ECMWF Global Data Monitoring Report

May 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

Contents

Summary of Revisions (in reverse order)

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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.
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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	Apr	May	Ident	Time	Apr	May
04089	(12)	22	0	03005	(00)	32	57
04692	(12)	24	6	03005	(12)	32	56
27595	(00)	11	0	32477	(00)	12	30
43369	(00)	20	0	32477	(12)	17	31
76595	(12)	15	0	33041	(00)	19	32
78583	(12)	30	6	33041	(12)	19	31
82193	(00)	21	2	33791	(12)	13	28
-	-	-	-	40875	(00)	0	24
-	-	-	-	41256	(00)	0	22
-	-	-	-	42809	(00)	10	31
-	-	-	-	42971	(00)	3	30
-	-	-	-	43150	(00)	0	29
-	-	-	-	43279	(00)	0	22
-	-	-	-	43371	(00)	0	20
-	-	-	-	61024	(12)	4	30
-	-	-	-	61052	(00)	17	31
-	-	-	-	61052	(12)	17	32
-	-	-	-	64400	(00)	0	19
-	-	-	-	64400	(12)	0	22
-	-	-	-	76394	(00)	1	27
-	-	-	-	76394	(12)	2	30
-	-	-	-	80398	(12)	7	28
-	-	-	-	82397	(12)	9	25
-	-	-	-	82532	(00)	9	31
-	-	-	-	82532	(12)	12	31
-	-	-	-	82678	(12)	3	26
-	-	-	-	82705	(00)	11	30
-	-	-	-	82705	(12)	13	31
-	-	-	-	83498	(12)	1	24
-	-	-	-	83612	(12)	0	11
-	-	-	-	84008	(12)	6	25
-	-	-	-	89512	(12)	0	14
-	-	-	-	89592	(12)	0	14
-	-	-	-	91348	(00)	13	30
-	-	-	-	91348	(12)	13	30
-	-	-	-	91843	(00)	12	31
-	-	-	-	96315	(12)	9	31
-	-	-	-	98753	(12)	18	30

2.2   Drifting Buoys

Surface pressure observations from **1504** 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 - MAY 2015
Availability - SYNOP/SHIP (manual, auto) pressure
Average number of observations in 24 hours - 100650
LAND - WMO Region I: 3859 II:18472 III: 2958 IV: 4848
Region V: 8888 VI:48613 Antarctic: 771
Oceans - N. Atlantic 7935 S. Atlantic 131 Indian 345 Pacific 3831
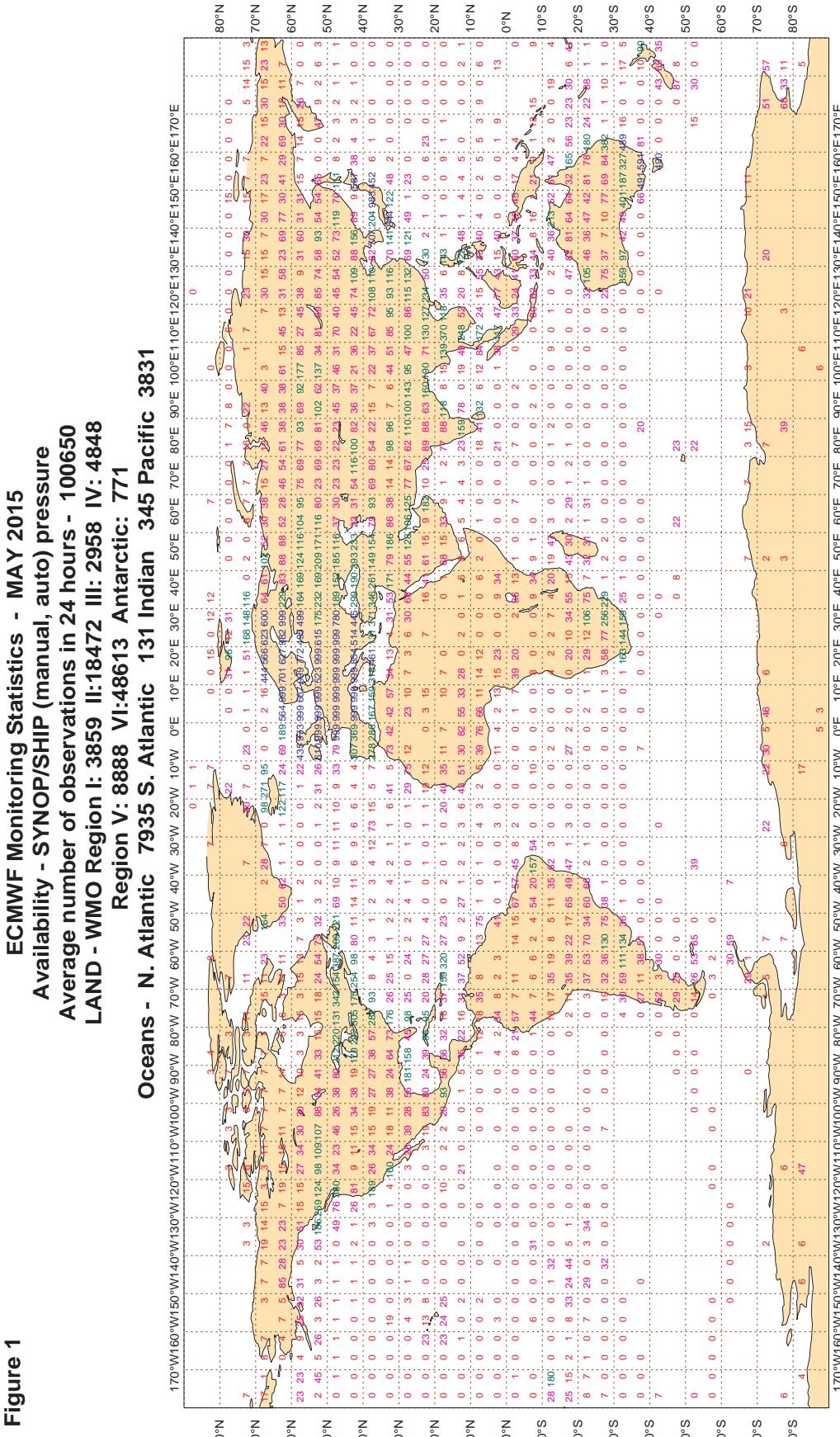
Magics 2.18.4 (64 bit)

3.2.2   Figure 2 - Availability - DRIFTER PRESSURE

Figure 2

ECMWF Monitoring Statistics - MAY 2015
Availability - DRIFTER PRESSURE
Average number of observations in 24 hours - 18517
Oceans - N. Atlantic 4267 S. Atlantic 2903 Indian 3650 Pacific 7697
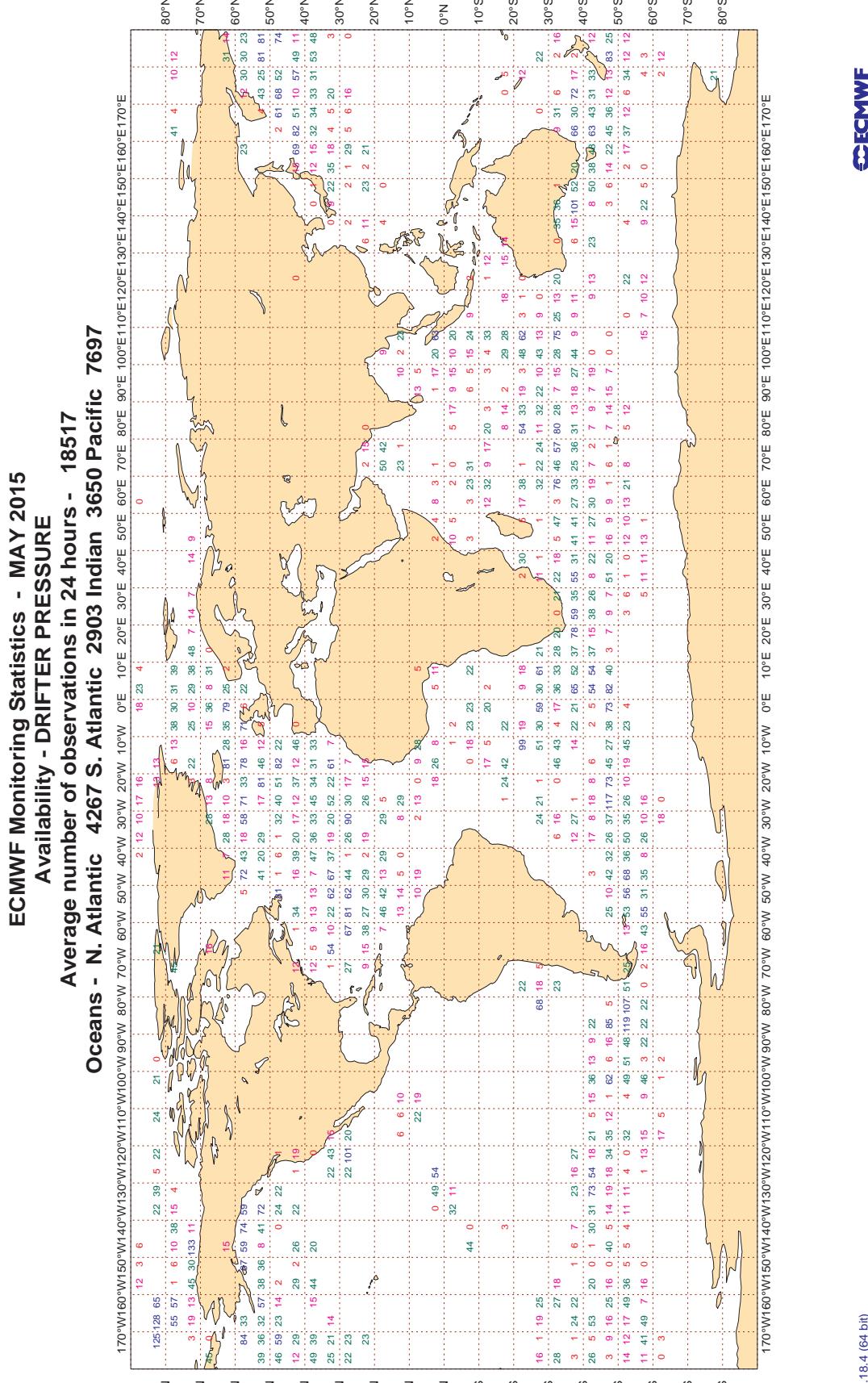
Magics 2.18.4 (64 bit)

3.2.3   Figure 3 - Availability - TEMP 500 hPa geopotential

Figure 3

ECMWF Monitoring Statistics - MAY 2015
Availability - TEMP 500 hPa Geopotential
Average number of observations in 24 hours -   1267
LAND - WMO Region I: 48 II: 483 III: 68 IV: 254
Region V: 123 VI: 258 Antarctic: 14
Oceans - N. Atlantic   14 S. Atlantic   0 Indian   0 Pacific   6
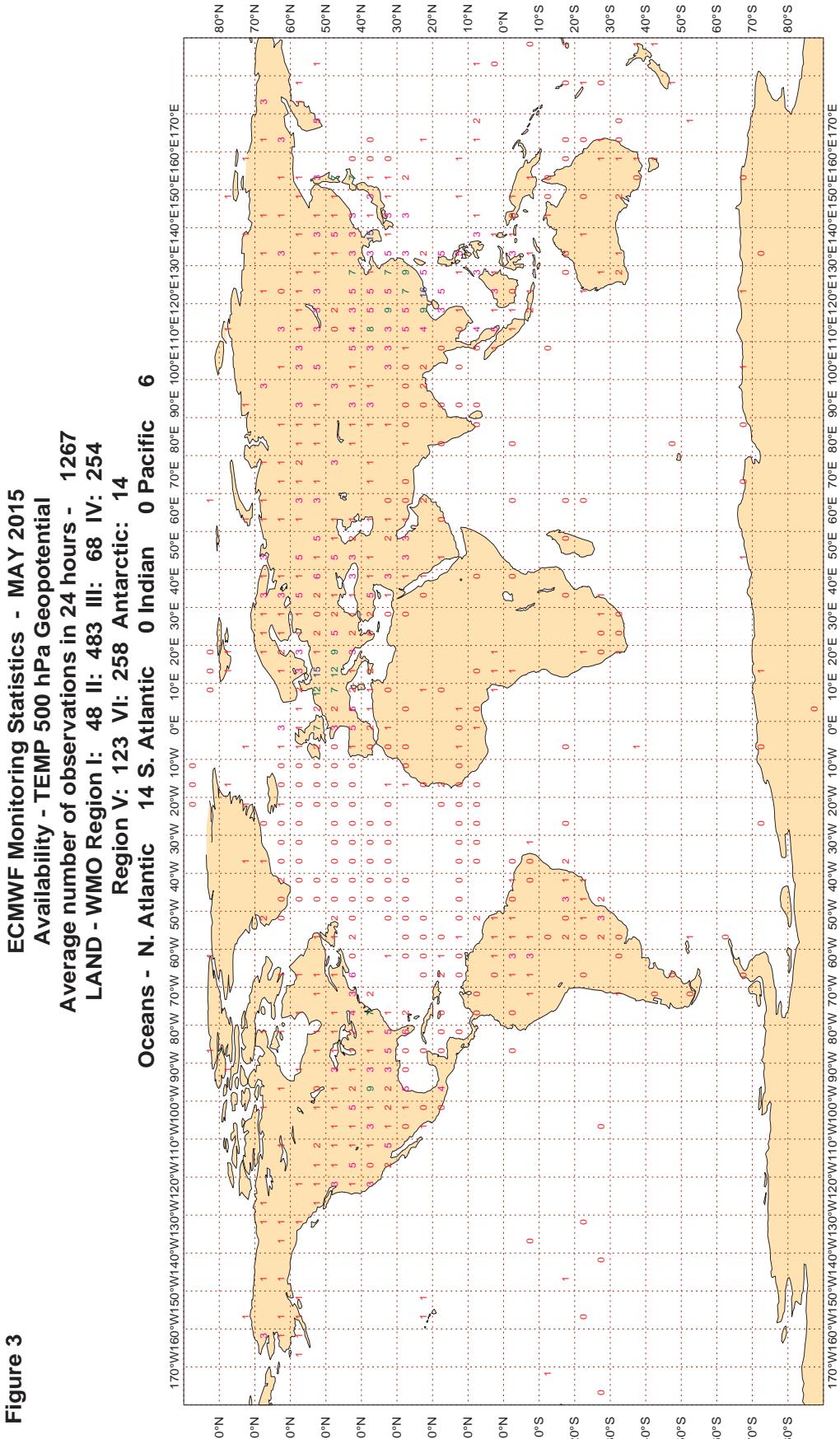
3.2.4   Figure 4 - Availability - TEMP/PILOT 300 hPa wind

Figure 4

ECMWF Monitoring Statistics - MAY 2015
Availability - TEMP/PILOT 300 hPa wind
Average number of observations in 24 hours -   1216
LAND - WMO Region I: 48 II: 461 III: 61 IV: 244
Region V: 115 VI: 254 Antarctic: 14
Oceans - N. Atlantic   14 S. Atlantic   0 Indian   0 Pacific   6
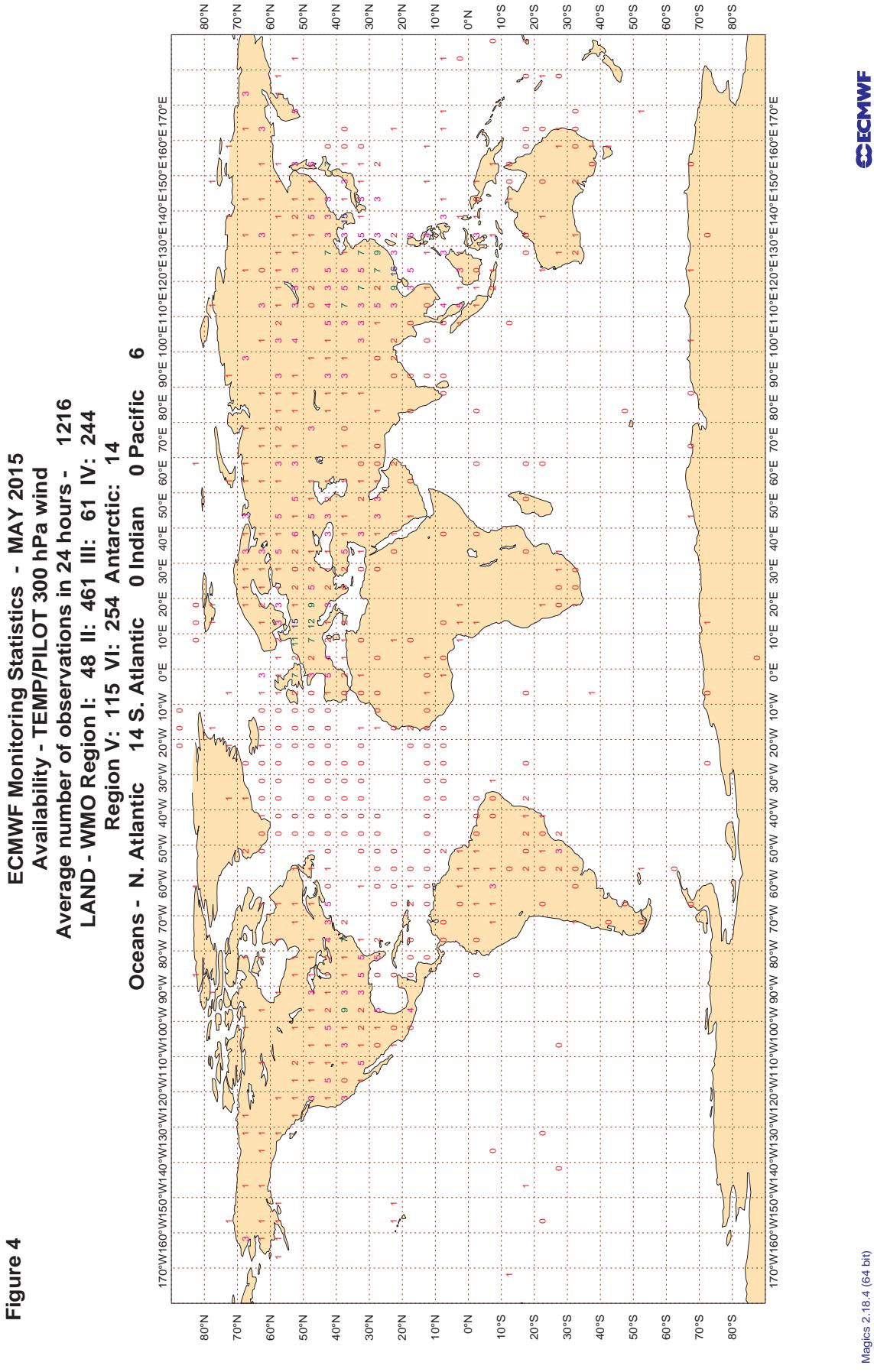
Magics 2.18.4 (64 bit)

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

Figure 5

ECMWF Monitoring Statistics - MAY 2015
Availability - Aircraft winds 300-150 hPa
Average number of observations in 24 hours - 234377
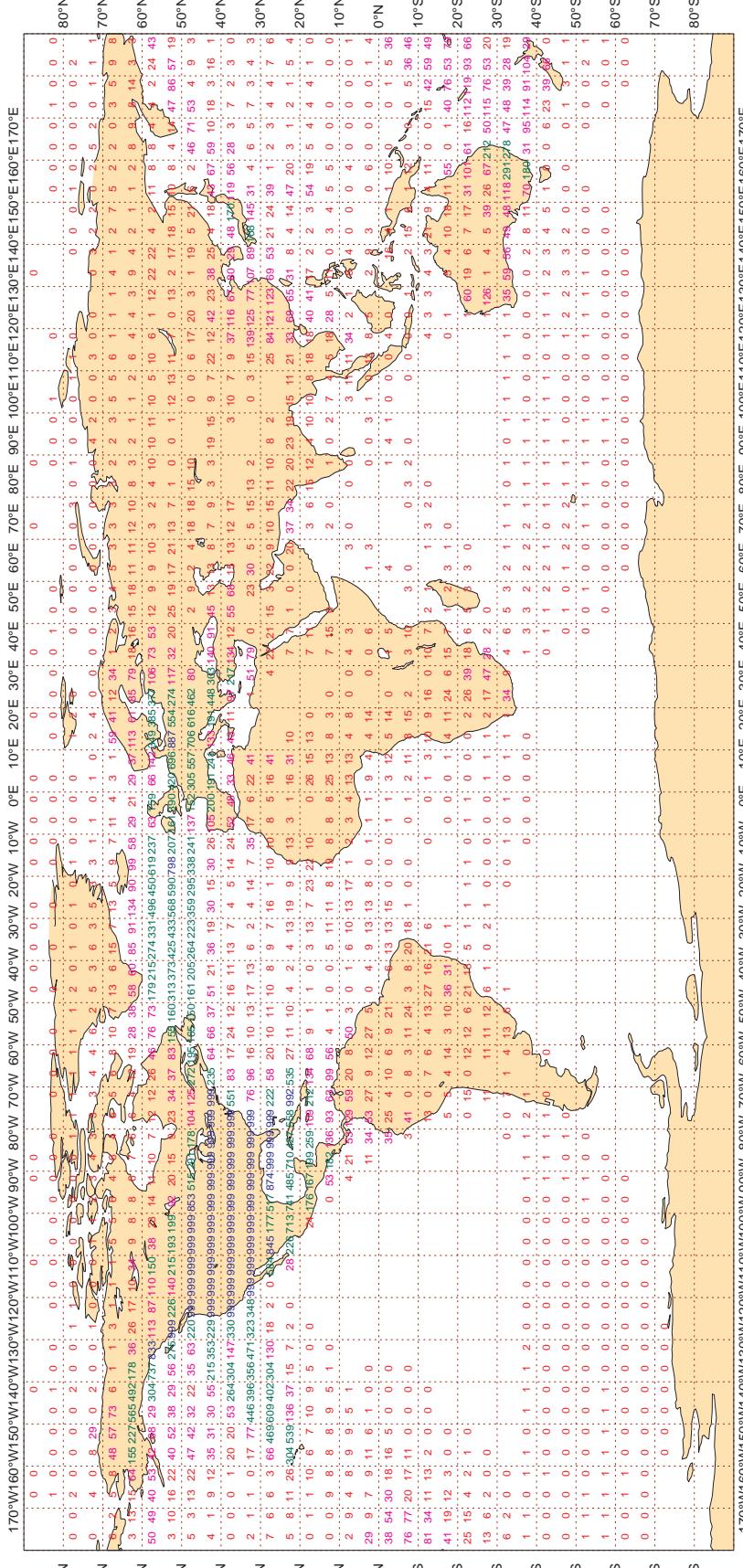
Magics 2.18.4 (64 bit)

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

Figure 6

ECMWF Monitoring Statistics - MAY 2015
Availability - AMV winds 400-150 hPa
Average number of observations in 24 hours - 1108414

Magics 2.18.4 (64 bit)

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

Figure 7

ECMWF Monitoring Statistics - MAY 2015
Availability - AMV winds 1000-700 hPa
Average number of observations in 24 hours - 1172929

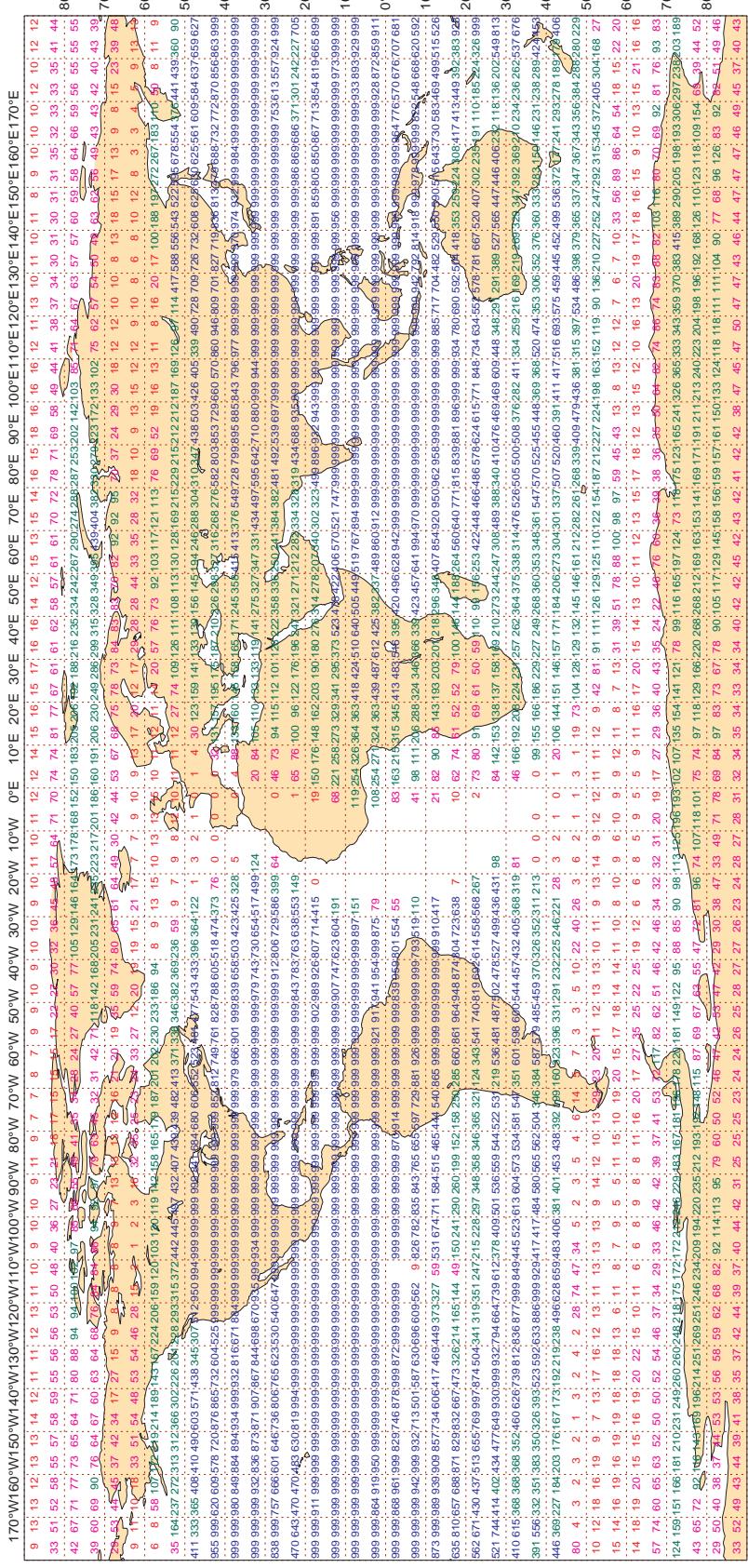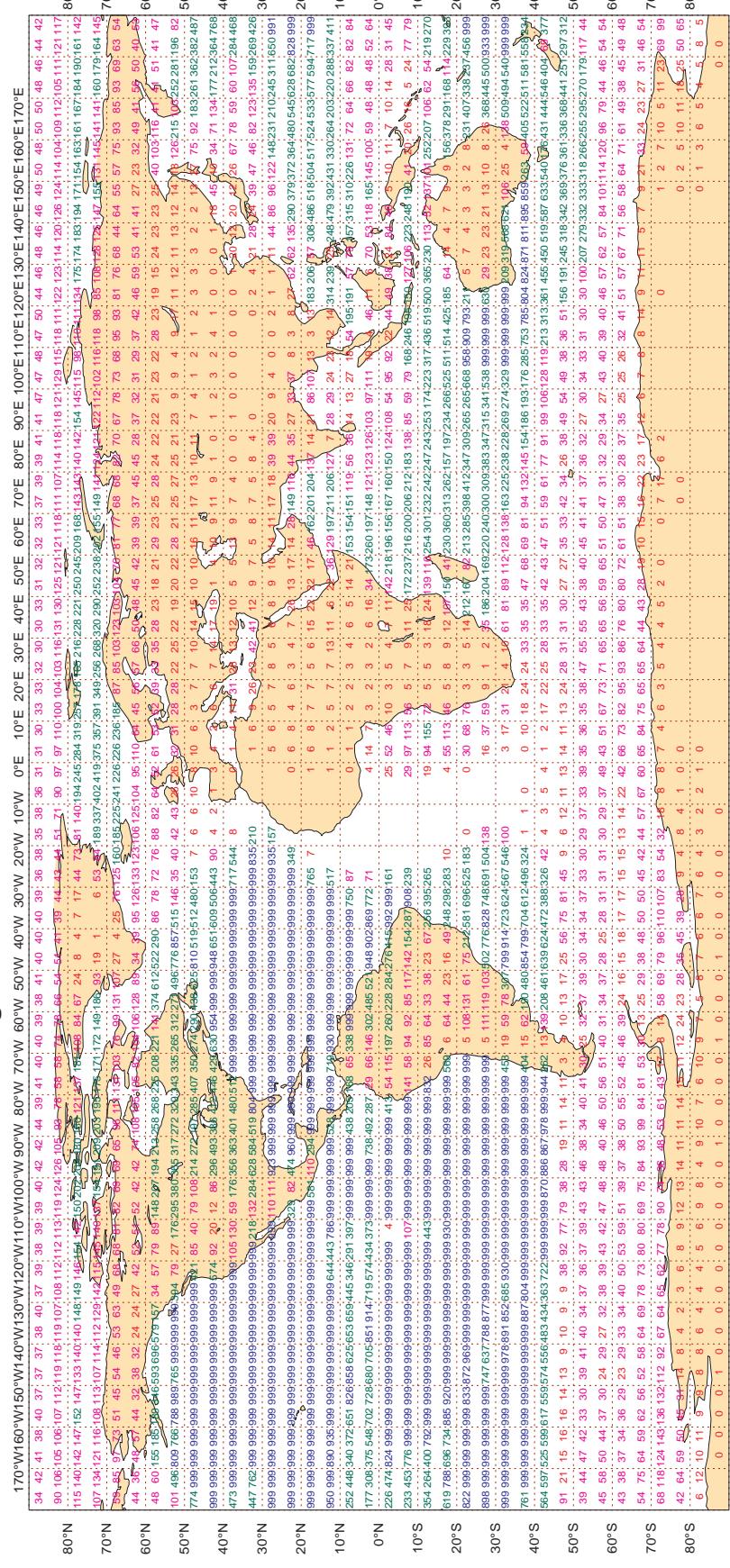Magics 2.18.4 (64 bit)

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

Figure 8

ECMWF Monitoring Statistics - MAY 2015
Availability - NOAA15 ATOVS : AMSU-A
Average number of observations in 24 hours - 325534

Magics 2.18.4 (64 bit)

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

Figure 9.1

ECMWF Monitoring Statistics - MAY 2015
Availability - NOAA18 ATOVS : AMSU-A
Average number of observations in 24 hours - 600260

Magics 2.18.4 (64 bit)

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

Figure 9.2

ECMWF Monitoring Statistics - MAY 2015
Availability - AQUA ATOVS : AMSU-A
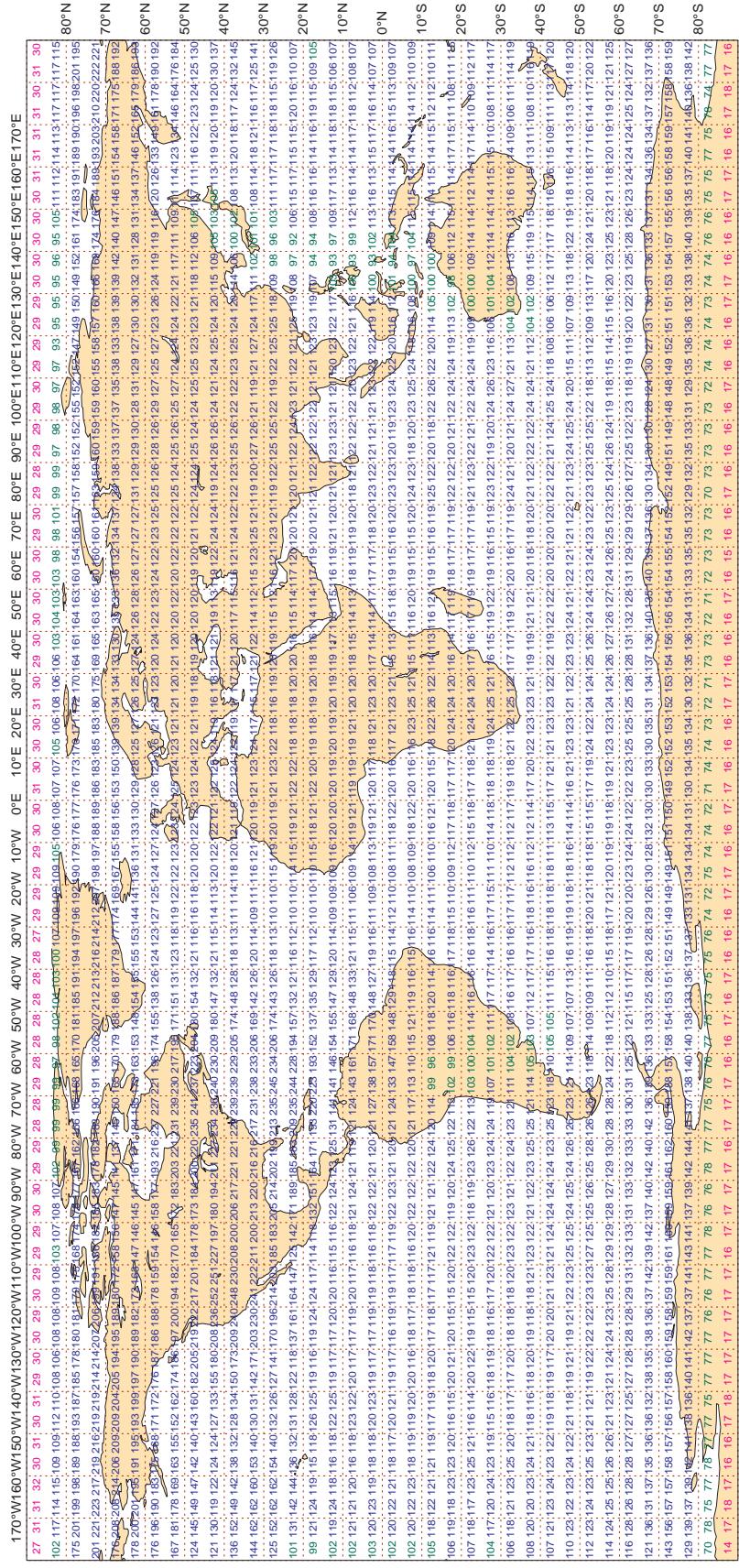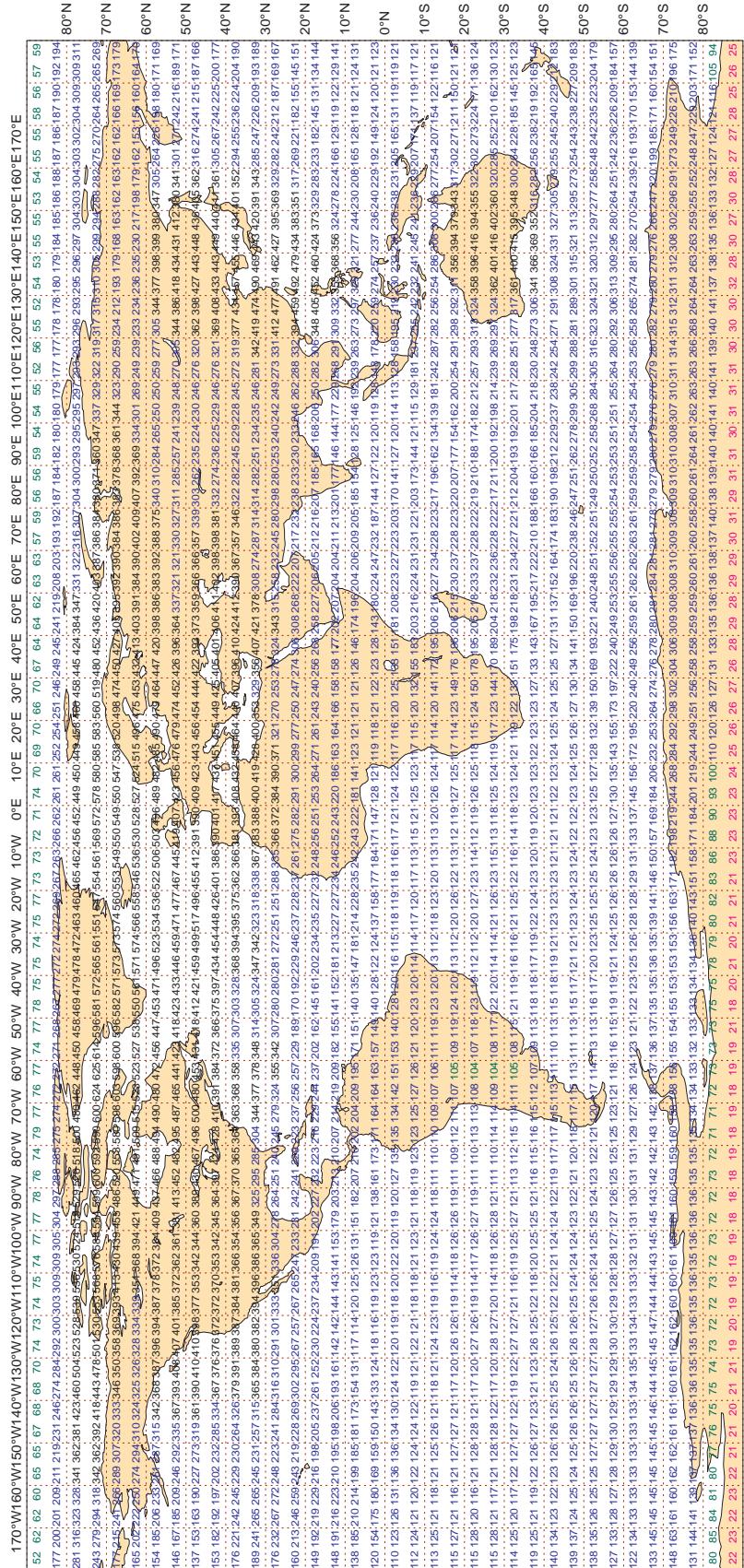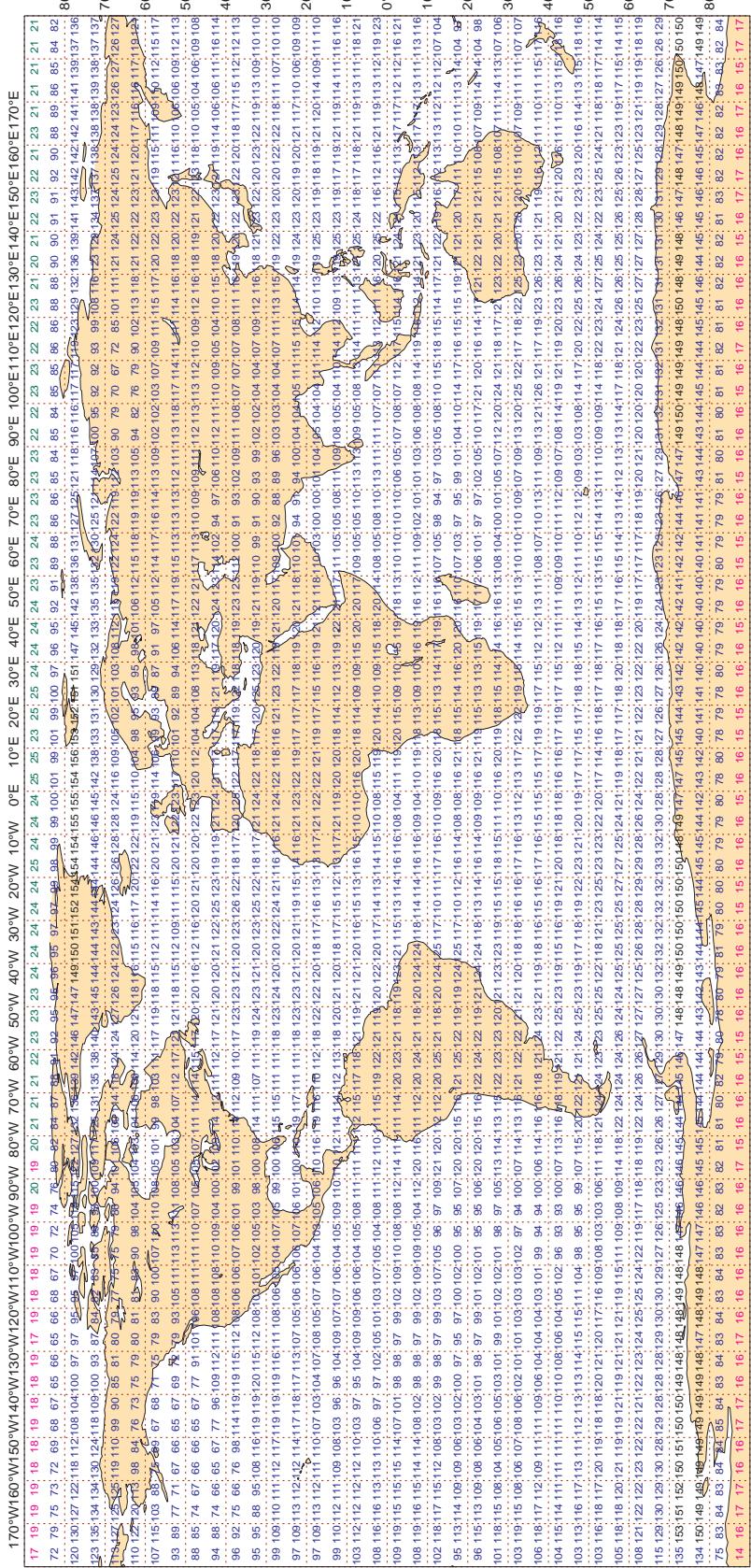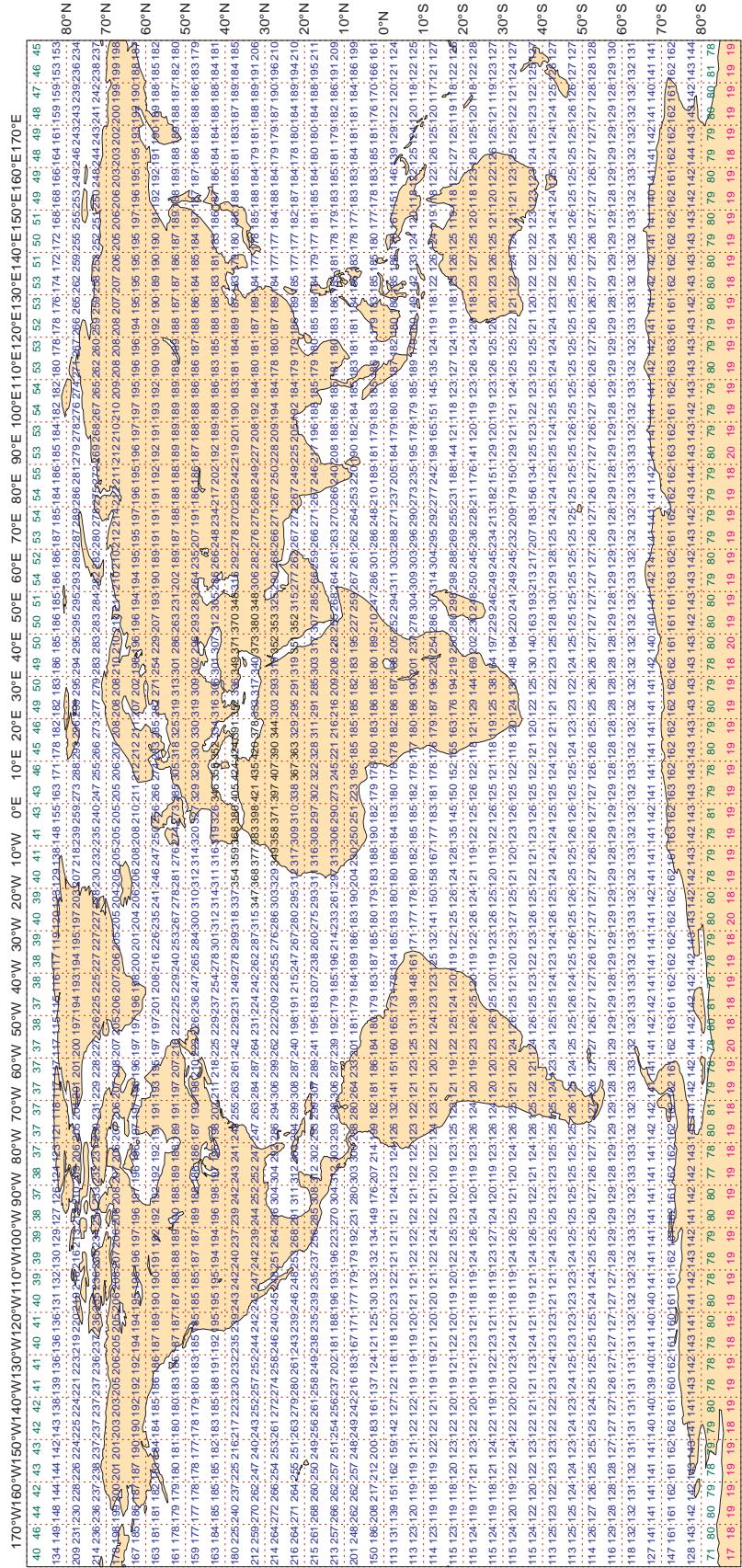Average number of observations in 24 hours - 283113

Magics 2.18.4 (64 bit)

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

Figure 9.3

ECMWF Monitoring Statistics - MAY 2015
Availability - METOP ATOVS : AMSU-A
Average number of observations in 24 hours - 448731

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               : MAY 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
IBCX	99	P	SUR	25	0	3.4	-3.1	4.6
J8NZ	99	P	SUR	21	0	1.1	8.4	8.4

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               : MAY 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
45027	99	SPEED	SUR	32	0	0	2.3	4.1	4.7

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               : MAY 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
45168	99	DIRN	SUR	46	0	0	27.5	35.9	45.3

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                : MAY 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
48627	99	P	SUR	0	0	24	24	0.0	0.0	0.0
48737	99	P	SUR	44	-72	124	124	0.0	0.0	0.0
51618	99	P	SUR	1	-132	214	175	7.0	7.0	9.9
51620	99	P	SUR	-7	-146	217	217	0.0	0.0	0.0
55588	99	P	SUR	-38	164	188	51	2.8	-0.9	2.9
56511	99	P	SUR	0	98	76	28	4.1	-3.5	5.4
64532	99	P	SUR	59	-46	217	155	0.4	-0.1	0.4

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                     : MAY 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                   : MAY 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
15001	99	DIRN	SUR	-10	-10	34	0	0	13.1	27.0	30.0
23099	99	DIRN	SUR	13	80	66	0	0	11.6	31.0	33.1
23451	99	DIRN	SUR	15	69	50	0	0	27.7	-21.2	34.8
23460	99	DIRN	SUR	7	88	26	0	0	15.5	21.1	26.2
23497	99	DIRN	SUR	11	72	27	0	0	153.7	51.3	162.0
31053	99	DIRN	SUR	-32	-50	172	0	0	44.7	36.4	57.7
31260	99	DIRN	SUR	-16	-38	129	0	0	46.4	40.0	61.3
51014	99	DIRN	SUR	-5	-140	190	0	0	12.9	20.3	24.1
51302	99	DIRN	SUR	-8	-155	53	0	0	43.2	-43.0	61.0
52087	99	DIRN	SUR	8	137	44	0	0	48.6	40.4	63.2
53040	99	DIRN	SUR	-8	95	191	0	0	164.0	-9.9	164.3
53056	99	DIRN	SUR	-5	95	141	0	0	128.0	-93.7	158.7

3.2.18   Table 7 - Suspect radiosondes: Geopotential height (metres)

```
         LIST OF SUSPECT STATIONS      : RADIOSONDES
                 MONITORING CENTRE     : ECMWF
                 ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
                 AREA                  : GLOBAL
                 PERIOD                : MAY 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
16716	12	Z	925	38	24	30	0	4.9	-29.4	29.8
24726	00	Z	500	63	114	14	0	34.0	41.7	53.8
24726	12	Z	850	63	114	17	0	17.8	37.6	41.6
31510	00	Z	250	50	127	17	0	44.0	83.5	94.4
31977	00	Z	200	43	132	12	1	40.3	102.9	110.5
33393	00	Z	200	50	24	16	0	36.1	97.2	103.7
40417	12	Z	1000	26	50	17	0	2.8	39.8	39.9
40417	00	Z	1000	26	50	23	0	2.9	40.8	40.9
40430	12	Z	925	25	40	28	1	6.0	44.2	44.6
40430	00	Z	925	25	40	29	0	5.0	41.2	41.5
42182	00	Z	150	29	77	11	1	143.7	21.7	145.3
42410	00	Z	300	26	92	20	0	61.9	-58.8	85.4
43003	00	Z	150	19	73	14	0	129.2	33.8	133.5
43150	00	Z	30	18	83	29	0	26.9	189.6	191.5
43333	00	Z	30	12	93	22	0	30.2	196.6	198.9
89625	12	Z	850	-75	123	28	20	9.3	-86.7	87.2
91680	00	Z	1000	-18	177	31	0	4.2	29.9	30.2
91680	12	Z	1000	-18	177	30	0	15.9	26.0	30.5
96481	12	Z	1000	4	118	25	3	17.9	25.7	31.3
96481	00	Z	50	4	118	22	0	98.9	123.7	158.4
ASEU03	00	Z	250	43	-55	14	3	0.0	216.3	216.3
ASEU03	12	Z	200	44	-60	14	1	51.0	214.1	220.1

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               : MAY 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
78866	12	V	150	18	-63	20	2	-5.0	-0.5	17.0

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                 : MAY 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

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

Figure 10 - ECMWF Monitoring Statistics - MAY 2015 00 UTC
Suspect TEMP observations - GEOPOTENTIAL
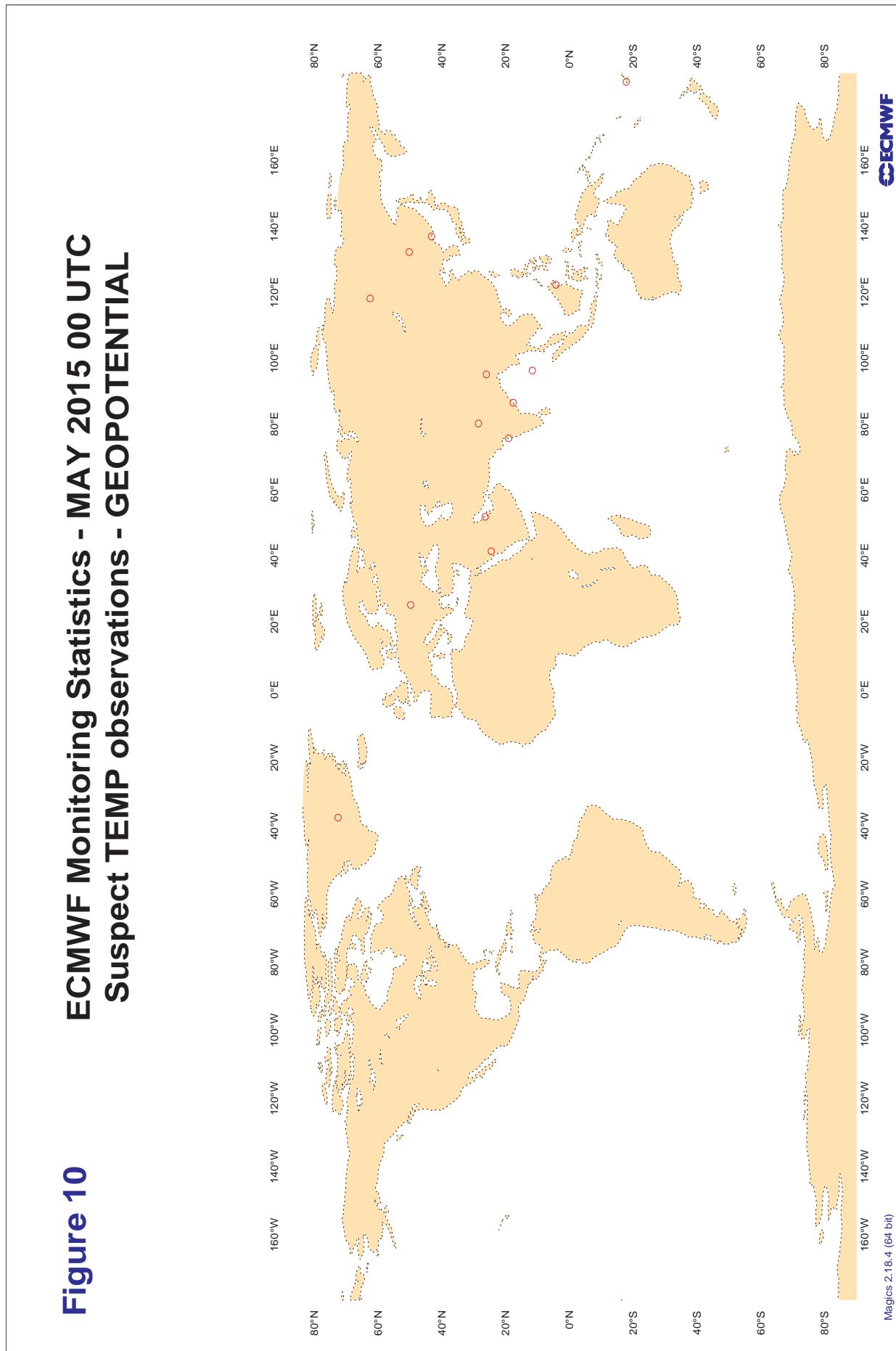
3.2.22 Figure 11 - Suspect TEMP observations - geopotential : 12 UTC

Figure 11 - ECMWF Monitoring Statistics - MAY 2015 12 UTC
Suspect TEMP observations - GEOPOTENTIAL
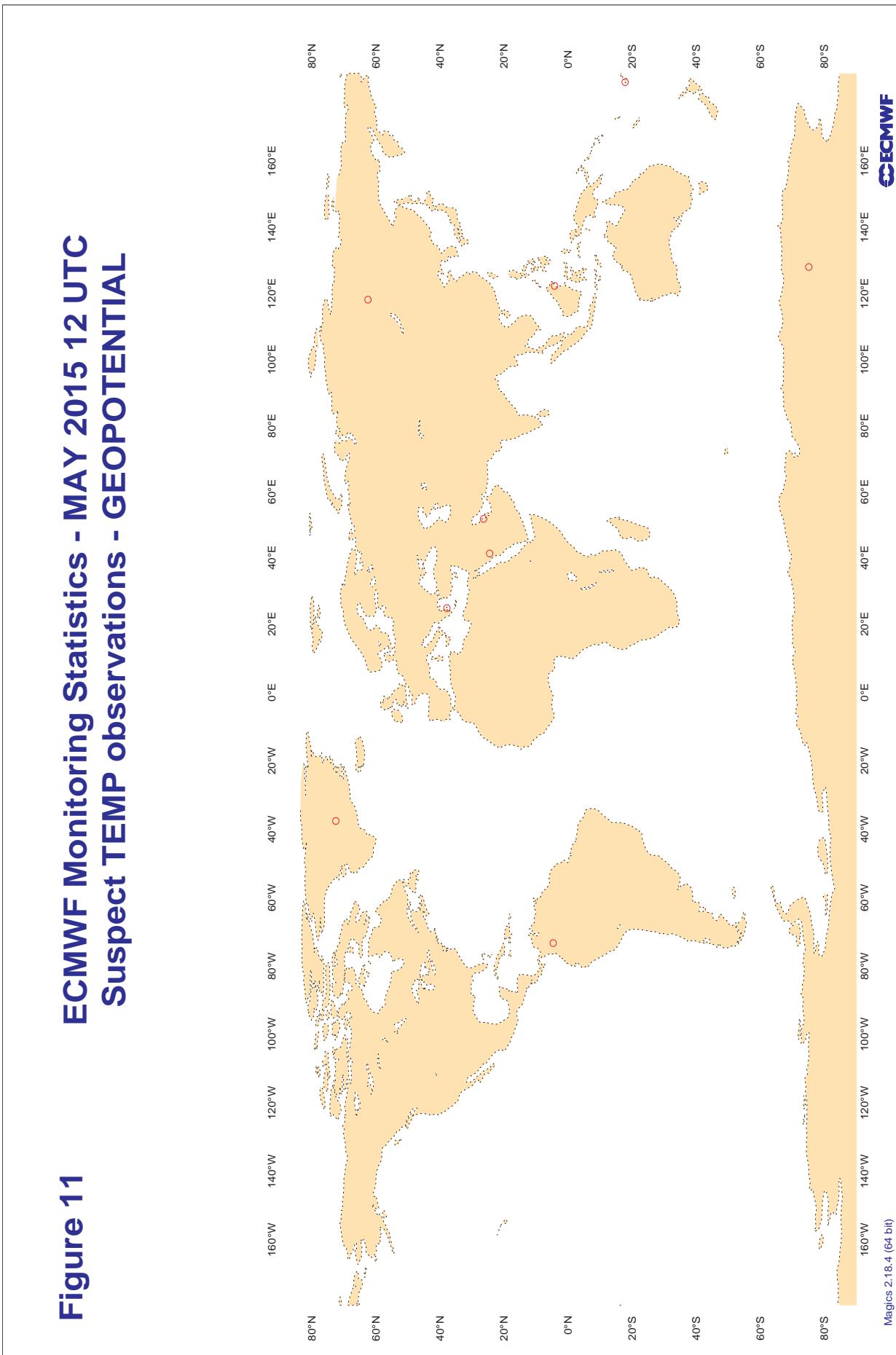
3.2.23   Figure 12 - Suspect TEMP/PILOT observations - wind : 00 UTC

Figure 12   ECMWF Monitoring Statistics - MAY 2015 00 UTC
Suspect TEMP/PILOT observations - WIND
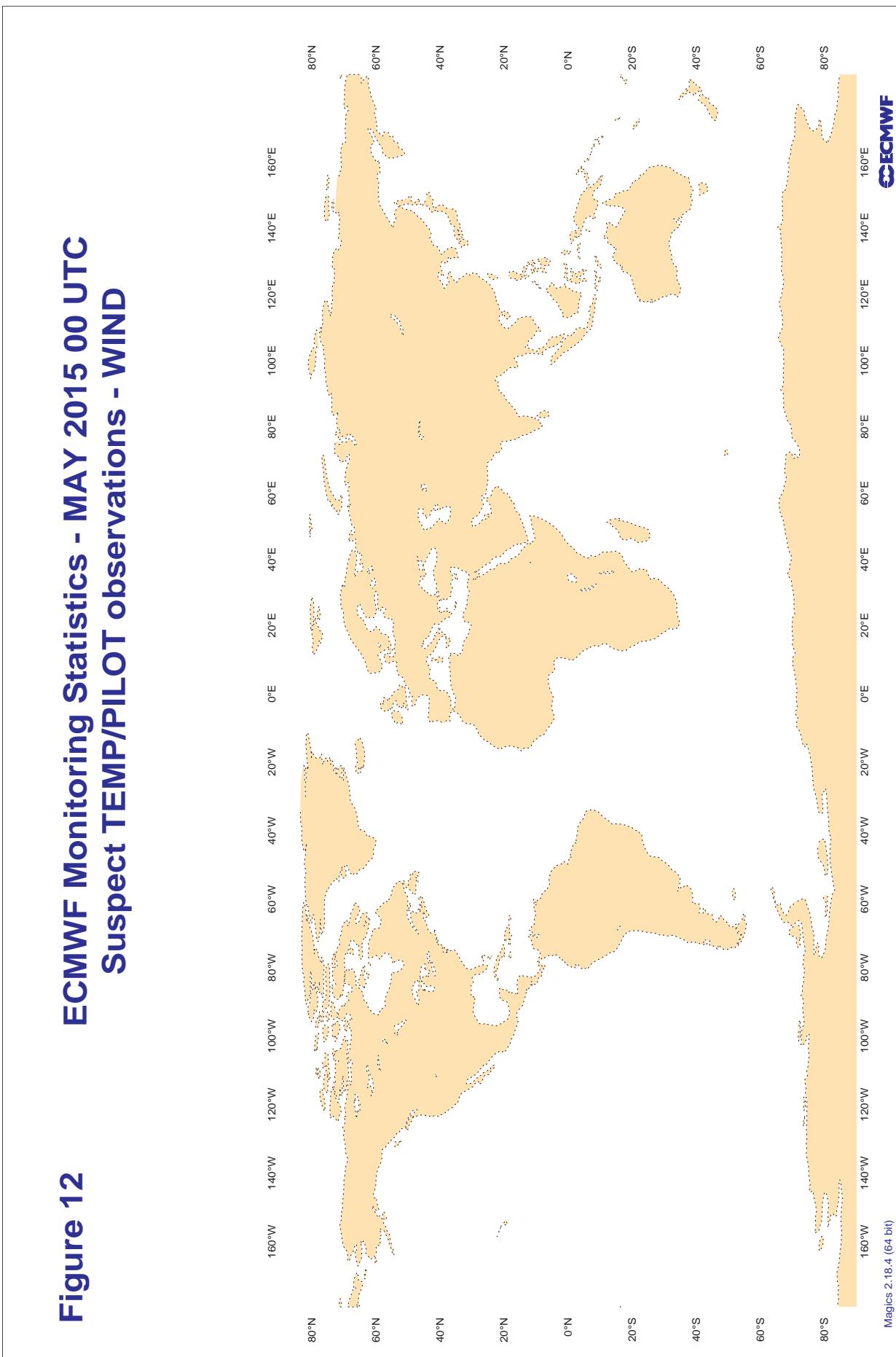
3.2.24 Figure 13 - Suspect TEMP/PILOT observations - wind : 12 UTC

Figure 13

ECMWF Monitoring Statistics - MAY 2015 12 UTC
Suspect TEMP/PILOT observations - WIND

Magics 2.18.4 (64 bit)
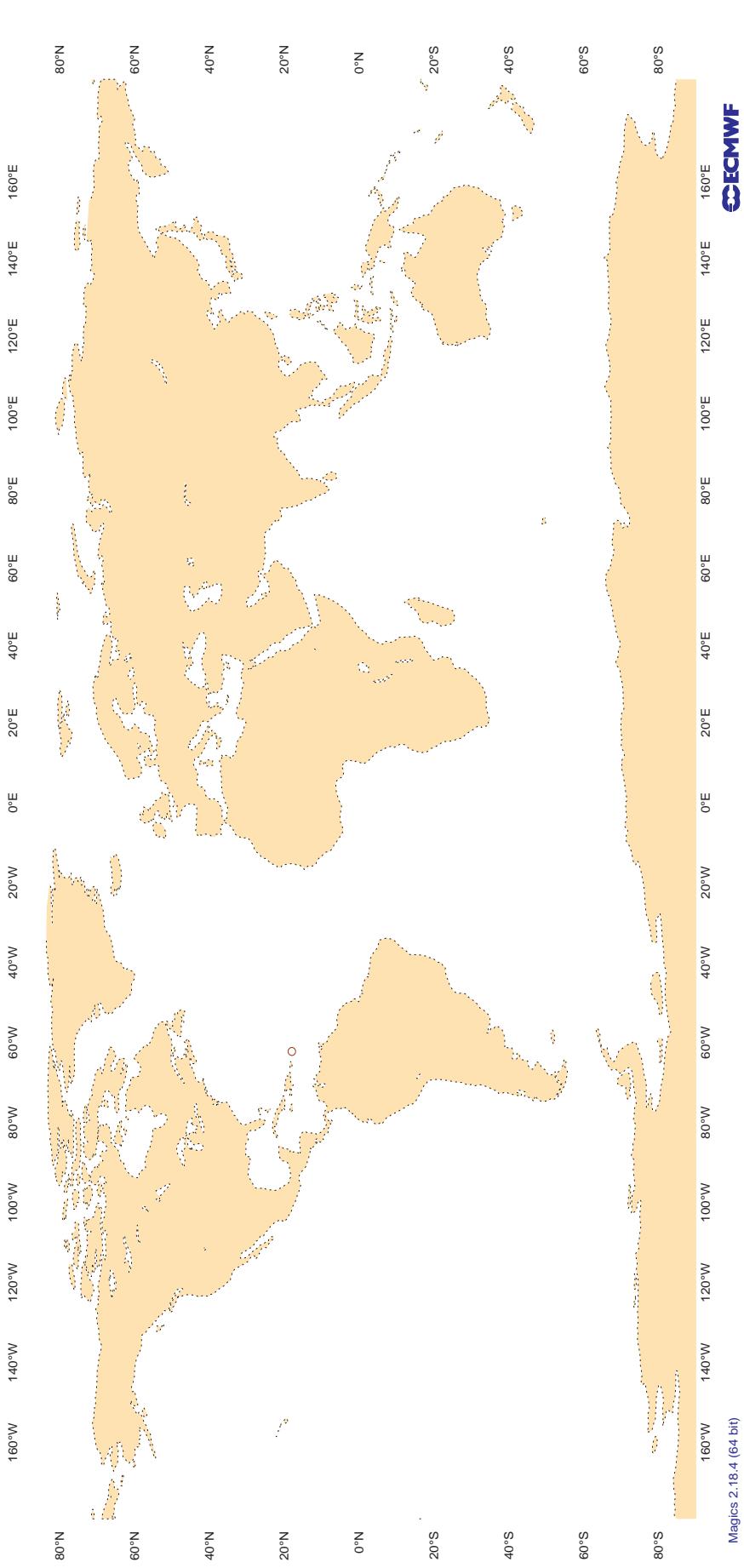
3.2.25   Table 10 - Radiosonde monitoring statistics (SHIPs): Geopotential height (metres)

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
AALUAA	00	Z	100	0	0.0	0.0
AALUAA	12	Z	100	0	0.0	0.0
AALUMO	12	Z	100	6	8.2	8.2
ALADDA	12	Z	100	0	0.0	0.0
ALADDA	00	Z	100	0	0.0	0.0
ASDE01	12	Z	100	14	86.1	52.3
ASDE01	00	Z	100	12	24.1	10.3
ASDE02	12	Z	100	3	29.8	29.7
ASDE02	00	Z	100	29	25.4	24.8
ASDE03	12	Z	100	8	27.4	26.3
ASDE03	00	Z	100	13	11.7	6.4
ASDE04	00	Z	100	7	42.3	41.7
ASDE04	12	Z	100	8	45.4	41.0
ASDE09	12	Z	100	3	16.8	-4.2
ASDK1	12	Z	100	9	23.3	22.8
ASDK1	00	Z	100	10	24.5	23.7
ASDK2	12	Z	100	9	8.1	5.4
ASDK2	00	Z	100	9	7.6	2.4
ASDK3	12	Z	100	12	27.9	26.1
ASDK3	00	Z	100	12	23.8	21.5
ASES01	12	Z	100	7	25.4	23.6
ASEU01	12	Z	100	2	23.1	22.6
ASEU01	00	Z	100	22	51.9	21.9
ASEU02	12	Z	100	7	40.9	39.3
ASEU02	00	Z	100	9	39.6	38.2
ASEU03	12	Z	100	14	239.4	234.3
ASEU03	00	Z	100	14	217.2	216.8
ASEU04	12	Z	100	3	18.0	17.1
ASEU04	00	Z	100	8	7.6	4.6
ASEU05	12	Z	100	14	25.0	23.5
ASEU05	00	Z	100	15	23.4	21.9
ASEU06	12	Z	100	8	11.5	9.4
ASEU06	00	Z	100	7	19.3	-18.7
ASFR1	12	Z	100	10	11.4	6.2
ASFR1	00	Z	100	12	7.9	3.3
ASFR2	12	Z	100	10	11.0	7.5
ASFR2	00	Z	100	14	13.7	7.2
ASFR3	12	Z	100	15	13.9	11.4
ASFR3	00	Z	100	14	13.7	10.7

RADIOSONDE MONITORING STATISTICS (SHIPS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASFR4	12	Z	100	5	15.0	12.6
ASFR4	00	Z	100	5	15.3	12.5
BAGUIO	00	Z	100	0	0.0	0.0
DAVAO0	12	Z	100	0	0.0	0.0
DAVAO0	00	Z	100	0	0.0	0.0
DBLK	12	Z	100	1	18.2	18.2
JGQH	12	Z	100	6	6.6	5.0
JGQH	00	Z	100	6	8.1	4.3
LAOAG	00	Z	100	2	70.8	70.8
LAOAG	12	Z	100	4	39.6	39.4
LEGASP	12	Z	100	19	15.5	14.7
LEGASP	00	Z	100	2	17.6	17.6
LGKI	00	Z	100	30	9.3	-3.4
LGKI	12	Z	100	29	6.7	-0.9
LUMBIA	12	Z	100	0	0.0	0.0
LUMBIA	00	Z	100	0	0.0	0.0
MACTAN	12	Z	100	19	12.3	10.4
MACTAN	00	Z	100	0	0.0	0.0
MUREN	00	Z	100	7	7.5	7.5
PUERTO	12	Z	100	0	0.0	0.0
PUERTO	00	Z	100	0	0.0	0.0
TANAY	12	Z	100	5	26.2	25.7
TANAY	00	Z	100	0	0.0	0.0
UFT5	00	Z	100	23	17.2	15.9

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
AALUAA	00	V	100	0	0.0	0.0	0.0
AALUAA	12	V	100	0	0.0	0.0	0.0
AALUMO	12	V	100	1	2.8	-0.9	-2.7
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	14	3.7	0.4	-0.7
ASDE01	00	V	100	12	3.1	0.1	-0.3
ASDE02	12	V	100	3	7.2	0.2	-4.5
ASDE02	00	V	100	29	4.7	0.7	-0.6
ASDE03	12	V	100	8	3.3	-0.2	0.0
ASDE03	00	V	100	13	4.0	-0.9	1.4
ASDE04	00	V	100	5	2.8	0.7	1.1
ASDE04	12	V	100	8	4.0	0.1	0.0
ASDE09	12	V	100	3	4.9	-2.1	1.5
ASDK1	12	V	100	9	2.7	-0.4	0.4
ASDK1	00	V	100	10	1.9	0.8	0.2
ASDK2	12	V	100	9	2.1	-0.3	0.8
ASDK2	00	V	100	9	1.9	0.3	0.0
ASDK3	12	V	100	12	2.2	-0.1	0.5
ASDK3	00	V	100	12	2.8	-0.7	0.0
ASES01	12	V	100	7	4.5	-1.6	-1.5
ASEU01	12	V	100	2	3.9	0.1	1.8
ASEU01	00	V	100	21	3.3	0.3	0.0
ASEU02	12	V	100	6	4.1	-1.6	-1.9
ASEU02	00	V	100	8	3.9	-0.8	-0.6
ASEU03	12	V	100	14	3.1	-0.1	0.0
ASEU03	00	V	100	12	2.6	-1.3	-0.2
ASEU04	12	V	100	2	4.0	2.7	0.4
ASEU04	00	V	100	7	2.1	0.2	-0.1
ASEU05	12	V	100	13	3.0	-0.5	0.7
ASEU05	00	V	100	13	3.4	0.0	0.5
ASEU06	12	V	100	5	4.0	-0.7	3.4
ASEU06	00	V	100	6	6.4	-1.7	3.5
ASFR1	12	V	100	9	2.6	-0.2	-0.7
ASFR1	00	V	100	9	5.6	0.7	0.3
ASFR2	12	V	100	10	2.0	0.1	0.4
ASFR2	00	V	100	13	3.3	-0.1	1.2
ASFR3	12	V	100	15	2.9	0.4	-0.7
ASFR3	00	V	100	14	3.3	0.5	-0.3

RADIOSONDE MONITORING STATISTICS (SHIPS)
(CONTINUED)

| WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASFR4	12	V	100	5	2.5	1.3	0.1
ASFR4	00	V	100	5	1.8	0.4	-0.4
BAGUIO	00	V	100	0	0.0	0.0	0.0
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	1	1.9	-0.6	-1.8
JGQH	12	V	100	6	4.6	2.4	1.0
JGQH	00	V	100	6	3.1	0.6	-1.4
LAOAG	00	V	100	1	2.9	-0.1	-2.9
LAOAG	12	V	100	4	3.4	1.0	-0.5
LEGASP	12	V	100	12	3.9	-0.9	-0.6
LEGASP	00	V	100	1	0.4	-0.3	-0.3
LGKI	00	V	100	27	2.2	0.0	0.0
LGKI	12	V	100	27	2.4	0.2	0.0
LUMBIA	12	V	100	0	0.0	0.0	0.0
LUMBIA	00	V	100	0	0.0	0.0	0.0
MACTAN	12	V	100	10	4.5	0.3	-1.9
MACTAN	00	V	100	0	0.0	0.0	0.0
MUREN	00	V	100	2	1.3	0.8	-0.9
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	5	3.9	0.1	2.8
TANAY	00	V	100	0	0.0	0.0	0.0
UFT5	00	V	100	23	2.1	-0.2	-0.2

3.2.27 Figure 14 - SATOB Winds: 700-1000hPa

Figure 14

ECMWF Monitoring Statistics: May 2015
AMV Winds: 700-1000hPa
Mean Observed Wind
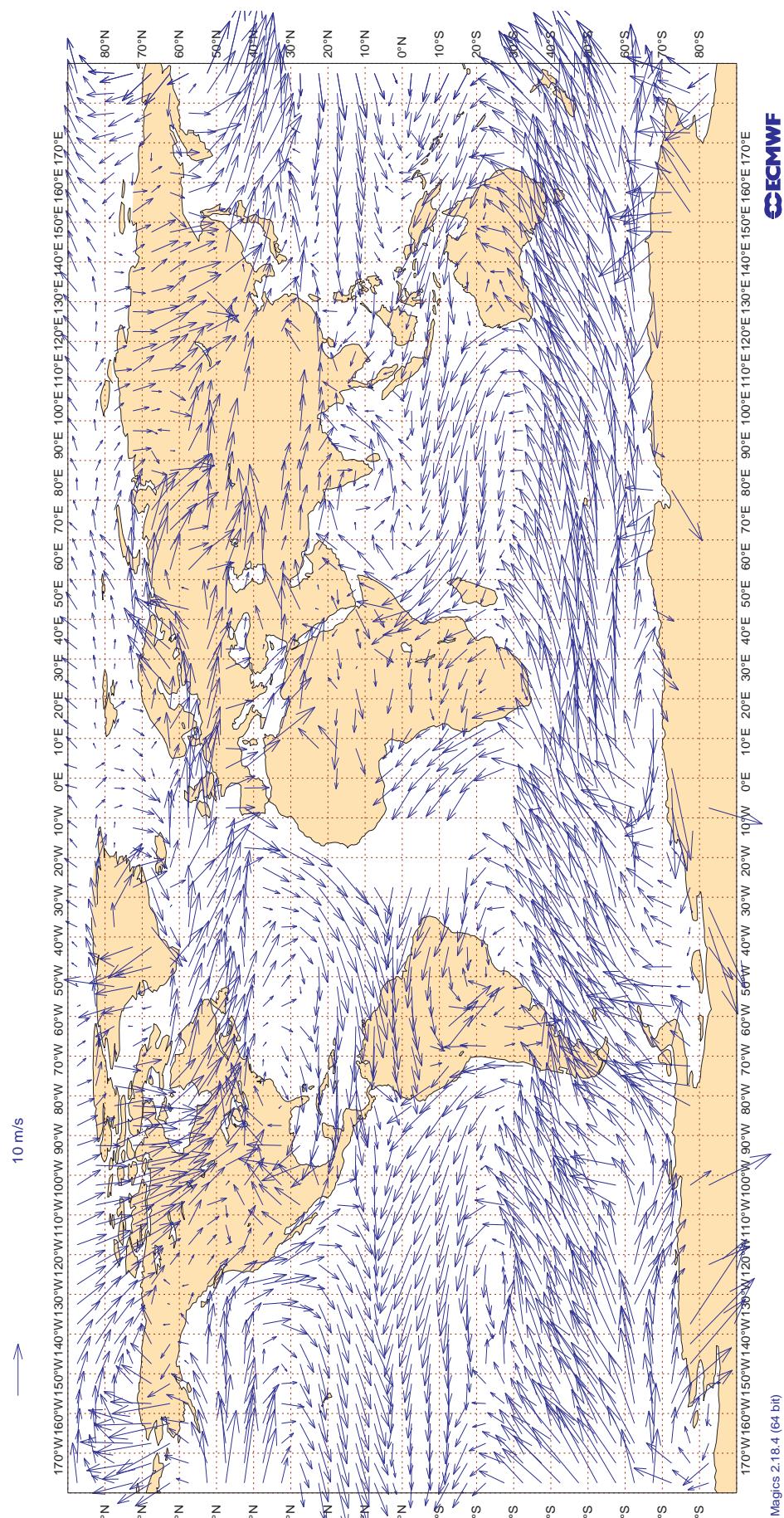
3.2.28   Figure 15 - SATOB Winds: 150- 400hPa

Figure 15
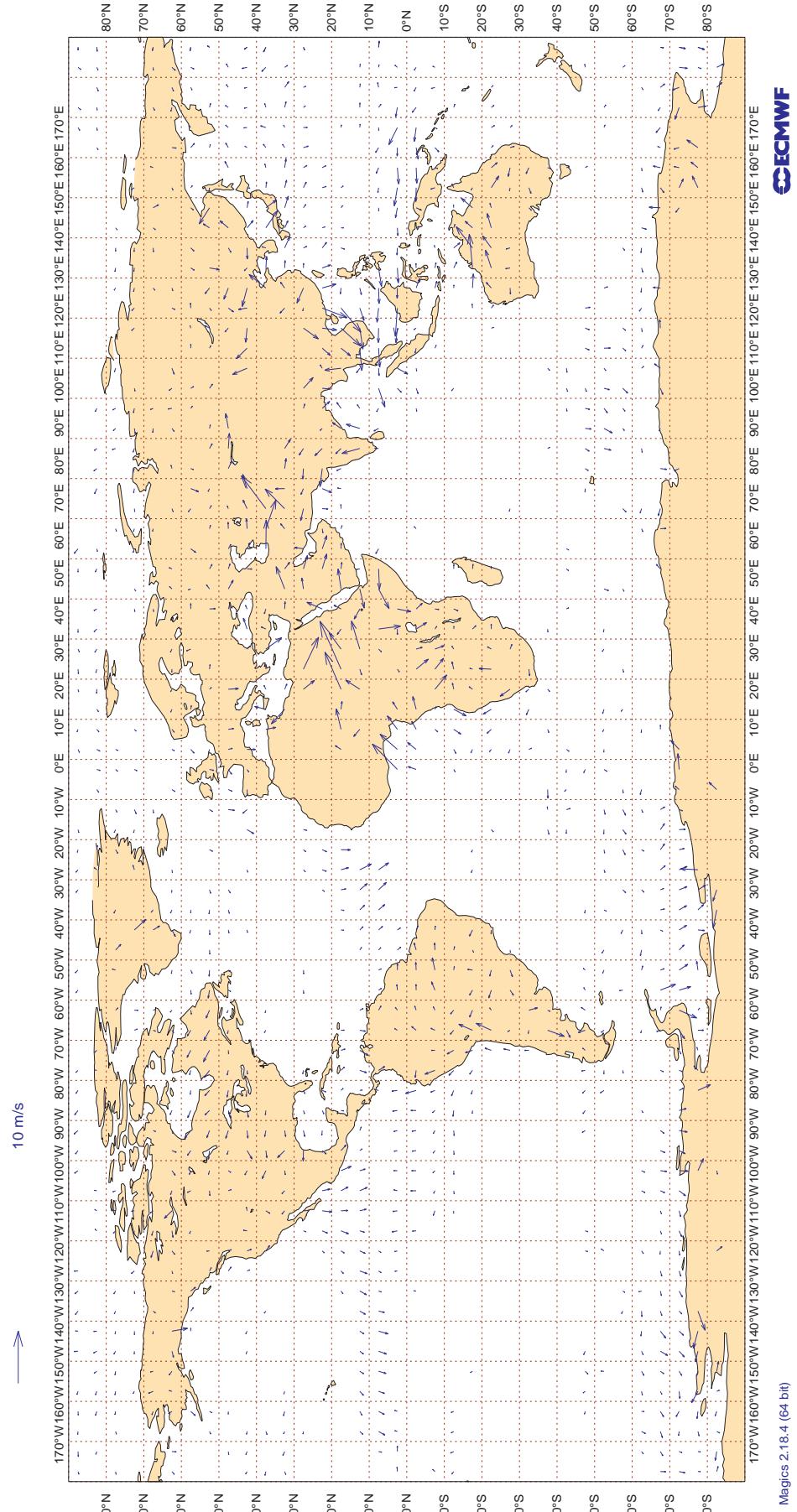
ECMWF Monitoring Statistics: May 2015
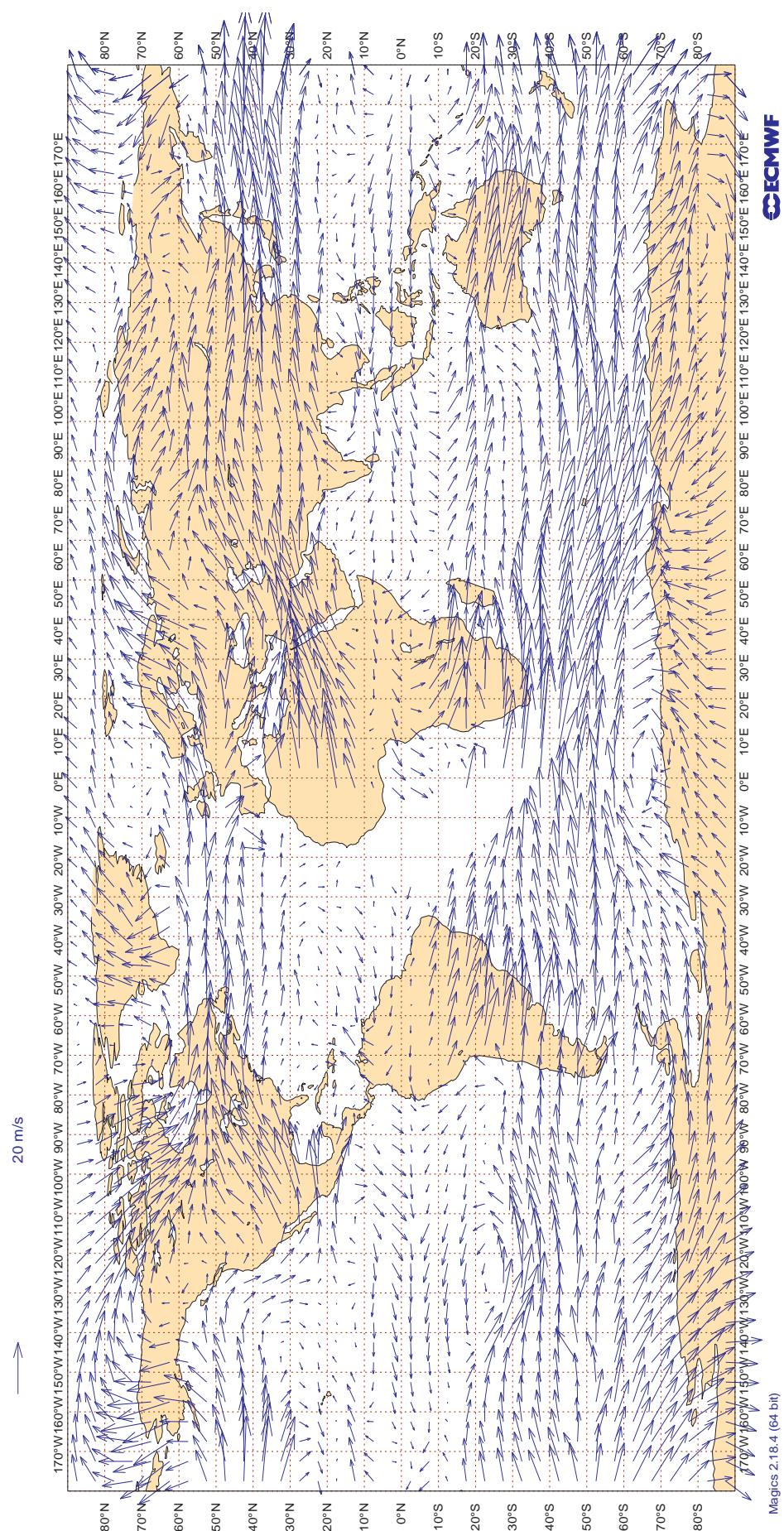AMV Winds: 150- 400hPa
Wind bias: Observation - FG
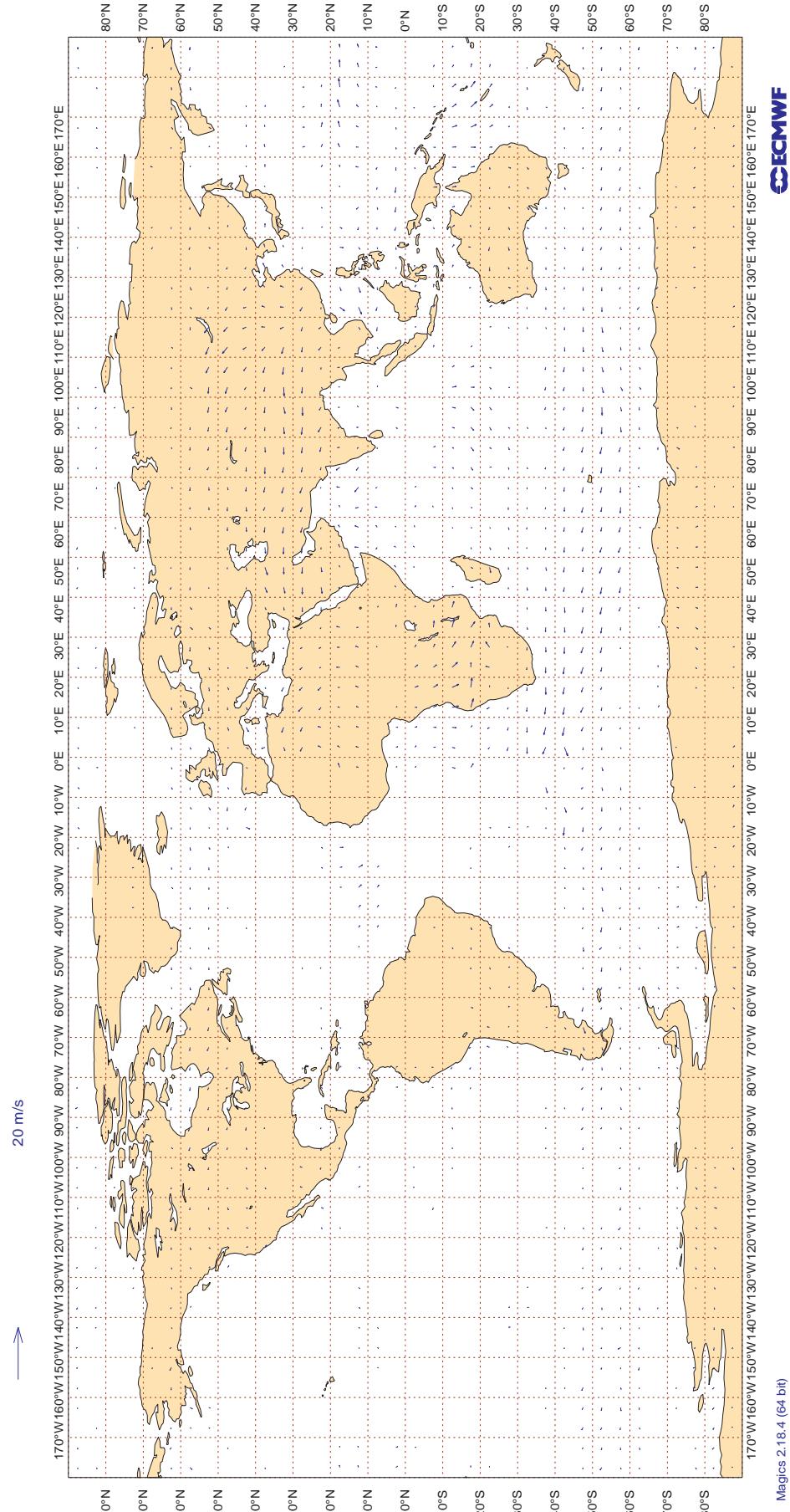
3.2.29   Figure 16 - SATOB Winds: 700-1000hPa

Figure 16

ECMWF Monitoring Statistics: May 2015
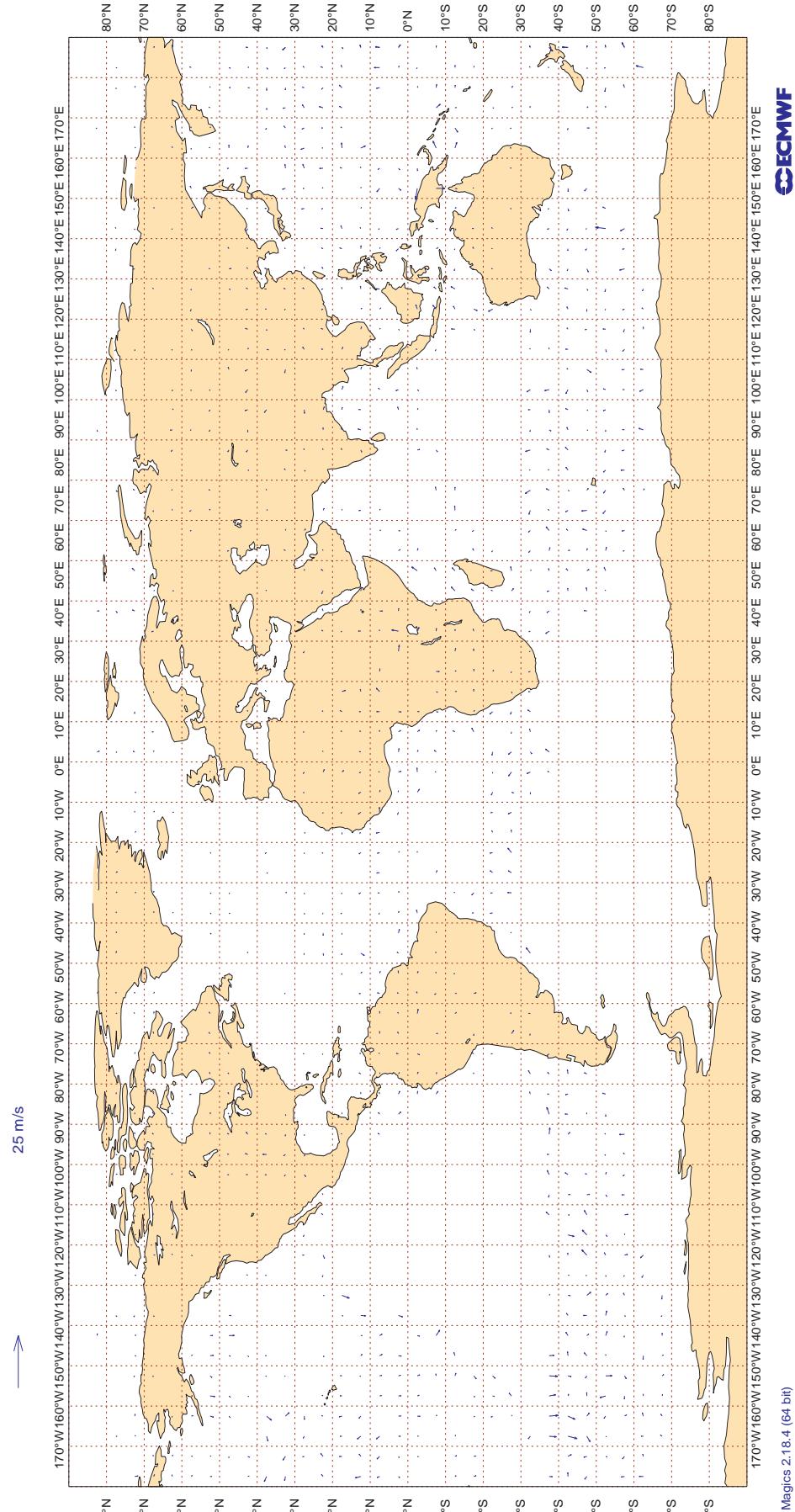AMV Winds: 700-1000hPa
Wind bias: Observation - FG

3.2.30   Figure 17 - SATOB Winds: 150- 400hPa

Figure 17

ECMWF Monitoring Statistics: May 2015
AMV Winds: 150- 400hPa
Mean Observed Wind

20 m/s

Magics 2.18.4 (64 bit)

3.2.31   Figure 18 - AIRCRAFT Winds: 150- 300hPa

Figure 18

ECMWF Monitoring Statistics: May 2015
Aircraft Winds: 150- 300hPa
Wind bias: Observation - FG

25 m/s

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                 : MAY 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	7427	0	0	4.0	-0.1
AAR	99	V	300-150	45	0	0	6.3	0.0
AAY	99	V	300-150	210	0	0	5.1	-0.3
ABW	99	V	300-150	52	0	0	2.5	0.3
ABX	99	V	300-150	45	0	0	4.5	-1.6
ACA	99	V	300-150	2603	1	0	4.5	-0.1
ACI	99	V	300-150	548	0	0	4.4	0.4
AFL	99	V	300-150	295	0	0	3.0	0.0
AFR	99	V	300-150	2856	0	0	3.8	0.3
AIC	99	V	300-150	624	0	0	3.5	0.0
AMX	99	V	300-150	322	8	0	9.6	0.3
ANZ	99	V	300-150	2651	0	0	4.7	0.6
ASA	99	V	300-150	2944	0	0	4.9	0.3
ASY	99	V	300-150	36	0	0	8.8	4.0
ATN	99	V	300-150	35	0	0	4.3	-0.2
AUA	99	V	300-150	1279	0	0	4.1	-0.9
AVN	99	V	300-150	76	0	0	6.9	0.7
AXM	99	V	300-150	55	0	0	5.6	2.0
AZA	99	V	300-150	791	0	0	3.7	0.8
BAW	99	V	300-150	3983	1	0	4.0	-0.1
BEL	99	V	300-150	436	0	0	3.5	0.0
BER	99	V	300-150	1313	0	0	3.9	0.9
BOX	99	V	300-150	67	0	0	3.0	0.0
CAL	99	V	300-150	44	0	0	6.1	1.2
CFC	99	V	300-150	42	0	0	2.8	0.6
CFG	99	V	300-150	298	0	0	3.9	-0.4
CKS	99	V	300-150	298	0	0	4.8	0.0
CLX	99	V	300-150	280	0	0	3.3	0.4
CNV	99	V	300-150	54	0	0	3.9	-0.1
CRL	99	V	300-150	55	0	0	7.1	1.5
CSN	99	V	300-150	134	0	0	5.0	0.4
DAH	99	V	300-150	110	0	0	4.0	1.0

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	9362	0	0	4.1	-0.5
DHK	99	V	300-150	224	0	0	4.2	1.0
DLH	99	V	300-150	5241	0	0	3.8	0.2
EIN	99	V	300-150	1714	0	0	3.6	-0.3
EJM	99	V	300-150	80	33	0	20.5	-0.4
ELY	99	V	300-150	370	0	0	4.1	-0.4
ETD	99	V	300-150	535	0	0	3.5	0.5
ETH	99	V	300-150	45	2	0	4.3	-0.3
FDX	99	V	300-150	1294	0	0	3.6	0.3
FIN	99	V	300-150	164	3	0	3.0	0.3
FJI	99	V	300-150	1108	0	0	5.1	0.1
FWI	99	V	300-150	95	0	0	3.1	-0.7
GEC	99	V	300-150	297	0	0	2.7	-0.1
GTI	99	V	300-150	286	0	0	3.6	-0.4
HAL	99	V	300-150	569	0	0	5.1	0.6
IAF	99	V	300-150	25	0	0	3.4	-0.5
IBE	99	V	300-150	495	0	0	3.2	0.2
JAF	99	V	300-150	87	0	0	4.5	-1.5
JAI	99	V	300-150	430	0	0	3.6	0.9
JST	99	V	300-150	1118	0	0	7.0	1.1
KAI	99	V	300-150	32	0	0	3.9	0.8
KAL	99	V	300-150	605	0	0	4.2	0.8
KLM	99	V	300-150	2207	0	0	3.7	-0.1
LAN	99	V	300-150	80	3	0	6.8	-0.7
LOT	99	V	300-150	32	16	0	8.2	0.2
MAS	99	V	300-150	86	0	0	3.8	0.6
MMD	99	V	300-150	62	0	0	3.5	-0.1
MMN	99	V	300-150	29	0	0	4.9	-2.2
MSR	99	V	300-150	213	0	0	3.5	-0.1
NAX	99	V	300-150	146	7	0	9.0	0.9
NCA	99	V	300-150	38	0	0	3.7	-0.9
NJE	99	V	300-150	43	14	0	4.8	-0.7
OAE	99	V	300-150	106	0	0	4.4	0.0
PAC	99	V	300-150	22	0	0	3.5	0.6
PAL	99	V	300-150	25	0	0	4.9	1.2
QFA	99	V	300-150	2060	0	0	4.6	-0.4
QTR	99	V	300-150	199	0	0	2.8	0.1
RCH	99	V	300-150	588	0	0	4.8	0.0
REP	99	V	300-150	24	0	0	5.4	1.7
RJA	99	V	300-150	109	7	0	7.8	0.0
ROU	99	V	300-150	461	0	0	3.9	-1.1
RRR	99	V	300-150	29	0	0	2.7	0.8
SAM	99	V	300-150	32	31	0	18.8	-1.8

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
SAS	99	V	300-150	864	0	0	3.1	0.3
SIA	99	V	300-150	233	0	0	4.1	0.4
SOO	99	V	300-150	26	0	0	2.4	-0.4
SQC	99	V	300-150	43	0	0	4.2	0.9
SVA	99	V	300-150	406	0	0	3.5	0.0
SWR	99	V	300-150	966	0	0	3.6	0.7
TAM	99	V	300-150	93	0	0	3.4	0.3
TAP	99	V	300-150	94	0	0	5.4	0.4
TAY	99	V	300-150	109	0	0	2.9	0.0
TCV	99	V	300-150	24	0	0	5.1	-2.5
TCX	99	V	300-150	536	0	0	3.5	0.9
TFL	99	V	300-150	79	24	0	12.8	-1.0
THA	99	V	300-150	75	0	0	4.3	0.3
THT	99	V	300-150	133	0	0	3.4	0.3
THY	99	V	300-150	431	0	0	3.5	0.1
TOM	99	V	300-150	848	10	0	8.1	-0.8
TSC	99	V	300-150	252	0	0	3.2	0.3
TSO	99	V	300-150	265	0	0	3.6	0.3
UAE	99	V	300-150	885	0	0	3.8	0.1
UAL	99	V	300-150	12651	0	0	4.4	-0.3
UPS	99	V	300-150	984	0	0	4.4	0.6
VIR	99	V	300-150	1647	0	0	3.8	0.1
VJT	99	V	300-150	52	35	0	23.2	0.4
VOZ	99	V	300-150	1210	0	0	4.2	-0.2
VPB	99	V	300-150	24	0	0	3.2	0.8
VPC	99	V	300-150	34	32	0	10.6	0.1
VQB	99	V	300-150	30	0	0	3.4	0.8
WGT	99	V	300-150	22	0	0	3.0	0.5
WJA	99	V	300-150	318	1	0	3.8	0.2
XLF	99	V	300-150	96	0	0	3.1	-0.2

4 EUCOS Area Monitoring Statistics

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

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

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

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	50	30	14.0	10.1
01001	00	Z	50	31	16.1	12.4
01028	00	Z	50	31	16.0	14.4
01028	12	Z	50	31	13.6	12.0
01400	12	Z	50	18	38.8	17.1
01400	00	Z	50	17	28.1	24.2
01415	00	Z	50	29	11.2	7.4
01415	12	Z	50	30	18.9	15.7
02365	12	Z	50	41	13.2	9.1
02365	00	Z	50	45	14.2	3.6
02591	00	Z	50	32	20.4	19.0
02591	12	Z	50	35	17.4	16.3
02836	00	Z	50	29	14.2	11.9
02836	12	Z	50	30	15.8	11.7
02963	00	Z	50	30	15.4	14.7
02963	12	Z	50	31	15.3	13.4
03005	00	Z	50	57	11.5	2.8
03005	12	Z	50	54	13.4	8.8
03238	12	Z	50	9	17.3	16.6
03238	00	Z	50	29	14.0	8.4
03808	00	Z	50	54	8.2	2.6
03808	12	Z	50	61	10.5	4.5
03918	00	Z	50	26	12.6	8.7
03918	12	Z	50	11	21.1	19.0
03953	12	Z	50	31	22.0	17.0
03953	00	Z	50	30	14.5	9.2
04018	12	Z	50	25	17.3	12.2
04018	00	Z	50	25	13.7	10.8
04220	00	Z	50	28	14.7	6.4
04220	12	Z	50	28	22.3	20.0
04270	12	Z	50	31	23.2	19.3
04270	00	Z	50	29	12.4	-1.0
04320	00	Z	50	31	19.8	-11.6
04320	12	Z	50	31	17.0	-3.0
04339	00	Z	50	31	22.9	19.1
04339	12	Z	50	29	29.7	20.6
04360	12	Z	50	14	25.9	18.7
04360	00	Z	50	10	26.8	-11.3
06011	00	Z	50	20	15.5	4.3

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	50	14	22.9	19.3
06260	00	Z	50	29	13.9	10.8
06260	12	Z	50	3	20.4	20.1
06610	12	Z	50	31	20.2	15.7
06610	00	Z	50	31	14.8	-0.8
07110	00	Z	50	28	22.6	17.5
07110	12	Z	50	25	26.4	21.4
07510	00	Z	50	17	14.1	11.1
07510	12	Z	50	22	38.7	29.3
07645	12	Z	50	13	70.8	68.4
07645	00	Z	50	16	52.3	51.4
07761	00	Z	50	12	9.7	-0.6
07761	12	Z	50	17	15.4	6.8
08001	00	Z	50	25	17.7	13.6
08001	12	Z	50	26	21.3	17.6
08221	12	Z	50	30	20.4	18.0
08221	00	Z	50	31	16.3	13.7
08302	00	Z	50	31	9.4	4.4
08302	12	Z	50	31	12.3	6.6
08495	12	Z	50	1	10.2	10.2
08508	12	Z	50	29	33.3	31.1
08522	12	Z	50	24	18.0	15.1
08579	12	Z	50	31	22.8	19.8
10035	00	Z	50	31	7.9	4.5
10035	12	Z	50	30	14.5	10.9
10393	00	Z	50	31	7.1	4.4
10393	12	Z	50	31	11.1	7.6
10410	00	Z	50	30	8.7	3.4
10410	12	Z	50	31	12.0	6.9
10739	00	Z	50	30	10.2	5.0
10739	12	Z	50	29	17.6	15.1
11035	12	Z	50	31	7.2	4.3
11035	00	Z	50	31	11.1	7.3
12982	00	Z	50	29	11.4	8.1
12982	12	Z	50	30	40.0	39.1
16044	12	Z	50	30	10.6	3.8
16044	00	Z	50	31	12.5	6.5
16080	12	Z	50	31	25.8	-2.5
16080	00	Z	50	29	9.0	2.1
16245	00	Z	50	31	9.3	4.1
16245	12	Z	50	29	13.1	4.3
16320	00	Z	50	30	9.4	7.0
16320	12	Z	50	30	10.5	3.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	50	30	13.7	1.6
16429	00	Z	50	30	10.1	5.3
16622	00	Z	50	27	50.3	41.7
16754	00	Z	50	28	35.5	30.8
17607	12	Z	50	17	25.5	-22.9
26435	00	Z	50	14	17.2	15.3
60018	00	Z	50	30	17.5	16.8
60018	12	Z	50	29	14.4	11.0
ASDE01	12	Z	50	14	96.6	66.8
ASDE01	00	Z	50	10	30.2	21.4
ASDE02	12	Z	50	3	37.5	37.3
ASDE02	00	Z	50	29	35.0	34.2
ASDE03	12	Z	50	5	42.1	40.8
ASDE03	00	Z	50	9	15.3	14.1
ASDE04	00	Z	50	5	45.3	44.6
ASDE04	12	Z	50	8	50.0	45.7
ASDE09	12	Z	50	3	25.5	-2.6
ASDK1	12	Z	50	7	28.9	28.4
ASDK1	00	Z	50	9	28.5	28.1
ASDK2	12	Z	50	9	12.0	9.4
ASDK2	00	Z	50	9	7.4	4.6
ASDK3	12	Z	50	11	33.4	31.1
ASDK3	00	Z	50	10	29.8	27.4
ASES01	12	Z	50	7	41.2	38.3
ASEU01	12	Z	50	2	36.9	35.8
ASEU01	00	Z	50	19	70.5	30.9
ASEU02	12	Z	50	5	50.3	49.7
ASEU02	00	Z	50	8	46.9	45.7
ASEU03	12	Z	50	14	261.1	256.0
ASEU03	00	Z	50	14	222.8	222.1
ASEU04	12	Z	50	2	25.1	24.9
ASEU04	00	Z	50	7	12.2	10.7
ASEU05	12	Z	50	14	34.8	32.6
ASEU05	00	Z	50	12	24.8	23.5
ASEU06	12	Z	50	6	30.8	29.0
ASEU06	00	Z	50	5	20.9	-2.9
ASFR1	12	Z	50	9	19.1	11.1
ASFR1	00	Z	50	10	14.2	10.6
ASFR2	12	Z	50	8	19.6	17.5
ASFR2	00	Z	50	14	19.6	11.9
ASFR3	12	Z	50	15	18.8	15.7
ASFR3	00	Z	50	14	19.3	17.4
ASFR4	12	Z	50	5	18.1	17.4

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASFR4	00	Z	50	4	19.4	17.6
DAVAO0	12	Z	50	0	0.0	0.0
DAVAO0	00	Z	50	0	0.0	0.0
DBLK	12	Z	50	1	27.5	27.5
LGKI	00	Z	50	29	9.2	1.9
LGKI	12	Z	50	29	9.9	5.5
LUMBIA	12	Z	50	0	0.0	0.0
LUMBIA	00	Z	50	0	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	27	25.2	24.1

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	50	30	2.1	0.2	0.0
01001	00	V	50	31	2.5	-0.2	0.4
01028	00	V	50	31	2.4	0.3	0.1
01028	12	V	50	31	2.5	0.2	-0.6
01400	12	V	50	12	3.3	-0.5	-0.7
01400	00	V	50	10	2.7	-0.4	-0.2
01415	00	V	50	27	2.7	0.2	-0.2
01415	12	V	50	30	2.5	0.8	-0.5
02365	12	V	50	30	2.8	-0.2	-0.1
02365	00	V	50	29	2.8	0.5	0.0
02591	00	V	50	26	2.4	-0.3	0.0
02591	12	V	50	28	2.6	0.3	-0.7
02836	00	V	50	29	3.1	0.0	0.3
02836	12	V	50	30	2.5	0.3	-0.3
02963	00	V	50	27	2.5	0.6	-0.5
02963	12	V	50	31	2.3	0.1	-0.7
03005	00	V	50	30	2.1	0.3	0.0
03005	12	V	50	31	3.1	0.9	0.9
03238	12	V	50	9	2.8	0.2	0.9
03238	00	V	50	26	3.5	0.7	-0.4
03808	00	V	50	31	2.7	0.8	-0.3
03808	12	V	50	31	3.1	0.7	-0.7
03918	00	V	50	22	3.9	0.3	0.2
03918	12	V	50	10	3.9	-0.2	0.1
03953	12	V	50	31	3.2	-0.1	-0.4
03953	00	V	50	29	3.3	0.1	-0.2
04018	12	V	50	25	1.9	-0.1	0.5
04018	00	V	50	25	2.9	0.1	0.0
04220	00	V	50	27	2.7	0.6	0.4
04220	12	V	50	28	2.2	-0.1	0.4
04270	12	V	50	31	2.6	0.3	0.3
04270	00	V	50	28	2.9	-0.2	-0.5
04320	00	V	50	30	2.2	-0.3	-0.1
04320	12	V	50	31	1.9	0.1	-0.3
04339	00	V	50	30	2.3	-0.1	-0.3
04339	12	V	50	29	2.8	-0.6	0.3
04360	12	V	50	14	2.5	0.0	-0.5
04360	00	V	50	10	2.1	0.0	0.7
06011	00	V	50	20	2.6	-0.7	0.1

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	50	14	2.0	-0.6	0.1
06260	00	V	50	26	3.1	0.6	-0.2
06260	12	V	50	3	2.9	0.8	0.3
06610	12	V	50	31	3.6	-0.1	0.2
06610	00	V	50	30	3.3	0.5	0.3
07110	00	V	50	27	4.0	0.8	-0.4
07110	12	V	50	25	4.2	0.6	-1.3
07510	00	V	50	14	3.9	0.3	0.1
07510	12	V	50	22	4.8	0.4	-0.1
07645	12	V	50	12	4.0	-0.1	-0.4
07645	00	V	50	14	4.4	0.8	0.6
07761	00	V	50	11	3.9	0.2	-0.1
07761	12	V	50	14	3.9	0.0	-0.5
08001	00	V	50	19	3.4	0.5	0.8
08001	12	V	50	22	3.8	1.3	0.3
08221	12	V	50	30	3.6	0.0	0.5
08221	00	V	50	30	3.4	1.1	-0.2
08302	00	V	50	30	3.0	-0.5	0.5
08302	12	V	50	31	3.1	-0.1	0.7
08495	12	V	50	1	1.5	1.5	0.3
08508	12	V	50	27	2.6	0.0	0.4
08522	12	V	50	24	4.5	0.9	1.1
08579	12	V	50	28	3.6	0.9	-0.8
10035	00	V	50	30	2.5	0.3	0.1
10035	12	V	50	30	2.4	0.6	-0.5
10393	00	V	50	30	2.5	0.8	-0.3
10393	12	V	50	31	2.7	0.0	-0.2
10410	00	V	50	29	3.1	0.3	0.3
10410	12	V	50	29	3.1	1.1	0.5
10739	00	V	50	30	2.8	0.7	0.4
10739	12	V	50	28	3.0	0.7	-0.2
11035	12	V	50	31	2.5	-0.1	0.0
11035	00	V	50	31	2.5	0.4	-0.7
12982	00	V	50	28	3.0	0.4	0.1
12982	12	V	50	29	2.8	-0.7	-0.7
16044	12	V	50	30	2.9	0.7	-0.2
16044	00	V	50	29	3.2	0.8	-0.3
16080	12	V	50	31	3.5	0.8	-0.2
16080	00	V	50	28	2.9	0.2	0.2
16245	00	V	50	28	3.5	0.8	0.4
16245	12	V	50	29	3.5	0.7	-0.3
16320	00	V	50	29	3.5	1.3	-0.2
16320	12	V	50	30	3.3	1.2	0.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	50	30	3.8	0.7	0.4
16429	00	V	50	27	3.3	0.4	-0.3
16622	00	V	50	11	2.9	0.0	0.1
16754	00	V	50	27	4.1	1.2	0.7
17607	12	V	50	17	4.2	0.2	1.7
26435	00	V	50	13	2.2	-0.5	0.7
60018	00	V	50	28	4.0	0.7	-0.1
60018	12	V	50	29	3.8	0.2	1.2
ASDE01	12	V	50	14	3.3	-0.9	0.3
ASDE01	00	V	50	10	3.3	-0.2	1.6
ASDE02	12	V	50	3	3.5	0.7	0.9
ASDE02	00	V	50	29	4.2	-0.7	1.0
ASDE03	12	V	50	5	3.5	1.0	-1.7
ASDE03	00	V	50	9	3.9	0.2	0.1
ASDE04	00	V	50	5	2.3	0.3	0.9
ASDE04	12	V	50	8	3.3	-0.8	0.1
ASDE09	12	V	50	3	2.4	-0.2	-0.5
ASDK1	12	V	50	7	3.0	-0.6	0.7
ASDK1	00	V	50	9	3.1	-1.1	0.4
ASDK2	12	V	50	9	3.2	0.3	0.5
ASDK2	00	V	50	9	3.3	-0.7	1.0
ASDK3	12	V	50	11	3.2	0.3	0.2
ASDK3	00	V	50	9	3.2	-2.2	0.2
ASES01	12	V	50	7	4.4	-0.5	1.0
ASEU01	12	V	50	1	4.3	-0.1	-4.3
ASEU01	00	V	50	16	4.2	-0.7	0.8
ASEU02	12	V	50	5	5.0	1.9	-0.8
ASEU02	00	V	50	8	4.3	0.8	-1.3
ASEU03	12	V	50	11	3.5	-0.9	1.6
ASEU03	00	V	50	13	3.0	-0.2	0.8
ASEU04	12	V	50	1	1.4	1.4	0.1
ASEU04	00	V	50	6	2.1	-0.1	0.7
ASEU05	12	V	50	12	3.4	-0.1	1.5
ASEU05	00	V	50	8	2.8	-1.0	0.3
ASEU06	12	V	50	5	2.1	0.0	0.6
ASEU06	00	V	50	4	2.9	0.3	0.5
ASFR1	12	V	50	9	3.9	0.8	1.6
ASFR1	00	V	50	9	4.2	0.3	-1.5
ASFR2	12	V	50	8	2.5	0.3	-0.5
ASFR2	00	V	50	13	2.8	-1.1	0.9
ASFR3	12	V	50	15	4.9	-0.9	-0.6
ASFR3	00	V	50	14	4.7	-0.8	-1.0
ASFR4	12	V	50	5	4.1	0.9	0.9

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASFR4	00	V	50	4	3.8	2.2	-0.7
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	1	3.0	-3.0	0.3
LGKI	00	V	50	27	2.1	-0.4	-0.1
LGKI	12	V	50	25	2.7	-0.2	1.0
LUMBIA	12	V	50	0	0.0	0.0	0.0
LUMBIA	00	V	50	0	0.0	0.0	0.0
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	27	2.1	-0.1	-0.4

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	100	31	7.8	2.7
01001	00	Z	100	31	11.4	6.1
01028	00	Z	100	30	9.6	7.4
01028	12	Z	100	31	7.5	5.3
01400	12	Z	100	21	28.9	9.9
01400	00	Z	100	17	24.4	20.1
01415	00	Z	100	31	7.8	3.0
01415	12	Z	100	30	12.4	9.7
02365	12	Z	100	43	6.1	1.4
02365	00	Z	100	45	8.0	-0.9
02591	00	Z	100	35	12.5	11.9
02591	12	Z	100	36	11.8	10.8
02836	00	Z	100	30	8.9	6.3
02836	12	Z	100	31	8.9	4.8
02963	00	Z	100	30	9.1	7.9
02963	12	Z	100	31	7.6	5.7
03005	00	Z	100	57	7.9	-0.5
03005	12	Z	100	56	8.8	2.4
03238	12	Z	100	10	10.6	9.2
03238	00	Z	100	29	9.7	4.8
03808	00	Z	100	57	6.7	-0.8
03808	12	Z	100	61	8.4	0.8
03918	00	Z	100	27	8.6	5.5
03918	12	Z	100	11	15.0	11.8
03953	12	Z	100	31	13.0	8.8
03953	00	Z	100	31	9.8	5.0
04018	12	Z	100	27	10.1	6.3
04018	00	Z	100	26	9.4	7.0
04220	00	Z	100	29	10.9	1.3
04220	12	Z	100	31	14.1	8.7
04270	12	Z	100	31	14.1	9.5
04270	00	Z	100	29	12.3	-4.8
04320	00	Z	100	31	14.5	-9.6
04320	12	Z	100	31	13.1	-3.7
04339	00	Z	100	31	15.2	9.7
04339	12	Z	100	30	19.5	11.2
04360	12	Z	100	22	13.0	9.0
04360	00	Z	100	17	17.4	-5.9
06011	00	Z	100	25	14.4	-0.8

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	100	20	15.4	11.1
06260	00	Z	100	30	9.5	6.7
06260	12	Z	100	3	10.6	9.5
06610	12	Z	100	31	15.1	10.4
06610	00	Z	100	31	13.2	1.3
07110	00	Z	100	30	14.6	11.2
07110	12	Z	100	27	13.7	11.5
07510	00	Z	100	22	10.3	6.0
07510	12	Z	100	25	24.3	19.4
07645	12	Z	100	20	50.3	49.1
07645	00	Z	100	21	37.4	36.6
07761	00	Z	100	20	10.7	-1.1
07761	12	Z	100	27	12.4	1.3
08001	00	Z	100	29	13.1	8.9
08001	12	Z	100	28	13.2	10.0
08221	12	Z	100	30	14.4	10.9
08221	00	Z	100	31	11.0	7.7
08302	00	Z	100	31	5.8	-0.1
08302	12	Z	100	31	7.8	0.1
08495	12	Z	100	1	2.9	2.9
08508	12	Z	100	29	25.4	23.0
08522	12	Z	100	28	12.4	8.7
08579	12	Z	100	31	13.9	10.4
10035	00	Z	100	31	5.0	0.8
10035	12	Z	100	31	9.5	4.6
10393	00	Z	100	31	5.3	-0.5
10393	12	Z	100	32	5.9	2.0
10410	00	Z	100	31	6.1	0.3
10410	12	Z	100	31	6.4	0.3
10739	00	Z	100	30	7.1	3.1
10739	12	Z	100	32	10.6	9.4
11035	12	Z	100	31	5.9	-1.2
11035	00	Z	100	31	6.6	3.0
12982	00	Z	100	30	7.7	4.4
12982	12	Z	100	30	47.7	32.2
16044	12	Z	100	30	8.7	-2.1
16044	00	Z	100	31	9.9	3.6
16080	12	Z	100	30	27.0	-9.1
16080	00	Z	100	30	6.9	-0.2
16245	00	Z	100	31	7.9	0.0
16245	12	Z	100	30	10.1	-2.8
16320	00	Z	100	31	5.6	2.4
16320	12	Z	100	31	8.6	-3.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	100	31	10.7	-3.9
16429	00	Z	100	31	7.0	1.1
16622	00	Z	100	29	37.6	31.1
16754	00	Z	100	29	28.6	24.3
17607	12	Z	100	36	20.4	-18.9
26435	00	Z	100	14	11.4	7.7
60018	00	Z	100	31	11.1	10.3
60018	12	Z	100	31	9.3	6.0
ASDE01	12	Z	100	14	86.1	52.3
ASDE01	00	Z	100	12	24.1	10.3
ASDE02	12	Z	100	3	29.8	29.7
ASDE02	00	Z	100	29	25.4	24.8
ASDE03	12	Z	100	8	27.4	26.3
ASDE03	00	Z	100	13	11.7	6.4
ASDE04	00	Z	100	7	42.3	41.7
ASDE04	12	Z	100	8	45.4	41.0
ASDE09	12	Z	100	3	16.8	-4.2
ASDK1	12	Z	100	9	23.3	22.8
ASDK1	00	Z	100	10	24.5	23.7
ASDK2	12	Z	100	9	8.1	5.4
ASDK2	00	Z	100	9	7.6	2.4
ASDK3	12	Z	100	12	27.9	26.1
ASDK3	00	Z	100	12	23.8	21.5
ASES01	12	Z	100	7	25.4	23.6
ASEU01	12	Z	100	2	23.1	22.6
ASEU01	00	Z	100	22	51.9	21.9
ASEU02	12	Z	100	7	40.9	39.3
ASEU02	00	Z	100	9	39.6	38.2
ASEU03	12	Z	100	14	239.4	234.3
ASEU03	00	Z	100	14	217.2	216.8
ASEU04	12	Z	100	3	18.0	17.1
ASEU04	00	Z	100	8	7.6	4.6
ASEU05	12	Z	100	14	25.0	23.5
ASEU05	00	Z	100	15	23.4	21.9
ASEU06	12	Z	100	8	11.5	9.4
ASEU06	00	Z	100	7	19.3	-18.7
ASFR1	12	Z	100	10	11.4	6.2
ASFR1	00	Z	100	12	7.9	3.3
ASFR2	12	Z	100	10	11.0	7.5
ASFR2	00	Z	100	14	13.7	7.2
ASFR3	12	Z	100	15	13.9	11.4
ASFR3	00	Z	100	14	13.7	10.7
ASFR4	12	Z	100	5	15.0	12.6

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASFR4	00	Z	100	5	15.3	12.5
DAVAO0	12	Z	100	0	0.0	0.0
DAVAO0	00	Z	100	0	0.0	0.0
DBLK	12	Z	100	1	18.2	18.2
LGKI	00	Z	100	30	9.3	-3.4
LGKI	12	Z	100	29	6.7	-0.9
LUMBIA	12	Z	100	0	0.0	0.0
LUMBIA	00	Z	100	0	0.0	0.0
PUERTO	12	Z	100	0	0.0	0.0
PUERTO	00	Z	100	0	0.0	0.0
UFT5	00	Z	100	23	17.2	15.9

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	100	31	2.1	0.0	-0.4
01001	00	V	100	31	2.3	0.1	-0.5
01028	00	V	100	30	2.2	0.0	0.2
01028	12	V	100	31	2.4	-0.2	0.5
01400	12	V	100	17	2.4	0.2	-0.8
01400	00	V	100	13	2.8	-0.4	1.0
01415	00	V	100	28	3.8	0.7	-0.1
01415	12	V	100	30	3.2	-0.4	0.0
02365	12	V	100	31	3.0	0.6	0.3
02365	00	V	100	30	2.8	0.6	0.4
02591	00	V	100	28	3.0	0.2	0.6
02591	12	V	100	30	2.8	0.4	0.0
02836	00	V	100	30	2.7	0.0	-0.2
02836	12	V	100	31	3.0	-0.3	0.0
02963	00	V	100	30	2.7	0.1	0.0
02963	12	V	100	31	2.5	-0.4	0.0
03005	00	V	100	30	3.3	-0.4	-0.4
03005	12	V	100	31	3.0	-0.3	0.5
03238	12	V	100	10	3.4	0.9	-0.2
03238	00	V	100	26	4.8	-0.4	-0.5
03808	00	V	100	31	3.1	0.2	0.5
03808	12	V	100	31	3.0	0.2	0.1
03918	00	V	100	23	3.3	-0.7	-0.1
03918	12	V	100	10	5.0	0.1	0.1
03953	12	V	100	31	3.4	0.4	0.3
03953	00	V	100	30	3.1	0.3	0.0
04018	12	V	100	26	2.6	-0.3	-0.2
04018	00	V	100	26	2.9	0.5	0.0
04220	00	V	100	28	2.4	0.4	0.0
04220	12	V	100	31	2.5	0.2	0.1
04270	12	V	100	31	3.0	0.4	0.7
04270	00	V	100	28	2.7	-0.2	-0.2
04320	00	V	100	30	2.4	0.1	-0.1
04320	12	V	100	31	2.3	-0.2	-0.4
04339	00	V	100	30	2.8	-0.6	-0.4
04339	12	V	100	29	2.4	-0.6	0.3
04360	12	V	100	22	3.1	0.3	-0.1
04360	00	V	100	17	2.8	-0.4	-0.6
06011	00	V	100	25	2.6	0.3	0.6

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	100	20	3.3	-0.5	-0.5
06260	00	V	100	26	2.9	0.7	0.0
06260	12	V	100	3	2.9	1.4	-0.8
06610	12	V	100	31	3.5	-0.1	0.1
06610	00	V	100	30	5.3	-0.4	-0.1
07110	00	V	100	29	3.7	0.1	0.5
07110	12	V	100	27	2.7	0.8	-0.7
07510	00	V	100	19	3.2	1.1	-0.1
07510	12	V	100	24	3.4	1.2	-0.8
07645	12	V	100	17	3.4	0.7	0.0
07645	00	V	100	18	4.1	1.1	1.0
07761	00	V	100	13	4.4	0.4	0.7
07761	12	V	100	14	4.4	-0.6	1.1
08001	00	V	100	27	4.3	-0.8	0.5
08001	12	V	100	25	3.6	0.2	-0.6
08221	12	V	100	30	3.5	0.3	-0.3
08221	00	V	100	30	4.0	-0.6	0.3
08302	00	V	100	30	4.1	1.0	-0.2
08302	12	V	100	31	4.0	-0.5	0.5
08495	12	V	100	1	3.4	3.3	-0.6
08508	12	V	100	28	2.7	0.2	0.5
08522	12	V	100	26	3.8	0.8	0.2
08579	12	V	100	29	3.2	-0.2	-0.1
10035	00	V	100	30	2.9	1.1	-0.1
10035	12	V	100	31	3.3	0.1	0.0
10393	00	V	100	30	3.1	-0.2	-0.4
10393	12	V	100	31	3.2	0.3	0.1
10410	00	V	100	30	3.4	0.4	0.1
10410	12	V	100	29	3.6	0.2	-0.3
10739	00	V	100	30	3.8	0.1	0.0
10739	12	V	100	29	3.1	0.5	-0.5
11035	12	V	100	31	3.4	-0.1	0.1
11035	00	V	100	31	3.6	1.3	-0.1
12982	00	V	100	30	3.0	-0.1	-0.1
12982	12	V	100	28	2.4	0.3	0.4
16044	12	V	100	30	3.9	-0.6	-0.9
16044	00	V	100	29	2.9	0.6	-0.2
16080	12	V	100	30	3.5	-0.8	-0.4
16080	00	V	100	29	4.2	-0.6	0.6
16245	00	V	100	28	3.4	0.7	-0.1
16245	12	V	100	30	3.8	0.3	0.0
16320	00	V	100	30	3.2	-0.1	-0.4
16320	12	V	100	31	3.9	0.2	-0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	100	31	4.1	0.1	1.1
16429	00	V	100	28	4.3	0.2	-1.3
16622	00	V	100	12	3.8	0.8	-0.7
16754	00	V	100	28	5.0	0.0	1.0
17607	12	V	100	19	4.2	0.3	1.6
26435	00	V	100	14	2.3	-0.3	0.5
60018	00	V	100	29	4.3	-0.5	0.0
60018	12	V	100	31	4.5	0.6	0.0
ASDE01	12	V	100	14	3.7	0.4	-0.7
ASDE01	00	V	100	12	3.1	0.1	-0.3
ASDE02	12	V	100	3	7.2	0.2	-4.5
ASDE02	00	V	100	29	4.7	0.7	-0.6
ASDE03	12	V	100	8	3.3	-0.2	0.0
ASDE03	00	V	100	13	4.0	-0.9	1.4
ASDE04	00	V	100	5	2.8	0.7	1.1
ASDE04	12	V	100	8	4.0	0.1	0.0
ASDE09	12	V	100	3	4.9	-2.1	1.5
ASDK1	12	V	100	9	2.7	-0.4	0.4
ASDK1	00	V	100	10	1.9	0.8	0.2
ASDK2	12	V	100	9	2.1	-0.3	0.8
ASDK2	00	V	100	9	1.9	0.3	0.0
ASDK3	12	V	100	12	2.2	-0.1	0.5
ASDK3	00	V	100	12	2.8	-0.7	0.0
ASES01	12	V	100	7	4.5	-1.6	-1.5
ASEU01	12	V	100	2	3.9	0.1	1.8
ASEU01	00	V	100	21	3.3	0.3	0.0
ASEU02	12	V	100	6	4.1	-1.6	-1.9
ASEU02	00	V	100	8	3.9	-0.8	-0.6
ASEU03	12	V	100	14	3.1	-0.1	0.0
ASEU03	00	V	100	12	2.6	-1.3	-0.2
ASEU04	12	V	100	2	4.0	2.7	0.4
ASEU04	00	V	100	7	2.1	0.2	-0.1
ASEU05	12	V	100	13	3.0	-0.5	0.7
ASEU05	00	V	100	13	3.4	0.0	0.5
ASEU06	12	V	100	5	4.0	-0.7	3.4
ASEU06	00	V	100	6	6.4	-1.7	3.5
ASFR1	12	V	100	9	2.6	-0.2	-0.7
ASFR1	00	V	100	9	5.6	0.7	0.3
ASFR2	12	V	100	10	2.0	0.1	0.4
ASFR2	00	V	100	13	3.3	-0.1	1.2
ASFR3	12	V	100	15	2.9	0.4	-0.7
ASFR3	00	V	100	14	3.3	0.5	-0.3
ASFR4	12	V	100	5	2.5	1.3	0.1

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASFR4	00	V	100	5	1.8	0.4	-0.4
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	1	1.9	-0.6	-1.8
LGKI	00	V	100	27	2.2	0.0	0.0
LGKI	12	V	100	27	2.4	0.2	0.0
LUMBIA	12	V	100	0	0.0	0.0	0.0
LUMBIA	00	V	100	0	0.0	0.0	0.0
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	23	2.1	-0.2	-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                 : MAY 2015
          STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	500	31	4.9	0.9
01001	00	Z	500	31	6.4	1.7
01028	00	Z	500	30	5.2	3.3
01028	12	Z	500	31	5.0	2.3
01400	12	Z	500	22	15.5	9.3
01400	00	Z	500	20	17.0	12.6
01415	00	Z	500	31	5.7	2.9
01415	12	Z	500	30	6.6	5.3
02365	12	Z	500	43	3.2	1.2
02365	00	Z	500	45	3.1	1.2
02591	00	Z	500	35	10.1	9.7
02591	12	Z	500	36	10.0	9.7
02836	00	Z	500	30	5.0	1.5
02836	12	Z	500	31	4.9	2.5
02963	00	Z	500	30	8.8	8.0
02963	12	Z	500	31	6.3	4.3
03005	00	Z	500	57	6.0	-1.6
03005	12	Z	500	56	5.8	-0.2
03238	12	Z	500	10	8.2	6.2
03238	00	Z	500	30	8.8	7.1
03808	00	Z	500	59	5.7	2.1
03808	12	Z	500	61	6.1	-0.2
03918	00	Z	500	27	8.4	5.7
03918	12	Z	500	11	11.3	9.9
03953	12	Z	500	31	6.7	5.9
03953	00	Z	500	31	5.7	4.2
04018	12	Z	500	27	6.3	4.5
04018	00	Z	500	27	5.8	3.9
04220	00	Z	500	30	7.1	2.6
04220	12	Z	500	31	7.4	5.1
04270	12	Z	500	31	5.5	3.3
04270	00	Z	500	31	5.2	-2.1
04320	00	Z	500	31	5.5	0.6
04320	12	Z	500	31	5.6	2.6
04339	00	Z	500	31	5.4	-0.2
04339	12	Z	500	31	9.2	4.6
04360	12	Z	500	28	7.6	5.6
04360	00	Z	500	24	6.8	1.9
06011	00	Z	500	28	7.6	1.0

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	500	27	44.7	25.5
06260	00	Z	500	32	6.4	5.0
06260	12	Z	500	3	5.1	5.1
06610	12	Z	500	31	9.1	7.8
06610	00	Z	500	31	7.5	5.6
07110	00	Z	500	31	6.6	1.6
07110	12	Z	500	30	7.5	2.5
07510	00	Z	500	28	5.4	-0.6
07510	12	Z	500	29	9.0	5.5
07645	12	Z	500	25	20.2	19.7
07645	00	Z	500	29	15.8	14.2
07761	00	Z	500	31	5.2	-1.9
07761	12	Z	500	35	6.4	1.5
08001	00	Z	500	29	7.8	5.5
08001	12	Z	500	28	6.9	4.6
08221	12	Z	500	31	9.7	9.1
08221	00	Z	500	31	8.1	7.3
08302	00	Z	500	31	4.4	1.0
08302	12	Z	500	31	4.2	1.3
08495	12	Z	500	1	13.1	13.1
08508	12	Z	500	29	15.7	13.5
08522	12	Z	500	31	8.6	7.3
08579	12	Z	500	31	8.9	7.8
10035	00	Z	500	32	3.1	0.7
10035	12	Z	500	31	4.9	1.9
10393	00	Z	500	31	3.5	-1.9
10393	12	Z	500	33	3.4	-1.0
10410	00	Z	500	31	2.8	-1.2
10410	12	Z	500	31	3.1	0.0
10739	00	Z	500	30	7.6	7.1
10739	12	Z	500	32	9.7	9.4
11035	12	Z	500	31	5.0	-1.2
11035	00	Z	500	31	4.3	1.9
12982	00	Z	500	30	7.0	5.7
12982	12	Z	500	30	11.0	9.8
16044	12	Z	500	30	4.2	-1.3
16044	00	Z	500	31	5.3	0.2
16080	12	Z	500	30	24.4	-3.5
16080	00	Z	500	30	3.9	0.3
16245	00	Z	500	31	8.9	-5.2
16245	12	Z	500	31	8.3	-2.9
16320	00	Z	500	31	6.2	1.9
16320	12	Z	500	31	6.4	-1.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	500	32	7.3	-2.3
16429	00	Z	500	31	6.7	3.0
16622	00	Z	500	31	22.7	20.7
16754	00	Z	500	29	23.2	17.9
17607	12	Z	500	37	7.5	3.5
26435	00	Z	500	14	8.0	5.7
60018	00	Z	500	31	4.7	3.6
60018	12	Z	500	31	4.9	3.9
ASDE01	12	Z	500	14	11.3	3.0
ASDE01	00	Z	500	14	10.1	-3.4
ASDE02	12	Z	500	3	16.1	15.9
ASDE02	00	Z	500	29	15.1	14.7
ASDE03	12	Z	500	9	11.9	4.8
ASDE03	00	Z	500	13	15.6	-1.8
ASDE04	00	Z	500	7	34.0	33.7
ASDE04	12	Z	500	8	34.7	30.9
ASDE09	12	Z	500	3	7.5	-5.7
ASDK1	12	Z	500	9	22.9	21.7
ASDK1	00	Z	500	10	21.5	20.6
ASDK2	12	Z	500	9	5.2	5.0
ASDK2	00	Z	500	11	4.7	2.5
ASDK3	12	Z	500	12	26.8	24.8
ASDK3	00	Z	500	13	25.2	23.8
ASES01	12	Z	500	8	9.8	8.7
ASEU01	12	Z	500	2	9.5	9.3
ASEU01	00	Z	500	23	18.3	3.8
ASEU02	12	Z	500	8	39.5	35.3
ASEU02	00	Z	500	9	32.8	32.0
ASEU03	12	Z	500	14	15.6	15.6
ASEU03	00	Z	500	14	0.0	0.0
ASEU04	12	Z	500	5	6.0	3.8
ASEU04	00	Z	500	8	6.6	-3.3
ASEU05	12	Z	500	17	14.7	12.9
ASEU05	00	Z	500	18	16.3	14.5
ASEU06	12	Z	500	8	42.1	-3.9
ASEU06	00	Z	500	8	30.7	-30.4
ASFR1	12	Z	500	11	7.1	-3.7
ASFR1	00	Z	500	12	6.9	-6.2
ASFR2	12	Z	500	12	4.8	0.7
ASFR2	00	Z	500	14	10.3	-1.1
ASFR3	12	Z	500	16	7.5	3.1
ASFR3	00	Z	500	15	5.1	1.6
ASFR4	12	Z	500	7	10.2	-0.4

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASFR4	00	Z	500	6	5.5	1.4
DAVAO0	12	Z	500	0	0.0	0.0
DAVAO0	00	Z	500	0	0.0	0.0
DBLK	12	Z	500	1	4.4	4.4
LGKI	00	Z	500	31	9.4	-6.5
LGKI	12	Z	500	30	8.1	-6.7
LUMBIA	12	Z	500	0	0.0	0.0
LUMBIA	00	Z	500	0	0.0	0.0
PUERTO	12	Z	500	0	0.0	0.0
PUERTO	00	Z	500	0	0.0	0.0
UFT5	00	Z	500	23	6.6	5.0

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	500	31	2.4	-0.5	0.1
01001	00	V	500	31	1.8	0.0	-0.2
01028	00	V	500	30	1.9	-0.2	0.2
01028	12	V	500	31	2.1	0.2	0.1
01400	12	V	500	22	2.1	0.5	0.1
01400	00	V	500	20	2.8	1.0	-0.3
01415	00	V	500	28	3.1	0.4	0.8
01415	12	V	500	30	3.2	0.1	0.0
02365	12	V	500	31	2.8	0.0	0.7
02365	00	V	500	30	3.0	0.0	0.9
02591	00	V	500	28	2.7	-0.3	0.6
02591	12	V	500	30	3.1	0.1	0.2
02836	00	V	500	30	2.6	0.5	0.0
02836	12	V	500	31	2.2	-0.2	0.2
02963	00	V	500	30	3.1	0.0	1.0
02963	12	V	500	31	2.9	-0.6	0.8
03005	00	V	500	30	3.0	0.0	0.8
03005	12	V	500	31	3.5	0.4	0.2
03238	12	V	500	10	3.7	1.4	-0.3
03238	00	V	500	27	3.2	-0.1	1.0
03808	00	V	500	31	3.5	0.3	0.6
03808	12	V	500	31	2.7	0.2	0.0
03918	00	V	500	23	3.5	-0.1	-0.4
03918	12	V	500	10	2.9	0.5	1.1
03953	12	V	500	31	3.3	0.1	0.2
03953	00	V	500	30	3.1	-0.2	1.0
04018	12	V	500	27	3.2	-0.3	-0.1
04018	00	V	500	26	2.9	0.2	0.6
04220	00	V	500	29	3.4	0.0	-0.1
04220	12	V	500	31	2.7	-0.2	-0.1
04270	12	V	500	31	3.7	0.5	0.6
04270	00	V	500	30	3.0	0.6	-0.4
04320	00	V	500	30	2.1	0.0	0.4
04320	12	V	500	31	2.0	-0.4	0.1
04339	00	V	500	30	2.7	-0.2	0.5
04339	12	V	500	31	2.8	-0.1	0.3
04360	12	V	500	28	3.6	-0.4	0.7
04360	00	V	500	24	2.4	0.2	0.2
06011	00	V	500	27	3.3	0.0	0.2

```
         RADIOSONDE MONITORING STATISTICS (EUCOS)
         (CONTINUED)
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	500	27	2.9	0.0	0.3
06260	00	V	500	29	2.4	0.0	0.4
06260	12	V	500	3	2.5	0.1	-1.2
06610	12	V	500	31	3.9	0.4	-0.2
06610	00	V	500	30	4.0	0.4	-0.4
07110	00	V	500	30	3.4	0.7	1.0
07110	12	V	500	30	3.3	-1.3	0.4
07510	00	V	500	24	3.2	0.5	0.5
07510	12	V	500	29	3.3	0.8	0.3
07645	12	V	500	24	3.3	0.4	0.5
07645	00	V	500	25	3.8	0.5	0.7
07761	00	V	500	26	3.3	0.6	0.6
07761	12	V	500	31	3.4	0.3	-0.4
08001	00	V	500	27	3.0	0.1	0.2
08001	12	V	500	26	2.7	-0.1	0.5
08221	12	V	500	31	2.5	0.0	0.2
08221	00	V	500	30	3.0	0.4	0.7
08302	00	V	500	30	2.3	0.1	0.1
08302	12	V	500	31	2.8	-0.4	-0.1
08495	12	V	500	1	3.2	-0.9	-3.1
08508	12	V	500	28	2.5	0.5	-0.5
08522	12	V	500	31	3.4	-0.2	0.0
08579	12	V	500	31	1.9	0.2	-0.3
10035	00	V	500	30	3.0	-0.1	0.3
10035	12	V	500	31	2.7	0.0	0.2
10393	00	V	500	30	2.9	0.3	0.6
10393	12	V	500	31	2.7	0.7	0.2
10410	00	V	500	30	2.5	-0.2	-0.1
10410	12	V	500	29	3.0	0.4	0.2
10739	00	V	500	30	3.4	0.9	-0.8
10739	12	V	500	29	3.1	0.9	-0.3
11035	12	V	500	31	3.0	-0.8	0.1
11035	00	V	500	31	3.0	1.0	0.1
12982	00	V	500	30	3.0	0.6	0.4
12982	12	V	500	30	3.0	0.4	0.2
16044	12	V	500	30	3.1	0.9	0.0
16044	00	V	500	29	3.9	1.5	-0.2
16080	12	V	500	30	2.9	0.5	0.1
16080	00	V	500	29	3.1	0.2	0.5
16245	00	V	500	28	2.5	0.5	0.1
16245	12	V	500	31	3.0	0.3	0.1
16320	00	V	500	30	4.3	1.6	-1.0
16320	12	V	500	31	3.2	0.1	-0.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	500	31	3.1	-0.2	-0.1
16429	00	V	500	29	3.2	0.5	-0.3
16622	00	V	500	13	3.3	0.8	-0.4
16754	00	V	500	29	3.5	0.4	-0.5
17607	12	V	500	20	2.2	0.1	-0.1
26435	00	V	500	14	2.5	0.3	-0.4
60018	00	V	500	29	3.4	0.8	-0.7
60018	12	V	500	30	3.1	0.7	0.5
ASDE01	12	V	500	14	3.9	0.7	-0.5
ASDE01	00	V	500	14	2.7	-0.2	-0.4
ASDE02	12	V	500	3	3.3	-0.9	-1.3
ASDE02	00	V	500	29	3.3	0.1	-0.7
ASDE03	12	V	500	9	3.0	0.0	-0.5
ASDE03	00	V	500	13	2.4	0.1	-0.2
ASDE04	00	V	500	7	2.2	0.9	1.1
ASDE04	12	V	500	8	2.3	0.5	0.7
ASDE09	12	V	500	3	3.4	1.1	0.7
ASDK1	12	V	500	9	3.1	-0.6	0.3
ASDK1	00	V	500	10	3.5	-0.3	0.3
ASDK2	12	V	500	9	2.6	-0.4	-0.4
ASDK2	00	V	500	11	3.4	-0.1	0.0
ASDK3	12	V	500	12	3.0	-0.6	0.0
ASDK3	00	V	500	12	2.4	-0.9	-0.3
ASES01	12	V	500	8	2.7	0.1	-0.3
ASEU01	12	V	500	2	1.7	0.7	-1.0
ASEU01	00	V	500	23	3.1	0.1	0.9
ASEU02	12	V	500	8	3.9	-0.2	-0.3
ASEU02	00	V	500	8	1.9	0.0	1.1
ASEU03	12	V	500	14	2.6	0.7	0.5
ASEU03	00	V	500	14	3.0	0.2	0.4
ASEU04	12	V	500	5	3.3	0.5	2.1
ASEU04	00	V	500	7	2.2	1.4	0.1
ASEU05	12	V	500	17	3.5	1.3	-0.8
ASEU05	00	V	500	17	4.2	0.5	-1.1
ASEU06	12	V	500	8	2.7	-0.8	0.3
ASEU06	00	V	500	8	2.9	0.9	0.2
ASFR1	12	V	500	11	2.8	0.7	-0.7
ASFR1	00	V	500	10	3.2	-0.3	-1.2
ASFR2	12	V	500	12	2.6	-0.6	0.1
ASFR2	00	V	500	13	2.4	0.2	0.5
ASFR3	12	V	500	16	3.5	-0.6	-0.7
ASFR3	00	V	500	15	3.4	-0.2	-0.2
ASFR4	12	V	500	7	3.3	0.6	-0.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASFR4	00	V	500	6	3.8	-0.3	2.0
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	1	2.1	1.4	-1.6
LGKI	00	V	500	30	2.1	0.1	0.6
LGKI	12	V	500	30	1.9	0.3	-0.2
LUMBIA	12	V	500	0	0.0	0.0	0.0
LUMBIA	00	V	500	0	0.0	0.0	0.0
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	23	1.7	-0.7	-0.6

4.7   Table 19 - Radiosonde Monitoring Statistics (EUCOS): 850 hPa Geopotential height (metres)

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
          MONITORING CENTRE      : ECMWF
          ELEMENT MONITORED      : GEOPOTENTIAL HEIGHT (METRES)
          LEVEL                  : 850 HPA
          AREA                   : 0 - 90N, 100W - 40E
          PERIOD                 : MAY 2015
          STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	850	31	4.5	-1.2
01001	00	Z	850	31	3.9	-0.7
01028	00	Z	850	30	2.9	0.4
01028	12	Z	850	31	3.0	1.3
01400	12	Z	850	22	11.3	7.3
01400	00	Z	850	20	13.7	11.0
01415	00	Z	850	32	3.3	2.1
01415	12	Z	850	30	4.6	1.9
02365	12	Z	850	43	2.9	1.1
02365	00	Z	850	45	3.0	1.6
02591	00	Z	850	35	9.0	8.7
02591	12	Z	850	36	9.1	8.9
02836	00	Z	850	30	3.0	1.5
02836	12	Z	850	31	3.6	2.1
02963	00	Z	850	30	5.5	5.0
02963	12	Z	850	31	4.0	3.0
03005	00	Z	850	57	3.6	-0.5
03005	12	Z	850	56	2.9	-0.2
03238	12	Z	850	10	6.5	5.7
03238	00	Z	850	30	7.1	6.4
03808	00	Z	850	59	3.5	2.1
03808	12	Z	850	61	3.1	2.0
03918	00	Z	850	27	6.4	5.2
03918	12	Z	850	11	7.7	6.2
03953	12	Z	850	31	5.3	4.7
03953	00	Z	850	31	4.7	3.8
04018	12	Z	850	27	2.8	1.9
04018	00	Z	850	27	3.1	2.1
04220	00	Z	850	30	3.8	1.3
04220	12	Z	850	31	4.0	2.1
04270	12	Z	850	31	3.5	1.9
04270	00	Z	850	31	2.9	-1.3
04320	00	Z	850	31	5.9	5.3
04320	12	Z	850	31	6.7	6.1
04339	00	Z	850	31	4.1	-2.7
04339	12	Z	850	31	2.9	-0.4
04360	12	Z	850	30	4.6	0.2
04360	00	Z	850	29	6.0	-2.8
06011	00	Z	850	29	5.1	2.9

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	850	28	11.8	8.8
06260	00	Z	850	32	4.6	3.2
06260	12	Z	850	3	3.0	2.8
06610	12	Z	850	31	5.0	3.3
06610	00	Z	850	31	4.3	3.0
07110	00	Z	850	31	3.8	0.7
07110	12	Z	850	30	3.7	1.2
07510	00	Z	850	28	3.4	-1.6
07510	12	Z	850	29	2.7	1.6
07645	12	Z	850	25	5.8	4.8
07645	00	Z	850	29	3.0	1.0
07761	00	Z	850	31	4.5	-2.8
07761	12	Z	850	35	3.0	0.0
08001	00	Z	850	29	4.5	1.3
08001	12	Z	850	28	4.9	1.5
08221	12	Z	850	31	5.0	4.5
08221	00	Z	850	31	4.8	4.1
08302	00	Z	850	31	3.5	-1.5
08302	12	Z	850	31	2.2	-0.8
08495	12	Z	850	1	6.8	6.8
08508	12	Z	850	29	9.1	5.9
08522	12	Z	850	31	4.5	3.6
08579	12	Z	850	31	5.2	4.4
10035	00	Z	850	32	3.1	0.8
10035	12	Z	850	31	3.8	1.5
10393	00	Z	850	31	3.0	-2.3
10393	12	Z	850	33	2.8	-1.9
10410	00	Z	850	31	3.0	-2.1
10410	12	Z	850	31	3.3	-1.5
10739	00	Z	850	30	8.6	8.2
10739	12	Z	850	32	8.7	8.5
11035	12	Z	850	31	3.1	-1.5
11035	00	Z	850	31	3.3	-0.6
12982	00	Z	850	31	3.2	2.3
12982	12	Z	850	30	9.2	4.9
16044	12	Z	850	30	4.9	-3.5
16044	00	Z	850	32	4.2	-1.3
16080	12	Z	850	31	6.5	-3.3
16080	00	Z	850	31	4.5	-2.6
16245	00	Z	850	31	11.1	-8.9
16245	12	Z	850	31	8.9	-7.2
16320	00	Z	850	31	5.1	-1.0
16320	12	Z	850	31	5.8	-2.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	850	32	7.5	-4.1
16429	00	Z	850	31	5.7	-1.0
16622	00	Z	850	31	13.2	12.3
16754	00	Z	850	29	17.2	11.4
17607	12	Z	850	37	3.4	1.1
26435	00	Z	850	14	3.9	2.9
60018	00	Z	850	31	2.4	-0.4
60018	12	Z	850	31	2.6	0.0
ASDE01	12	Z	850	14	11.1	-9.8
ASDE01	00	Z	850	14	10.4	-8.6
ASDE02	12	Z	850	3	12.1	11.8
ASDE02	00	Z	850	29	11.1	10.6
ASDE03	12	Z	850	9	7.0	-2.5
ASDE03	00	Z	850	13	5.8	-5.0
ASDE04	00	Z	850	7	31.1	30.8
ASDE04	12	Z	850	8	31.0	27.0
ASDE09	12	Z	850	3	6.3	-6.3
ASDK1	12	Z	850	9	20.8	20.3
ASDK1	00	Z	850	11	24.1	23.5
ASDK2	12	Z	850	9	3.9	2.8
ASDK2	00	Z	850	11	3.2	0.8
ASDK3	12	Z	850	12	27.6	26.7
ASDK3	00	Z	850	13	25.4	24.1
ASES01	12	Z	850	8	4.8	3.0
ASEU01	12	Z	850	2	5.2	4.9
ASEU01	00	Z	850	23	8.1	-3.0
ASEU02	12	Z	850	8	29.4	27.1
ASEU02	00	Z	850	9	30.0	29.3
ASEU03	12	Z	850	14	6.2	6.2
ASEU03	00	Z	850	14	0.0	0.0
ASEU04	12	Z	850	5	4.8	0.5
ASEU04	00	Z	850	8	8.6	-6.5
ASEU05	12	Z	850	17	12.1	9.5
ASEU05	00	Z	850	19	14.7	12.2
ASEU06	12	Z	850	8	27.6	-16.5
ASEU06	00	Z	850	8	39.9	-27.9
ASFR1	12	Z	850	11	9.4	-7.5
ASFR1	00	Z	850	12	10.1	-9.8
ASFR2	12	Z	850	12	4.1	-1.8
ASFR2	00	Z	850	14	5.8	-1.6
ASFR3	12	Z	850	16	4.1	-0.8
ASFR3	00	Z	850	15	4.1	-2.6
ASFR4	12	Z	850	7	7.1	-2.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASFR4	00	Z	850	6	3.9	-2.9
DAVAO0	12	Z	850	0	0.0	0.0
DAVAO0	00	Z	850	0	0.0	0.0
DBLK	12	Z	850	1	3.0	3.0
LGKI	00	Z	850	31	9.6	-7.9
LGKI	12	Z	850	30	8.1	-7.6
LUMBIA	12	Z	850	0	0.0	0.0
LUMBIA	00	Z	850	0	0.0	0.0
PUERTO	12	Z	850	0	0.0	0.0
PUERTO	00	Z	850	0	0.0	0.0
UFT5	00	Z	850	23	4.5	3.3

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	850	31	3.6	-0.1	0.3
01001	00	V	850	31	3.4	0.2	-0.7
01028	00	V	850	30	2.8	-0.3	0.7
01028	12	V	850	31	3.4	0.1	0.4
01400	12	V	850	22	2.1	-0.1	0.0
01400	00	V	850	20	2.3	0.2	-0.3
01415	00	V	850	29	2.2	-0.3	-0.1
01415	12	V	850	30	2.6	-0.4	0.1
02365	12	V	850	31	3.3	-0.2	0.4
02365	00	V	850	30	2.3	0.1	0.4
02591	00	V	850	28	2.4	0.6	0.5
02591	12	V	850	30	3.0	0.4	-0.9
02836	00	V	850	30	3.0	0.0	0.3
02836	12	V	850	31	2.9	-0.2	-0.3
02963	00	V	850	30	2.7	0.6	-0.3
02963	12	V	850	31	2.4	-0.6	-0.1
03005	00	V	850	30	3.6	-0.4	-0.1
03005	12	V	850	31	2.9	-0.1	0.3
03238	12	V	850	10	4.3	1.0	-0.2
03238	00	V	850	27	2.5	0.4	0.4
03808	00	V	850	31	2.7	-0.2	-0.2
03808	12	V	850	31	2.7	0.1	-0.3
03918	00	V	850	23	2.4	-0.1	0.5
03918	12	V	850	10	3.8	0.9	-0.2
03953	12	V	850	31	2.7	0.7	0.4
03953	00	V	850	30	2.6	0.1	-0.4
04018	12	V	850	27	2.4	0.2	0.2
04018	00	V	850	27	2.9	0.3	0.3
04220	00	V	850	29	2.8	0.0	-0.7
04220	12	V	850	31	3.1	-0.1	-0.1
04270	12	V	850	31	3.6	0.5	0.6
04270	00	V	850	30	4.2	0.0	-0.1
04320	00	V	850	30	2.1	-0.3	-0.6
04320	12	V	850	31	2.6	-0.3	-0.2
04339	00	V	850	29	3.8	0.5	0.2
04339	12	V	850	31	3.5	1.1	-0.1
04360	12	V	850	30	6.1	1.1	0.2
04360	00	V	850	28	5.5	1.5	0.6
06011	00	V	850	28	2.9	-0.7	-0.3

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          RADIOSONDE MONITORING STATISTICS (EUCOS)
          (CONTINUED)
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WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	850	28	2.8	-0.7	-0.1
06260	00	V	850	29	2.7	0.5	0.0
06260	12	V	850	3	5.4	-3.6	-1.3
06610	12	V	850	31	2.6	-0.2	-0.2
06610	00	V	850	30	3.2	0.1	0.7
07110	00	V	850	30	2.7	-0.4	-0.3
07110	12	V	850	30	3.0	-0.6	0.7
07510	00	V	850	24	3.7	-1.6	-0.1
07510	12	V	850	29	3.9	0.2	-0.3
07645	12	V	850	24	3.5	-0.4	0.3
07645	00	V	850	25	3.7	-0.2	0.9
07761	00	V	850	26	3.7	-0.4	-0.5
07761	12	V	850	31	4.1	0.1	0.1
08001	00	V	850	27	3.1	0.1	0.7
08001	12	V	850	26	3.0	-0.2	-1.1
08221	12	V	850	31	3.0	0.2	-0.3
08221	00	V	850	30	3.8	0.7	0.1
08302	00	V	850	30	3.2	0.6	0.0
08302	12	V	850	31	4.2	0.6	0.1
08495	12	V	850	1	2.5	2.5	0.5
08508	12	V	850	28	3.1	0.0	0.0
08522	12	V	850	31	2.8	0.1	-0.2
08579	12	V	850	31	2.9	0.3	-0.1
10035	00	V	850	30	2.1	0.6	0.5
10035	12	V	850	31	2.6	0.4	0.0
10393	00	V	850	30	2.5	0.5	0.3
10393	12	V	850	31	2.1	-0.3	0.2
10410	00	V	850	30	2.8	0.4	0.2
10410	12	V	850	29	2.5	0.2	0.2
10739	00	V	850	30	2.8	0.5	-0.3
10739	12	V	850	29	3.2	-0.8	0.8
11035	12	V	850	31	2.8	0.5	-0.4
11035	00	V	850	31	2.8	0.4	-0.5
12982	00	V	850	31	4.0	1.3	-0.4
12982	12	V	850	30	3.7	0.5	-0.6
16044	12	V	850	30	2.8	0.2	0.2
16044	00	V	850	30	3.1	0.1	-0.1
16080	12	V	850	31	4.0	0.0	-0.5
16080	00	V	850	30	3.0	0.7	-0.8
16245	00	V	850	27	3.0	0.4	0.3
16245	12	V	850	31	3.0	-0.1	0.5
16320	00	V	850	30	2.3	0.3	0.2
16320	12	V	850	31	3.4	0.1	-0.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	850	31	2.8	-0.7	0.4
16429	00	V	850	29	2.8	-0.2	0.5
16622	00	V	850	13	2.6	0.9	0.0
16754	00	V	850	29	3.0	0.0	0.0
17607	12	V	850	20	2.9	-0.5	-0.7
26435	00	V	850	14	2.3	0.2	-0.1
60018	00	V	850	29	2.7	-0.2	0.1
60018	12	V	850	31	3.2	0.0	-0.4
ASDE01	12	V	850	14	3.0	0.4	-0.2
ASDE01	00	V	850	14	2.5	-0.5	0.6
ASDE02	12	V	850	3	2.3	-1.2	0.6
ASDE02	00	V	850	29	3.5	-0.8	0.8
ASDE03	12	V	850	9	3.6	-0.3	-1.9
ASDE03	00	V	850	13	2.3	0.7	-0.2
ASDE04	00	V	850	7	1.6	-0.3	-0.3
ASDE04	12	V	850	8	1.6	-0.6	0.2
ASDE09	12	V	850	3	4.1	2.8	0.3
ASDK1	12	V	850	9	3.0	-0.6	0.4
ASDK1	00	V	850	11	3.5	0.8	0.0
ASDK2	12	V	850	9	2.4	0.4	-0.4
ASDK2	00	V	850	11	2.3	-0.1	-0.8
ASDK3	12	V	850	12	3.5	0.8	-0.3
ASDK3	00	V	850	12	2.7	0.3	0.1
ASES01	12	V	850	7	3.4	0.3	0.4
ASEU01	12	V	850	2	2.2	-0.1	-1.2
ASEU01	00	V	850	23	2.8	-0.4	-0.2
ASEU02	12	V	850	8	2.7	-0.3	-1.3
ASEU02	00	V	850	8	2.0	0.8	0.0
ASEU03	12	V	850	14	3.1	-0.2	-0.5
ASEU03	00	V	850	14	2.3	0.6	0.6
ASEU04	12	V	850	5	2.2	0.5	1.1
ASEU04	00	V	850	7	3.4	-0.2	-0.6
ASEU05	12	V	850	17	2.7	0.5	-0.4
ASEU05	00	V	850	18	2.6	0.6	-0.5
ASEU06	12	V	850	8	2.9	0.7	0.4
ASEU06	00	V	850	8	2.4	-0.1	0.5
ASFR1	12	V	850	11	2.8	-1.1	0.2
ASFR1	00	V	850	10	3.9	0.7	-0.4
ASFR2	12	V	850	12	2.6	0.2	0.5
ASFR2	00	V	850	13	2.9	-0.2	0.6
ASFR3	12	V	850	16	2.6	-0.2	0.5
ASFR3	00	V	850	15	2.6	0.4	-0.2
ASFR4	12	V	850	7	2.5	1.3	-0.1

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RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)
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WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASFR4	00	V	850	6	3.8	2.2	0.4
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	1	2.1	1.9	0.9
LGKI	00	V	850	30	2.8	0.7	0.3
LGKI	12	V	850	30	2.5	0.1	-0.2
LUMBIA	12	V	850	0	0.0	0.0	0.0
LUMBIA	00	V	850	0	0.0	0.0	0.0
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	23	2.8	0.1	0.1

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

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                    DRIFTER MONITORING STATISTICS (EUCOS)
                         MONITORING CENTRE        : ECMWF
                         ELEMENT MONITORED         : SURFACE PRESSURE (HPA)
                         AREA                      : 10N - 90N, 70W - 40E
                         PERIOD                    : MAY 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	143	0	0.4	0.1	0.4
13008	99	P	SUR	15	-38	109	0	0.3	0.2	0.4
13515	99	P	SUR	21	-37	191	0	0.2	0.5	0.5
13517	99	P	SUR	15	-29	194	0	0.3	0.3	0.4
13519	99	P	SUR	17	-32	213	0	0.3	0.3	0.4
13530	99	P	SUR	10	-27	207	0	0.4	0.0	0.4
13531	99	P	SUR	15	-44	178	0	0.3	0.0	0.3
13569	99	P	SUR	30	-30	191	0	0.3	0.1	0.3
13570	99	P	SUR	37	-24	212	0	0.6	0.5	0.8
13572	99	P	SUR	35	-29	217	0	0.5	0.1	0.5
13590	99	P	SUR	34	-22	212	0	0.3	0.5	0.6
13633	99	P	SUR	36	-30	217	0	0.5	-0.4	0.6
13659	99	P	SUR	28	-52	217	0	0.8	-0.1	0.8
13660	99	P	SUR	32	-50	217	0	0.6	-0.2	0.6
13661	99	P	SUR	10	-27	217	0	0.3	-0.3	0.5
13662	99	P	SUR	28	-46	217	0	0.3	0.0	0.3
13869	99	P	SUR	25	-31	217	0	0.2	0.3	0.4
13870	99	P	SUR	33	-16	196	0	0.6	0.4	0.7
13871	99	P	SUR	24	-26	217	0	0.5	0.6	0.7
13872	99	P	SUR	26	-19	217	0	0.5	0.5	0.7
21942	99	P	SUR	28	-29	210	0	0.2	0.4	0.5
25540	99	P	SUR	85	-26	217	0	0.3	-0.4	0.5
25575	99	P	SUR	86	-32	218	0	0.3	0.1	0.3
25617	99	P	SUR	87	-42	217	0	0.3	-0.3	0.4
25618	99	P	SUR	89	1	217	0	0.5	0.4	0.6
25620	99	P	SUR	87	-4	217	0	0.3	0.0	0.3
31515	99	P	SUR	13	-54	202	0	0.4	0.4	0.5
31717	99	P	SUR	19	-58	217	0	0.3	0.2	0.4
31863	99	P	SUR	19	-55	217	0	0.5	0.5	0.7
41139	99	P	SUR	20	-38	187	0	0.2	0.0	0.3
41564	99	P	SUR	35	-33	205	0	0.4	0.4	0.5
41580	99	P	SUR	16	-43	212	0	0.2	0.6	0.6
41590	99	P	SUR	20	-61	216	0	0.3	0.1	0.3
41591	99	P	SUR	17	-51	206	0	0.3	0.4	0.4
41594	99	P	SUR	21	-48	216	0	0.3	0.4	0.6
41596	99	P	SUR	22	-60	217	0	0.3	0.1	0.3

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DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)
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WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
41597	99	P	SUR	23	-57	217	0	0.3	0.3	0.4
41598	99	P	SUR	24	-47	133	0	2.1	0.0	2.1
41599	99	P	SUR	22	-70	217	0	0.2	0.4	0.5
41600	99	P	SUR	15	-60	217	0	0.3	0.6	0.7
41632	99	P	SUR	27	-63	217	0	0.3	0.0	0.3
41705	99	P	SUR	35	-52	217	0	0.3	0.0	0.3
41706	99	P	SUR	25	-62	217	0	0.3	0.0	0.3
41711	99	P	SUR	32	-50	217	0	0.4	0.0	0.4
41729	99	P	SUR	32	-65	29	0	0.2	0.4	0.5
41731	99	P	SUR	32	-54	57	0	0.3	0.4	0.5
41739	99	P	SUR	32	-68	217	0	0.4	-0.3	0.5
41933	99	P	SUR	37	-45	216	0	0.4	-0.3	0.4
41936	99	P	SUR	33	-55	216	0	0.4	-0.6	0.8
41969	99	P	SUR	22	-49	217	0	0.3	-0.3	0.4
41970	99	P	SUR	29	-60	217	0	0.4	0.2	0.4
41971	99	P	SUR	40	-33	217	0	0.4	-0.1	0.4
41972	99	P	SUR	28	-51	214	0	0.6	0.2	0.7
41975	99	P	SUR	38	-43	216	0	0.3	0.0	0.3
44505	99	P	SUR	44	-12	373	0	0.5	0.2	0.5
44509	99	P	SUR	48	-52	332	0	0.5	0.6	0.8
44510	99	P	SUR	48	-51	325	0	0.7	0.5	0.8
44513	99	P	SUR	48	-23	216	0	0.3	0.4	0.5
44515	99	P	SUR	43	-56	217	0	0.4	0.2	0.4
44516	99	P	SUR	31	-67	203	0	0.3	0.3	0.4
44517	99	P	SUR	48	-32	217	0	0.5	0.0	0.5
44546	99	P	SUR	27	-33	217	0	0.2	0.1	0.3
44547	99	P	SUR	58	-26	217	0	0.3	0.1	0.3
44548	99	P	SUR	56	-32	217	0	0.3	0.2	0.3
44549	99	P	SUR	52	-19	217	0	0.5	0.1	0.5
44550	99	P	SUR	53	-20	217	0	0.4	0.1	0.4
44551	99	P	SUR	58	-18	217	0	0.3	0.1	0.3
44554	99	P	SUR	32	-43	122	0	0.9	0.2	0.9
44558	99	P	SUR	36	-46	214	0	0.4	0.6	0.7
44560	99	P	SUR	48	-28	217	0	0.5	0.4	0.6
44601	99	P	SUR	52	-19	217	0	0.4	-0.4	0.6
44602	99	P	SUR	56	-7	216	0	0.3	-0.1	0.4
44606	99	P	SUR	50	-20	217	0	0.3	0.0	0.3
44608	99	P	SUR	43	-20	42	8	3.0	-0.5	3.0
44609	99	P	SUR	48	-31	217	0	0.5	0.3	0.5
44612	99	P	SUR	57	-10	202	0	0.4	-0.2	0.4
44613	99	P	SUR	32	-19	217	0	0.3	-0.1	0.3
44614	99	P	SUR	52	-21	208	0	0.5	0.0	0.5
44620	99	P	SUR	57	-26	217	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
44621	99	P	SUR	58	-12	217	0	0.4	0.4	0.5
44622	99	P	SUR	57	-7	148	0	0.3	-0.5	0.5
44623	99	P	SUR	57	-36	217	0	0.4	-0.1	0.4
44624	99	P	SUR	24	-22	212	0	0.3	0.0	0.3
44625	99	P	SUR	59	-15	176	0	0.4	0.3	0.5
44725	99	P	SUR	27	-58	217	0	0.4	0.1	0.4
44739	99	P	SUR	42	-41	217	0	0.5	0.5	0.7
44740	99	P	SUR	28	-52	217	0	0.3	-0.2	0.4
44760	99	P	SUR	56	-41	217	0	0.4	-0.3	0.5
44761	99	P	SUR	54	-37	217	0	0.4	-0.4	0.6
44762	99	P	SUR	50	-46	217	0	0.5	0.4	0.7
44763	99	P	SUR	56	-34	217	0	0.4	0.2	0.4
44764	99	P	SUR	53	-42	217	0	0.6	-0.4	0.7
44768	99	P	SUR	44	-60	57	0	0.4	0.5	0.6
44769	99	P	SUR	39	-59	57	0	0.3	0.3	0.4
44773	99	P	SUR	24	-60	204	0	0.6	0.1	0.6
44774	99	P	SUR	37	-64	217	0	0.4	0.2	0.4
44775	99	P	SUR	34	-69	215	0	0.4	0.3	0.5
44776	99	P	SUR	41	-47	217	0	0.5	0.5	0.7
44778	99	P	SUR	35	-51	216	0	0.3	0.4	0.5
44835	99	P	SUR	41	-22	213	0	0.3	-0.3	0.4
44836	99	P	SUR	53	-25	214	0	0.4	0.0	0.4
44837	99	P	SUR	38	-15	212	0	0.4	0.1	0.4
44839	99	P	SUR	34	-22	212	0	0.3	0.1	0.3
44846	99	P	SUR	37	-33	212	0	0.4	0.5	0.7
44847	99	P	SUR	47	-18	213	0	0.3	0.4	0.5
44848	99	P	SUR	41	-39	215	0	0.4	0.2	0.5
44863	99	P	SUR	30	-39	217	0	0.2	-0.1	0.3
44866	99	P	SUR	58	-20	217	0	0.4	-0.3	0.5
44867	99	P	SUR	56	-29	217	0	0.3	-0.3	0.4
44868	99	P	SUR	29	-46	217	0	0.4	-0.2	0.5
44871	99	P	SUR	46	-16	218	0	0.2	0.1	0.3
44872	99	P	SUR	52	-29	217	0	0.3	-0.4	0.5
44877	99	P	SUR	34	-24	215	0	0.3	0.0	0.3
44878	99	P	SUR	47	-17	213	0	0.3	0.0	0.3
44880	99	P	SUR	45	-39	175	0	1.4	0.0	1.4
44885	99	P	SUR	40	-24	213	0	0.3	0.0	0.3
44887	99	P	SUR	36	-40	215	0	0.4	0.0	0.4
44888	99	P	SUR	45	-23	215	0	0.3	-0.1	0.3
44889	99	P	SUR	34	-49	211	0	0.3	-0.1	0.3
44890	99	P	SUR	29	-60	213	0	0.3	0.1	0.3
44891	99	P	SUR	28	-33	213	0	0.2	0.2	0.3
44892	99	P	SUR	49	-27	216	0	0.4	-0.2	0.4

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DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)
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WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
44896	99	P	SUR	31	-42	216	0	0.3	-0.1	0.3
47503	99	P	SUR	74	-17	218	0	0.6	-0.3	0.7
47585	99	P	SUR	68	-67	158	0	0.5	0.1	0.6
47586	99	P	SUR	54	-48	210	0	2.3	-1.2	2.6
48506	99	P	SUR	84	-68	197	0	0.4	0.3	0.4
48568	99	P	SUR	64	-35	210	0	0.6	0.0	0.6
48597	99	P	SUR	84	-24	160	0	0.4	-0.3	0.5
48778	99	P	SUR	77	-15	210	0	0.3	-0.5	0.6
48779	99	P	SUR	68	-24	209	0	0.6	-0.5	0.8
62091	99	P	SUR	53	-5	216	0	0.4	-0.2	0.4
62092	99	P	SUR	51	-11	216	1	0.4	0.0	0.4
62093	99	P	SUR	55	-10	216	0	0.5	0.0	0.5
62094	99	P	SUR	52	-7	215	0	0.4	-0.1	0.4
62513	99	P	SUR	59	-28	217	0	0.4	0.2	0.4
62514	99	P	SUR	68	0	217	0	0.3	-0.1	0.3
62516	99	P	SUR	26	-24	217	0	0.3	0.5	0.6
62536	99	P	SUR	60	1	217	0	0.3	-0.3	0.4
62538	99	P	SUR	63	-10	217	0	2.0	0.0	2.0
62539	99	P	SUR	56	-19	217	0	0.4	0.0	0.4
62551	99	P	SUR	60	-2	84	0	0.6	-0.3	0.7
62552	99	P	SUR	50	-16	218	0	0.4	0.1	0.4
62553	99	P	SUR	78	6	217	0	0.4	-0.1	0.4
62677	99	P	SUR	61	-29	85	0	0.5	0.4	0.6
62681	99	P	SUR	36	-13	217	0	0.3	0.1	0.3
62687	99	P	SUR	76	-4	13	0	0.2	-0.3	0.4
62695	99	P	SUR	26	-34	217	0	0.2	0.5	0.5
62713	99	P	SUR	27	-56	217	0	0.4	-0.1	0.4
62714	99	P	SUR	27	-57	217	0	0.3	-0.2	0.4
62940	99	P	SUR	34	-28	214	0	0.4	0.1	0.4
62941	99	P	SUR	34	-31	212	0	0.4	0.0	0.4
63546	99	P	SUR	69	-4	209	0	1.1	-1.1	1.5
63644	99	P	SUR	74	26	217	0	0.5	-0.3	0.6
64471	99	P	SUR	80	9	42	0	0.3	-0.4	0.5
64472	99	P	SUR	82	13	210	0	0.4	-0.1	0.4
64517	99	P	SUR	59	-1	176	0	0.4	0.5	0.6
64518	99	P	SUR	60	-7	217	0	0.3	-0.1	0.3
64519	99	P	SUR	62	2	217	0	0.2	0.3	0.4
64520	99	P	SUR	71	2	217	0	0.3	-0.3	0.4
64521	99	P	SUR	71	2	217	0	0.2	-0.2	0.3
64522	99	P	SUR	72	11	217	0	0.3	-0.1	0.3
64523	99	P	SUR	64	-3	216	0	0.4	0.3	0.5
64524	99	P	SUR	66	6	217	0	0.3	-0.2	0.3
64525	99	P	SUR	70	-5	217	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	61	-16	217	0	0.3	0.1	0.3
64527	99	P	SUR	62	-17	200	0	0.4	0.6	0.7
64532	99	P	SUR	59	-46	217	155	0.4	-0.1	0.4
64534	99	P	SUR	61	-36	217	0	1.9	0.1	1.9
64535	99	P	SUR	68	-29	217	0	0.4	-0.1	0.5
64546	99	P	SUR	63	-40	217	0	0.4	0.4	0.6
64606	99	P	SUR	62	-3	171	0	0.5	0.5	0.7
64613	99	P	SUR	78	5	217	0	0.5	-0.2	0.5
64614	99	P	SUR	60	-20	217	0	0.3	0.0	0.3
64615	99	P	SUR	76	-4	217	0	3.1	-0.3	3.1
64620	99	P	SUR	62	-12	217	0	0.3	0.0	0.3
64621	99	P	SUR	63	-16	217	0	0.3	0.2	0.4
64622	99	P	SUR	72	8	217	0	0.4	0.0	0.4
64623	99	P	SUR	78	-1	217	0	1.9	-1.1	2.2
64665	99	P	SUR	78	7	217	0	0.3	0.1	0.4
64666	99	P	SUR	72	15	217	0	0.3	0.3	0.4
64667	99	P	SUR	62	-4	196	0	0.4	-0.1	0.4
64668	99	P	SUR	75	-7	217	0	1.3	-0.1	1.3
64669	99	P	SUR	65	-23	48	0	0.3	0.1	0.3
64692	99	P	SUR	73	10	217	0	0.3	0.3	0.4
65596	99	P	SUR	56	-45	217	0	0.5	0.6	0.8
65598	99	P	SUR	52	-11	128	0	0.8	-0.2	0.8
65599	99	P	SUR	59	-50	136	0	0.5	0.2	0.5
65600	99	P	SUR	60	-49	134	0	0.5	-0.3	0.6
65601	99	P	SUR	60	-50	127	0	0.4	-0.1	0.4
65602	99	P	SUR	57	-50	92	0	0.5	-0.3	0.5

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                : MAY 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	143	0	0	0.9	0.8	1.3
13002	99	SPEED	SUR	20	-23	139	0	0	0.9	0.3	0.9
13008	99	SPEED	SUR	15	-38	109	0	0	0.7	0.0	0.7
41026	99	SPEED	SUR	12	-38	92	0	0	0.7	0.1	0.7
41139	99	SPEED	SUR	20	-38	187	0	0	0.7	0.0	0.7
62091	99	SPEED	SUR	53	-5	216	0	0	1.4	-0.1	1.4
62092	99	SPEED	SUR	51	-11	216	0	0	1.2	-0.4	1.3
62093	99	SPEED	SUR	55	-10	216	0	0	1.1	-0.2	1.1
62094	99	SPEED	SUR	52	-7	215	0	0	1.2	0.0	1.2

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                 : MAY 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	108	0	0	11.3	0.1	11.3
13002	99	DIRN	SUR	20	-23	139	0	0	9.5	4.7	10.6
13008	99	DIRN	SUR	15	-38	109	0	0	8.5	-2.6	8.9
41026	99	DIRN	SUR	12	-38	92	0	0	7.9	2.4	8.3
41139	99	DIRN	SUR	20	-38	187	0	0	8.0	11.7	14.2
62091	99	DIRN	SUR	53	-5	197	0	0	12.8	4.0	13.4
62092	99	DIRN	SUR	51	-11	203	0	0	11.5	-0.9	11.5
62093	99	DIRN	SUR	55	-10	200	0	0	12.1	-5.6	13.3
62094	99	DIRN	SUR	52	-7	201	0	0	11.0	5.5	12.3

4.12   Table 24 – List of Assimilated BUFR Encoded Radiosonde Stations

```
ASDE02   ASDE04   ASDE09   ASES01   ASEU01   ASEU02   ASEU04   ASEU05   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  ASES01  ASEU01  ASEU02  ASEU03
ASEU04  ASEU05  ASEU06  BAGUIO  Baguio  DALANZAD        DAVAOAI DBLK
Dalanzad        DavaoAi LAOAG   LEGASPI LUMBIAA Laoag   Legaspi LumbiaA
MACTAN  MUREN   Mactan  Muren   PUERTOP PuertoP TANAY   Tanay   ULAANBAA
ULAANGOM        Ulaan-Ba        Ulaan-Go        04692   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 PI-LOTSHIPs 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.