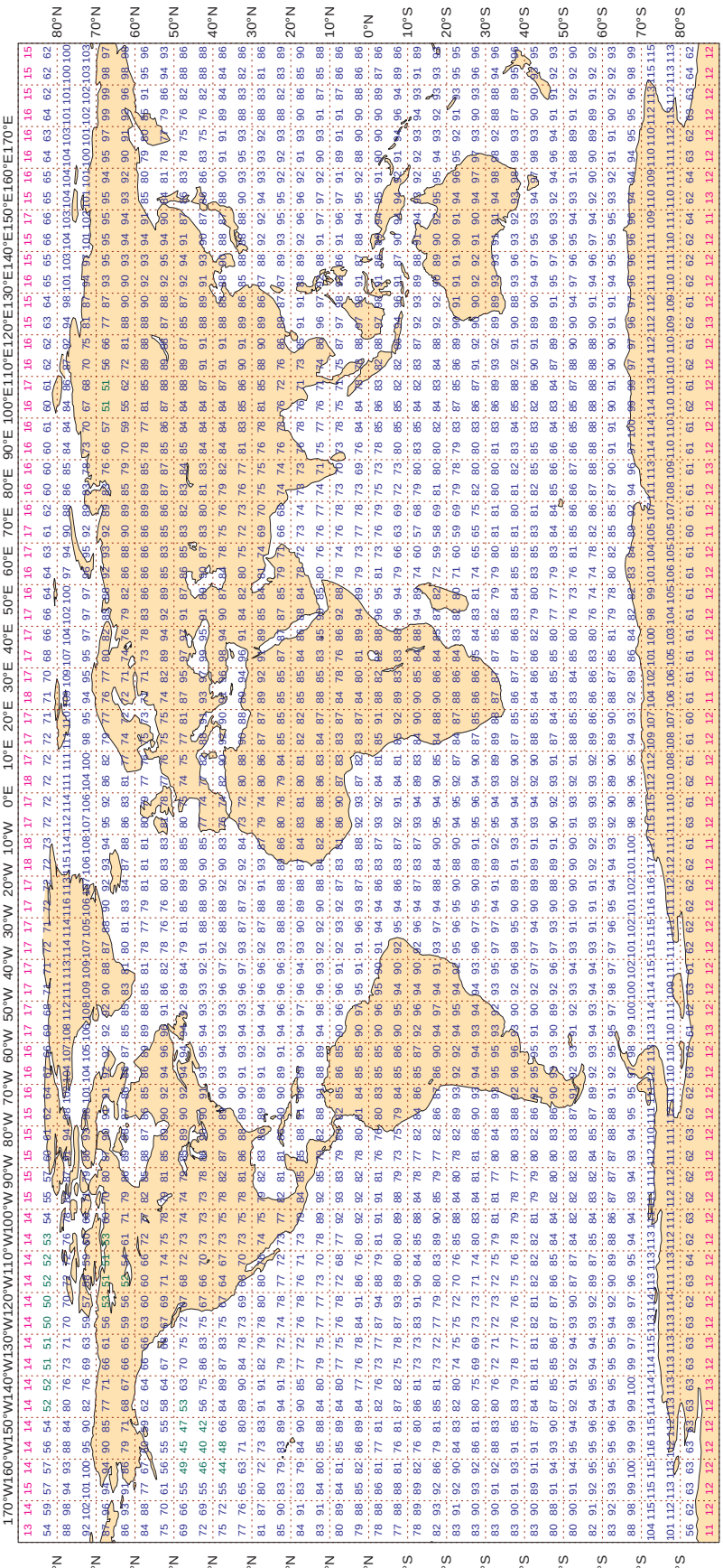


Figure 9.2

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

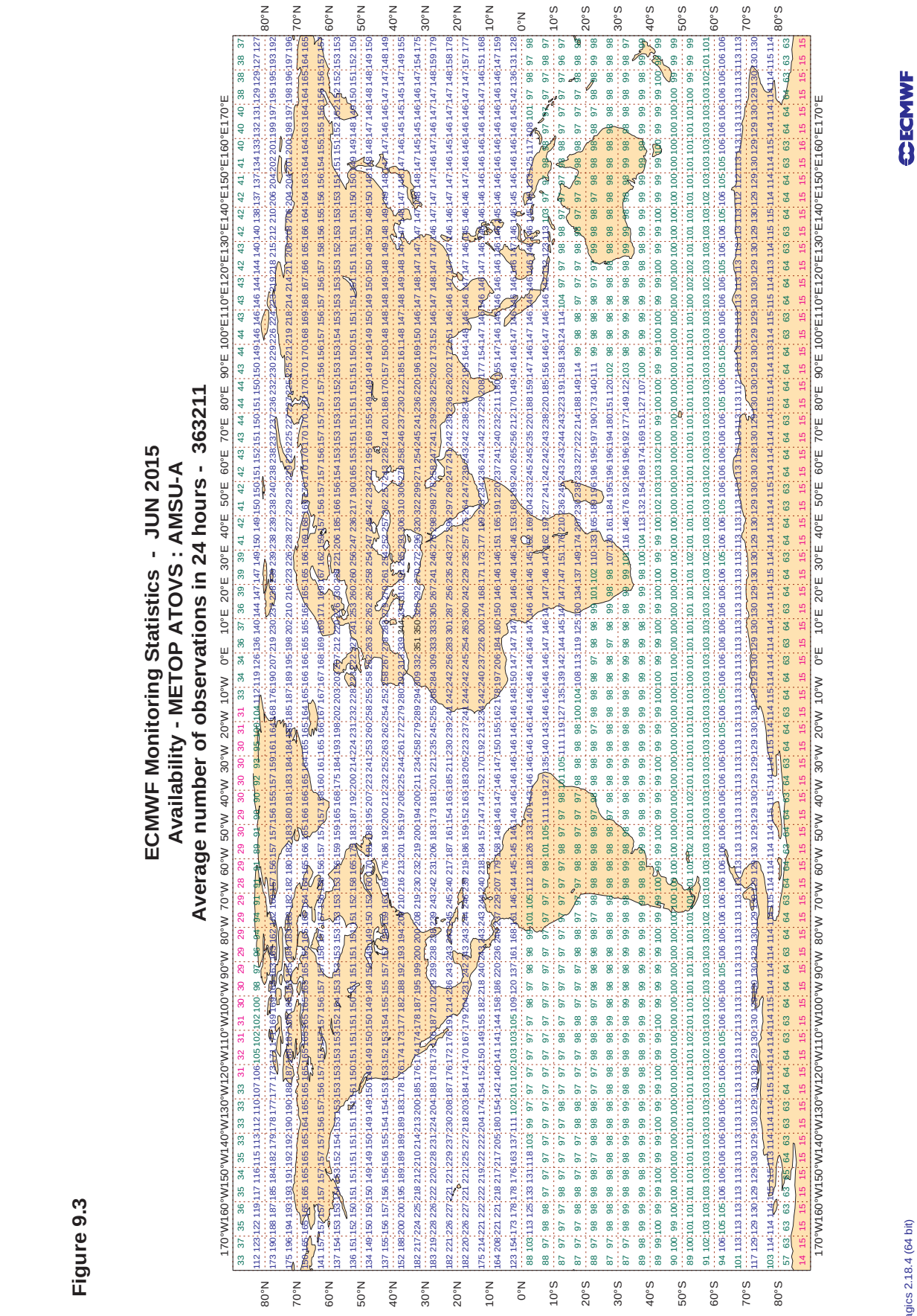


Figure 9.3

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

```
          LIST OF SUSPECT STATIONS        : SHIPS + FIXED MARINE PLATFORMS
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : SURFACE PRESSURE (HPA)
                    AREA                  : GLOBAL
                    PERIOD                : JUN 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
VRZK8	99	P	SUR	15	0	3.9	3.0	5.0

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                : JUN 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	1.6	5.5	5.7

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

```
          LIST OF SUSPECT STATIONS        : SHIPS + FIXED MARINE PLATFORMS
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND DIRECTION (DEGREES)
                    AREA                  : GLOBAL
                    PERIOD                : JUN 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
62118	99	DIRN	SUR	28	0	0	20.8	-34.1	39.9

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                : JUN 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
46916	99	P	SUR	50	-159	68	43	0.1	0.3	0.3
48638	99	P	SUR	71	-152	210	30	6.9	1.2	7.0
48644	99	P	SUR	71	-148	210	58	5.2	0.3	5.2
48737	99	P	SUR	44	-72	21	21	0.0	0.0	0.0
51618	99	P	SUR	4	-128	207	194	0.9	13.3	13.3
51620	99	P	SUR	-8	-148	203	203	0.0	0.0	0.0
55588	99	P	SUR	-35	162	76	76	0.0	0.0	0.0
62500	99	P	SUR	61	-29	21	0	1.8	4.9	5.2
64532	99	P	SUR	58	-43	210	210	0.0	0.0	0.0

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                : JUN 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

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

```
          LIST OF SUSPECT STATIONS        : DRIFTER
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND DIRECTION (DEGREES)
                    PERIOD                : JUN 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
23099	99	DIRN	SUR	13	80	65	0	0	17.5	42.6	46.1
23453	99	DIRN	SUR	8	73	59	0	0	15.4	23.0	27.7
23460	99	DIRN	SUR	7	88	49	0	0	168.4	21.2	169.7
23491	99	DIRN	SUR	12	93	33	0	0	16.6	42.4	45.6
23492	99	DIRN	SUR	11	72	27	0	0	115.5	103.0	154.8
23497	99	DIRN	SUR	11	72	37	0	0	106.5	127.1	165.8
31053	99	DIRN	SUR	-32	-50	150	0	0	29.0	65.1	71.3
31260	99	DIRN	SUR	-16	-38	137	0	0	52.5	49.1	71.9
52073	99	DIRN	SUR	5	137	100	0	0	86.1	-18.4	88.0
53040	99	DIRN	SUR	-8	95	179	0	0	165.7	-18.8	166.8
53056	99	DIRN	SUR	-5	95	162	0	0	158.7	-37.2	163.0

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                : JUN 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
33791	12	Z	300	48	33	25	0	59.5	42.6	73.2
38064	00	Z	70	45	66	24	0	118.5	30.7	122.4
40417	12	Z	1000	26	50	13	0	2.9	41.0	41.1
40417	00	Z	1000	26	50	13	0	0.0	40.5	40.5
40430	00	Z	850	25	40	22	0	3.0	44.0	44.1
40430	12	Z	925	25	40	22	0	4.3	45.3	45.5
42182	00	Z	200	29	77	13	0	125.9	-14.2	126.7
42379	00	Z	200	27	83	16	2	99.3	97.5	139.2
42410	00	Z	250	26	92	21	0	89.9	-46.9	101.4
43003	00	Z	700	19	73	26	0	20.9	-43.9	48.6
76679	00	Z	1000	19	-99	30	13	10.7	-81.0	81.7
84132	12	Z	850	-1	-75	19	0	6.4	40.5	41.0
89592	00	Z	50	-67	93	25	1	83.8	-173.1	192.3
91680	12	Z	925	-18	177	30	0	0.0	31.6	31.6
ASEU03	00	Z	250	39	-72	13	2	0.0	214.8	214.8
ASEU03	12	Z	250	37	-75	13	7	6.6	216.9	217.0
ASEU06	00	Z	1000	51	-16	11	0	7.1	-35.7	36.4
ASEU06	12	Z	1000	50	-20	15	0	13.0	-35.4	37.7

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                : JUN 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
```

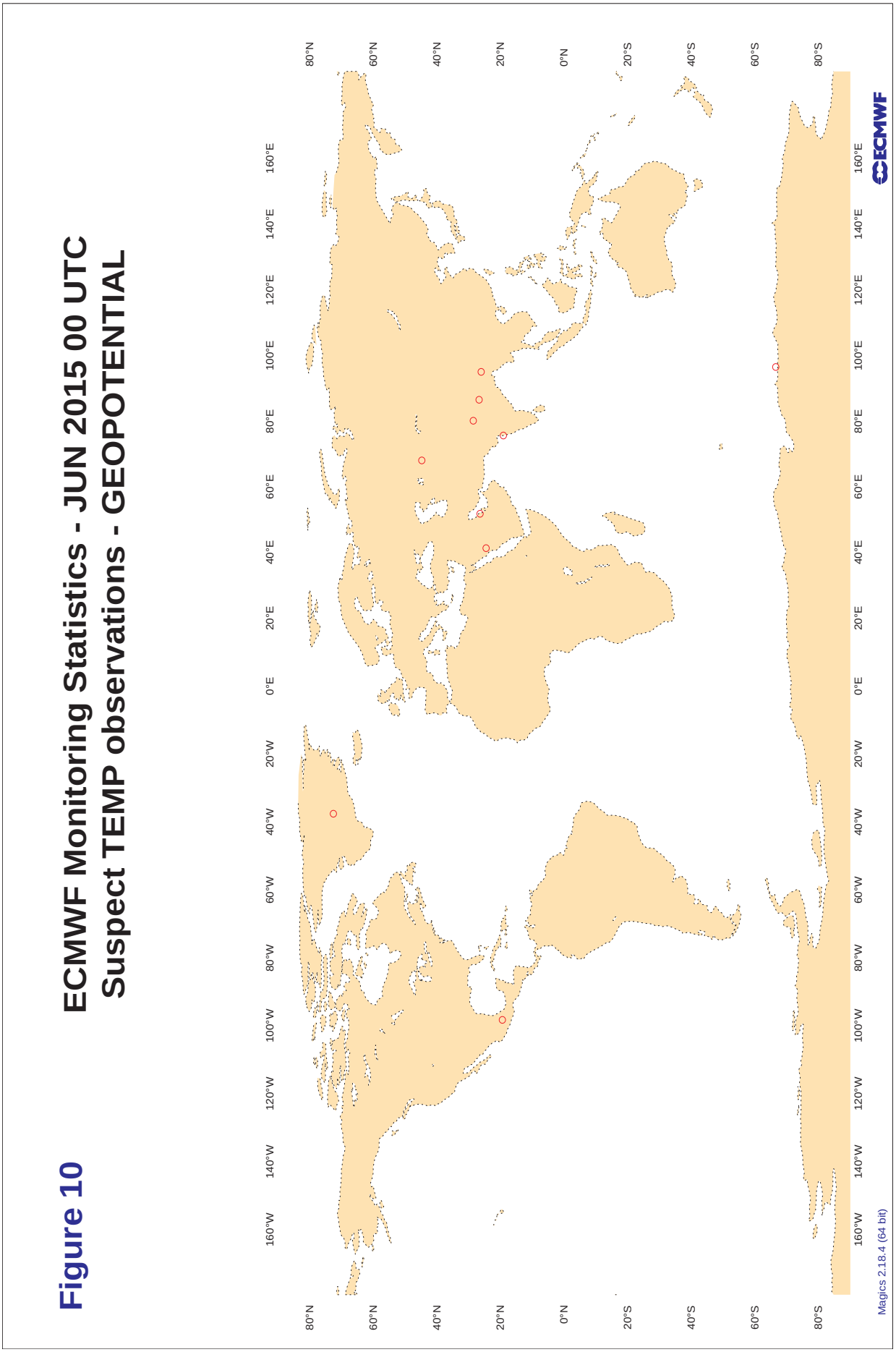
WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	UBIAS	VBIAS	RMS
38064	00	V	250	45	66	27	0	0.7	-0.4	15.5
80001	12	V	150	13	-82	10	0	-5.7	-3.3	16.9

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

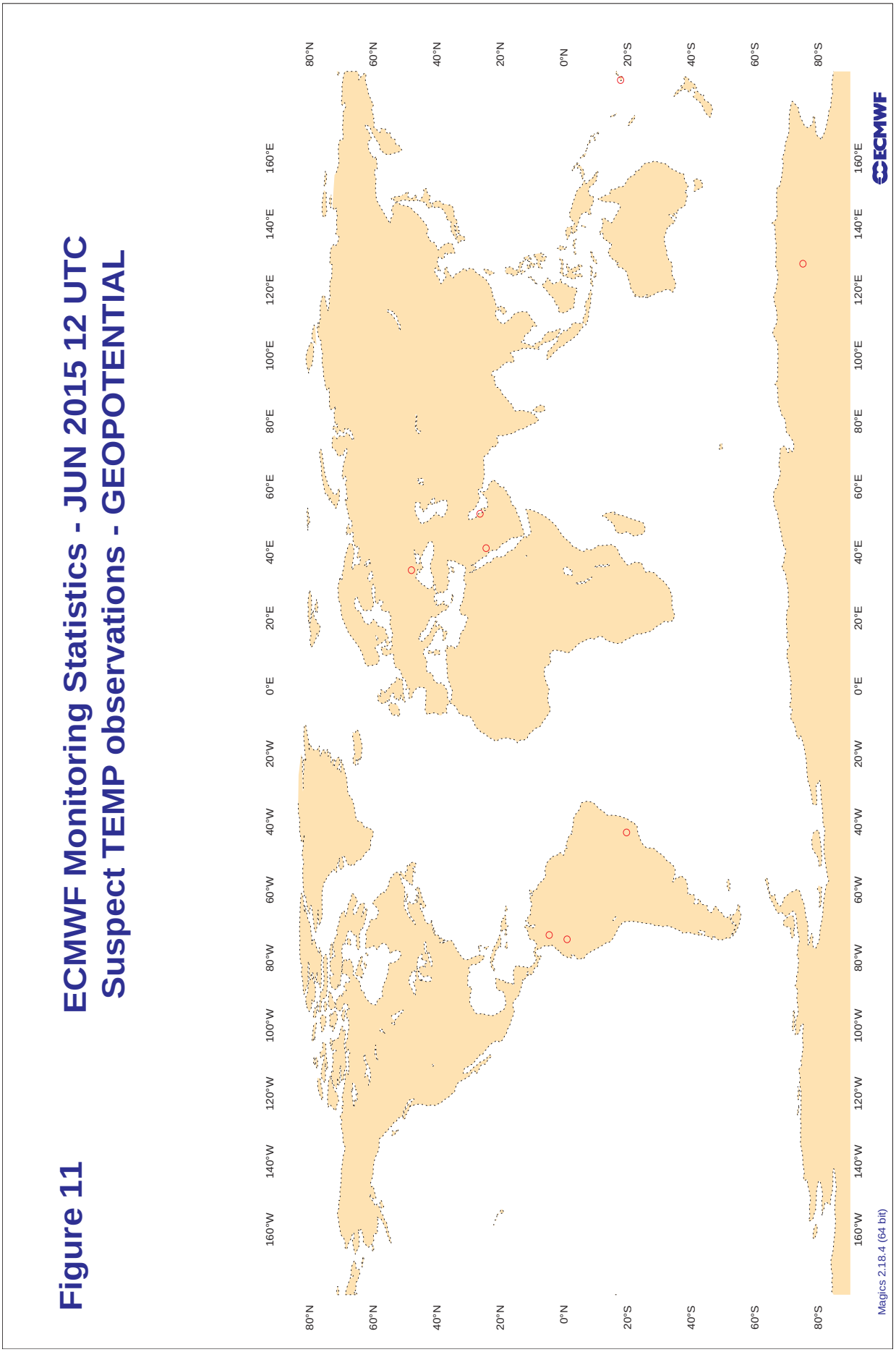
```
          LIST OF SUSPECT STATIONS        : RADIOSONDES
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND DIRECTION (DEGREES)
                    AREA                  : GLOBAL
                    PERIOD                : JUN 2015
                 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


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

WMO IDENT	OBS TIME	ELM	LAT	LONG	NUM OBS	BIAS	MAX SPREAD	SD
32215	12	DD	51	156	26	12.7	2.7	8.3
32215	00	DD	51	156	27	12.0	7.6	12.4
59431	12	DD	23	108	16	-12.0	5.8	19.8

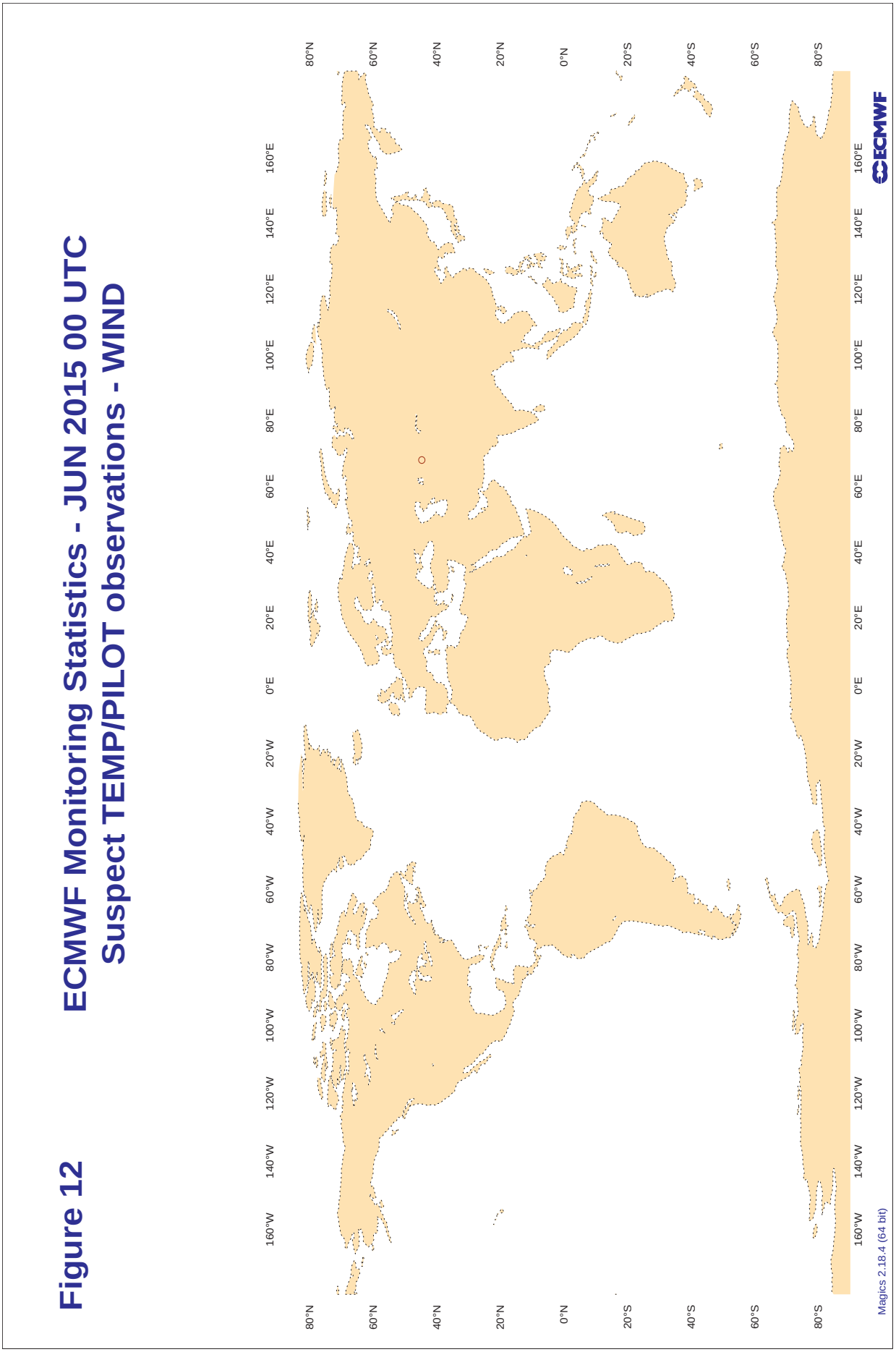
3.2.21 Figure 10 - Suspect TEMP observations - geopotential : 00 UTC



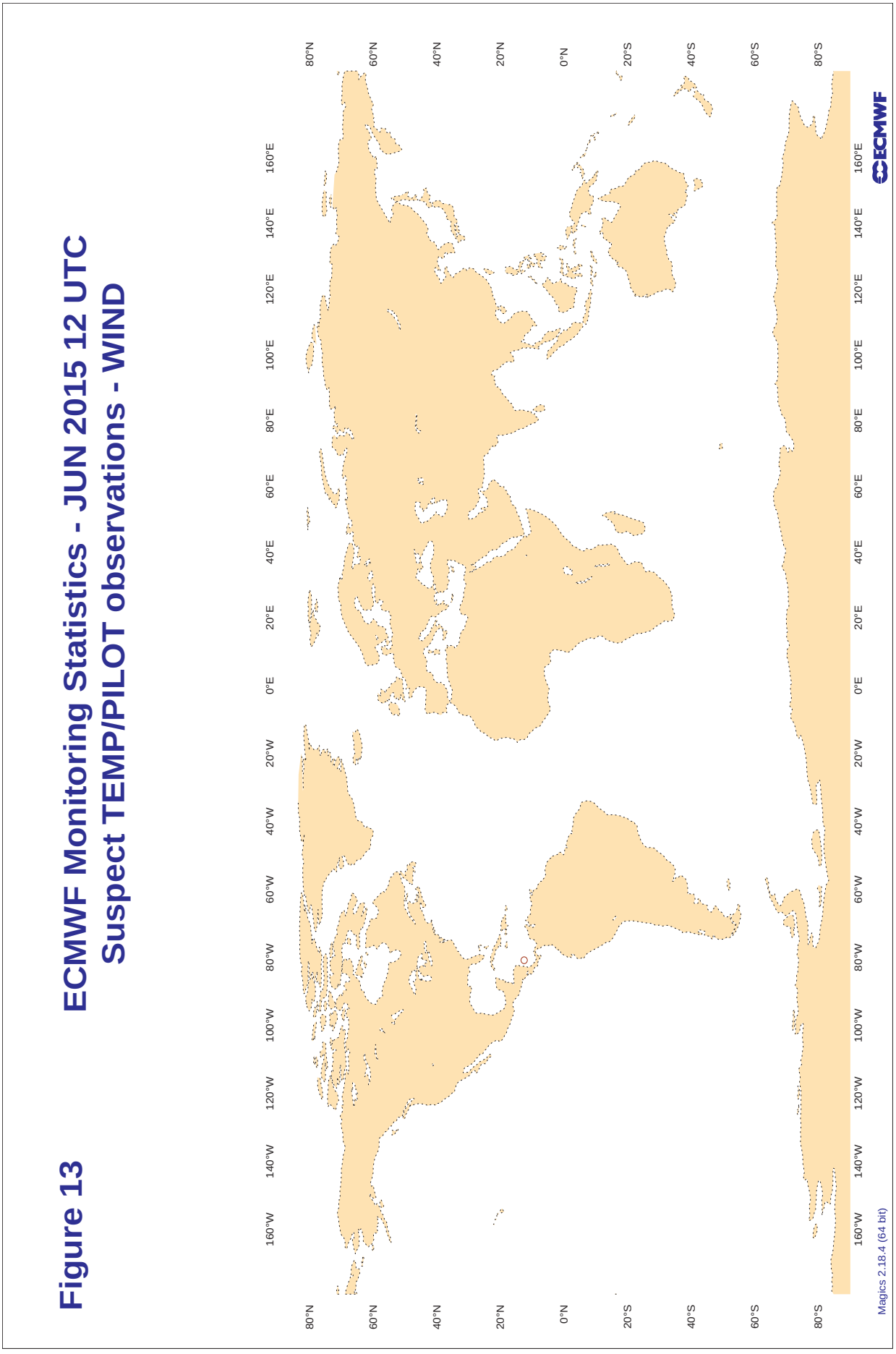
3.2.22 Figure 11 - Suspect TEMP observations - geopotential : 12 UTC



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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
AALUAA	12	Z	100	1	13.0	-13.0
AALUAA	00	Z	100	2	0.0	0.0
AALUMO	12	Z	100	20	7.3	4.2
ALADDA	12	Z	100	1	62.7	62.7
ALADDA	00	Z	100	0	0.0	0.0
ASDE01	12	Z	100	13	69.7	34.7
ASDE01	00	Z	100	10	52.1	20.4
ASDE02	12	Z	100	10	24.6	23.7
ASDE02	00	Z	100	5	22.9	22.1
ASDE03	12	Z	100	9	29.5	28.7
ASDE03	00	Z	100	8	10.0	6.9
ASDE04	12	Z	100	1	37.4	37.4
ASDE04	00	Z	100	2	44.7	44.4
ASDE09	12	Z	100	7	34.1	-1.2
ASDK01	12	Z	100	4	14.5	13.5
ASDK01	00	Z	100	5	10.7	9.9
ASDK02	12	Z	100	13	13.5	11.5
ASDK02	00	Z	100	14	7.1	4.2
ASDK03	12	Z	100	7	29.9	29.5
ASDK03	00	Z	100	6	28.9	27.7
ASDK1	12	Z	100	4	17.1	16.8
ASDK1	00	Z	100	5	10.2	9.4
ASDK2	12	Z	100	13	14.5	10.2
ASDK2	00	Z	100	13	6.0	2.1
ASDK3	12	Z	100	10	30.2	30.0
ASDK3	00	Z	100	9	28.5	27.1
ASES01	12	Z	100	21	29.3	27.9
ASEU01	12	Z	100	18	25.3	23.0
ASEU01	00	Z	100	12	13.3	11.9
ASEU03	12	Z	100	13	232.9	232.5
ASEU03	00	Z	100	12	216.4	215.6
ASEU04	12	Z	100	6	11.8	10.3
ASEU04	00	Z	100	9	55.1	21.4
ASEU06	12	Z	100	14	64.2	18.9
ASEU06	00	Z	100	11	20.7	-16.8
ASFR1	12	Z	100	11	7.4	3.0
ASFR1	00	Z	100	12	7.4	1.2
ASFR2	12	Z	100	11	10.6	8.5
ASFR2	00	Z	100	9	15.0	10.4

RADIOSONDE MONITORING STATISTICS (SHIPS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASFR3	12	Z	100	12	10.5	7.8
ASFR3	00	Z	100	14	14.1	10.8
ASFR4	12	Z	100	9	17.8	15.2
ASFR4	00	Z	100	8	20.7	19.9
BAGUIO	00	Z	100	0	0.0	0.0
BREWS	12	Z	100	1	1.9	1.9
BREWS	00	Z	100	26	24.9	23.1
DAVAO0	12	Z	100	0	0.0	0.0
DAVAO0	00	Z	100	0	0.0	0.0
DBLK	12	Z	100	27	14.8	13.7
ELLIS	12	Z	100	2	19.8	11.1
ELLIS	00	Z	100	22	64.3	19.7
GREEN	00	Z	100	11	17.1	13.2
HESS	00	Z	100	27	11.9	3.9
JGQH	12	Z	100	10	12.6	10.8
JGQH	00	Z	100	6	11.3	6.1
JNSR	12	Z	100	1	17.8	-17.8
JNSR	00	Z	100	1	8.4	-8.4
LAOAG	00	Z	100	0	0.0	0.0
LEGASP	12	Z	100	1	10.0	10.0
LEGASP	00	Z	100	3	19.8	19.8
LGKI	00	Z	100	23	12.1	-8.7
LGKI	12	Z	100	19	13.4	-4.1
LUMBIA	12	Z	100	0	0.0	0.0
LUMBIA	00	Z	100	0	0.0	0.0
MACTAN	00	Z	100	2	0.0	0.0
MACTAN	12	Z	100	1	6.9	6.9
MIND	12	Z	100	2	26.4	26.3
MIND	00	Z	100	30	38.4	36.5
MUREN	12	Z	100	0	0.0	0.0
MUREN	00	Z	100	19	5.3	3.8
OZ203	12	Z	100	1	208.3	-208.3
OZ203	00	Z	100	1	252.0	-252.0
PUERTO	12	Z	100	0	0.0	0.0
PUERTO	00	Z	100	0	0.0	0.0
TANAY	12	Z	100	1	25.2	25.2
TANAY	00	Z	100	1	19.8	19.8
UFT5	00	Z	100	30	10.1	8.9

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
AALUAA	12	V	100	1	4.3	1.0	-4.2
AALUAA	00	V	100	2	4.7	-3.2	-1.5
AALUMO	12	V	100	6	3.9	0.0	-0.4
ALADDA	12	V	100	1	0.6	0.4	-0.4
ALADDA	00	V	100	0	0.0	0.0	0.0
ASDE01	12	V	100	13	3.4	-0.3	0.3
ASDE01	00	V	100	10	3.5	0.3	1.1
ASDE02	12	V	100	10	3.6	0.8	0.0
ASDE02	00	V	100	5	3.7	0.4	-1.3
ASDE03	12	V	100	9	3.4	0.1	-0.5
ASDE03	00	V	100	8	2.4	0.0	0.2
ASDE04	12	V	100	1	3.3	-3.0	-1.3
ASDE04	00	V	100	1	1.7	0.7	-1.5
ASDE09	12	V	100	7	2.1	0.1	-0.2
ASDK01	12	V	100	4	2.7	-1.7	-0.1
ASDK01	00	V	100	5	1.8	0.1	-0.5
ASDK02	12	V	100	13	2.1	0.6	-0.3
ASDK02	00	V	100	13	2.8	-1.0	-0.7
ASDK03	12	V	100	7	2.3	0.6	-0.9
ASDK03	00	V	100	6	2.0	-0.7	0.5
ASDK1	12	V	100	4	2.3	-1.3	0.0
ASDK1	00	V	100	5	1.6	0.5	-0.5
ASDK2	12	V	100	13	2.3	0.6	-0.4
ASDK2	00	V	100	13	2.5	-0.7	-0.4
ASDK3	12	V	100	10	2.6	0.4	-0.7
ASDK3	00	V	100	9	1.5	-0.6	0.3
ASES01	12	V	100	21	3.5	-0.7	0.2
ASEU01	12	V	100	18	2.8	0.1	0.6
ASEU01	00	V	100	12	3.7	-1.2	-0.8
ASEU03	12	V	100	11	3.3	0.9	0.1
ASEU03	00	V	100	10	5.2	-0.6	-1.0
ASEU04	12	V	100	6	1.7	-0.1	-0.4
ASEU04	00	V	100	5	2.9	0.6	-0.2
ASEU06	12	V	100	12	2.7	0.2	-0.1
ASEU06	00	V	100	11	3.1	-0.8	0.2
ASFR1	12	V	100	11	2.2	-0.2	-0.3
ASFR1	00	V	100	11	3.0	0.1	-0.6
ASFR2	12	V	100	11	3.9	-0.4	-0.2
ASFR2	00	V	100	9	3.8	-0.5	-0.7

RADIOSONDE MONITORING STATISTICS (SHIPS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASFR3	12	V	100	12	2.5	0.9	0.2
ASFR3	00	V	100	14	2.9	-0.3	0.2
ASFR4	12	V	100	9	3.6	1.0	-0.5
ASFR4	00	V	100	8	2.5	-0.4	0.8
BAGUIO	00	V	100	0	0.0	0.0	0.0
BREWS	12	V	100	1	5.4	-2.5	-4.8
BREWS	00	V	100	12	4.5	-2.3	0.2
DAVAO0	12	V	100	0	0.0	0.0	0.0
DAVAO0	00	V	100	0	0.0	0.0	0.0
DBLK	12	V	100	26	2.6	-0.4	0.3
ELLIS	12	V	100	1	5.8	-3.5	-4.6
ELLIS	00	V	100	14	6.7	-1.4	1.3
GREEN	00	V	100	6	3.7	0.3	-0.8
HESS	00	V	100	15	4.5	-0.1	1.9
JGQH	12	V	100	9	3.8	-1.3	1.5
JGQH	00	V	100	6	2.8	-0.1	-0.9
JNSR	12	V	100	1	7.5	7.0	-2.6
JNSR	00	V	100	1	2.3	2.1	-1.0
LAOAG	00	V	100	0	0.0	0.0	0.0
LEGASP	12	V	100	1	8.2	5.5	6.1
LEGASP	00	V	100	2	5.7	2.5	4.6
LGKI	00	V	100	23	2.6	0.1	0.1
LGKI	12	V	100	18	2.6	0.1	0.3
LUMBIA	12	V	100	0	0.0	0.0	0.0
LUMBIA	00	V	100	0	0.0	0.0	0.0
MACTAN	00	V	100	1	5.0	4.5	-2.2
MACTAN	12	V	100	1	10.7	-10.0	-3.7
MIND	12	V	100	2	3.2	1.5	1.5
MIND	00	V	100	15	4.7	0.5	0.6
MUREN	12	V	100	0	0.0	0.0	0.0
MUREN	00	V	100	4	3.3	1.2	-0.7
OZ203	12	V	100	1	2.8	2.6	-1.1
OZ203	00	V	100	1	4.1	-0.4	-4.1
PUERTO	12	V	100	0	0.0	0.0	0.0
PUERTO	00	V	100	0	0.0	0.0	0.0
TANAY	12	V	100	1	2.1	-1.9	-0.8
TANAY	00	V	100	1	1.5	-0.3	-1.5
UFT5	00	V	100	30	2.3	0.5	0.2

3.2.27 Figure 14 - SATOB Winds: 700-1000hPa

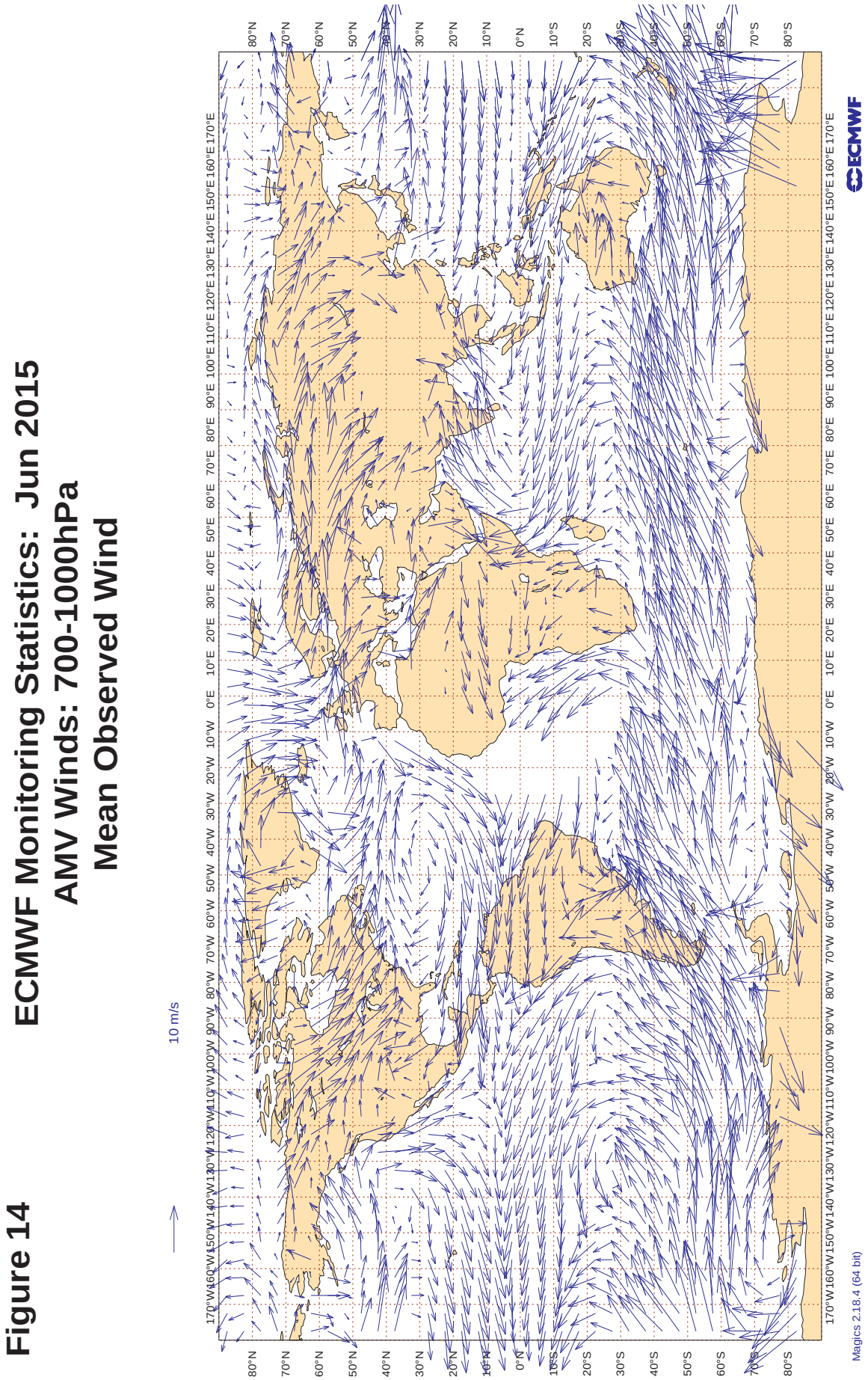


Figure 14

3.2.28 Figure 15 - SATOB Winds: 150- 400hPa

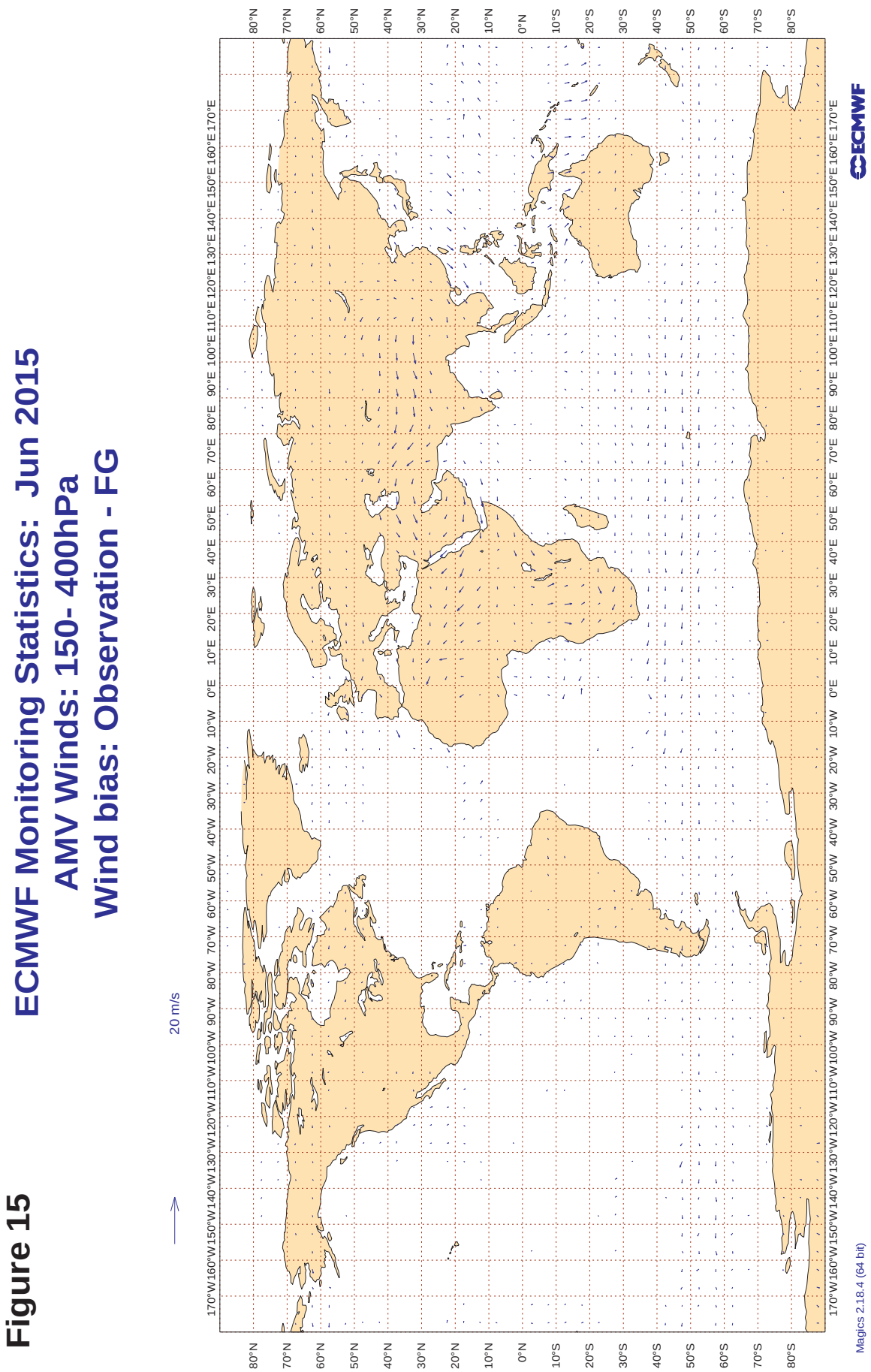


Figure 15

3.2.29 Figure 16 - SATOB Winds: 700-1000hPa

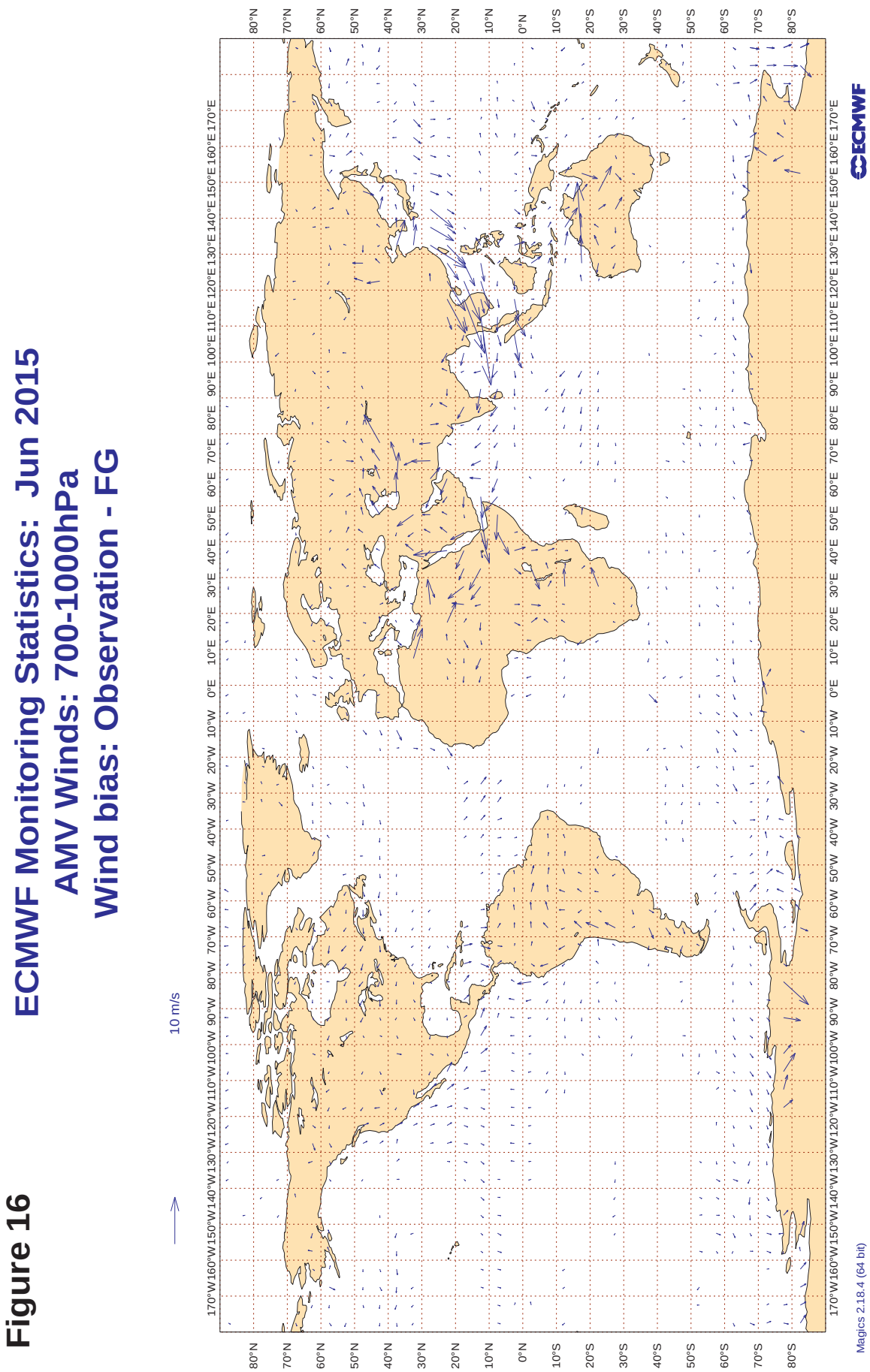


Figure 16

3.2.30 Figure 17 - SATOB Winds: 150- 400hPa

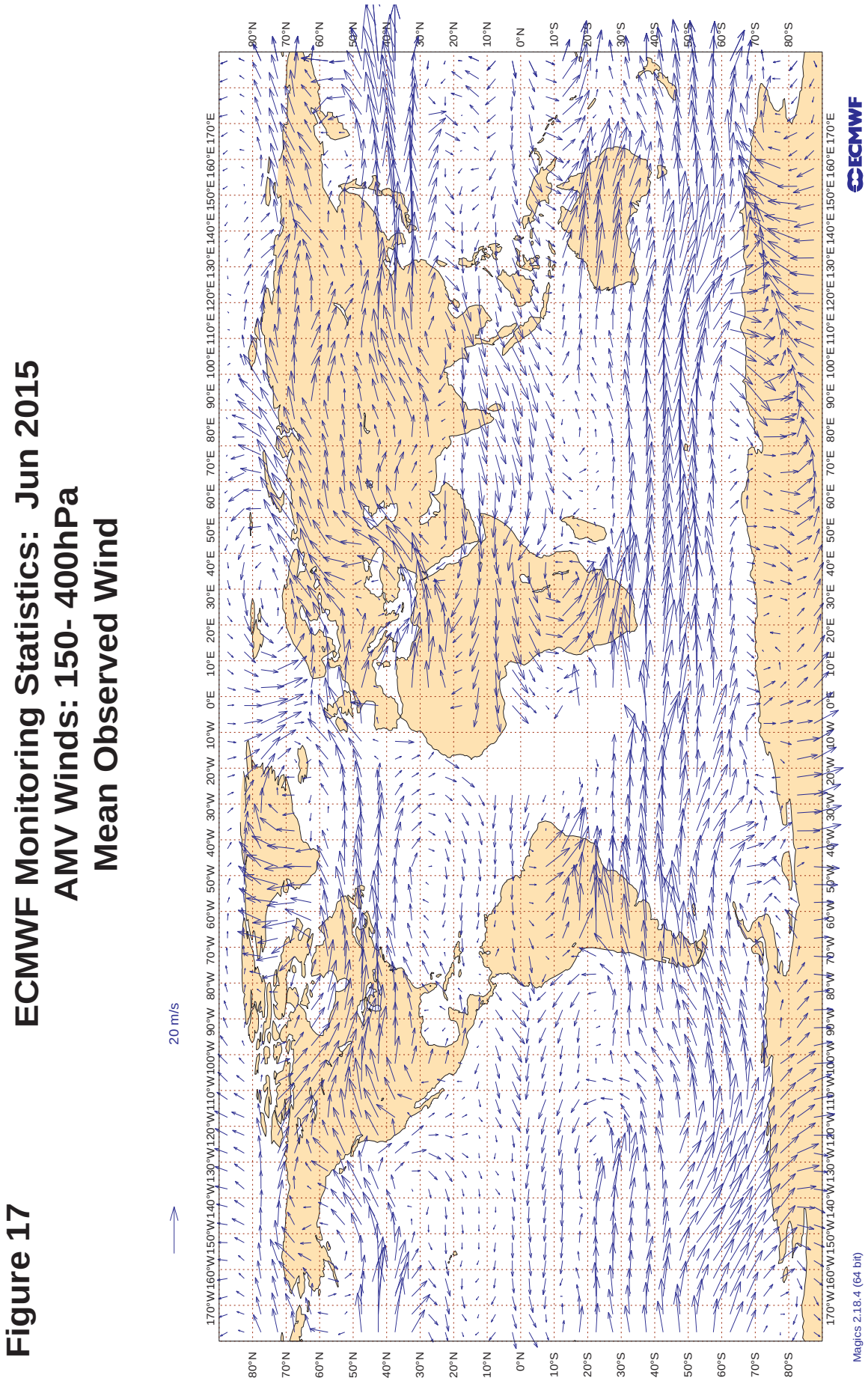


Figure 17

3.2.31 Figure 18 - AIRCRAFT Winds: 150- 300hPa

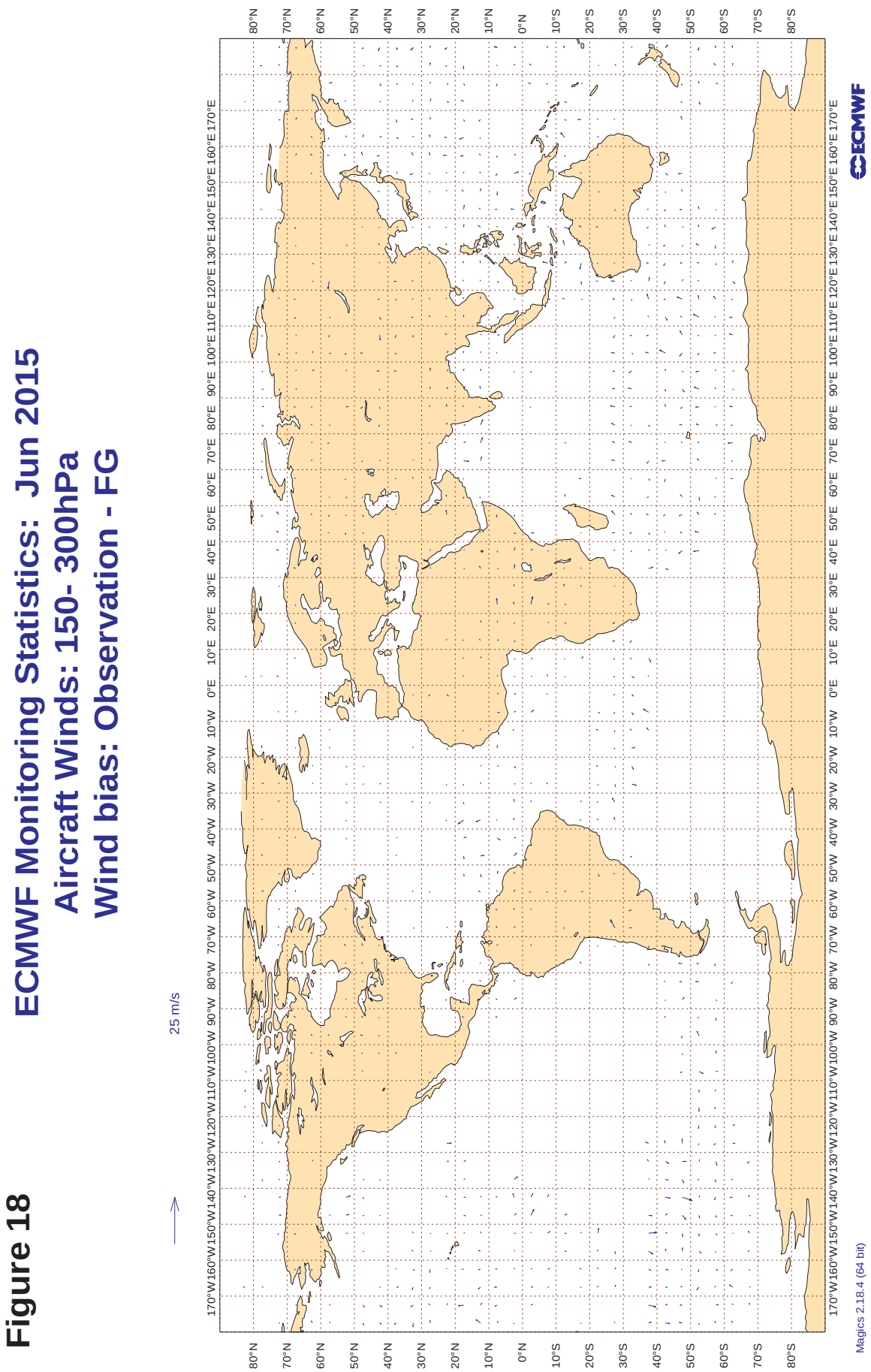


Figure 18

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

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
MONITORING CENTRE : ECMWF
ELEMENT MONITORED : VECTOR WIND (M/S)
AREA : GLOBAL
PERIOD : JUN 2015
STANDARD OF COMPARISON: FIRST-GUESS FIELD

SELECTION CRITERIA: NO. OF OBS. >= 20

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

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
AAL	99	V	300-150	8224	0	0	4.1	-0.1
AAR	99	V	300-150	26	0	0	4.9	-0.9
AAY	99	V	300-150	344	1	0	3.9	-0.2
ABW	99	V	300-150	55	0	0	4.1	0.3
ABX	99	V	300-150	41	0	0	4.8	-1.2
ACA	99	V	300-150	2650	1	0	5.0	-0.2
ACI	99	V	300-150	633	0	0	3.7	0.6
AFL	99	V	300-150	295	0	0	3.2	0.4
AFR	99	V	300-150	2900	0	0	3.9	0.4
AIC	99	V	300-150	563	0	0	3.6	-0.2
AMX	99	V	300-150	267	10	0	11.3	0.4
ANZ	99	V	300-150	3642	0	0	4.3	0.5
AOJ	99	V	300-150	25	24	0	22.2	-0.9
ASA	99	V	300-150	2780	0	0	3.8	0.1
ASY	99	V	300-150	162	0	0	3.5	0.6
AUA	99	V	300-150	1181	0	0	4.4	-0.7
AVN	99	V	300-150	86	0	0	6.4	0.9
AXM	99	V	300-150	49	0	0	5.6	1.4
AZA	99	V	300-150	812	0	0	4.2	1.0
BAW	99	V	300-150	3849	0	0	4.6	-0.1
BEL	99	V	300-150	415	0	0	4.0	0.1
BER	99	V	300-150	1354	0	0	3.8	1.0
BOX	99	V	300-150	83	0	0	3.1	0.0
CAL	99	V	300-150	60	0	0	4.0	1.0
CAZ	99	V	300-150	22	0	0	3.9	-1.0
CFG	99	V	300-150	348	0	0	4.3	-0.6
CGG	99	V	300-150	26	0	0	4.7	-1.4
CKS	99	V	300-150	286	0	1	3.9	0.2
CLX	99	V	300-150	282	0	0	3.8	-0.3
CNV	99	V	300-150	60	0	0	4.6	1.2
CRL	99	V	300-150	74	0	0	3.8	0.7
CSN	99	V	300-150	205	0	0	4.5	0.2

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
DAH	99	V	300-150	150	0	0	3.5	0.7
DAL	99	V	300-150	10527	0	0	4.2	-0.4
DHK	99	V	300-150	243	0	0	4.4	0.0
DLH	99	V	300-150	5095	0	0	3.9	0.2
EIN	99	V	300-150	1493	0	0	3.6	-0.1
EJM	99	V	300-150	114	4	0	7.4	-1.3
ELY	99	V	300-150	441	0	0	3.8	-0.4
ETD	99	V	300-150	546	0	0	3.9	0.3
FDX	99	V	300-150	1221	0	0	3.7	0.1
FIN	99	V	300-150	192	0	0	2.9	0.4
FJI	99	V	300-150	1739	0	0	4.2	-0.1
FWI	99	V	300-150	70	0	0	2.9	0.2
GEC	99	V	300-150	262	0	0	3.5	0.0
GST	99	V	300-150	26	0	0	3.8	-0.4
GTI	99	V	300-150	239	0	0	4.4	-0.4
HAL	99	V	300-150	557	0	0	5.2	1.0
HZA	99	V	300-150	32	0	0	3.9	-0.7
IBE	99	V	300-150	427	0	0	3.5	0.5
ICV	99	V	300-150	31	0	0	4.6	-1.2
JAF	99	V	300-150	80	11	0	7.6	-1.3
JAI	99	V	300-150	436	0	0	4.1	0.8
JST	99	V	300-150	1077	0	0	5.2	0.6
KAC	99	V	300-150	20	0	0	2.6	0.5
KAI	99	V	300-150	49	0	0	3.6	0.6
KAL	99	V	300-150	722	0	0	4.3	0.7
KLM	99	V	300-150	2177	0	0	3.9	-0.2
LAE	99	V	300-150	20	0	0	4.3	0.9
LAN	99	V	300-150	118	3	0	9.6	-1.0
LOT	99	V	300-150	159	4	0	8.7	-0.3
MAS	99	V	300-150	116	0	0	4.0	0.5
MMD	99	V	300-150	32	0	0	3.1	0.8
MMN	99	V	300-150	54	0	0	4.2	-1.3
MSR	99	V	300-150	266	0	0	4.1	0.2
NAX	99	V	300-150	125	2	1	9.3	0.9
NCA	99	V	300-150	39	3	0	3.7	-0.1
NOS	99	V	300-150	24	0	0	4.7	-2.2
NWS	99	V	300-150	21	0	0	2.9	0.0
OAE	99	V	300-150	91	0	0	4.0	-0.7
PAC	99	V	300-150	29	0	0	4.2	-2.2
PIA	99	V	300-150	20	0	0	3.1	-0.3
QFA	99	V	300-150	2785	0	0	4.0	-0.3
QTR	99	V	300-150	308	0	0	3.6	0.3
RAN	99	V	300-150	24	0	0	3.5	0.6

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
RCH	99	V	300-150	750	0	0	4.8	-0.6
RJA	99	V	300-150	55	13	2	6.1	-1.3
ROU	99	V	300-150	793	0	0	4.0	-1.0
RRR	99	V	300-150	35	0	0	3.1	1.2
SAM	99	V	300-150	43	0	0	6.8	0.4
SAS	99	V	300-150	780	0	0	3.0	0.1
SIA	99	V	300-150	383	0	0	4.1	0.3
SOO	99	V	300-150	32	0	0	3.7	-0.2
SQC	99	V	300-150	42	0	0	3.7	0.9
SVA	99	V	300-150	312	0	0	3.8	0.0
SWR	99	V	300-150	957	0	0	3.9	0.8
TAM	99	V	300-150	91	0	0	3.2	-0.3
TAP	99	V	300-150	52	0	0	3.4	0.9
TAY	99	V	300-150	115	0	0	3.7	0.6
TCV	99	V	300-150	42	0	0	6.5	-0.7
TCX	99	V	300-150	589	0	0	4.1	0.7
TFL	99	V	300-150	68	4	0	8.7	0.1
THA	99	V	300-150	122	0	0	3.8	0.1
THT	99	V	300-150	165	0	0	3.6	-0.2
THY	99	V	300-150	402	0	0	3.3	0.4
TMN	99	V	300-150	21	0	0	3.3	2.3
TOM	99	V	300-150	947	8	0	9.7	-0.7
TSC	99	V	300-150	674	0	0	3.9	0.3
TSO	99	V	300-150	280	0	0	3.6	0.7
UAE	99	V	300-150	1071	0	0	3.7	0.0
UAL	99	V	300-150	12835	0	0	4.3	-0.2
UPS	99	V	300-150	1042	0	0	4.1	0.0
VHV	99	V	300-150	40	75	0	14.4	-0.5
VIR	99	V	300-150	1799	1	0	4.6	0.2
VOZ	99	V	300-150	1649	0	0	3.5	0.1
VPB	99	V	300-150	28	32	0	11.8	-1.1
WGT	99	V	300-150	20	0	0	3.3	-1.2
WJA	99	V	300-150	256	0	0	4.7	0.2
XLF	99	V	300-150	90	0	0	2.9	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                : JUN 2015
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	50	28	13.6	6.7
01001	00	Z	50	29	14.1	9.7
01028	12	Z	50	29	11.2	4.6
01028	00	Z	50	30	13.6	10.9
01400	12	Z	50	24	25.5	20.5
01400	00	Z	50	23	23.6	21.4
01415	00	Z	50	28	12.2	10.5
01415	12	Z	50	28	15.5	12.0
02365	12	Z	50	38	8.8	1.0
02365	00	Z	50	38	6.4	3.5
02591	12	Z	50	36	19.5	17.8
02591	00	Z	50	36	17.7	16.9
02836	12	Z	50	30	16.1	13.8
02836	00	Z	50	29	18.7	16.7
02963	12	Z	50	30	37.8	19.1
02963	00	Z	50	30	12.5	10.7
03005	12	Z	50	30	15.4	11.1
03005	00	Z	50	31	24.7	-2.0
03238	00	Z	50	28	15.2	12.0
03238	12	Z	50	8	22.9	19.1
03808	12	Z	50	31	10.5	3.7
03808	00	Z	50	33	7.6	3.2
03918	00	Z	50	22	9.2	8.0
03918	12	Z	50	11	16.2	14.8
03953	00	Z	50	30	8.7	4.0
03953	12	Z	50	30	17.4	13.9
04018	00	Z	50	30	14.8	12.5
04018	12	Z	50	29	15.5	13.5
04220	12	Z	50	29	20.9	12.6
04220	00	Z	50	29	14.5	6.8
04270	00	Z	50	29	15.6	2.2
04270	12	Z	50	28	24.3	18.4
04320	00	Z	50	30	23.6	14.4
04320	12	Z	50	29	31.0	27.0
04339	00	Z	50	28	25.6	17.7
04339	12	Z	50	30	23.8	18.5
04360	12	Z	50	24	19.8	15.1
04360	00	Z	50	18	14.1	2.3
06011	12	Z	50	19	17.5	10.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	50	23	17.3	-0.8
06260	00	Z	50	27	14.0	9.1
06260	12	Z	50	4	14.1	12.5
06610	12	Z	50	30	37.8	26.4
06610	00	Z	50	30	13.8	5.8
07110	12	Z	50	30	21.5	17.4
07110	00	Z	50	28	26.3	21.3
07510	00	Z	50	15	14.2	4.1
07510	12	Z	50	14	23.4	18.1
07645	12	Z	50	17	60.2	48.0
07645	00	Z	50	15	45.1	34.2
07761	00	Z	50	11	9.9	0.6
07761	12	Z	50	17	16.8	7.0
08001	12	Z	50	24	20.7	15.4
08001	00	Z	50	23	18.9	16.1
08221	12	Z	50	28	20.9	17.1
08221	00	Z	50	29	11.4	8.4
08302	12	Z	50	30	13.9	7.4
08302	00	Z	50	30	8.2	3.5
08508	12	Z	50	28	29.6	27.3
08522	12	Z	50	28	19.4	16.6
08579	12	Z	50	30	23.8	21.4
10035	12	Z	50	26	12.9	8.5
10035	00	Z	50	25	7.4	4.3
10393	00	Z	50	30	6.0	0.4
10393	12	Z	50	30	8.7	4.7
10410	12	Z	50	25	10.4	6.4
10410	00	Z	50	22	10.1	1.7
10739	12	Z	50	30	14.1	12.7
10739	00	Z	50	30	10.9	8.9
11035	00	Z	50	30	10.0	6.1
11035	12	Z	50	30	11.0	4.6
12982	00	Z	50	29	13.2	9.5
12982	12	Z	50	30	50.9	39.2
16044	00	Z	50	30	9.4	3.8
16044	12	Z	50	30	13.9	2.8
16080	12	Z	50	29	16.2	0.6
16080	00	Z	50	30	6.6	1.9
16245	12	Z	50	29	11.8	-6.2
16245	00	Z	50	29	12.9	0.5
16320	12	Z	50	29	30.0	-5.4
16320	00	Z	50	30	9.3	6.5
16429	00	Z	50	29	8.3	2.7

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	50	30	9.6	-3.1
16622	00	Z	50	25	33.6	32.7
16754	00	Z	50	29	31.7	29.0
17607	12	Z	50	19	23.1	-21.2
26435	00	Z	50	15	17.3	12.6
60018	12	Z	50	27	12.8	9.2
60018	00	Z	50	30	16.7	15.9
ASDE01	12	Z	50	13	76.7	49.4
ASDE01	00	Z	50	10	55.9	24.4
ASDE02	12	Z	50	10	37.5	36.8
ASDE02	00	Z	50	5	31.0	30.7
ASDE03	12	Z	50	9	44.4	42.8
ASDE03	00	Z	50	7	12.9	12.0
ASDE04	12	Z	50	1	43.7	43.7
ASDE04	00	Z	50	1	48.0	48.0
ASDE09	12	Z	50	7	41.1	2.4
ASDK01	12	Z	50	2	17.8	17.8
ASDK01	00	Z	50	1	8.7	8.7
ASDK02	12	Z	50	9	16.2	14.9
ASDK02	00	Z	50	12	11.9	7.9
ASDK03	12	Z	50	0	0.0	0.0
ASDK03	00	Z	50	0	0.0	0.0
ASDK1	12	Z	50	4	22.8	22.4
ASDK1	00	Z	50	5	19.0	17.5
ASDK2	12	Z	50	13	19.9	16.2
ASDK2	00	Z	50	11	8.0	3.5
ASDK3	12	Z	50	10	35.8	35.5
ASDK3	00	Z	50	9	32.0	30.1
ASES01	12	Z	50	21	40.1	37.6
ASEU01	12	Z	50	18	36.5	33.6
ASEU01	00	Z	50	12	18.6	17.4
ASEU03	12	Z	50	12	250.3	249.5
ASEU03	00	Z	50	9	218.8	217.9
ASEU04	12	Z	50	5	22.4	19.2
ASEU04	00	Z	50	8	56.6	28.9
ASEU06	12	Z	50	12	66.6	28.4
ASEU06	00	Z	50	11	21.0	-14.6
ASFR1	12	Z	50	11	13.9	8.7
ASFR1	00	Z	50	11	16.4	10.8
ASFR2	12	Z	50	8	14.7	11.8
ASFR2	00	Z	50	9	23.1	20.4
ASFR3	12	Z	50	11	11.8	5.8
ASFR3	00	Z	50	14	17.4	14.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASFR4	12	Z	50	9	26.1	23.0
ASFR4	00	Z	50	9	35.7	33.4
DAVAO0	12	Z	50	0	0.0	0.0
DAVAO0	00	Z	50	0	0.0	0.0
DBLK	12	Z	50	26	31.9	29.7
ELLIS	12	Z	50	0	0.0	0.0
ELLIS	00	Z	50	12	19.6	9.6
GREEN	00	Z	50	8	18.6	15.2
HESS	00	Z	50	12	14.6	12.0
LGKI	00	Z	50	23	10.7	-4.8
LGKI	12	Z	50	18	14.3	1.1
LUMBIA	12	Z	50	0	0.0	0.0
LUMBIA	00	Z	50	0	0.0	0.0
MIND	12	Z	50	1	17.1	17.1
MIND	00	Z	50	4	51.0	46.8
OZ203	12	Z	50	1	0.0	0.0
OZ203	00	Z	50	1	0.0	0.0
PUERTO	12	Z	50	0	0.0	0.0
PUERTO	00	Z	50	0	0.0	0.0
UFT5	00	Z	50	30	17.3	16.0

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	50	28	2.3	0.3	0.3
01001	00	V	50	29	2.3	0.4	-0.6
01028	12	V	50	29	2.2	0.5	-0.3
01028	00	V	50	30	2.3	-0.1	-0.1
01400	12	V	50	20	2.6	0.1	-0.5
01400	00	V	50	21	3.3	0.7	-0.4
01415	00	V	50	28	3.4	-0.5	-1.0
01415	12	V	50	28	3.4	-0.2	-1.1
02365	12	V	50	30	3.5	0.6	-0.9
02365	00	V	50	30	2.8	-0.2	-0.2
02591	12	V	50	29	3.5	-0.3	-0.3
02591	00	V	50	28	3.0	-0.3	0.1
02836	12	V	50	29	3.1	0.4	-0.9
02836	00	V	50	29	2.8	-0.1	0.4
02963	12	V	50	30	2.6	0.4	-0.4
02963	00	V	50	30	2.8	0.4	0.1
03005	12	V	50	30	3.6	0.4	-0.6
03005	00	V	50	30	3.2	0.4	-0.2
03238	00	V	50	26	3.3	1.0	0.2
03238	12	V	50	8	3.6	-0.6	1.1
03808	12	V	50	29	3.0	0.7	0.3
03808	00	V	50	30	3.1	0.8	0.8
03918	00	V	50	19	3.1	0.6	-0.9
03918	12	V	50	11	2.9	0.1	-0.8
03953	00	V	50	30	2.8	0.9	0.3
03953	12	V	50	30	2.8	0.3	0.1
04018	00	V	50	30	3.0	-0.2	-0.4
04018	12	V	50	27	3.2	-0.4	-0.3
04220	12	V	50	29	2.3	0.2	0.3
04220	00	V	50	29	2.5	0.7	0.5
04270	00	V	50	29	2.6	-0.5	0.1
04270	12	V	50	28	2.4	-0.1	0.0
04320	00	V	50	30	2.2	-0.3	-0.3
04320	12	V	50	29	2.5	-0.3	0.2
04339	00	V	50	27	2.5	0.1	-0.4
04339	12	V	50	30	2.4	0.2	0.6
04360	12	V	50	24	2.6	-0.4	0.1
04360	00	V	50	18	2.5	-0.2	-0.6
06011	12	V	50	19	3.2	0.0	0.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	50	23	2.7	0.3	-0.3
06260	00	V	50	22	3.2	0.5	-0.1
06260	12	V	50	4	2.2	1.3	-1.1
06610	12	V	50	30	3.1	0.2	0.5
06610	00	V	50	30	3.0	0.0	0.3
07110	12	V	50	30	3.2	0.4	-0.2
07110	00	V	50	28	3.2	0.2	-0.4
07510	00	V	50	13	3.8	-0.3	0.2
07510	12	V	50	14	3.3	1.0	-0.4
07645	12	V	50	17	4.0	0.8	-0.3
07645	00	V	50	14	3.6	-0.5	0.1
07761	00	V	50	10	4.2	0.3	-1.7
07761	12	V	50	17	3.5	1.2	-0.4
08001	12	V	50	23	3.1	0.2	0.5
08001	00	V	50	21	3.1	0.1	0.1
08221	12	V	50	28	3.9	1.1	0.4
08221	00	V	50	29	3.0	0.7	0.5
08302	12	V	50	30	3.8	0.5	1.3
08302	00	V	50	28	3.6	0.6	1.1
08508	12	V	50	27	3.3	0.9	0.5
08522	12	V	50	28	3.2	0.7	-0.3
08579	12	V	50	30	3.4	0.5	-0.2
10035	12	V	50	26	3.6	-0.1	-0.5
10035	00	V	50	25	3.6	-0.9	0.0
10393	00	V	50	30	3.3	0.1	-0.3
10393	12	V	50	30	3.0	-0.2	-0.1
10410	12	V	50	25	3.1	-0.2	0.1
10410	00	V	50	22	2.9	0.1	-0.4
10739	12	V	50	30	3.9	0.4	-0.5
10739	00	V	50	29	3.4	0.5	0.4
11035	00	V	50	28	3.0	0.3	-0.3
11035	12	V	50	30	3.6	-0.7	0.5
12982	00	V	50	29	3.7	0.0	0.5
12982	12	V	50	29	3.3	0.9	0.4
16044	00	V	50	29	4.1	0.4	-0.1
16044	12	V	50	30	3.7	0.4	-0.4
16080	12	V	50	29	3.3	0.6	-0.1
16080	00	V	50	30	3.1	0.2	-0.2
16245	12	V	50	29	3.2	1.4	1.3
16245	00	V	50	28	3.4	0.3	0.7
16320	12	V	50	29	3.4	1.3	0.0
16320	00	V	50	29	3.5	0.9	-0.2
16429	00	V	50	28	3.9	0.5	-0.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	50	30	4.0	1.9	0.5
16622	00	V	50	14	3.7	-0.7	0.4
16754	00	V	50	26	3.6	0.9	0.0
17607	12	V	50	14	3.1	0.7	0.1
26435	00	V	50	13	3.2	0.0	-0.4
60018	12	V	50	27	4.1	1.2	-0.4
60018	00	V	50	30	3.2	0.0	-0.9
ASDE01	12	V	50	11	3.1	0.4	0.8
ASDE01	00	V	50	10	3.8	0.5	0.0
ASDE02	12	V	50	10	3.7	0.6	-1.6
ASDE02	00	V	50	5	3.9	-0.2	2.5
ASDE03	12	V	50	9	2.7	0.6	-0.9
ASDE03	00	V	50	7	2.6	0.8	-0.7
ASDE04	12	V	50	1	2.2	2.0	-0.9
ASDE04	00	V	50	1	2.2	-1.0	-2.0
ASDE09	12	V	50	5	4.4	3.1	0.8
ASDK01	12	V	50	2	3.5	-0.8	0.0
ASDK01	00	V	50	1	0.4	0.3	0.3
ASDK02	12	V	50	9	3.2	0.6	-1.0
ASDK02	00	V	50	11	3.9	0.4	-0.1
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	4	2.7	-0.3	0.3
ASDK1	00	V	50	5	1.7	0.4	0.2
ASDK2	12	V	50	13	2.8	0.0	-0.3
ASDK2	00	V	50	10	4.3	0.5	0.3
ASDK3	12	V	50	10	2.4	-0.4	0.3
ASDK3	00	V	50	9	2.5	0.0	0.0
ASES01	12	V	50	21	3.5	0.3	-0.2
ASEU01	12	V	50	18	3.0	0.5	0.0
ASEU01	00	V	50	12	2.8	-0.5	0.4
ASEU03	12	V	50	10	2.6	-0.9	-0.2
ASEU03	00	V	50	9	6.9	0.7	0.3
ASEU04	12	V	50	5	2.8	0.5	0.9
ASEU04	00	V	50	5	1.9	-0.2	0.1
ASEU06	12	V	50	12	2.6	1.4	-0.4
ASEU06	00	V	50	11	3.1	-0.6	-1.0
ASFR1	12	V	50	11	3.7	1.1	1.8
ASFR1	00	V	50	11	3.3	1.0	-1.0
ASFR2	12	V	50	8	3.8	0.1	0.2
ASFR2	00	V	50	9	2.7	-0.8	-0.4
ASFR3	12	V	50	11	2.5	-0.1	0.1
ASFR3	00	V	50	14	2.6	0.4	-1.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASFR4	12	V	50	9	3.1	-0.2	-0.1
ASFR4	00	V	50	9	4.4	-0.4	-0.8
DAVAO0	12	V	50	0	0.0	0.0	0.0
DAVAO0	00	V	50	0	0.0	0.0	0.0
DBLK	12	V	50	24	2.8	-0.3	0.7
ELLIS	12	V	50	0	0.0	0.0	0.0
ELLIS	00	V	50	10	4.9	0.3	-2.0
GREEN	00	V	50	6	3.9	-0.3	-0.7
HESS	00	V	50	8	3.5	1.6	-1.3
LGKI	00	V	50	22	2.4	-0.1	0.9
LGKI	12	V	50	17	1.8	0.1	0.2
LUMBIA	12	V	50	0	0.0	0.0	0.0
LUMBIA	00	V	50	0	0.0	0.0	0.0
MIND	12	V	50	1	3.6	-3.6	-0.1
MIND	00	V	50	4	9.1	-1.1	-2.4
OZ203	12	V	50	1	4.3	-0.1	4.3
OZ203	00	V	50	1	2.3	-1.3	1.9
PUERTO	12	V	50	0	0.0	0.0	0.0
PUERTO	00	V	50	0	0.0	0.0	0.0
UFT5	00	V	50	30	2.5	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                : JUN 2015
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	100	28	10.5	2.0
01001	00	Z	100	30	10.1	5.4
01028	12	Z	100	29	9.4	-2.3
01028	00	Z	100	30	9.4	5.9
01400	12	Z	100	24	21.2	14.3
01400	00	Z	100	23	17.5	15.6
01415	00	Z	100	28	7.6	5.0
01415	12	Z	100	28	9.2	5.6
02365	12	Z	100	38	7.2	-3.6
02365	00	Z	100	38	4.2	-1.4
02591	12	Z	100	37	14.0	12.5
02591	00	Z	100	36	12.9	12.1
02836	12	Z	100	30	7.2	3.8
02836	00	Z	100	30	10.6	8.3
02963	12	Z	100	30	32.5	10.0
02963	00	Z	100	29	8.0	5.4
03005	12	Z	100	30	6.8	2.1
03005	00	Z	100	31	25.8	-4.8
03238	00	Z	100	29	11.4	7.9
03238	12	Z	100	8	15.4	9.8
03808	12	Z	100	32	6.6	0.5
03808	00	Z	100	33	5.7	-0.1
03918	00	Z	100	25	7.8	4.8
03918	12	Z	100	11	7.6	5.9
03953	00	Z	100	30	5.7	1.0
03953	12	Z	100	30	8.9	6.4
04018	00	Z	100	30	10.7	6.5
04018	12	Z	100	29	8.9	7.5
04220	12	Z	100	30	13.6	5.9
04220	00	Z	100	30	9.0	-0.4
04270	00	Z	100	29	11.4	-1.6
04270	12	Z	100	28	11.1	6.6
04320	00	Z	100	30	17.0	9.0
04320	12	Z	100	29	19.7	17.1
04339	00	Z	100	29	20.3	12.8
04339	12	Z	100	30	16.5	9.6
04360	12	Z	100	26	15.8	13.6
04360	00	Z	100	27	8.5	3.1
06011	12	Z	100	24	10.1	5.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	100	26	32.8	2.5
06260	00	Z	100	28	8.7	4.9
06260	12	Z	100	4	7.1	5.6
06610	12	Z	100	30	23.8	17.1
06610	00	Z	100	30	12.9	8.0
07110	12	Z	100	30	13.5	11.6
07110	00	Z	100	28	15.9	12.4
07510	00	Z	100	23	9.9	-1.8
07510	12	Z	100	21	16.2	11.9
07645	12	Z	100	21	40.6	31.5
07645	00	Z	100	21	32.0	24.6
07761	00	Z	100	18	10.4	-7.9
07761	12	Z	100	20	9.3	-2.6
08001	12	Z	100	28	15.4	9.4
08001	00	Z	100	25	13.0	10.9
08221	12	Z	100	30	13.3	10.2
08221	00	Z	100	29	7.3	5.1
08302	12	Z	100	30	8.1	1.7
08302	00	Z	100	30	5.4	-0.5
08508	12	Z	100	29	20.6	18.6
08522	12	Z	100	28	10.8	8.5
08579	12	Z	100	30	13.5	11.1
10035	12	Z	100	26	8.5	2.8
10035	00	Z	100	25	4.8	0.4
10393	00	Z	100	30	4.8	-1.8
10393	12	Z	100	31	5.9	-0.7
10410	12	Z	100	25	5.8	1.3
10410	00	Z	100	24	8.2	-0.6
10739	12	Z	100	30	9.1	7.6
10739	00	Z	100	30	7.7	6.0
11035	00	Z	100	29	7.0	2.3
11035	12	Z	100	30	7.1	-1.2
12982	00	Z	100	29	8.2	3.5
12982	12	Z	100	30	27.4	24.3
16044	00	Z	100	30	7.3	1.0
16044	12	Z	100	30	9.2	-2.4
16080	12	Z	100	30	13.8	-3.4
16080	00	Z	100	30	7.7	-0.3
16245	12	Z	100	29	11.5	-8.9
16245	00	Z	100	30	10.6	-2.3
16320	12	Z	100	30	31.4	-7.4
16320	00	Z	100	30	7.2	1.1
16429	00	Z	100	29	8.2	-0.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	100	30	9.5	-5.5
16622	00	Z	100	29	26.8	25.6
16754	00	Z	100	30	25.7	22.6
17607	12	Z	100	36	18.0	-17.0
26435	00	Z	100	15	11.4	8.8
60018	12	Z	100	30	8.3	5.2
60018	00	Z	100	30	11.1	10.4
ASDE01	12	Z	100	13	69.7	34.7
ASDE01	00	Z	100	10	52.1	20.4
ASDE02	12	Z	100	10	24.6	23.7
ASDE02	00	Z	100	5	22.9	22.1
ASDE03	12	Z	100	9	29.5	28.7
ASDE03	00	Z	100	8	10.0	6.9
ASDE04	12	Z	100	1	37.4	37.4
ASDE04	00	Z	100	2	44.7	44.4
ASDE09	12	Z	100	7	34.1	-1.2
ASDK01	12	Z	100	4	14.5	13.5
ASDK01	00	Z	100	5	10.7	9.9
ASDK02	12	Z	100	13	13.5	11.5
ASDK02	00	Z	100	14	7.1	4.2
ASDK03	12	Z	100	7	29.9	29.5
ASDK03	00	Z	100	6	28.9	27.7
ASDK1	12	Z	100	4	17.1	16.8
ASDK1	00	Z	100	5	10.2	9.4
ASDK2	12	Z	100	13	14.5	10.2
ASDK2	00	Z	100	13	6.0	2.1
ASDK3	12	Z	100	10	30.2	30.0
ASDK3	00	Z	100	9	28.5	27.1
ASES01	12	Z	100	21	29.3	27.9
ASEU01	12	Z	100	18	25.3	23.0
ASEU01	00	Z	100	12	13.3	11.9
ASEU03	12	Z	100	13	232.9	232.5
ASEU03	00	Z	100	12	216.4	215.6
ASEU04	12	Z	100	6	11.8	10.3
ASEU04	00	Z	100	9	55.1	21.4
ASEU06	12	Z	100	14	64.2	18.9
ASEU06	00	Z	100	11	20.7	-16.8
ASFR1	12	Z	100	11	7.4	3.0
ASFR1	00	Z	100	12	7.4	1.2
ASFR2	12	Z	100	11	10.6	8.5
ASFR2	00	Z	100	9	15.0	10.4
ASFR3	12	Z	100	12	10.5	7.8
ASFR3	00	Z	100	14	14.1	10.8

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASFR4	12	Z	100	9	17.8	15.2
ASFR4	00	Z	100	8	20.7	19.9
DAVAO0	12	Z	100	0	0.0	0.0
DAVAO0	00	Z	100	0	0.0	0.0
DBLK	12	Z	100	27	14.8	13.7
ELLIS	12	Z	100	2	19.8	11.1
ELLIS	00	Z	100	22	64.3	19.7
GREEN	00	Z	100	11	17.1	13.2
HESS	00	Z	100	27	11.9	3.9
LGKI	00	Z	100	23	12.1	-8.7
LGKI	12	Z	100	19	13.4	-4.1
LUMBIA	12	Z	100	0	0.0	0.0
LUMBIA	00	Z	100	0	0.0	0.0
MIND	12	Z	100	2	26.4	26.3
MIND	00	Z	100	30	38.4	36.5
OZ203	12	Z	100	1	208.3	-208.3
OZ203	00	Z	100	1	252.0	-252.0
PUERTO	12	Z	100	0	0.0	0.0
PUERTO	00	Z	100	0	0.0	0.0
UFT5	00	Z	100	30	10.1	8.9

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	100	28	2.3	0.0	0.2
01001	00	V	100	30	2.5	-0.7	0.2
01028	12	V	100	29	1.9	-0.5	0.1
01028	00	V	100	30	1.7	-0.2	-0.3
01400	12	V	100	23	2.7	0.4	-0.3
01400	00	V	100	22	3.0	0.5	0.2
01415	00	V	100	28	2.9	1.3	-0.4
01415	12	V	100	28	3.4	1.0	0.8
02365	12	V	100	30	3.0	0.0	-0.7
02365	00	V	100	30	3.5	0.1	-0.2
02591	12	V	100	30	3.7	0.0	-0.8
02591	00	V	100	28	3.0	0.4	-0.4
02836	12	V	100	29	2.9	-0.4	0.1
02836	00	V	100	30	2.8	-0.1	0.7
02963	12	V	100	30	3.6	-0.2	-0.1
02963	00	V	100	29	2.4	0.0	0.3
03005	12	V	100	30	2.3	0.1	-0.2
03005	00	V	100	30	3.0	0.7	0.1
03238	00	V	100	27	3.6	0.7	-0.1
03238	12	V	100	8	3.3	0.8	-0.3
03808	12	V	100	30	2.7	0.4	0.4
03808	00	V	100	29	3.0	0.1	-0.2
03918	00	V	100	24	2.6	1.0	0.3
03918	12	V	100	11	3.3	0.1	-0.4
03953	00	V	100	29	3.1	-0.5	0.1
03953	12	V	100	30	3.2	-0.1	0.1
04018	00	V	100	30	2.8	0.6	-0.4
04018	12	V	100	27	2.8	0.5	-0.7
04220	12	V	100	30	2.0	0.4	0.1
04220	00	V	100	30	1.9	0.2	-0.2
04270	00	V	100	29	3.3	0.3	0.3
04270	12	V	100	28	3.2	-0.1	0.5
04320	00	V	100	30	2.4	-0.5	-0.2
04320	12	V	100	29	2.0	-0.1	0.0
04339	00	V	100	27	1.8	-0.1	-0.4
04339	12	V	100	30	2.4	-0.1	0.0
04360	12	V	100	26	2.8	0.2	-0.4
04360	00	V	100	27	2.8	0.1	0.7
06011	12	V	100	24	2.1	0.1	0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	100	26	2.4	0.8	0.2
06260	00	V	100	24	2.8	1.0	-0.2
06260	12	V	100	4	2.6	-0.7	-0.1
06610	12	V	100	30	4.0	0.9	-0.4
06610	00	V	100	30	3.6	0.2	0.2
07110	12	V	100	30	2.8	0.5	0.1
07110	00	V	100	28	2.6	0.2	0.7
07510	00	V	100	19	3.5	1.2	0.3
07510	12	V	100	17	3.8	0.6	1.1
07645	12	V	100	21	2.7	0.4	-0.3
07645	00	V	100	13	3.6	0.4	0.6
07761	00	V	100	10	3.6	1.8	0.5
07761	12	V	100	12	4.6	0.5	0.8
08001	12	V	100	27	2.9	-0.2	0.1
08001	00	V	100	22	3.5	-0.2	0.2
08221	12	V	100	30	3.5	-0.6	-0.1
08221	00	V	100	29	3.4	-0.1	1.0
08302	12	V	100	30	4.1	0.0	-0.1
08302	00	V	100	29	3.0	0.2	0.3
08508	12	V	100	28	3.4	0.1	0.2
08522	12	V	100	28	3.8	0.5	-0.1
08579	12	V	100	30	3.0	0.1	0.0
10035	12	V	100	26	2.3	0.0	-0.5
10035	00	V	100	25	2.4	-0.8	0.0
10393	00	V	100	30	2.4	0.3	-0.3
10393	12	V	100	30	2.3	0.0	-0.6
10410	12	V	100	25	2.5	0.0	0.1
10410	00	V	100	23	3.3	0.9	-0.1
10739	12	V	100	29	2.8	0.2	0.0
10739	00	V	100	29	2.8	-0.4	0.2
11035	00	V	100	29	2.6	0.0	-0.4
11035	12	V	100	30	2.5	0.0	-0.3
12982	00	V	100	29	3.2	0.3	0.5
12982	12	V	100	29	3.4	-0.4	-0.2
16044	00	V	100	29	4.1	-0.5	-0.7
16044	12	V	100	30	3.8	0.9	-0.5
16080	12	V	100	30	3.2	0.5	0.2
16080	00	V	100	30	3.8	0.5	-0.5
16245	12	V	100	29	3.8	0.6	-1.2
16245	00	V	100	29	3.7	1.1	0.2
16320	12	V	100	30	3.7	0.3	0.5
16320	00	V	100	29	3.0	0.7	0.2
16429	00	V	100	28	4.8	0.8	0.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	100	30	3.4	0.9	0.2
16622	00	V	100	18	3.7	1.4	0.1
16754	00	V	100	29	5.0	-0.2	1.1
17607	12	V	100	20	5.6	0.0	1.0
26435	00	V	100	15	2.5	-0.1	0.0
60018	12	V	100	30	4.9	-0.2	0.6
60018	00	V	100	30	4.4	-0.4	-1.4
ASDE01	12	V	100	13	3.4	-0.3	0.3
ASDE01	00	V	100	10	3.5	0.3	1.1
ASDE02	12	V	100	10	3.6	0.8	0.0
ASDE02	00	V	100	5	3.7	0.4	-1.3
ASDE03	12	V	100	9	3.4	0.1	-0.5
ASDE03	00	V	100	8	2.4	0.0	0.2
ASDE04	12	V	100	1	3.3	-3.0	-1.3
ASDE04	00	V	100	1	1.7	0.7	-1.5
ASDE09	12	V	100	7	2.1	0.1	-0.2
ASDK01	12	V	100	4	2.7	-1.7	-0.1
ASDK01	00	V	100	5	1.8	0.1	-0.5
ASDK02	12	V	100	13	2.1	0.6	-0.3
ASDK02	00	V	100	13	2.8	-1.0	-0.7
ASDK03	12	V	100	7	2.3	0.6	-0.9
ASDK03	00	V	100	6	2.0	-0.7	0.5
ASDK1	12	V	100	4	2.3	-1.3	0.0
ASDK1	00	V	100	5	1.6	0.5	-0.5
ASDK2	12	V	100	13	2.3	0.6	-0.4
ASDK2	00	V	100	13	2.5	-0.7	-0.4
ASDK3	12	V	100	10	2.6	0.4	-0.7
ASDK3	00	V	100	9	1.5	-0.6	0.3
ASES01	12	V	100	21	3.5	-0.7	0.2
ASEU01	12	V	100	18	2.8	0.1	0.6
ASEU01	00	V	100	12	3.7	-1.2	-0.8
ASEU03	12	V	100	11	3.3	0.9	0.1
ASEU03	00	V	100	10	5.2	-0.6	-1.0
ASEU04	12	V	100	6	1.7	-0.1	-0.4
ASEU04	00	V	100	5	2.9	0.6	-0.2
ASEU06	12	V	100	12	2.7	0.2	-0.1
ASEU06	00	V	100	11	3.1	-0.8	0.2
ASFR1	12	V	100	11	2.2	-0.2	-0.3
ASFR1	00	V	100	11	3.0	0.1	-0.6
ASFR2	12	V	100	11	3.9	-0.4	-0.2
ASFR2	00	V	100	9	3.8	-0.5	-0.7
ASFR3	12	V	100	12	2.5	0.9	0.2
ASFR3	00	V	100	14	2.9	-0.3	0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASFR4	12	V	100	9	3.6	1.0	-0.5
ASFR4	00	V	100	8	2.5	-0.4	0.8
DAVAO0	12	V	100	0	0.0	0.0	0.0
DAVAO0	00	V	100	0	0.0	0.0	0.0
DBLK	12	V	100	26	2.6	-0.4	0.3
ELLIS	12	V	100	1	5.8	-3.5	-4.6
ELLIS	00	V	100	14	6.7	-1.4	1.3
GREEN	00	V	100	6	3.7	0.3	-0.8
HESS	00	V	100	15	4.5	-0.1	1.9
LGKI	00	V	100	23	2.6	0.1	0.1
LGKI	12	V	100	18	2.6	0.1	0.3
LUMBIA	12	V	100	0	0.0	0.0	0.0
LUMBIA	00	V	100	0	0.0	0.0	0.0
MIND	12	V	100	2	3.2	1.5	1.5
MIND	00	V	100	15	4.7	0.5	0.6
OZ203	12	V	100	1	2.8	2.6	-1.1
OZ203	00	V	100	1	4.1	-0.4	-4.1
PUERTO	12	V	100	0	0.0	0.0	0.0
PUERTO	00	V	100	0	0.0	0.0	0.0
UFT5	00	V	100	30	2.3	0.5	0.2

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

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
         LEVEL                 : 500 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : JUN 2015
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	500	28	7.3	1.6
01001	00	Z	500	30	6.1	1.4
01028	12	Z	500	29	5.6	0.3
01028	00	Z	500	30	5.8	3.2
01400	12	Z	500	24	18.9	13.6
01400	00	Z	500	23	14.4	13.2
01415	00	Z	500	28	6.6	3.5
01415	12	Z	500	28	8.2	6.2
02365	12	Z	500	38	3.6	-0.6
02365	00	Z	500	38	2.8	0.0
02591	12	Z	500	37	10.8	10.6
02591	00	Z	500	36	10.0	9.7
02836	12	Z	500	30	5.6	1.0
02836	00	Z	500	30	6.4	5.1
02963	12	Z	500	30	6.4	3.8
02963	00	Z	500	29	7.3	5.2
03005	12	Z	500	30	4.9	2.1
03005	00	Z	500	31	25.7	-5.1
03238	00	Z	500	29	8.9	8.2
03238	12	Z	500	8	10.5	8.8
03808	12	Z	500	33	4.5	2.6
03808	00	Z	500	33	5.7	2.5
03918	00	Z	500	27	9.6	8.1
03918	12	Z	500	11	8.6	7.4
03953	00	Z	500	30	4.7	3.4
03953	12	Z	500	30	6.2	5.6
04018	00	Z	500	30	5.1	2.9
04018	12	Z	500	30	5.6	4.1
04220	12	Z	500	30	6.0	3.5
04220	00	Z	500	30	5.5	0.7
04270	00	Z	500	30	5.1	-0.3
04270	12	Z	500	30	4.7	3.1
04320	00	Z	500	30	10.7	8.0
04320	12	Z	500	30	13.6	11.8
04339	00	Z	500	30	8.1	3.8
04339	12	Z	500	30	7.4	4.0
04360	12	Z	500	29	8.3	6.7
04360	00	Z	500	28	6.9	2.2
06011	12	Z	500	30	27.8	9.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	500	30	12.4	-0.9
06260	00	Z	500	28	5.7	2.9
06260	12	Z	500	4	3.3	2.9
06610	12	Z	500	30	9.9	8.8
06610	00	Z	500	30	10.3	9.1
07110	12	Z	500	30	7.7	5.5
07110	00	Z	500	30	8.0	4.4
07510	00	Z	500	32	5.8	-2.4
07510	12	Z	500	32	6.0	3.8
07645	12	Z	500	29	18.2	15.4
07645	00	Z	500	25	11.6	7.9
07761	00	Z	500	29	5.5	-3.8
07761	12	Z	500	29	5.4	1.6
08001	12	Z	500	28	9.5	6.9
08001	00	Z	500	25	7.6	6.0
08221	12	Z	500	30	8.4	7.8
08221	00	Z	500	30	6.4	5.3
08302	12	Z	500	30	2.7	0.8
08302	00	Z	500	30	2.5	-0.4
08508	12	Z	500	30	13.7	12.2
08522	12	Z	500	30	8.8	7.9
08579	12	Z	500	30	8.9	7.0
10035	12	Z	500	26	5.1	1.5
10035	00	Z	500	25	3.9	-0.2
10393	00	Z	500	30	3.6	-2.6
10393	12	Z	500	33	3.7	-2.1
10410	12	Z	500	25	2.6	0.2
10410	00	Z	500	24	3.3	-1.0
10739	12	Z	500	31	9.8	9.3
10739	00	Z	500	31	7.0	6.3
11035	00	Z	500	30	4.9	0.5
11035	12	Z	500	30	4.3	-0.9
12982	00	Z	500	30	6.7	4.6
12982	12	Z	500	30	10.6	8.2
16044	00	Z	500	31	4.7	-1.9
16044	12	Z	500	30	5.6	-1.7
16080	12	Z	500	30	6.1	-2.0
16080	00	Z	500	30	6.4	-0.6
16245	12	Z	500	30	8.0	-5.1
16245	00	Z	500	30	8.3	-5.0
16320	12	Z	500	30	5.7	-2.9
16320	00	Z	500	30	7.8	0.1
16429	00	Z	500	29	4.7	-0.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	500	31	5.7	-2.5
16622	00	Z	500	30	21.8	21.1
16754	00	Z	500	30	19.3	15.9
17607	12	Z	500	36	6.2	3.3
26435	00	Z	500	15	7.1	5.9
60018	12	Z	500	30	4.0	1.9
60018	00	Z	500	30	3.3	2.5
ASDE01	12	Z	500	13	18.0	-0.6
ASDE01	00	Z	500	13	29.0	4.5
ASDE02	12	Z	500	10	12.0	11.7
ASDE02	00	Z	500	5	11.3	10.4
ASDE03	12	Z	500	10	8.9	6.3
ASDE03	00	Z	500	8	4.5	-0.7
ASDE04	12	Z	500	1	31.7	31.7
ASDE04	00	Z	500	2	36.7	36.3
ASDE09	12	Z	500	7	22.0	2.5
ASDK01	12	Z	500	4	10.6	9.9
ASDK01	00	Z	500	5	10.7	9.6
ASDK02	12	Z	500	14	11.5	8.3
ASDK02	00	Z	500	14	6.2	5.2
ASDK03	12	Z	500	7	29.5	29.2
ASDK03	00	Z	500	6	28.1	27.1
ASDK1	12	Z	500	4	13.6	12.9
ASDK1	00	Z	500	5	11.6	11.2
ASDK2	12	Z	500	14	11.9	7.0
ASDK2	00	Z	500	13	3.1	1.7
ASDK3	12	Z	500	10	27.9	27.5
ASDK3	00	Z	500	9	27.4	26.3
ASES01	12	Z	500	21	16.7	15.7
ASEU01	12	Z	500	18	9.2	7.9
ASEU01	00	Z	500	12	5.7	4.3
ASEU03	12	Z	500	13	0.0	0.0
ASEU03	00	Z	500	13	0.0	0.0
ASEU04	12	Z	500	6	4.0	0.2
ASEU04	00	Z	500	9	5.2	-3.2
ASEU06	12	Z	500	15	24.9	-17.3
ASEU06	00	Z	500	11	27.3	-26.5
ASFR1	12	Z	500	12	7.7	-5.5
ASFR1	00	Z	500	12	11.5	-9.4
ASFR2	12	Z	500	13	10.8	9.1
ASFR2	00	Z	500	9	10.6	6.3
ASFR3	12	Z	500	13	9.3	2.6
ASFR3	00	Z	500	15	5.4	0.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASFR4	12	Z	500	10	9.4	6.3
ASFR4	00	Z	500	10	7.1	3.8
DAVAO0	12	Z	500	0	0.0	0.0
DAVAO0	00	Z	500	0	0.0	0.0
DBLK	12	Z	500	27	4.8	3.9
ELLIS	12	Z	500	4	5.8	3.4
ELLIS	00	Z	500	31	7.2	0.9
GREEN	00	Z	500	12	12.4	10.3
HESS	00	Z	500	31	8.3	5.8
LGKI	00	Z	500	23	11.1	-7.8
LGKI	12	Z	500	19	12.5	-7.9
LUMBIA	12	Z	500	0	0.0	0.0
LUMBIA	00	Z	500	0	0.0	0.0
MIND	12	Z	500	2	22.4	21.4
MIND	00	Z	500	31	25.7	25.0
OZ203	12	Z	500	2	53.3	-53.1
OZ203	00	Z	500	2	59.2	-58.6
PUERTO	12	Z	500	0	0.0	0.0
PUERTO	00	Z	500	0	0.0	0.0
UFT5	00	Z	500	30	7.4	5.6

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	500	28	1.9	-0.2	0.4
01001	00	V	500	30	2.9	-0.1	-0.3
01028	12	V	500	29	2.4	-0.3	0.1
01028	00	V	500	30	3.1	0.3	-0.1
01400	12	V	500	24	2.8	0.4	-0.4
01400	00	V	500	23	2.6	-0.3	0.1
01415	00	V	500	28	2.6	0.1	0.8
01415	12	V	500	28	2.7	0.5	0.6
02365	12	V	500	30	2.9	0.1	0.1
02365	00	V	500	30	2.8	0.8	-0.2
02591	12	V	500	30	2.8	-0.3	0.2
02591	00	V	500	28	2.4	-0.1	0.1
02836	12	V	500	29	2.7	0.3	0.1
02836	00	V	500	30	2.9	-0.5	-0.2
02963	12	V	500	30	2.6	0.3	0.8
02963	00	V	500	29	2.8	-0.1	0.5
03005	12	V	500	30	3.0	-0.6	-0.7
03005	00	V	500	30	3.6	0.3	0.4
03238	00	V	500	27	3.5	0.2	0.3
03238	12	V	500	8	2.6	0.1	-0.4
03808	12	V	500	30	3.6	0.6	0.4
03808	00	V	500	30	2.9	0.5	0.0
03918	00	V	500	25	3.4	0.9	0.5
03918	12	V	500	11	2.1	-0.2	-0.5
03953	00	V	500	29	2.7	0.2	0.1
03953	12	V	500	30	2.8	0.5	0.3
04018	00	V	500	30	2.4	0.2	0.3
04018	12	V	500	28	3.8	0.4	0.2
04220	12	V	500	30	2.0	0.2	-0.5
04220	00	V	500	30	2.3	0.1	0.1
04270	00	V	500	30	2.7	-0.2	-0.4
04270	12	V	500	30	3.8	0.9	-0.1
04320	00	V	500	30	2.1	0.4	0.5
04320	12	V	500	30	2.0	0.1	0.6
04339	00	V	500	29	2.3	-0.1	0.4
04339	12	V	500	30	2.3	0.3	-0.2
04360	12	V	500	29	2.5	0.0	0.7
04360	00	V	500	28	2.3	0.6	0.4
06011	12	V	500	30	3.0	-0.4	0.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	500	30	2.2	-0.4	-0.1
06260	00	V	500	24	2.3	0.8	-0.1
06260	12	V	500	4	1.7	-0.2	0.1
06610	12	V	500	30	2.4	0.6	0.0
06610	00	V	500	30	3.1	0.7	0.1
07110	12	V	500	30	2.8	-0.5	0.0
07110	00	V	500	30	2.7	-0.3	0.0
07510	00	V	500	28	3.4	0.0	0.3
07510	12	V	500	30	2.8	-0.4	0.7
07645	12	V	500	26	2.5	0.8	0.1
07645	00	V	500	23	2.7	0.1	0.2
07761	00	V	500	27	2.7	0.5	0.3
07761	12	V	500	26	3.3	-0.2	-0.5
08001	12	V	500	27	2.2	-0.2	-0.4
08001	00	V	500	24	2.5	-0.2	0.2
08221	12	V	500	30	2.2	-0.1	0.1
08221	00	V	500	30	2.4	0.5	0.5
08302	12	V	500	30	2.4	0.1	-0.2
08302	00	V	500	29	2.8	0.3	0.5
08508	12	V	500	27	2.1	0.3	0.4
08522	12	V	500	30	2.5	0.1	-0.4
08579	12	V	500	30	2.8	0.5	0.2
10035	12	V	500	26	3.0	0.0	-0.9
10035	00	V	500	25	2.7	-0.1	-0.6
10393	00	V	500	30	2.0	-0.3	-0.1
10393	12	V	500	30	2.7	0.2	-0.6
10410	12	V	500	25	2.1	0.1	-0.3
10410	00	V	500	23	3.0	0.9	0.2
10739	12	V	500	29	2.4	-0.4	-0.4
10739	00	V	500	30	3.3	0.3	-0.4
11035	00	V	500	30	3.0	0.1	-0.2
11035	12	V	500	30	3.0	0.3	-0.8
12982	00	V	500	30	3.4	1.0	0.3
12982	12	V	500	30	2.8	0.2	0.7
16044	00	V	500	30	2.8	-0.3	-0.5
16044	12	V	500	30	3.2	0.3	0.0
16080	12	V	500	30	2.5	0.1	-0.3
16080	00	V	500	30	3.5	0.2	0.0
16245	12	V	500	30	3.2	0.8	0.3
16245	00	V	500	29	2.8	0.9	0.5
16320	12	V	500	30	2.8	0.2	-0.5
16320	00	V	500	29	2.7	1.0	0.2
16429	00	V	500	28	3.0	0.9	0.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	500	30	2.3	0.0	-0.2
16622	00	V	500	20	2.8	0.3	-0.2
16754	00	V	500	29	2.8	0.1	0.2
17607	12	V	500	20	2.4	0.0	0.4
26435	00	V	500	15	2.1	-0.7	-0.3
60018	12	V	500	30	2.7	0.2	0.0
60018	00	V	500	30	3.0	0.6	0.1
ASDE01	12	V	500	13	4.2	1.1	0.4
ASDE01	00	V	500	12	2.5	-0.3	0.5
ASDE02	12	V	500	10	2.4	-0.1	-0.1
ASDE02	00	V	500	5	2.1	-0.5	-1.1
ASDE03	12	V	500	10	2.4	0.4	0.0
ASDE03	00	V	500	8	1.8	1.0	-0.6
ASDE04	12	V	500	1	1.5	0.8	1.3
ASDE04	00	V	500	2	2.0	0.0	1.5
ASDE09	12	V	500	7	3.0	-0.1	0.0
ASDK01	12	V	500	4	2.9	-1.3	0.8
ASDK01	00	V	500	5	2.6	0.5	-0.3
ASDK02	12	V	500	14	3.8	-0.7	-0.1
ASDK02	00	V	500	13	3.3	-0.9	0.0
ASDK03	12	V	500	7	3.6	-1.1	0.9
ASDK03	00	V	500	6	2.0	0.1	-0.7
ASDK1	12	V	500	4	2.6	-1.4	0.1
ASDK1	00	V	500	5	2.3	0.5	-0.8
ASDK2	12	V	500	14	4.0	-0.6	-0.4
ASDK2	00	V	500	13	3.4	-1.2	0.0
ASDK3	12	V	500	10	3.5	-0.2	0.8
ASDK3	00	V	500	9	2.1	-0.1	-0.8
ASES01	12	V	500	21	1.9	-0.2	-0.4
ASEU01	12	V	500	18	2.4	0.5	0.6
ASEU01	00	V	500	12	4.2	-0.2	0.3
ASEU03	12	V	500	13	2.4	0.4	1.1
ASEU03	00	V	500	12	6.9	-1.2	-0.5
ASEU04	12	V	500	6	2.0	0.2	0.7
ASEU04	00	V	500	7	5.0	0.9	1.3
ASEU06	12	V	500	13	2.6	1.4	0.7
ASEU06	00	V	500	11	3.0	-0.5	0.2
ASFR1	12	V	500	12	3.1	0.0	-1.5
ASFR1	00	V	500	12	3.0	0.7	0.5
ASFR2	12	V	500	13	2.9	1.0	-1.1
ASFR2	00	V	500	9	3.5	0.0	0.4
ASFR3	12	V	500	13	2.6	0.4	0.4
ASFR3	00	V	500	15	2.9	-0.4	-0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASFR4	12	V	500	10	2.2	0.5	1.1
ASFR4	00	V	500	10	2.1	-0.6	0.6
DAVAO0	12	V	500	0	0.0	0.0	0.0
DAVAO0	00	V	500	0	0.0	0.0	0.0
DBLK	12	V	500	26	3.9	-0.5	-1.1
ELLIS	12	V	500	2	2.0	-0.5	0.2
ELLIS	00	V	500	17	3.9	-0.9	-0.4
GREEN	00	V	500	7	4.4	1.4	-0.6
HESS	00	V	500	16	3.0	-0.8	0.4
LGKI	00	V	500	23	2.0	-0.3	-0.2
LGKI	12	V	500	19	2.3	0.5	0.1
LUMBIA	12	V	500	0	0.0	0.0	0.0
LUMBIA	00	V	500	0	0.0	0.0	0.0
MIND	12	V	500	2	6.4	-2.6	3.2
MIND	00	V	500	15	4.1	1.2	0.0
OZ203	12	V	500	2	1.3	-0.9	-0.5
OZ203	00	V	500	2	2.7	0.8	-0.5
PUERTO	12	V	500	0	0.0	0.0	0.0
PUERTO	00	V	500	0	0.0	0.0	0.0
UFT5	00	V	500	30	2.3	-0.2	-0.4

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	850	28	5.2	-0.7
01001	00	Z	850	30	4.0	-0.2
01028	12	Z	850	29	3.8	-1.4
01028	00	Z	850	30	3.1	-0.3
01400	12	Z	850	24	16.0	9.2
01400	00	Z	850	24	10.4	7.9
01415	00	Z	850	28	3.3	1.9
01415	12	Z	850	28	2.8	2.3
02365	12	Z	850	40	2.2	0.5
02365	00	Z	850	38	2.4	1.1
02591	12	Z	850	37	9.4	9.3
02591	00	Z	850	37	9.5	9.2
02836	12	Z	850	30	4.2	3.0
02836	00	Z	850	30	3.9	2.9
02963	12	Z	850	30	4.1	3.6
02963	00	Z	850	30	4.9	4.5
03005	12	Z	850	30	3.5	-0.6
03005	00	Z	850	31	3.6	-2.1
03238	00	Z	850	29	6.0	5.7
03238	12	Z	850	8	6.5	6.3
03808	12	Z	850	33	3.3	1.7
03808	00	Z	850	33	4.4	2.1
03918	00	Z	850	27	5.5	4.9
03918	12	Z	850	11	4.9	4.4
03953	00	Z	850	30	4.6	3.3
03953	12	Z	850	30	5.0	4.5
04018	00	Z	850	30	2.7	1.8
04018	12	Z	850	30	3.1	1.5
04220	12	Z	850	30	4.4	2.9
04220	00	Z	850	30	3.2	1.3
04270	00	Z	850	30	2.6	-0.5
04270	12	Z	850	30	3.0	0.5
04320	00	Z	850	30	10.1	8.9
04320	12	Z	850	30	12.4	11.5
04339	00	Z	850	30	3.2	-1.0
04339	12	Z	850	30	2.5	0.6
04360	12	Z	850	29	4.3	2.2
04360	00	Z	850	27	5.1	0.0
06011	12	Z	850	30	7.6	5.7

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	850	30	11.9	3.8
06260	00	Z	850	28	4.0	1.8
06260	12	Z	850	4	1.7	-0.4
06610	12	Z	850	30	5.1	4.5
06610	00	Z	850	30	4.8	3.6
07110	12	Z	850	30	4.0	2.4
07110	00	Z	850	30	5.2	2.6
07510	00	Z	850	32	3.6	-2.8
07510	12	Z	850	32	3.5	0.2
07645	12	Z	850	29	3.7	2.2
07645	00	Z	850	25	4.1	-0.9
07761	00	Z	850	29	4.3	-3.6
07761	12	Z	850	29	2.8	-0.7
08001	12	Z	850	28	6.6	4.3
08001	00	Z	850	25	5.8	3.3
08221	12	Z	850	30	5.6	5.0
08221	00	Z	850	30	4.8	3.8
08302	12	Z	850	30	1.7	0.0
08302	00	Z	850	30	3.0	-1.6
08508	12	Z	850	30	9.5	7.0
08522	12	Z	850	30	3.7	3.2
08579	12	Z	850	30	4.5	3.6
10035	12	Z	850	26	4.3	1.4
10035	00	Z	850	25	3.5	0.2
10393	00	Z	850	30	3.3	-2.5
10393	12	Z	850	33	4.1	-2.8
10410	12	Z	850	25	2.1	-1.4
10410	00	Z	850	24	3.6	-2.5
10739	12	Z	850	31	8.9	8.5
10739	00	Z	850	31	7.9	7.3
11035	00	Z	850	30	3.4	-0.4
11035	12	Z	850	30	2.6	-0.7
12982	00	Z	850	30	3.9	1.7
12982	12	Z	850	30	6.4	5.7
16044	00	Z	850	31	4.6	-2.3
16044	12	Z	850	30	4.8	-3.1
16080	12	Z	850	30	5.9	-3.0
16080	00	Z	850	30	7.8	-2.8
16245	12	Z	850	30	9.2	-8.2
16245	00	Z	850	30	9.9	-7.8
16320	12	Z	850	30	5.6	-2.3
16320	00	Z	850	30	6.8	-1.7
16429	00	Z	850	30	4.9	-2.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	850	31	6.4	-5.0
16622	00	Z	850	30	13.2	12.8
16754	00	Z	850	30	15.1	10.3
17607	12	Z	850	37	2.4	1.1
26435	00	Z	850	15	4.8	3.9
60018	12	Z	850	30	3.2	-0.1
60018	00	Z	850	30	2.1	0.2
ASDE01	12	Z	850	13	12.6	-9.2
ASDE01	00	Z	850	13	10.3	-6.6
ASDE02	12	Z	850	10	6.6	6.4
ASDE02	00	Z	850	5	6.9	5.8
ASDE03	12	Z	850	10	3.4	0.8
ASDE03	00	Z	850	8	6.1	-3.7
ASDE04	12	Z	850	2	26.5	26.4
ASDE04	00	Z	850	2	35.3	35.1
ASDE09	12	Z	850	7	14.0	6.0
ASDK01	12	Z	850	4	7.7	6.6
ASDK01	00	Z	850	5	10.6	9.8
ASDK02	12	Z	850	14	9.3	5.2
ASDK02	00	Z	850	14	3.5	2.3
ASDK03	12	Z	850	7	29.1	28.9
ASDK03	00	Z	850	6	29.4	28.3
ASDK1	12	Z	850	4	9.9	9.3
ASDK1	00	Z	850	5	11.3	10.8
ASDK2	12	Z	850	14	9.4	3.3
ASDK2	00	Z	850	13	3.2	-0.6
ASDK3	12	Z	850	10	28.5	28.4
ASDK3	00	Z	850	9	29.7	29.0
ASES01	12	Z	850	22	13.5	12.1
ASEU01	12	Z	850	18	5.2	2.7
ASEU01	00	Z	850	12	3.9	1.5
ASEU03	12	Z	850	13	0.0	0.0
ASEU03	00	Z	850	13	0.0	0.0
ASEU04	12	Z	850	6	6.9	-3.8
ASEU04	00	Z	850	9	6.9	-5.7
ASEU06	12	Z	850	15	31.7	-28.5
ASEU06	00	Z	850	11	33.1	-32.1
ASFR1	12	Z	850	12	9.3	-8.8
ASFR1	00	Z	850	12	10.0	-9.7
ASFR2	12	Z	850	13	6.9	5.7
ASFR2	00	Z	850	9	7.2	6.7
ASFR3	12	Z	850	13	4.0	-1.5
ASFR3	00	Z	850	15	5.0	-2.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASFR4	12	Z	850	10	8.5	2.7
ASFR4	00	Z	850	10	7.2	-1.1
DAVAO0	12	Z	850	0	0.0	0.0
DAVAO0	00	Z	850	0	0.0	0.0
DBLK	12	Z	850	27	3.0	2.1
ELLIS	12	Z	850	4	6.6	-5.3
ELLIS	00	Z	850	32	8.2	-6.4
GREEN	00	Z	850	12	9.2	8.2
HESS	00	Z	850	31	5.9	-1.1
LGKI	00	Z	850	23	9.9	-6.9
LGKI	12	Z	850	20	12.6	-9.4
LUMBIA	12	Z	850	0	0.0	0.0
LUMBIA	00	Z	850	0	0.0	0.0
MIND	12	Z	850	2	17.5	17.3
MIND	00	Z	850	32	17.5	16.1
OZ203	12	Z	850	2	41.8	-41.6
OZ203	00	Z	850	2	36.3	-35.8
PUERTO	12	Z	850	0	0.0	0.0
PUERTO	00	Z	850	0	0.0	0.0
UFT5	00	Z	850	30	6.9	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                : JUN 2015
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	850	28	3.3	-0.1	-0.4
01001	00	V	850	30	3.1	0.2	-0.5
01028	12	V	850	29	2.2	0.1	-0.3
01028	00	V	850	30	2.8	0.3	-0.7
01400	12	V	850	24	2.5	0.1	-0.2
01400	00	V	850	24	2.7	0.2	-0.3
01415	00	V	850	28	1.9	-0.1	0.1
01415	12	V	850	28	2.3	0.1	0.3
02365	12	V	850	30	2.7	-0.5	-0.2
02365	00	V	850	30	2.4	-0.1	0.5
02591	12	V	850	30	2.1	0.1	-0.4
02591	00	V	850	29	2.7	0.7	0.2
02836	12	V	850	29	2.5	0.1	0.2
02836	00	V	850	30	2.8	0.4	0.7
02963	12	V	850	30	2.3	-0.5	-0.5
02963	00	V	850	30	2.2	0.2	-0.2
03005	12	V	850	29	3.3	0.1	-0.5
03005	00	V	850	30	2.8	-0.3	-0.2
03238	00	V	850	27	3.0	0.5	1.0
03238	12	V	850	8	4.3	0.5	-0.9
03808	12	V	850	30	2.4	0.7	0.5
03808	00	V	850	30	2.5	0.6	0.4
03918	00	V	850	25	2.2	0.4	-0.1
03918	12	V	850	11	2.4	1.1	-0.2
03953	00	V	850	30	3.1	0.6	-0.2
03953	12	V	850	30	2.5	-0.1	0.4
04018	00	V	850	30	2.8	-0.3	0.8
04018	12	V	850	28	3.7	-0.8	0.4
04220	12	V	850	30	2.7	0.8	0.4
04220	00	V	850	30	3.1	0.1	0.5
04270	00	V	850	30	2.9	-0.2	-0.4
04270	12	V	850	30	3.5	-0.2	-0.7
04320	00	V	850	30	2.6	0.0	-0.1
04320	12	V	850	30	2.8	-0.5	0.4
04339	00	V	850	29	2.2	0.1	0.0
04339	12	V	850	30	3.5	0.2	-1.0
04360	12	V	850	29	5.4	2.2	0.8
04360	00	V	850	27	3.6	0.5	-0.1
06011	12	V	850	30	3.2	-1.1	-0.5

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	850	30	2.7	-1.0	0.6
06260	00	V	850	24	2.2	0.6	-0.9
06260	12	V	850	4	1.3	0.2	-0.4
06610	12	V	850	30	2.8	0.4	0.6
06610	00	V	850	30	3.7	0.0	0.4
07110	12	V	850	30	3.5	0.5	0.2
07110	00	V	850	30	2.5	0.2	0.0
07510	00	V	850	28	3.2	-0.7	-0.5
07510	12	V	850	30	3.9	-0.6	-0.1
07645	12	V	850	26	3.1	0.4	1.0
07645	00	V	850	23	4.0	0.1	0.6
07761	00	V	850	27	3.4	0.0	-1.0
07761	12	V	850	27	4.5	0.7	0.9
08001	12	V	850	27	1.9	-0.4	-0.3
08001	00	V	850	24	2.8	0.2	-0.1
08221	12	V	850	30	2.7	1.0	0.1
08221	00	V	850	30	4.8	-0.6	0.5
08302	12	V	850	30	2.3	-0.1	-0.4
08302	00	V	850	28	2.7	-0.8	-0.3
08508	12	V	850	27	3.3	-0.4	-0.2
08522	12	V	850	30	2.7	-0.3	0.3
08579	12	V	850	29	3.0	-0.5	-0.3
10035	12	V	850	26	2.4	0.4	-0.5
10035	00	V	850	25	2.3	-0.2	-0.2
10393	00	V	850	30	2.5	1.0	-0.3
10393	12	V	850	30	2.0	0.1	0.2
10410	12	V	850	25	2.1	0.3	-0.2
10410	00	V	850	23	2.7	0.2	-0.1
10739	12	V	850	30	2.3	0.2	0.8
10739	00	V	850	30	2.8	0.7	0.3
11035	00	V	850	30	2.9	0.5	0.2
11035	12	V	850	30	2.9	1.1	0.2
12982	00	V	850	30	2.4	0.6	-0.6
12982	12	V	850	30	2.9	-0.1	0.1
16044	00	V	850	30	2.7	0.4	-0.1
16044	12	V	850	30	3.0	0.1	-0.1
16080	12	V	850	30	2.6	0.7	-0.6
16080	00	V	850	30	2.8	-0.3	-0.1
16245	12	V	850	30	2.5	-0.3	0.7
16245	00	V	850	29	2.6	0.5	-0.2
16320	12	V	850	30	2.8	0.5	-0.7
16320	00	V	850	29	2.5	0.3	-0.3
16429	00	V	850	29	2.9	-0.6	0.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	850	30	2.5	-0.7	0.4
16622	00	V	850	18	3.5	0.3	-1.5
16754	00	V	850	29	2.5	0.5	-0.6
17607	12	V	850	21	3.6	-1.0	-0.1
26435	00	V	850	15	1.8	0.3	-0.2
60018	12	V	850	30	3.0	-1.0	-0.5
60018	00	V	850	30	3.0	-0.2	-0.8
ASDE01	12	V	850	13	2.7	0.3	0.2
ASDE01	00	V	850	12	6.3	-1.4	-1.4
ASDE02	12	V	850	10	2.9	0.3	0.8
ASDE02	00	V	850	5	3.1	0.0	1.8
ASDE03	12	V	850	10	3.2	-0.1	1.6
ASDE03	00	V	850	8	2.4	0.3	-0.1
ASDE04	12	V	850	2	1.0	0.9	0.0
ASDE04	00	V	850	2	4.9	3.4	1.8
ASDE09	12	V	850	7	1.9	-0.7	0.5
ASDK01	12	V	850	4	1.9	-0.5	-0.7
ASDK01	00	V	850	5	2.5	0.8	-1.0
ASDK02	12	V	850	14	2.4	0.0	-0.3
ASDK02	00	V	850	13	2.1	-0.1	0.2
ASDK03	12	V	850	7	2.1	-0.3	0.6
ASDK03	00	V	850	6	2.6	0.2	-0.3
ASDK1	12	V	850	4	1.5	-0.3	-0.4
ASDK1	00	V	850	5	2.6	0.8	-1.0
ASDK2	12	V	850	14	2.6	-0.4	-0.3
ASDK2	00	V	850	13	2.3	0.0	0.0
ASDK3	12	V	850	10	1.8	-0.2	0.5
ASDK3	00	V	850	9	2.8	0.8	-0.2
ASES01	12	V	850	22	3.0	0.8	-0.1
ASEU01	12	V	850	18	2.2	0.0	0.6
ASEU01	00	V	850	12	2.6	-0.9	-0.9
ASEU03	12	V	850	13	2.4	0.5	-0.5
ASEU03	00	V	850	13	2.2	0.5	-0.2
ASEU04	12	V	850	6	2.7	0.4	1.2
ASEU04	00	V	850	7	2.5	-0.1	0.6
ASEU06	12	V	850	13	2.7	1.0	0.3
ASEU06	00	V	850	11	1.9	-0.9	-0.1
ASFR1	12	V	850	12	3.2	-0.9	-0.5
ASFR1	00	V	850	12	3.2	0.6	0.3
ASFR2	12	V	850	13	2.8	0.8	-0.2
ASFR2	00	V	850	9	1.8	0.1	-0.1
ASFR3	12	V	850	13	3.0	-0.3	0.1
ASFR3	00	V	850	15	2.3	0.4	-0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASFR4	12	V	850	10	2.8	0.4	-0.8
ASFR4	00	V	850	10	2.5	-1.1	0.5
DAVAO0	12	V	850	0	0.0	0.0	0.0
DAVAO0	00	V	850	0	0.0	0.0	0.0
DBLK	12	V	850	26	4.5	-1.1	-0.6
ELLIS	12	V	850	2	1.9	-1.7	0.0
ELLIS	00	V	850	17	5.0	-0.4	0.1
GREEN	00	V	850	7	3.8	-1.2	-0.8
HESS	00	V	850	16	3.0	0.2	-0.2
LGKI	00	V	850	23	2.3	-0.3	0.1
LGKI	12	V	850	20	3.0	-0.9	0.4
LUMBIA	12	V	850	0	0.0	0.0	0.0
LUMBIA	00	V	850	0	0.0	0.0	0.0
MIND	12	V	850	2	6.5	2.3	-5.4
MIND	00	V	850	15	3.4	-1.3	-1.4
OZ203	12	V	850	2	2.1	-1.7	-1.2
OZ203	00	V	850	2	1.9	-0.9	-0.3
PUERTO	12	V	850	0	0.0	0.0	0.0
PUERTO	00	V	850	0	0.0	0.0	0.0
UFT5	00	V	850	30	3.6	0.0	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                 : JUN 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	127	0	0.4	0.1	0.4
13008	99	P	SUR	15	-38	101	0	0.4	-0.1	0.4
13515	99	P	SUR	22	-41	190	0	0.2	0.5	0.5
13517	99	P	SUR	14	-34	185	0	0.3	0.2	0.4
13519	99	P	SUR	17	-33	206	1	0.3	0.1	0.3
13523	99	P	SUR	12	-54	195	0	0.4	0.4	0.5
13531	99	P	SUR	14	-45	194	0	0.3	-0.3	0.4
13569	99	P	SUR	30	-29	183	0	0.2	0.1	0.3
13570	99	P	SUR	36	-24	208	0	0.5	0.5	0.7
13572	99	P	SUR	33	-32	210	0	0.2	0.1	0.2
13590	99	P	SUR	32	-21	199	0	0.2	0.5	0.6
13633	99	P	SUR	36	-31	210	0	0.2	-0.4	0.4
13659	99	P	SUR	29	-54	203	0	1.3	-0.2	1.3
13660	99	P	SUR	31	-48	203	0	0.6	-0.2	0.6
13661	99	P	SUR	12	-28	203	0	0.4	-0.5	0.6
13662	99	P	SUR	29	-47	203	0	0.2	0.1	0.2
13869	99	P	SUR	25	-34	203	0	0.2	0.3	0.3
13870	99	P	SUR	33	-17	178	0	0.9	0.3	0.9
13871	99	P	SUR	25	-28	204	0	0.6	0.5	0.7
13872	99	P	SUR	24	-19	203	0	0.5	0.5	0.7
21942	99	P	SUR	27	-33	205	0	0.2	0.4	0.4
25540	99	P	SUR	84	-21	209	0	0.4	-0.2	0.4
25575	99	P	SUR	85	-27	178	0	2.0	0.2	2.0
25617	99	P	SUR	86	-35	210	0	0.4	-0.6	0.7
25618	99	P	SUR	88	1	203	0	0.3	-0.1	0.3
25620	99	P	SUR	86	-1	210	0	0.4	-0.3	0.5
26537	99	P	SUR	77	0	210	0	0.3	-0.2	0.4
31515	99	P	SUR	15	-58	194	0	0.3	0.3	0.4
31717	99	P	SUR	18	-61	203	0	0.3	0.2	0.4
31863	99	P	SUR	18	-56	203	0	0.5	0.5	0.7
41139	99	P	SUR	20	-38	174	0	0.3	0.0	0.3
41564	99	P	SUR	33	-34	194	0	0.2	0.5	0.5
41580	99	P	SUR	18	-45	198	0	0.2	0.6	0.7
41590	99	P	SUR	21	-67	209	0	0.3	0.1	0.3
41591	99	P	SUR	17	-52	205	0	0.3	0.3	0.4
41594	99	P	SUR	23	-53	208	0	0.2	0.5	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	24	-61	184	0	0.3	0.1	0.3
41597	99	P	SUR	23	-60	203	0	0.3	0.4	0.4
41598	99	P	SUR	25	-52	147	0	1.8	0.3	1.8
41600	99	P	SUR	17	-60	203	0	0.3	0.7	0.7
41632	99	P	SUR	26	-64	203	0	0.3	0.1	0.3
41705	99	P	SUR	34	-54	203	0	0.3	0.0	0.3
41706	99	P	SUR	27	-62	203	0	0.3	0.1	0.3
41711	99	P	SUR	30	-49	203	0	0.2	0.0	0.2
41729	99	P	SUR	33	-66	203	0	0.3	0.0	0.3
41731	99	P	SUR	31	-54	203	0	0.3	0.4	0.4
41933	99	P	SUR	36	-43	209	0	0.3	-0.3	0.4
41936	99	P	SUR	31	-53	208	0	0.3	-0.7	0.7
41969	99	P	SUR	24	-53	204	0	0.3	-0.3	0.4
41970	99	P	SUR	29	-62	203	0	0.3	0.3	0.4
41971	99	P	SUR	42	-19	182	0	0.4	0.1	0.4
41972	99	P	SUR	28	-52	204	0	0.2	0.1	0.3
41975	99	P	SUR	37	-40	210	0	0.2	0.0	0.3
44505	99	P	SUR	41	-13	364	0	0.7	0.0	0.7
44509	99	P	SUR	47	-52	364	0	0.7	0.5	0.8
44510	99	P	SUR	47	-50	369	0	0.5	0.7	0.8
44513	99	P	SUR	48	-24	203	0	0.3	0.4	0.5
44515	99	P	SUR	43	-57	203	0	0.4	0.0	0.4
44516	99	P	SUR	33	-69	199	0	0.4	0.2	0.4
44517	99	P	SUR	48	-32	203	0	0.4	0.2	0.5
44519	99	P	SUR	60	-35	84	0	0.3	-0.3	0.4
44546	99	P	SUR	25	-37	203	0	0.2	0.0	0.2
44547	99	P	SUR	58	-24	203	0	0.4	0.2	0.4
44548	99	P	SUR	56	-31	204	0	0.4	0.2	0.4
44549	99	P	SUR	52	-21	203	0	0.5	0.1	0.5
44550	99	P	SUR	55	-14	205	0	0.4	0.1	0.4
44551	99	P	SUR	58	-18	203	0	0.3	0.3	0.4
44558	99	P	SUR	35	-41	208	0	0.2	0.7	0.7
44560	99	P	SUR	48	-27	210	0	0.7	0.3	0.8
44601	99	P	SUR	51	-19	203	0	0.5	-0.4	0.6
44606	99	P	SUR	51	-19	203	0	1.0	-0.2	1.0
44608	99	P	SUR	42	-22	196	0	0.2	0.3	0.4
44609	99	P	SUR	47	-27	203	0	0.6	0.3	0.7
44612	99	P	SUR	56	-7	33	0	0.4	0.0	0.4
44613	99	P	SUR	30	-21	203	0	0.2	-0.1	0.3
44614	99	P	SUR	52	-23	203	0	0.5	-0.1	0.5
44620	99	P	SUR	58	-22	203	0	0.4	0.3	0.5
44621	99	P	SUR	59	-7	203	0	0.3	0.7	0.8
44622	99	P	SUR	57	-7	122	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
44623	99	P	SUR	58	-35	203	0	0.4	-0.3	0.5
44624	99	P	SUR	25	-23	196	0	0.3	0.0	0.3
44625	99	P	SUR	61	-16	173	0	0.3	0.4	0.5
44725	99	P	SUR	31	-61	203	0	0.3	0.1	0.3
44739	99	P	SUR	41	-42	203	0	0.9	0.6	1.1
44740	99	P	SUR	29	-54	203	0	0.3	-0.2	0.3
44760	99	P	SUR	57	-42	203	0	0.5	-0.4	0.7
44761	99	P	SUR	53	-36	203	0	0.4	-0.4	0.5
44762	99	P	SUR	50	-48	203	0	0.5	0.3	0.6
44763	99	P	SUR	56	-33	190	0	0.5	0.0	0.5
44764	99	P	SUR	53	-39	203	0	0.5	-0.4	0.6
44768	99	P	SUR	44	-60	199	0	0.5	0.2	0.6
44769	99	P	SUR	39	-60	203	0	0.3	0.0	0.3
44773	99	P	SUR	26	-63	182	0	0.5	0.1	0.5
44774	99	P	SUR	38	-59	203	0	0.5	0.2	0.5
44776	99	P	SUR	43	-42	202	0	0.7	0.3	0.8
44778	99	P	SUR	35	-51	203	0	0.4	0.4	0.5
44835	99	P	SUR	41	-19	203	0	0.2	-0.1	0.3
44836	99	P	SUR	55	-23	203	0	0.4	0.0	0.4
44837	99	P	SUR	35	-16	203	0	0.3	0.1	0.3
44839	99	P	SUR	34	-20	203	0	0.3	0.1	0.3
44846	99	P	SUR	37	-33	203	0	0.2	0.6	0.6
44847	99	P	SUR	46	-15	202	0	0.2	0.4	0.5
44848	99	P	SUR	43	-35	202	0	0.4	0.1	0.4
44863	99	P	SUR	27	-41	203	0	0.2	-0.1	0.3
44866	99	P	SUR	57	-18	202	0	0.3	-0.3	0.4
44867	99	P	SUR	56	-27	203	0	0.3	-0.3	0.4
44868	99	P	SUR	30	-45	203	0	0.4	-0.2	0.5
44871	99	P	SUR	46	-14	203	0	0.2	0.1	0.3
44872	99	P	SUR	53	-25	203	0	0.3	-0.5	0.6
44877	99	P	SUR	35	-21	203	0	0.3	0.1	0.3
44878	99	P	SUR	47	-15	203	0	0.2	0.1	0.3
44880	99	P	SUR	45	-41	192	0	1.0	-0.3	1.0
44885	99	P	SUR	40	-26	203	0	0.2	0.1	0.3
44887	99	P	SUR	37	-39	203	0	0.3	0.0	0.3
44888	99	P	SUR	43	-22	203	0	0.3	-0.1	0.3
44889	99	P	SUR	34	-48	203	0	0.3	0.0	0.3
44890	99	P	SUR	30	-63	203	0	0.3	0.1	0.3
44891	99	P	SUR	27	-34	203	0	0.2	0.1	0.2
44892	99	P	SUR	48	-18	203	0	0.3	-0.1	0.3
44896	99	P	SUR	30	-43	210	0	0.2	-0.1	0.3
47503	99	P	SUR	70	-22	210	0	0.3	0.0	0.3
47509	99	P	SUR	87	-49	141	0	0.3	0.0	0.3

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
47585	99	P	SUR	68	-67	22	0	0.2	-0.1	0.3
47586	99	P	SUR	53	-44	210	0	2.1	-0.3	2.1
48506	99	P	SUR	84	-68	210	0	0.3	-0.1	0.4
48568	99	P	SUR	62	-40	209	0	0.4	0.0	0.4
48597	99	P	SUR	83	-20	210	0	0.5	0.0	0.5
48679	99	P	SUR	86	-32	172	0	0.4	0.2	0.5
48778	99	P	SUR	74	-19	210	0	0.8	-0.7	1.0
48779	99	P	SUR	66	-34	210	3	3.6	-1.5	3.9
62091	99	P	SUR	53	-5	210	0	0.3	-0.2	0.4
62092	99	P	SUR	51	-11	210	0	0.3	0.1	0.3
62093	99	P	SUR	55	-10	210	0	0.4	0.3	0.5
62094	99	P	SUR	52	-7	210	0	0.3	0.0	0.3
62500	99	P	SUR	61	-29	21	0	1.8	4.9	5.2
62513	99	P	SUR	59	-30	203	0	0.4	0.0	0.4
62514	99	P	SUR	69	-3	203	0	0.3	-0.2	0.4
62516	99	P	SUR	23	-29	203	0	0.3	0.5	0.6
62536	99	P	SUR	59	3	159	0	2.7	-0.2	2.7
62538	99	P	SUR	63	-9	203	0	0.9	0.0	0.9
62539	99	P	SUR	55	-19	203	0	0.4	0.1	0.4
62552	99	P	SUR	49	-18	203	0	0.3	0.0	0.3
62553	99	P	SUR	79	4	203	0	0.3	-0.2	0.4
62681	99	P	SUR	33	-15	203	0	0.3	0.0	0.3
62695	99	P	SUR	26	-37	203	0	0.2	0.4	0.5
62713	99	P	SUR	29	-59	198	0	0.3	-0.2	0.4
62714	99	P	SUR	30	-63	196	0	0.2	-0.2	0.3
62940	99	P	SUR	35	-27	203	0	0.2	0.3	0.3
62941	99	P	SUR	33	-27	203	0	0.3	0.0	0.3
63546	99	P	SUR	67	-9	210	0	0.6	-0.5	0.7
63560	99	P	SUR	74	-5	134	0	0.3	-0.3	0.4
63561	99	P	SUR	74	-5	134	0	0.3	0.0	0.3
63640	99	P	SUR	73	37	203	0	0.4	-0.1	0.4
63644	99	P	SUR	71	18	210	0	0.3	-0.6	0.6
63923	99	P	SUR	88	6	141	0	1.5	0.0	1.5
64472	99	P	SUR	81	6	76	0	0.3	-0.1	0.3
64517	99	P	SUR	60	1	201	0	0.5	0.5	0.7
64518	99	P	SUR	62	1	135	0	0.3	0.1	0.3
64519	99	P	SUR	65	5	203	0	0.3	0.3	0.4
64520	99	P	SUR	69	-9	147	28	1.5	-0.6	1.7
64521	99	P	SUR	72	3	203	0	0.2	-0.3	0.4
64522	99	P	SUR	74	12	202	0	0.3	-0.1	0.3
64523	99	P	SUR	64	-3	203	0	0.3	0.2	0.4
64524	99	P	SUR	67	10	203	0	0.3	-0.2	0.4
64525	99	P	SUR	71	-9	203	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
64526	99	P	SUR	62	-18	203	0	0.3	0.3	0.4
64527	99	P	SUR	62	-22	196	0	0.3	0.7	0.7
64528	99	P	SUR	64	-11	92	0	0.2	0.3	0.4
64529	99	P	SUR	59	-33	92	0	0.5	-0.3	0.6
64530	99	P	SUR	64	-8	85	0	0.2	0.2	0.3
64532	99	P	SUR	58	-43	210	210	0.0	0.0	0.0
64534	99	P	SUR	62	-31	295	9	1.6	0.3	1.7
64535	99	P	SUR	66	-35	210	0	0.4	-0.2	0.4
64537	99	P	SUR	87	-4	61	0	0.3	-0.4	0.5
64538	99	P	SUR	87	-28	141	0	0.2	0.0	0.3
64546	99	P	SUR	59	-39	204	0	0.4	0.5	0.6
64547	99	P	SUR	64	-5	85	0	0.2	0.1	0.3
64549	99	P	SUR	61	-11	49	0	0.3	-0.1	0.3
64550	99	P	SUR	63	-31	50	0	0.3	0.3	0.4
64551	99	P	SUR	63	-33	43	0	0.3	0.2	0.3
64606	99	P	SUR	63	-1	185	0	0.5	0.7	0.8
64613	99	P	SUR	78	-2	203	0	0.3	-0.2	0.4
64614	99	P	SUR	59	-20	203	0	0.3	0.0	0.3
64615	99	P	SUR	75	-9	203	0	0.3	0.2	0.4
64620	99	P	SUR	62	-11	203	0	0.3	0.1	0.3
64621	99	P	SUR	63	-19	201	0	0.3	0.3	0.4
64622	99	P	SUR	71	8	203	0	0.3	-0.1	0.3
64623	99	P	SUR	76	-3	203	0	0.3	-0.6	0.6
64665	99	P	SUR	78	8	203	0	0.3	0.0	0.3
64666	99	P	SUR	74	14	203	0	0.3	0.2	0.3
64667	99	P	SUR	61	-2	204	0	0.3	0.3	0.4
64668	99	P	SUR	75	-6	203	0	0.3	0.0	0.3
64692	99	P	SUR	70	8	203	0	0.3	0.2	0.4
65596	99	P	SUR	56	-46	203	0	0.4	0.5	0.6
65599	99	P	SUR	58	-49	194	0	0.5	0.1	0.5
65600	99	P	SUR	59	-49	203	0	0.4	-0.1	0.4
65601	99	P	SUR	58	-48	203	0	0.4	0.1	0.4
65602	99	P	SUR	58	-49	203	0	0.4	-0.2	0.4

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                : JUN 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	127	0	0	1.1	0.6	1.3
13002	99	SPEED	SUR	20	-23	125	0	0	0.8	-0.2	0.9
13008	99	SPEED	SUR	15	-38	101	0	0	0.8	-0.1	0.8
41026	99	SPEED	SUR	11	-38	94	0	0	0.9	0.3	0.9
41139	99	SPEED	SUR	20	-38	174	0	0	0.7	-0.2	0.7
62091	99	SPEED	SUR	53	-5	210	0	0	1.5	0.0	1.5
62092	99	SPEED	SUR	51	-11	210	0	0	1.0	-0.1	1.0
62093	99	SPEED	SUR	55	-10	210	0	0	1.0	-0.1	1.0
62094	99	SPEED	SUR	52	-7	210	0	0	1.1	-0.1	1.1

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                : JUN 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	103	0	0	15.1	0.7	15.1
13002	99	DIRN	SUR	20	-23	125	0	0	8.7	2.3	9.0
13008	99	DIRN	SUR	15	-38	101	0	0	8.4	-1.3	8.5
41026	99	DIRN	SUR	11	-38	94	0	0	7.1	7.4	10.3
41139	99	DIRN	SUR	20	-38	174	0	0	7.5	12.3	14.4
62091	99	DIRN	SUR	53	-5	188	0	0	17.4	3.0	17.6
62092	99	DIRN	SUR	51	-11	175	0	0	15.0	-1.3	15.0
62093	99	DIRN	SUR	55	-10	175	0	0	9.7	-3.6	10.3
62094	99	DIRN	SUR	52	-7	190	0	0	12.4	3.5	12.9

4.12 Table 24 - List of Assimilated BUFR Encoded Radiosonde Stations

ASDE02	ASDE04	ASDE09	ASDK01	ASDK02	ASDK03	ASES01	ASEU01	ASEU04
DBLK	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 ASDE04 ASDE09 ASDE09 ASDK01 ASDK02 ASDK03
ASES01 ASEU01 ASEU03 ASEU04 ASEU06 BAGUIO DALANZAD DAVAOAI
DBLK LAOAG LEGASPI LUMBIAA MACTAN MUREN PUERTOP TANAY ULAANBAA
ULAANGOM 17516 48811

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.