ECMWF Global Data Monitoring Report

January 2016

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

Contents

Summary of Revisions (in reverse order)

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

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

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

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

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

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

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

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

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

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

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

1 Introduction

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

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

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

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

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

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

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

2 Data summary - History of events

2.1 Radiosondes

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

Ident	Time	Dec	Jan	Ident	Time	Dec	Jan
08594	(12)	18	2	16113	(12)	2	19
24125	(00)	29	0	17196	(00)	0	24
24125	(12)	29	1	17196	(12)	0	26
24343	(00)	22	1	25400	(00)	13	31
24343	(12)	22	1	25400	(12)	14	31
38507	(00)	16	0	25428	(00)	0	31
40948	(12)	30	6	25428	(12)	0	29
41256	(00)	24	0	34300	(00)	14	25
42410	(12)	31	0	42056	(00)	5	22
43150	(00)	27	4	43185	(00)	13	27
43371	(00)	23	0	43285	(00)	13	24
47090	(00)	23	0	43295	(12)	0	16
47090	(12)	22	0	43311	(00)	12	32
60390	(12)	31	3	47104	(00)	8	31
60571	(12)	31	3	47104	(12)	8	31
60680	(12)	30	3	61024	(12)	9	30
62337	(12)	13	0	61052	(00)	15	31
62423	(12)	12	0	61052	(12)	14	30
76595	(12)	17	0	61291	(00)	0	21
78807	(12)	28	8	61291	(12)	0	20
82107	(00)	16	0	64910	(00)	13	28
82107	(12)	15	0	64910	(12)	14	28
82917	(00)	30	0	65503	(12)	9	22
83362	(00)	17	0	68110	(12)	16	28
83650	(12)	29	4	72797	(00)	19	31
84008	(12)	26	4	72797	(12)	19	30
96471	(00)	27	0	76526	(12)	20	31
96471	(12)	27	0	83566	(00)	8	29
-	-	-	-	83566	(12)	10	30

2.2 Drifting Buoys

Surface pressure observations from **1468** drifting buoys were received during the month.

3 Global monitoring statistics

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

3.1 Data Availability

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

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

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

3.2 Data Quality

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

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

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

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

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

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

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

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

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

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

3.2.1 Figure 1 - Availability - SYNOP PRESSURE

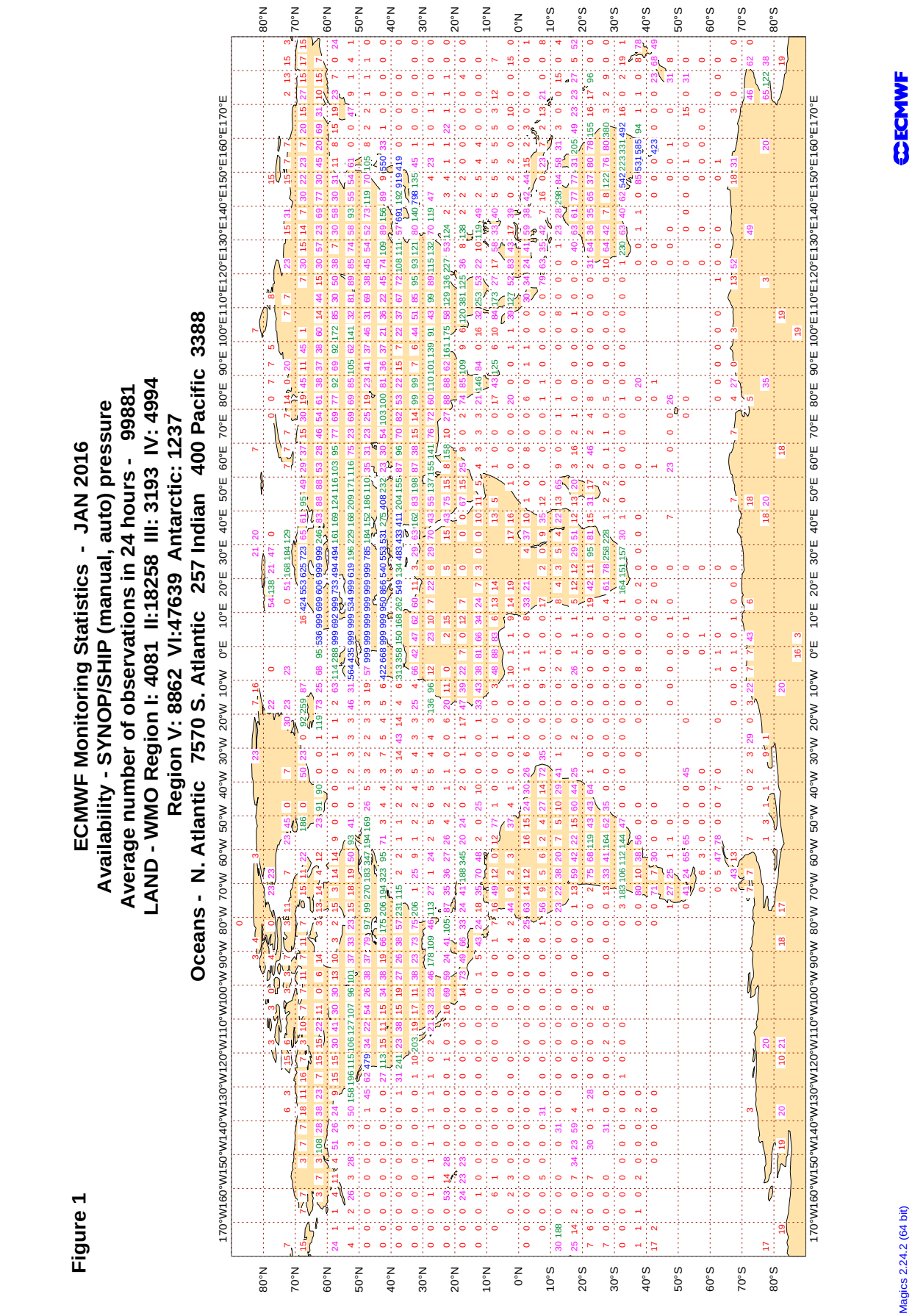


Figure 1

3.2.2 Figure 2 - Availability - DRIFTER PRESSURE

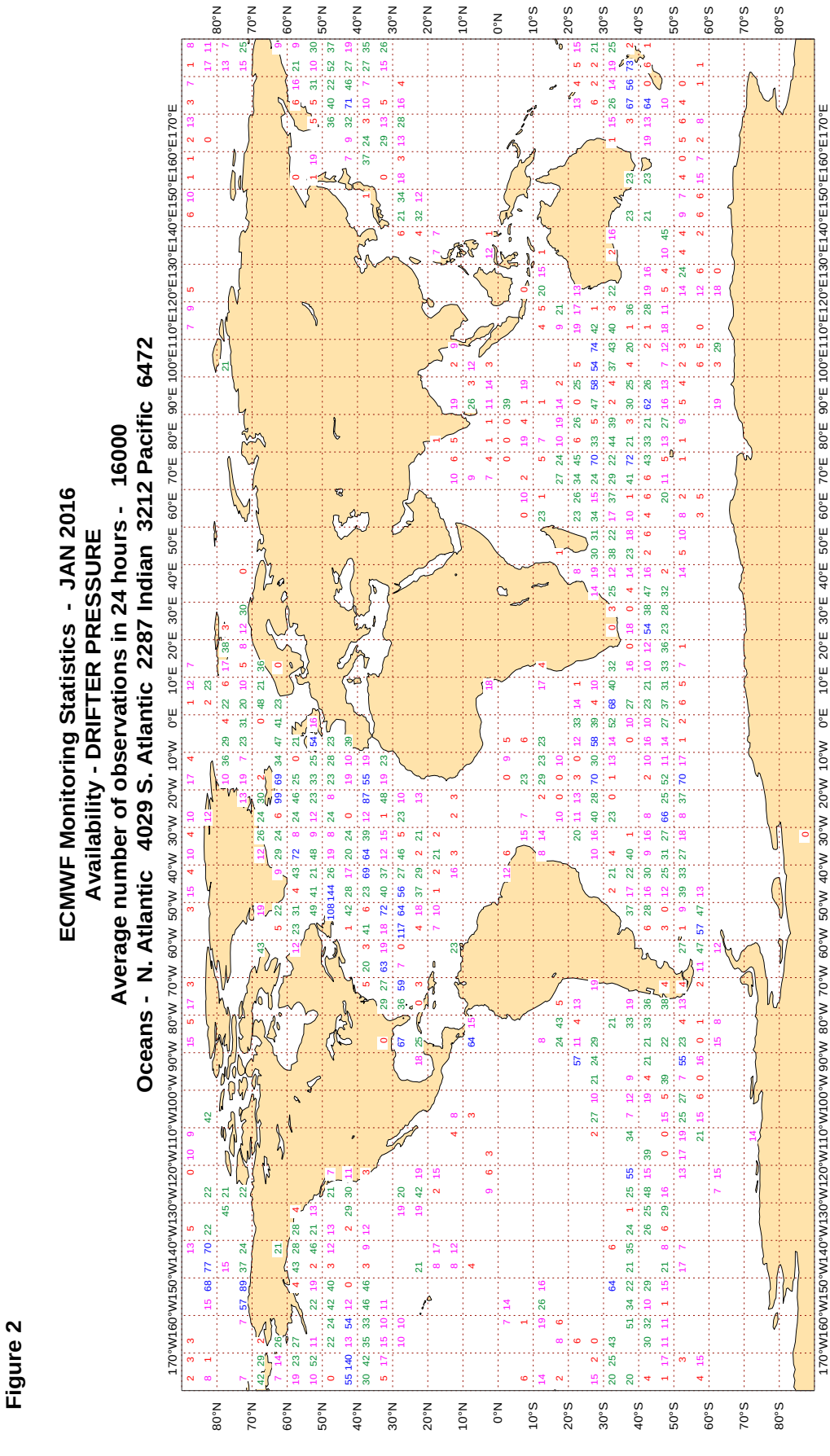


Figure 2

3.2.3 Figure 3 - Availability - TEMP 500 hPa geopotential

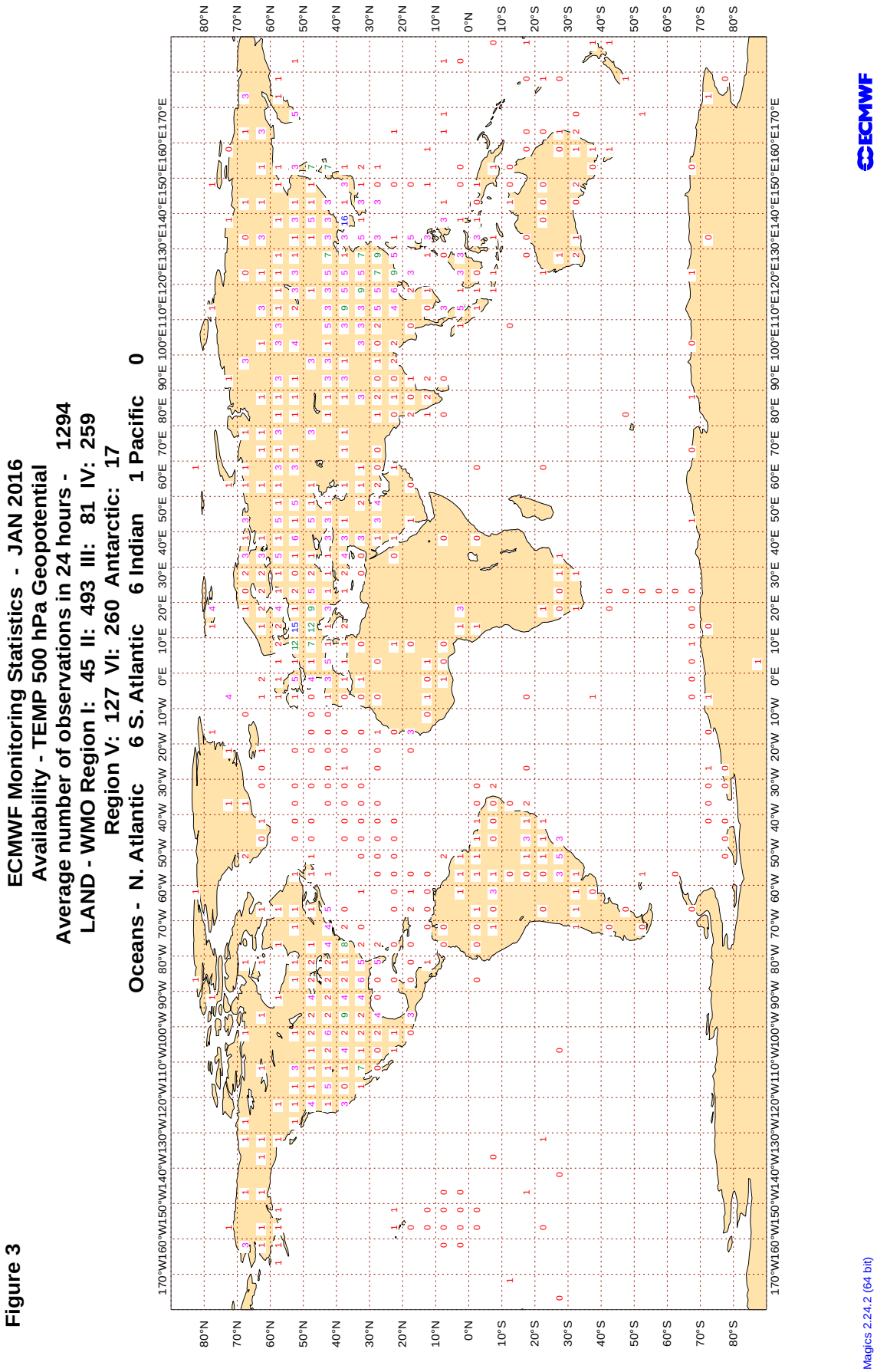


Figure 3

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

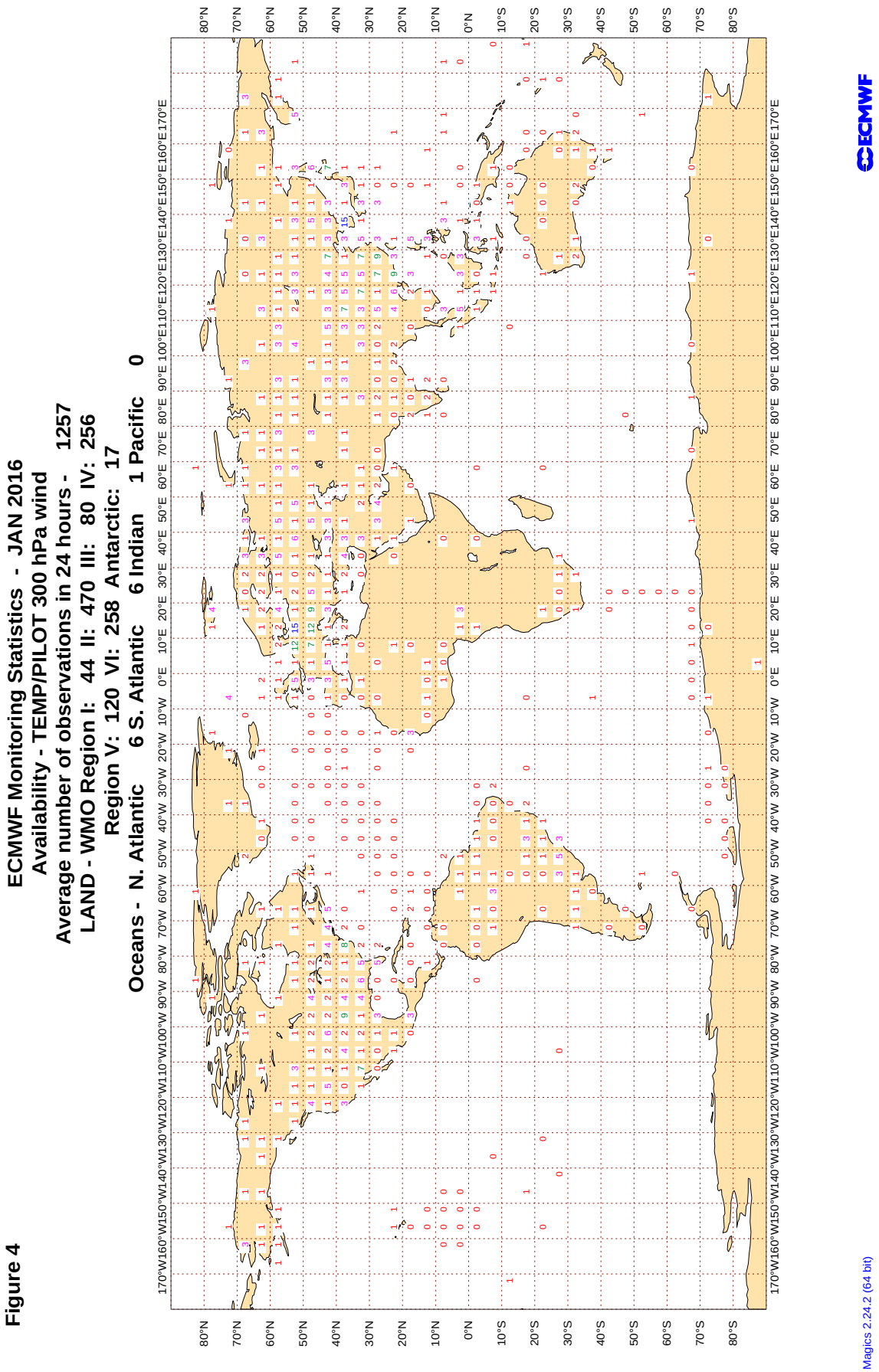


Figure 4

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

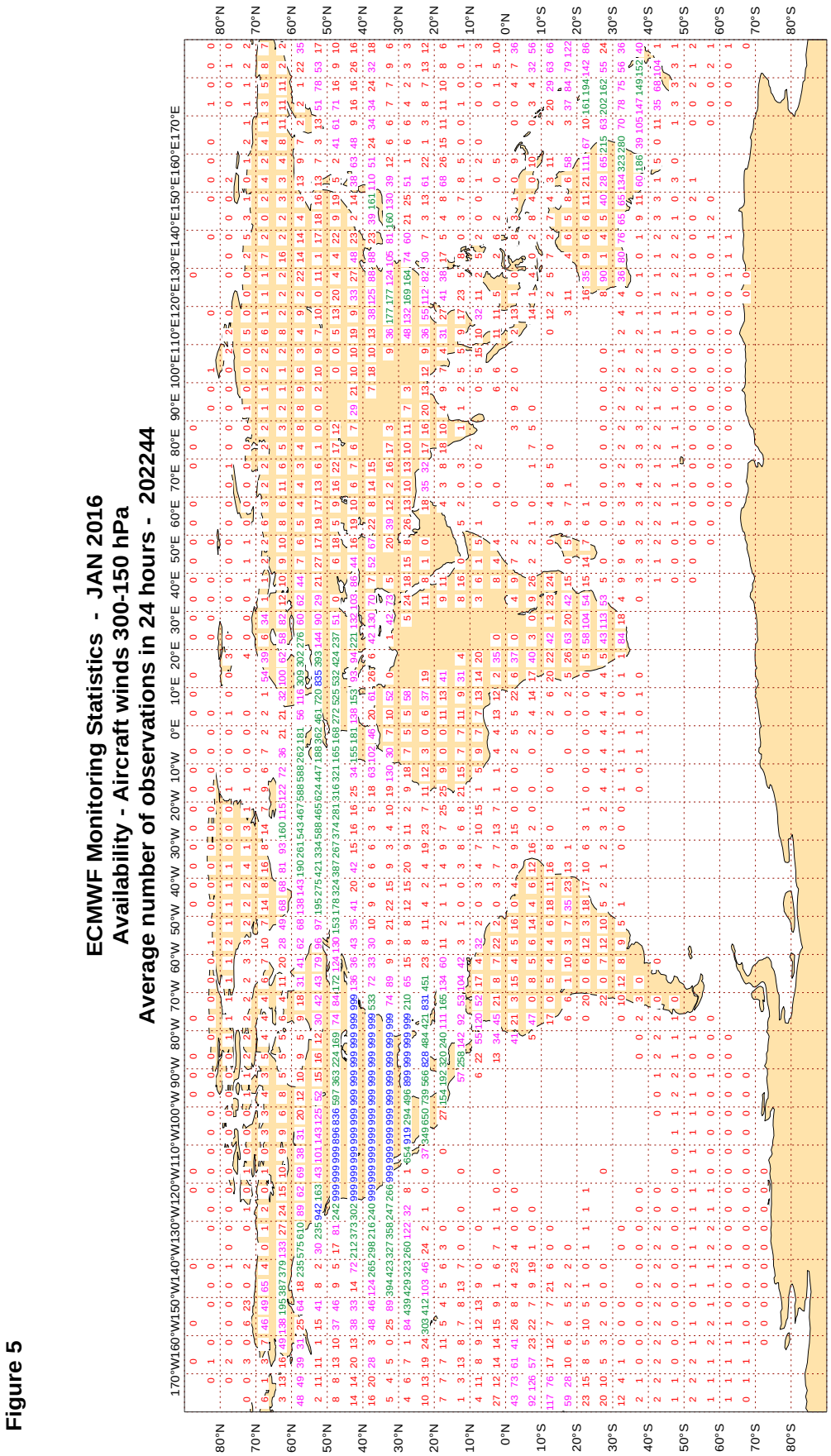
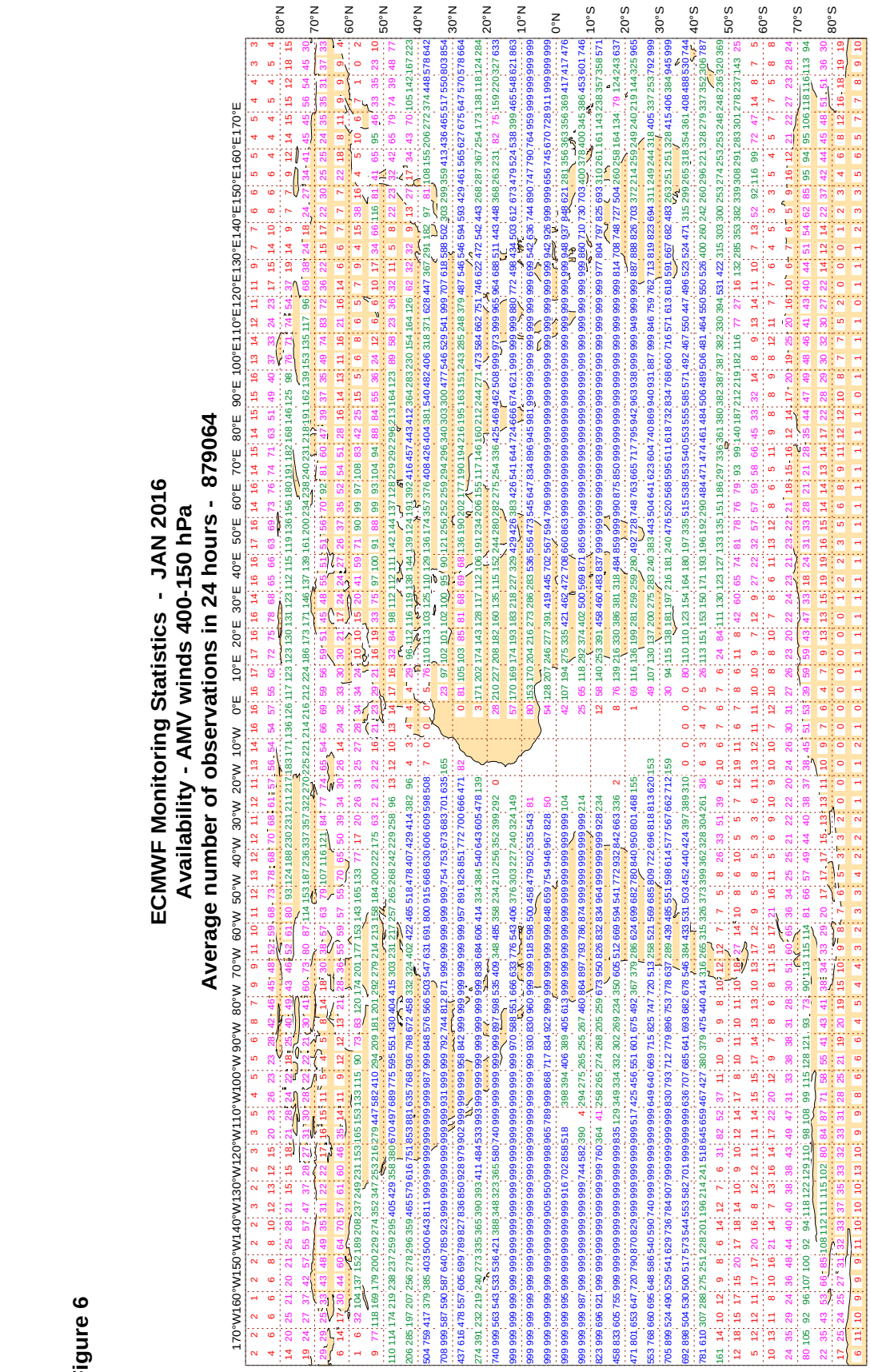


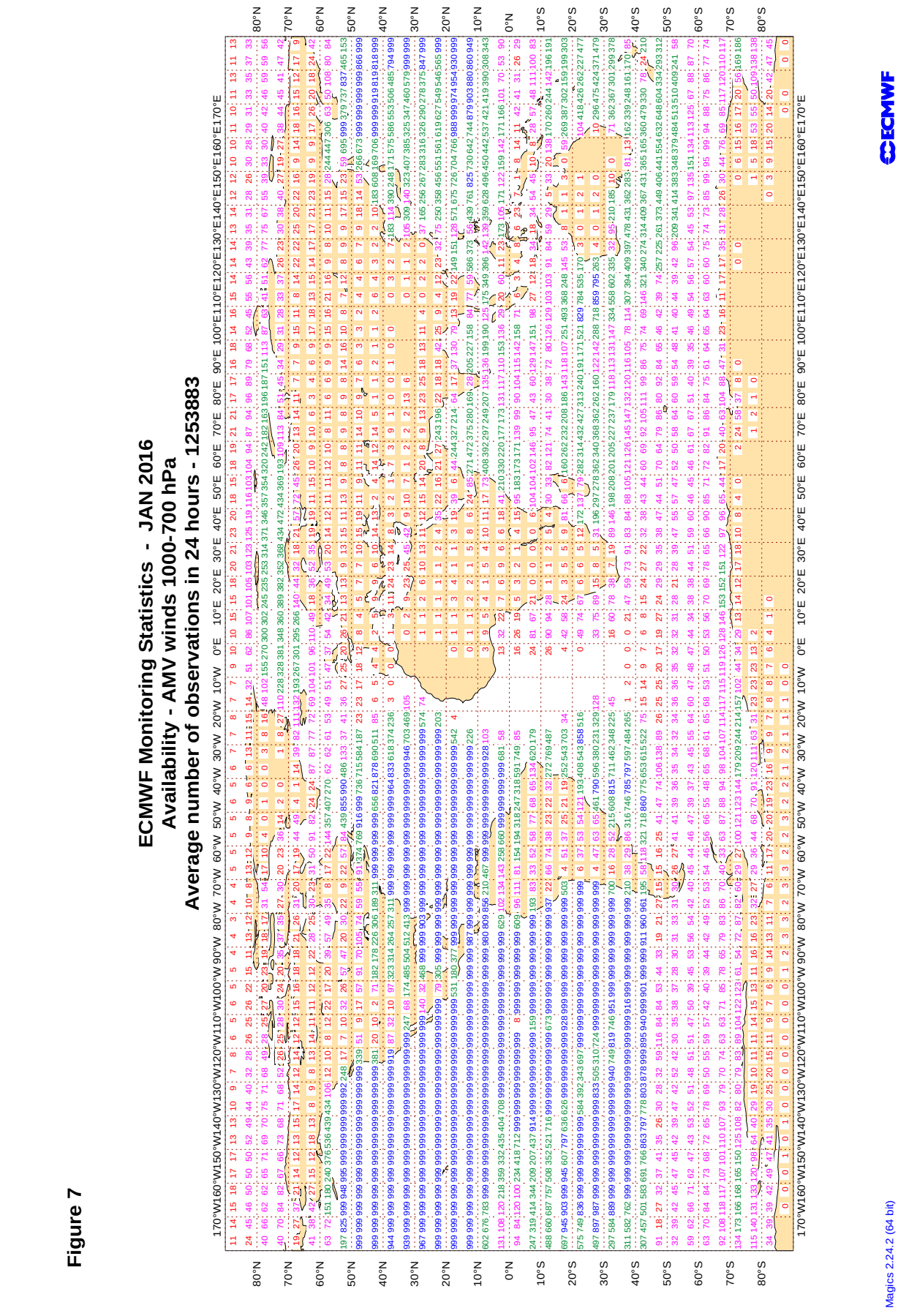
Figure 5

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

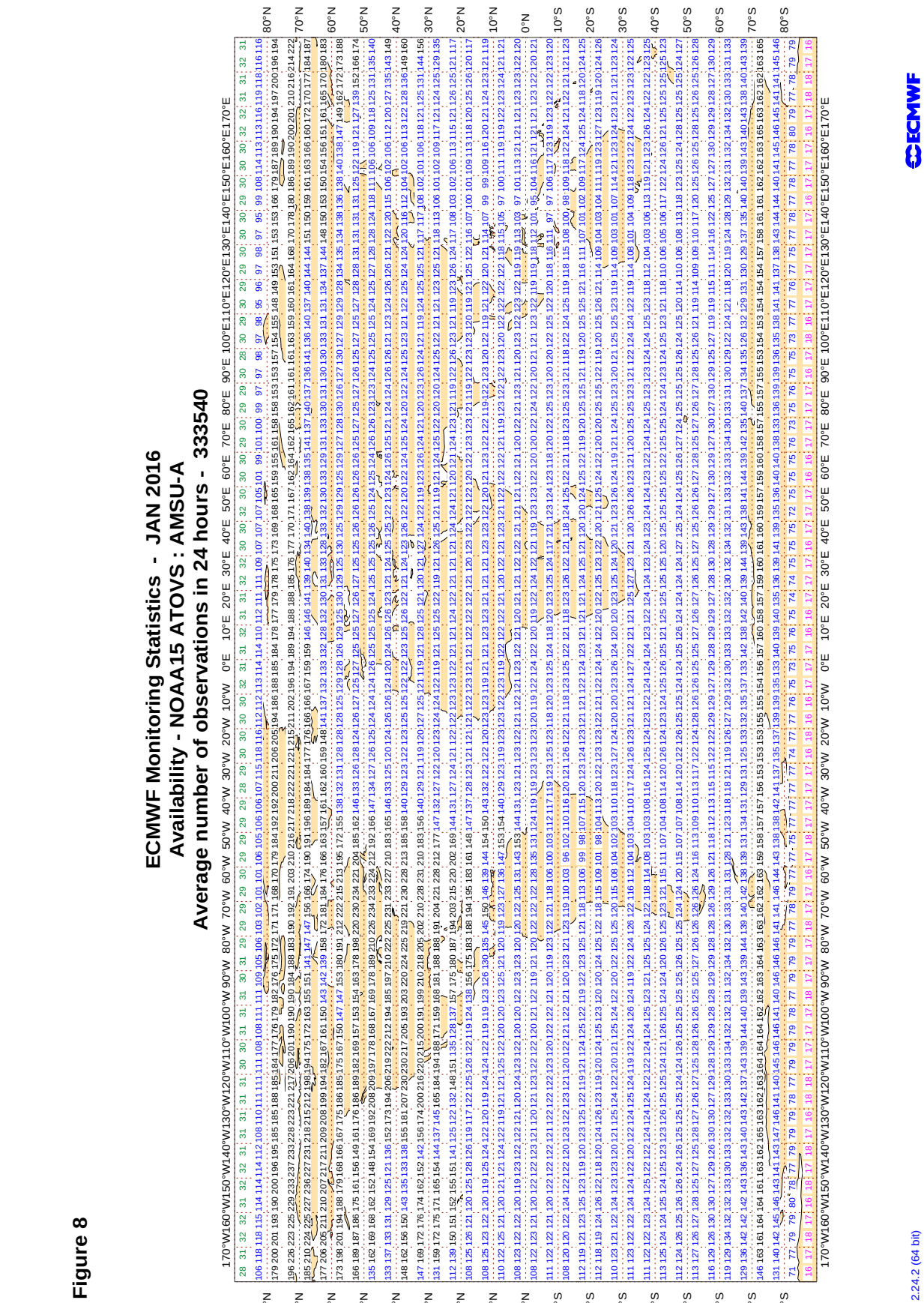
Figure 6



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

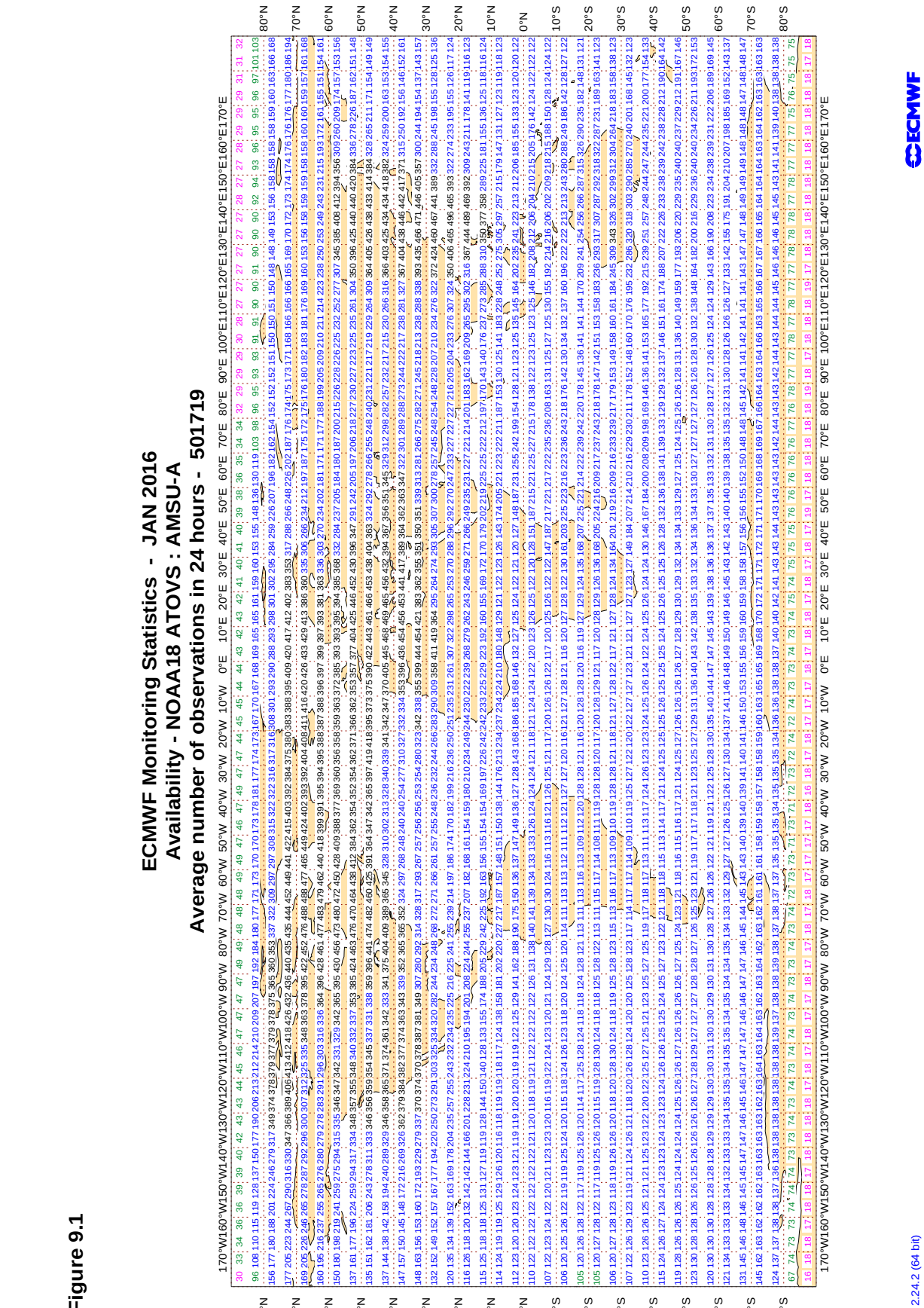


3.2.8 Figure 8 - Availability - NOAA15 ATOVS : AMSU-A



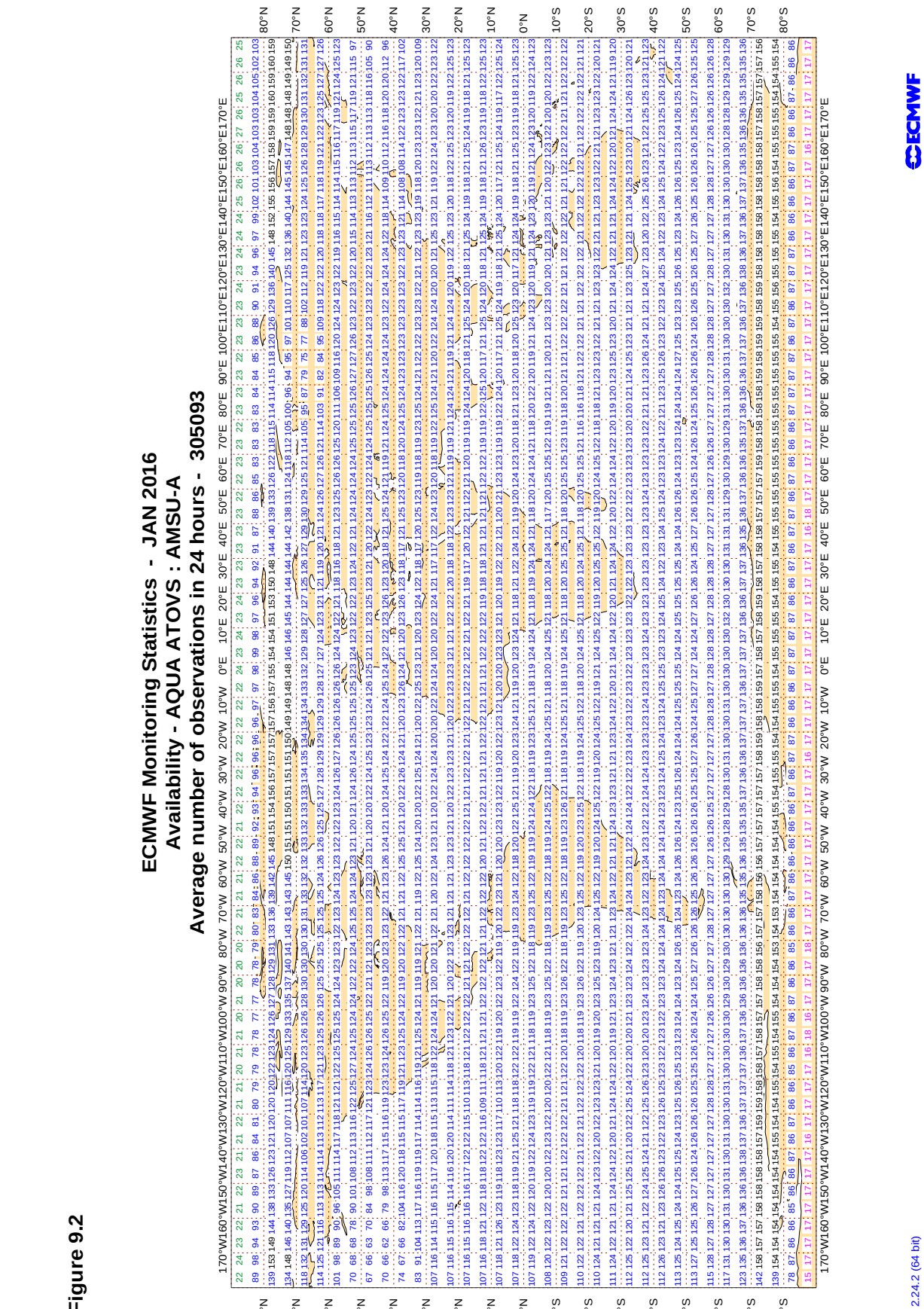
3.2.9 Figure 9.1 - Availability - NOAA18 ATOVS : AMSU-A

Figure 9.1



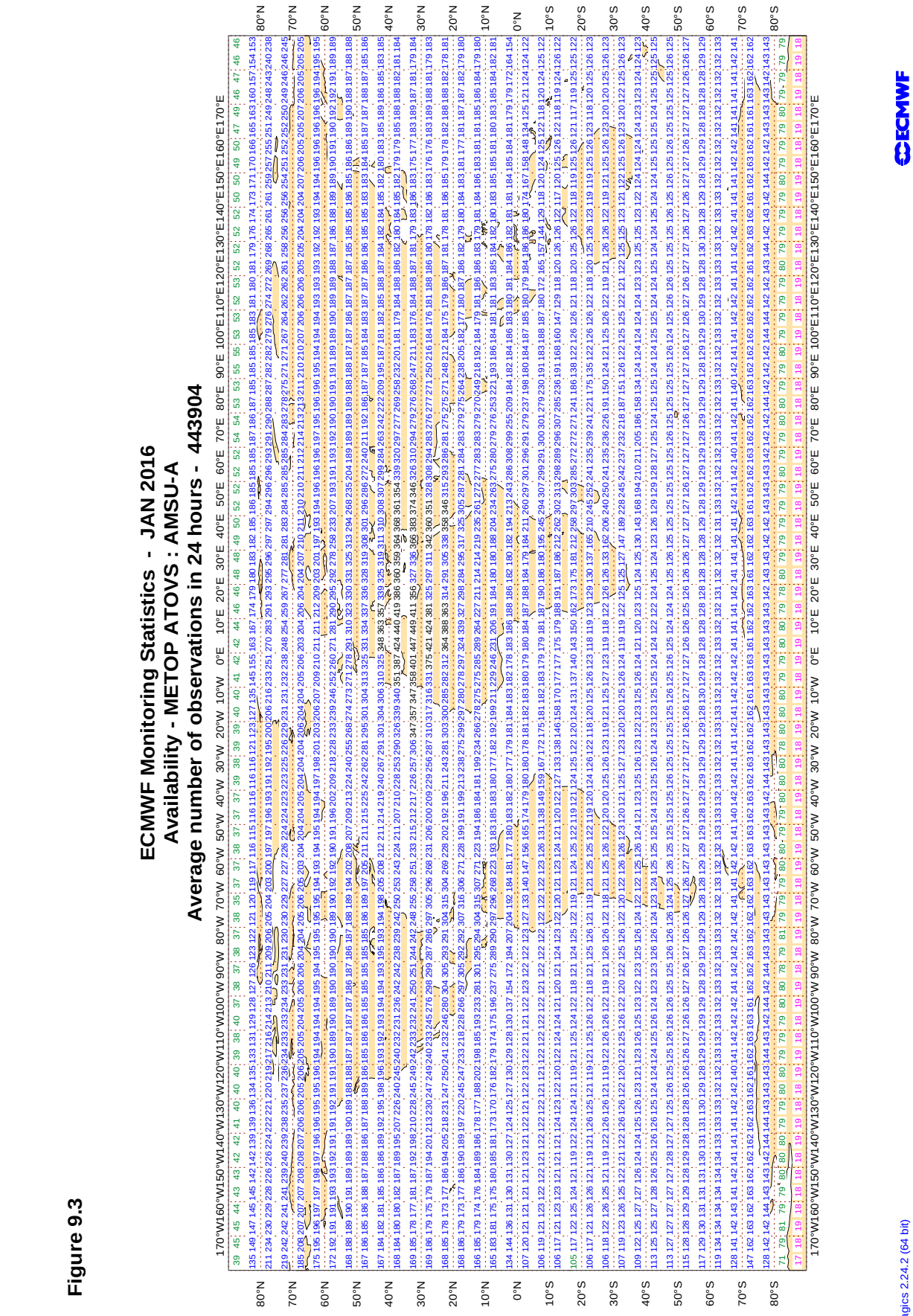
3.2.10 Figure 9.2 - Availability - AQUA ATOVS : AMSU-A

Figure 9.2



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

Figure 9.3



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

```
          LIST OF SUSPECT STATIONS        : SHIPS + FIXED MARINE PLATFORMS
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : SURFACE PRESSURE (HPA)
                    AREA                  : GLOBAL
                    PERIOD                : JAN 2016
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


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

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

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	SD	BIAS	RMS
3EPD8	99	P	SUR	26	0	0.4	-3.1	3.1
9V2737	99	P	SUR	28	0	0.9	-4.8	4.8
9V2781	99	P	SUR	28	1	3.3	4.0	5.1
9V2782	99	P	SUR	20	0	1.1	3.1	3.3
9V7645	99	P	SUR	23	0	3.6	4.6	5.8
9V9131	99	P	SUR	19	0	4.1	3.1	5.1
9V9132	99	P	SUR	52	0	2.5	3.1	4.0
C6AX4	99	P	SUR	24	0	0.9	-3.4	3.5
C6FM5	99	P	SUR	30	0	1.0	-3.2	3.4
C6FR3	99	P	SUR	22	0	2.2	-3.3	3.9
C6JT	99	P	SUR	44	0	1.1	-3.5	3.6
C6LU4	99	P	SUR	18	0	1.3	6.8	7.0
C6YZ5	99	P	SUR	35	0	1.8	-3.0	3.5
C6ZJ8	99	P	SUR	20	0	1.4	3.0	3.3
IBCX	99	P	SUR	23	1	3.3	-4.7	5.7
LAJK7	99	P	SUR	20	0	1.0	3.4	3.5
LAQK7	99	P	SUR	26	0	1.0	3.2	3.3
LAQQ7	99	P	SUR	55	0	1.7	3.8	4.2
ONIK	99	P	SUR	54	0	1.8	9.3	9.4
OZ2049	99	P	SUR	43	0	1.7	-4.8	5.1
PCGM	99	P	SUR	33	0	1.8	-4.7	5.0
S6TE	99	P	SUR	41	0	1.7	-3.2	3.6
UASX	99	P	SUR	25	0	4.7	6.1	7.7
UBVF4	99	P	SUR	33	0	1.2	-6.6	6.7
UCJT	99	P	SUR	25	0	0.8	-3.2	3.3
V7FJ8	99	P	SUR	93	0	1.6	-3.2	3.6
V7UT8	99	P	SUR	19	0	2.7	4.8	5.5
VRBI8	99	P	SUR	35	0	2.3	3.8	4.4
VRDW2	99	P	SUR	21	0	1.8	3.6	4.0
VRFI7	99	P	SUR	60	0	1.1	4.4	4.5
VRFX8	99	P	SUR	23	1	3.8	-8.5	9.3
VRHE3	99	P	SUR	27	1	4.2	3.7	5.6

LIST OF SUSPECT STATIONS : SHIPS + FIXED MARINE PLATFORMS
MONITORING CENTRE : ECMWF
ELEMENT MONITORED : SURFACE PRESSURE (HPA)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	SD	BIAS	RMS
VRKE9	99	P	SUR	54	0	1.4	3.2	3.5
WACW	99	P	SUR	24	0	1.0	3.0	3.2
WAZV	99	P	SUR	42	0	0.7	-4.3	4.3
WGAX	99	P	SUR	31	0	1.9	4.8	5.2
WGJT	99	P	SUR	16	0	1.4	-3.8	4.0
WMKN	99	P	SUR	23	0	2.3	-7.5	7.8

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                : JAN 2016
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


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


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

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
46087	99	SPEED	SUR	248	0	0	2.2	4.3	4.8
46181	99	SPEED	SUR	117	0	0	3.3	5.4	6.3
62086	99	SPEED	SUR	120	0	0	5.0	-9.4	10.7
62146	99	SPEED	SUR	124	0	0	4.2	-4.4	6.1
62153	99	SPEED	SUR	245	0	0	4.8	-5.3	7.1

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

```
          LIST OF SUSPECT STATIONS        : SHIPS + FIXED MARINE PLATFORMS
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND DIRECTION (DEGREES)
                    AREA                  : GLOBAL
                    PERIOD                : JAN 2016
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


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


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

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS

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                : JAN 2016
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


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

TIME = 99 => AVERAGE OF ALL OBSERVATIONS
```

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
16519	99	P	SUR	-41	62	325	82	0.5	0.1	0.6
26545	99	P	SUR	83	5	698	459	6.8	-4.9	8.3
42535	99	P	SUR	29	-87	110	74	0.4	-0.2	0.5
47503	99	P	SUR	64	-33	584	581	3.6	-6.1	7.1
48513	99	P	SUR	74	175	651	214	8.3	2.1	8.5
48570	99	P	SUR	68	-176	685	233	8.3	-1.9	8.5
48643	99	P	SUR	70	-144	697	664	3.2	-10.2	10.7
63923	99	P	SUR	77	-10	554	531	2.2	-7.8	8.1
64532	99	P	SUR	53	-26	569	6	0.7	-13.0	13.0
64550	99	P	SUR	63	-26	216	88	1.5	-0.3	1.5

3.2.16 Table 5 - Suspect drifters: Wind speed (m/s)

```
          LIST OF SUSPECT STATIONS        : DRIFTER
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND SPEED (M/S)
                    AREA                  : GLOBAL
                    PERIOD                : JAN 2016
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


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


TIME = 99 => AVERAGE OF ALL OBSERVATIONS
```

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
42360	99	SPEED	SUR	27	-91	20	0	0	2.4	-7.4	7.8
46181	99	SPEED	SUR	54	-129	702	0	0	3.4	5.3	6.3
62086	99	SPEED	SUR	55	6	728	2	0	5.2	-9.0	10.4
62153	99	SPEED	SUR	57	2	1468	0	0	4.7	-5.2	7.0

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

```
          LIST OF SUSPECT STATIONS         : DRIFTER
                    MONITORING CENTRE      : ECMWF
                    ELEMENT MONITORED      : WIND DIRECTION (DEGREES)
                    PERIOD                 : JAN 2016
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


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


TIME = 99 => AVERAGE OF ALL OBSERVATIONS
```

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
23097	99	DIRN	SUR	15	69	163	0	0	30.1	-27.3	40.7
23099	99	DIRN	SUR	13	80	62	0	0	143.6	-6.6	143.8
23454	99	DIRN	SUR	10	73	87	0	0	94.8	-111.1	146.1
23460	99	DIRN	SUR	7	88	179	0	0	163.0	-46.1	169.4
23491	99	DIRN	SUR	12	93	38	0	0	28.6	48.0	55.9
23492	99	DIRN	SUR	11	72	88	0	0	160.6	50.3	168.2
23494	99	DIRN	SUR	8	73	84	0	0	25.0	-28.3	37.7
23497	99	DIRN	SUR	11	72	66	0	0	32.8	-41.8	53.2
31006	99	DIRN	SUR	4	-23	110	0	0	24.8	20.6	32.3
31053	99	DIRN	SUR	-32	-50	216	0	0	27.6	-51.0	58.0
42361	99	DIRN	SUR	28	-93	683	0	0	20.4	24.8	32.1
44022	99	DIRN	SUR	41	-74	96	0	0	46.4	26.9	53.7
44059	99	DIRN	SUR	37	-76	306	0	0	18.2	-25.8	31.5
46120	99	DIRN	SUR	48	-122	332	0	0	46.7	-21.6	51.4
46121	99	DIRN	SUR	47	-123	22	0	0	26.3	-48.3	55.0
46125	99	DIRN	SUR	48	-123	49	0	0	14.1	47.0	49.1
51022	99	DIRN	SUR	-2	-155	276	0	0	63.2	42.3	76.1
51310	99	DIRN	SUR	-8	-170	137	0	0	99.3	47.2	109.9

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

```
          LIST OF SUSPECT STATIONS         : RADIOSONDES
                    MONITORING CENTRE      : ECMWF
                    ELEMENT MONITORED      : GEOPOTENTIAL HEIGHT (METRES)
                    AREA                   : GLOBAL
                    PERIOD                 : JAN 2016
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


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


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

WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
20292	12	Z	100	78	104	24	0	55.5	98.1	112.7
30230	12	Z	30	58	108	12	0	158.6	85.9	180.4
38064	12	Z	200	45	66	30	0	72.0	55.0	90.6
40437	00	Z	925	25	47	28	0	3.6	32.4	32.6
43192	00	Z	50	15	74	18	0	36.8	132.6	137.6
43295	00	Z	200	13	78	24	0	27.4	69.8	75.0
43295	12	Z	100	13	78	10	0	8.8	129.0	129.3
76405	12	Z	400	24	-110	22	0	64.7	52.8	83.5
76654	12	Z	50	19	-104	19	2	103.7	90.5	137.6
83362	12	Z	250	-16	-56	13	0	69.3	43.4	81.8
96147	12	Z	925	4	108	30	3	12.7	53.3	54.8
96147	00	Z	925	4	108	29	2	9.7	52.1	53.0
98223	00	Z	30	18	121	19	0	69.9	227.6	238.1

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                : JAN 2016
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

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

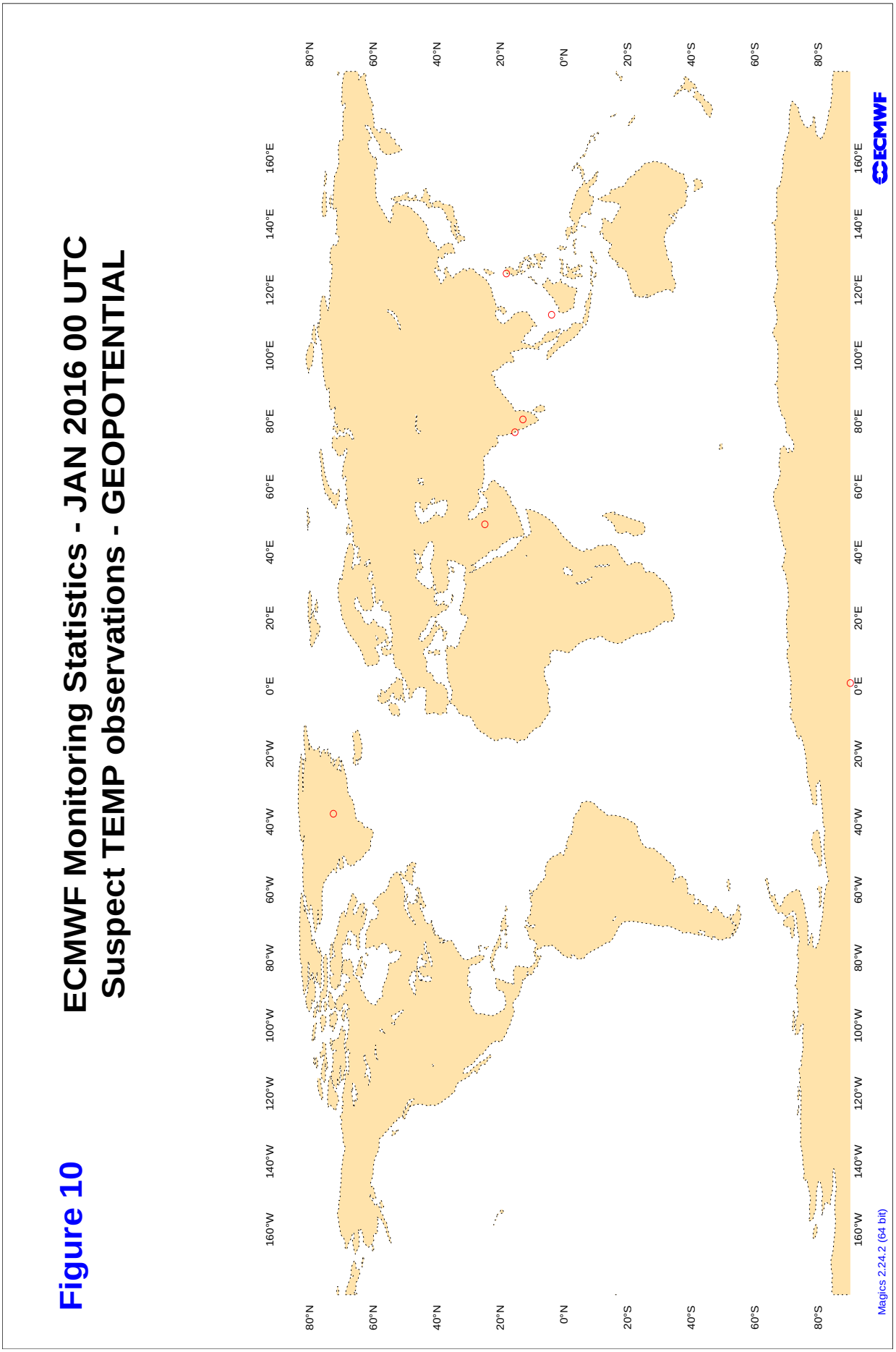
WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	UBIAS	VBIAS	RMS
42339	12	V	250	26	73	23	0	-4.9	0.0	18.8

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

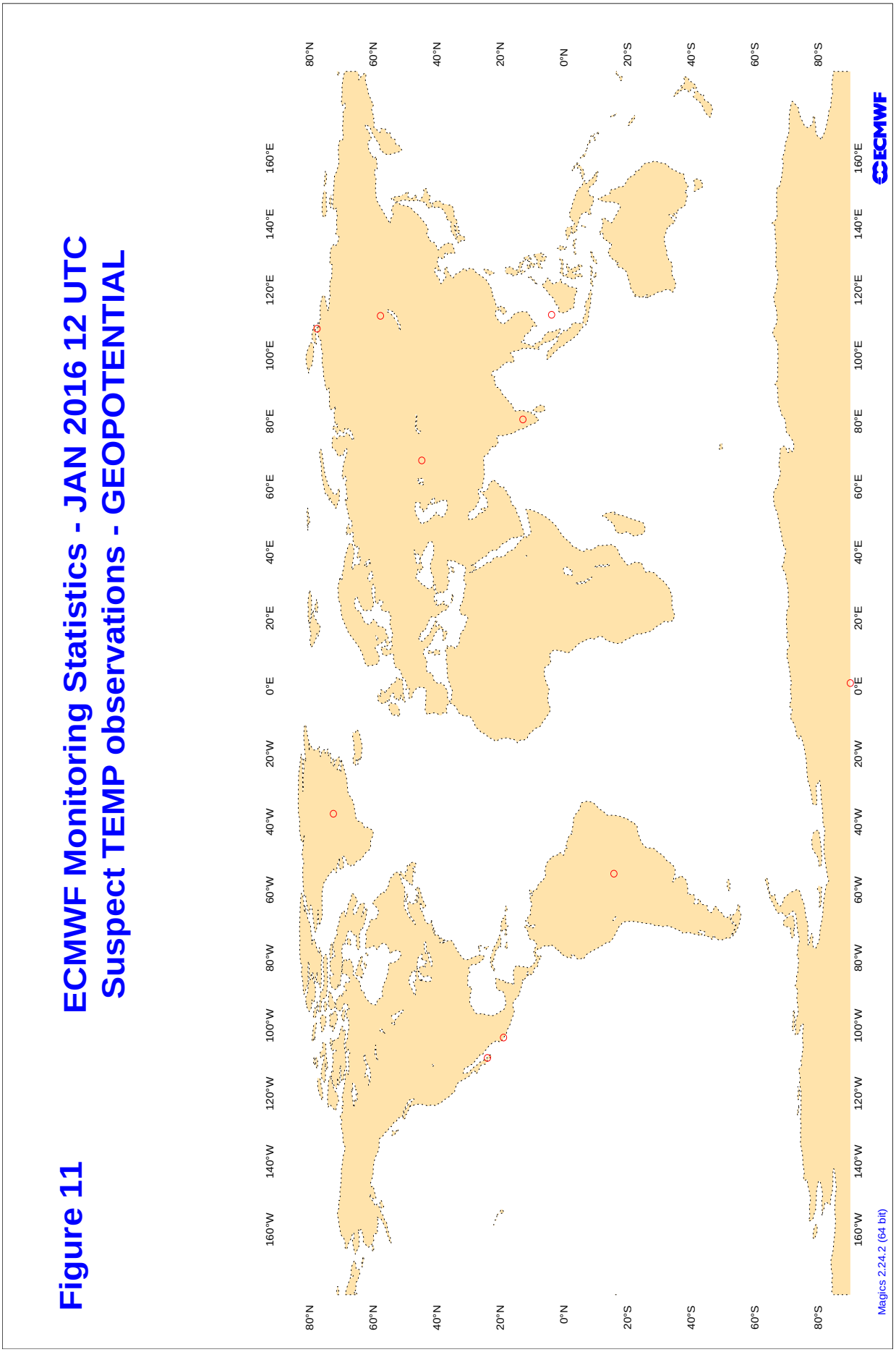
```
          LIST OF SUSPECT STATIONS        : RADIOSONDES
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND DIRECTION (DEGREES)
                    AREA                  : GLOBAL
                    PERIOD                : JAN 2016
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


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

WMO IDENT	OBS TIME	ELM	LAT	LONG	NUM OBS	BIAS	MAX SPREAD	SD
32215	12	DD	51	156	27	10.1	3.6	9.3
32215	00	DD	51	156	29	10.1	2.5	9.0

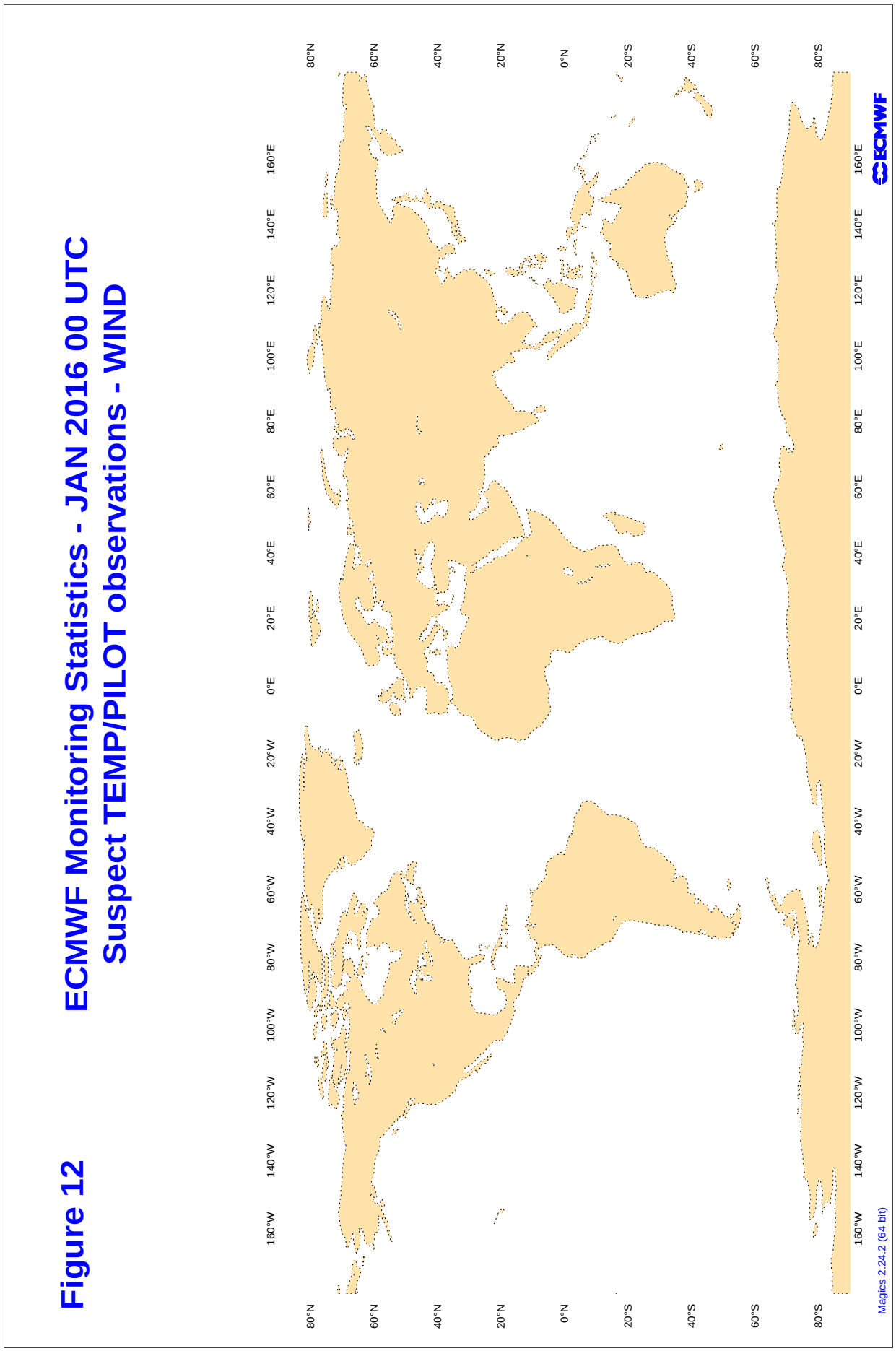
3.2.21 Figure 10 - Suspect TEMP observations - geopotential : 00 UTC



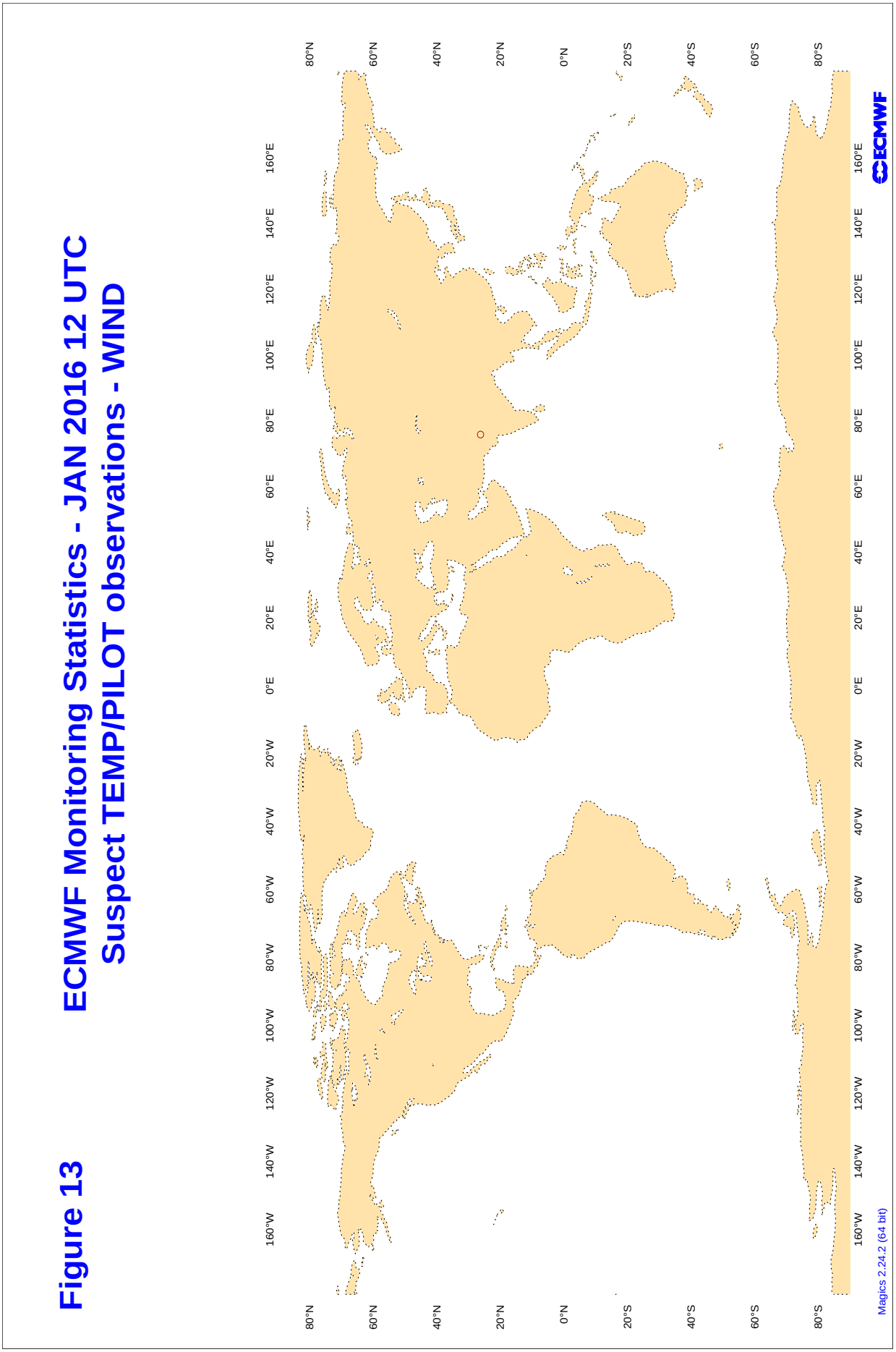
3.2.22 Figure 11 - Suspect TEMP observations - geopotential : 12 UTC



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



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



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

```
RADIOSONDE MONITORING STATISTICS (SHIPS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
         LEVEL                 : 100 HPA
         AREA                  : GLOBAL
         PERIOD                : JAN 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
ASDE01	12	Z	100	6	18.9	9.0
ASDE01	00	Z	100	7	15.3	-8.7
ASDE03	12	Z	100	5	20.4	10.0
ASDE03	00	Z	100	6	10.3	-7.2
ASDE04	12	Z	100	7	34.7	33.2
ASDE04	00	Z	100	7	26.7	25.8
ASDE09	12	Z	100	8	27.4	24.3
ASDK01	12	Z	100	2	18.8	18.8
ASDK01	00	Z	100	5	24.1	16.1
ASDK02	12	Z	100	21	11.2	9.1
ASDK02	00	Z	100	29	8.2	5.6
ASDK03	00	Z	100	2	27.1	27.1
ASDK1	12	Z	100	2	19.2	18.6
ASDK1	00	Z	100	5	20.4	12.5
ASDK2	12	Z	100	19	9.3	6.5
ASDK2	00	Z	100	25	8.2	4.7
ASDK3	00	Z	100	1	28.8	28.8
ASES01	12	Z	100	18	21.4	20.5
ASEU01	12	Z	100	1	1.1	-1.1
ASEU02	12	Z	100	9	45.2	44.7
ASEU02	00	Z	100	8	29.2	28.8
ASEU03	00	Z	100	3	21.3	19.8
ASEU03	12	Z	100	2	38.7	38.2
ASEU04	12	Z	100	5	3.3	-1.7
ASEU04	00	Z	100	5	37.2	-11.8
ASEU06	12	Z	100	6	22.1	12.7
ASEU06	00	Z	100	4	28.9	17.9
ASFR1	12	Z	100	11	19.9	16.5
ASFR1	00	Z	100	12	23.1	19.1
ASFR2	12	Z	100	11	18.2	16.9
ASFR2	00	Z	100	10	19.4	18.2
ASFR3	12	Z	100	10	21.3	20.0
ASFR3	00	Z	100	10	13.8	8.3
ASFR4	12	Z	100	10	24.4	22.6
ASFR4	00	Z	100	11	21.1	16.9
DBLK	12	Z	100	57	12.1	10.0
DBLK	00	Z	100	2	4.3	4.3
JGQH	12	Z	100	8	17.2	13.6
JGQH	00	Z	100	5	20.5	20.3

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
ASDE01	12	V	100	5	4.9	-1.6	-0.4
ASDE01	00	V	100	6	4.3	-1.5	0.7
ASDE03	12	V	100	5	3.9	1.9	-1.5
ASDE03	00	V	100	5	4.5	0.0	2.4
ASDE04	12	V	100	6	6.4	-1.9	-1.1
ASDE04	00	V	100	5	4.7	-1.9	-0.1
ASDE09	12	V	100	5	3.5	2.3	0.5
ASDK01	12	V	100	2	2.2	-0.9	-1.2
ASDK01	00	V	100	5	3.9	-1.3	-0.9
ASDK02	12	V	100	20	2.9	-0.5	-0.4
ASDK02	00	V	100	26	3.3	-0.8	-0.1
ASDK03	00	V	100	1	2.8	-2.2	1.8
ASDK1	12	V	100	2	3.0	-1.1	-1.1
ASDK1	00	V	100	5	3.8	-1.5	-1.1
ASDK2	12	V	100	19	3.0	-0.7	-0.3
ASDK2	00	V	100	25	3.2	-0.8	0.0
ASDK3	00	V	100	1	1.4	-0.9	-1.1
ASES01	12	V	100	16	4.9	-0.3	1.4
ASEU01	12	V	100	1	1.5	1.3	-0.7
ASEU02	12	V	100	7	3.1	-1.0	-0.2
ASEU02	00	V	100	5	4.7	1.1	-1.4
ASEU03	00	V	100	3	3.5	-2.6	1.2
ASEU03	12	V	100	2	5.4	-4.7	-0.9
ASEU04	12	V	100	4	4.5	-0.3	0.1
ASEU04	00	V	100	4	5.2	0.8	-0.9
ASEU06	12	V	100	5	1.7	-1.1	0.7
ASEU06	00	V	100	3	2.1	0.4	-0.3
ASFR1	12	V	100	9	3.2	-0.2	0.5
ASFR1	00	V	100	12	3.2	-1.2	0.1
ASFR2	12	V	100	11	4.2	0.2	-0.6
ASFR2	00	V	100	10	3.7	-0.7	0.1
ASFR3	12	V	100	10	3.3	-0.1	0.7
ASFR3	00	V	100	9	4.5	-0.5	1.2
ASFR4	12	V	100	10	5.2	2.0	1.4
ASFR4	00	V	100	9	4.7	-2.0	2.2
DBLK	12	V	100	31	2.6	-0.6	0.3
DBLK	00	V	100	1	1.5	-1.4	-0.6
JGQH	12	V	100	8	5.5	-1.6	1.3
JGQH	00	V	100	5	3.9	2.3	-1.0

3.2.27 Figure 14 - SATOB Winds: 700-1000hPa

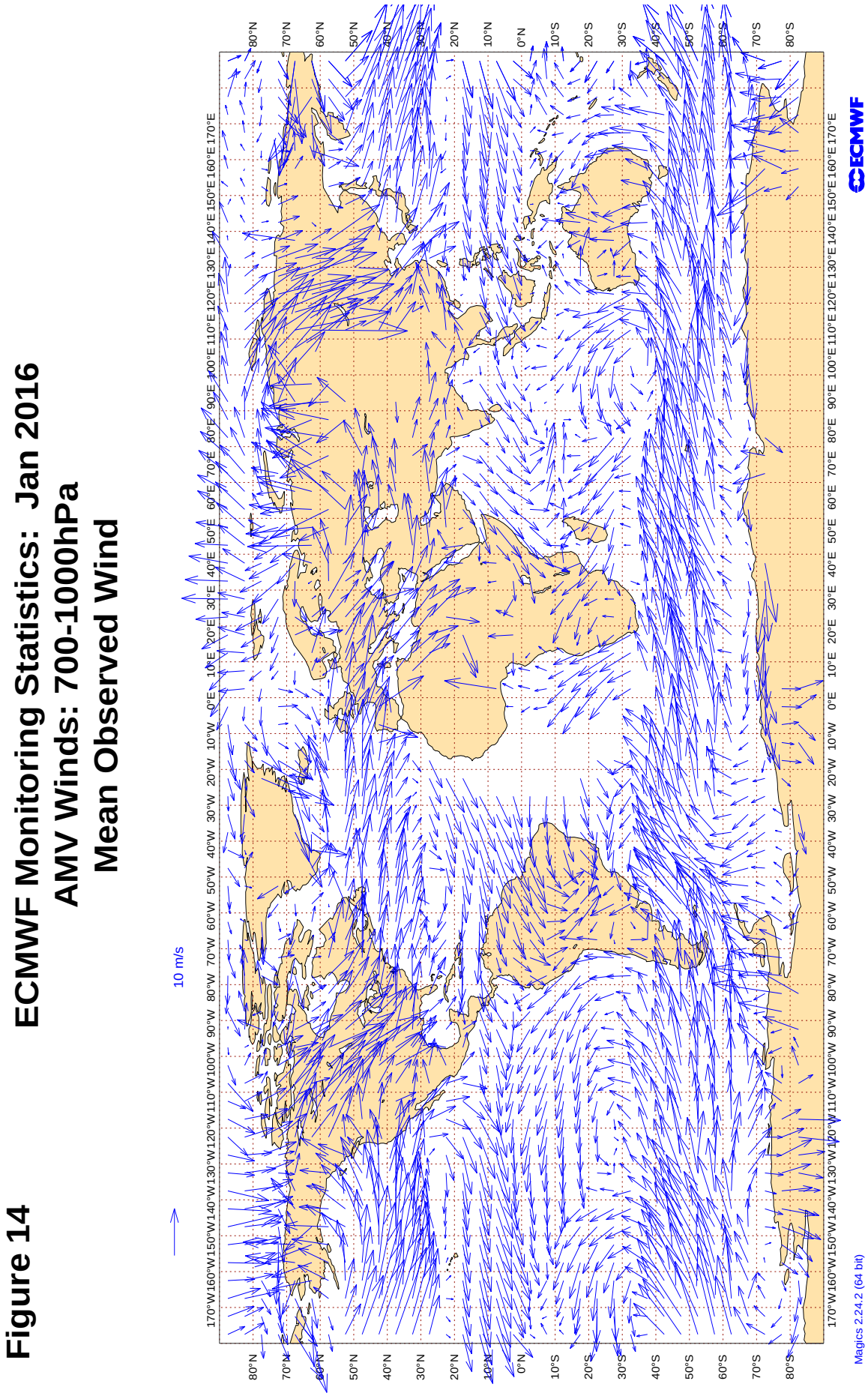


Figure 14

3.2.28 Figure 15 - SATOB Winds: 150- 400hPa

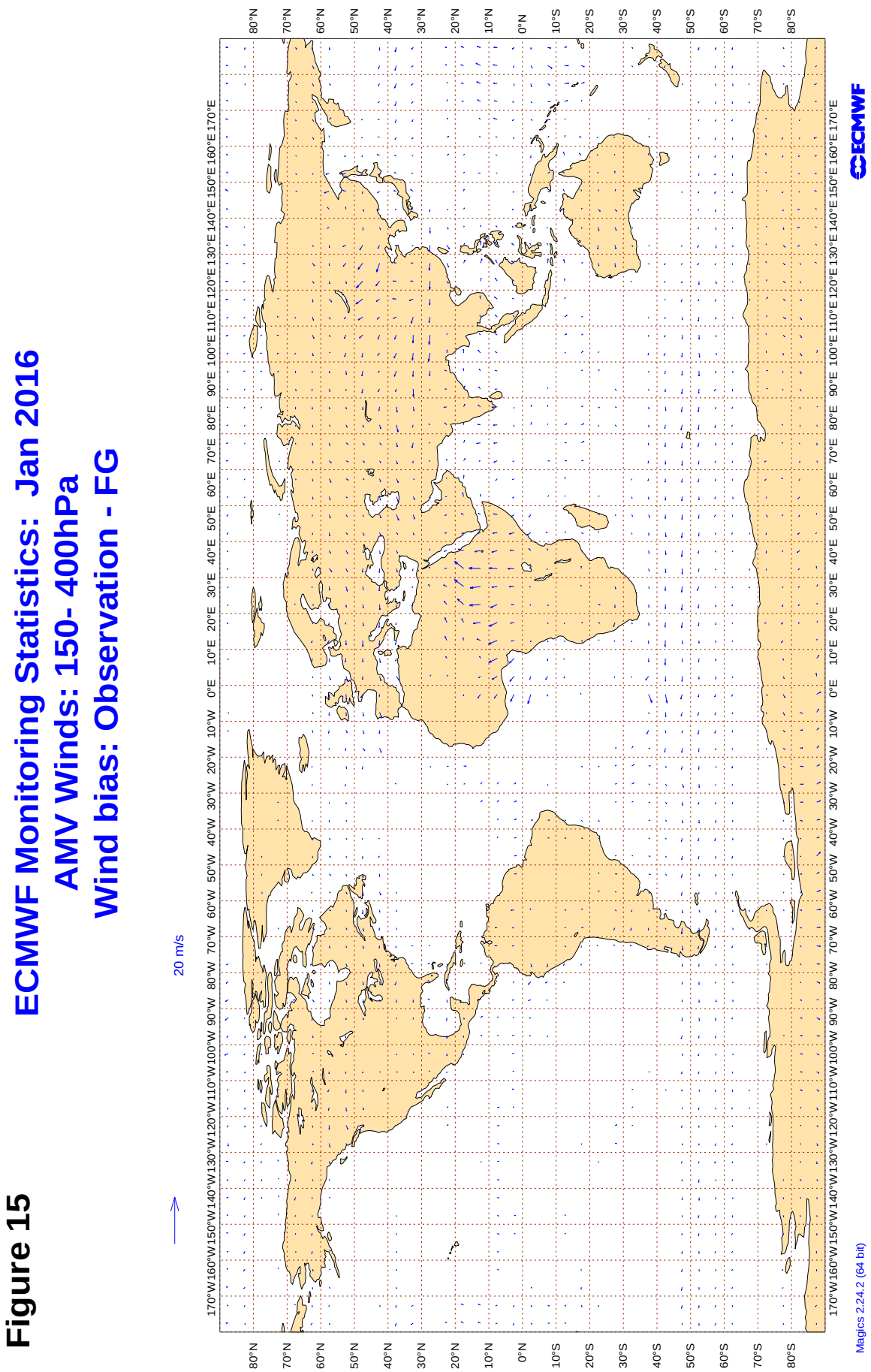


Figure 15

3.2.29 Figure 16 - SATOB Winds: 700-1000hPa

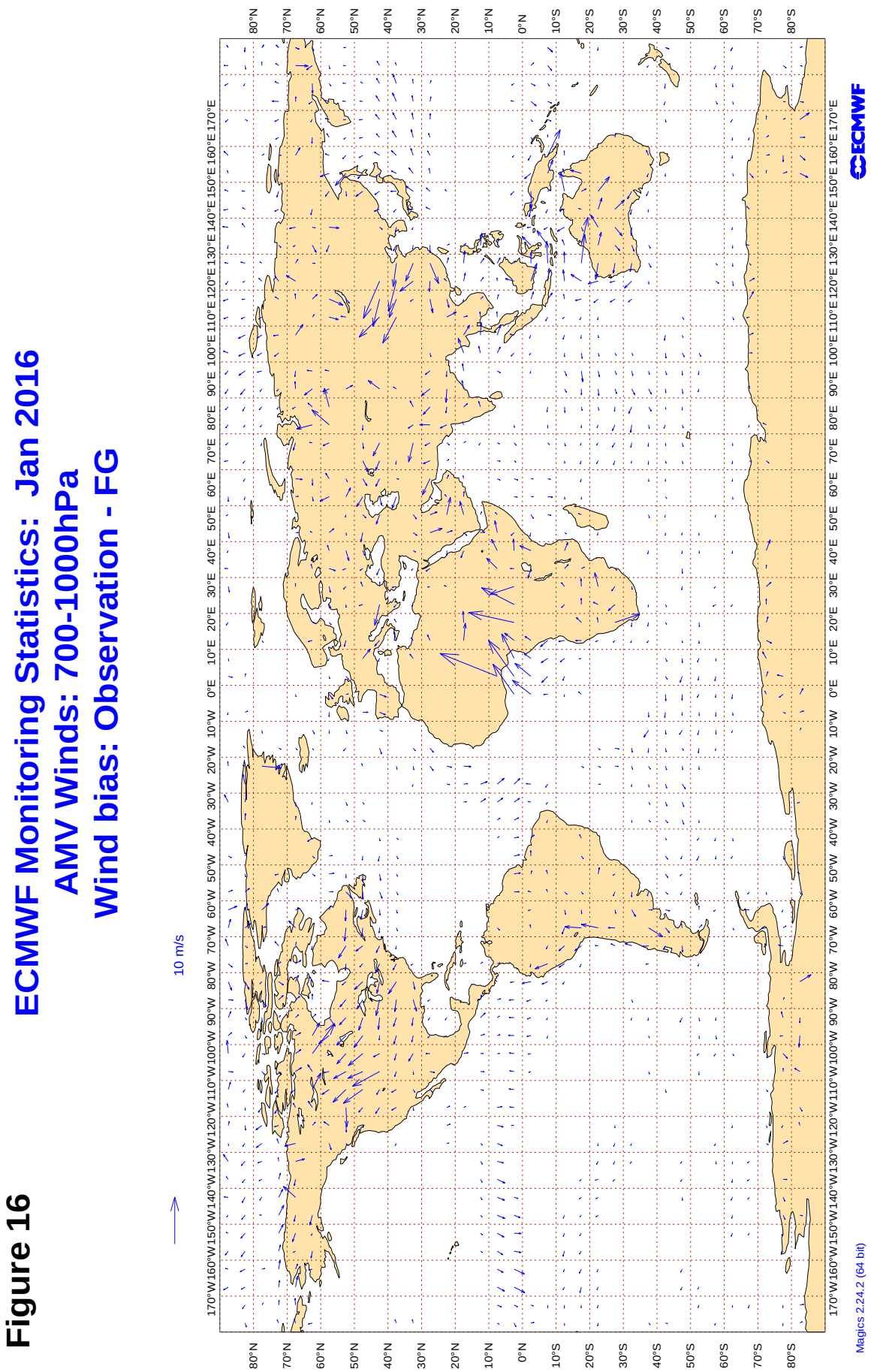


Figure 16

3.2.30 Figure 17 - SATOB Winds: 150- 400hPa

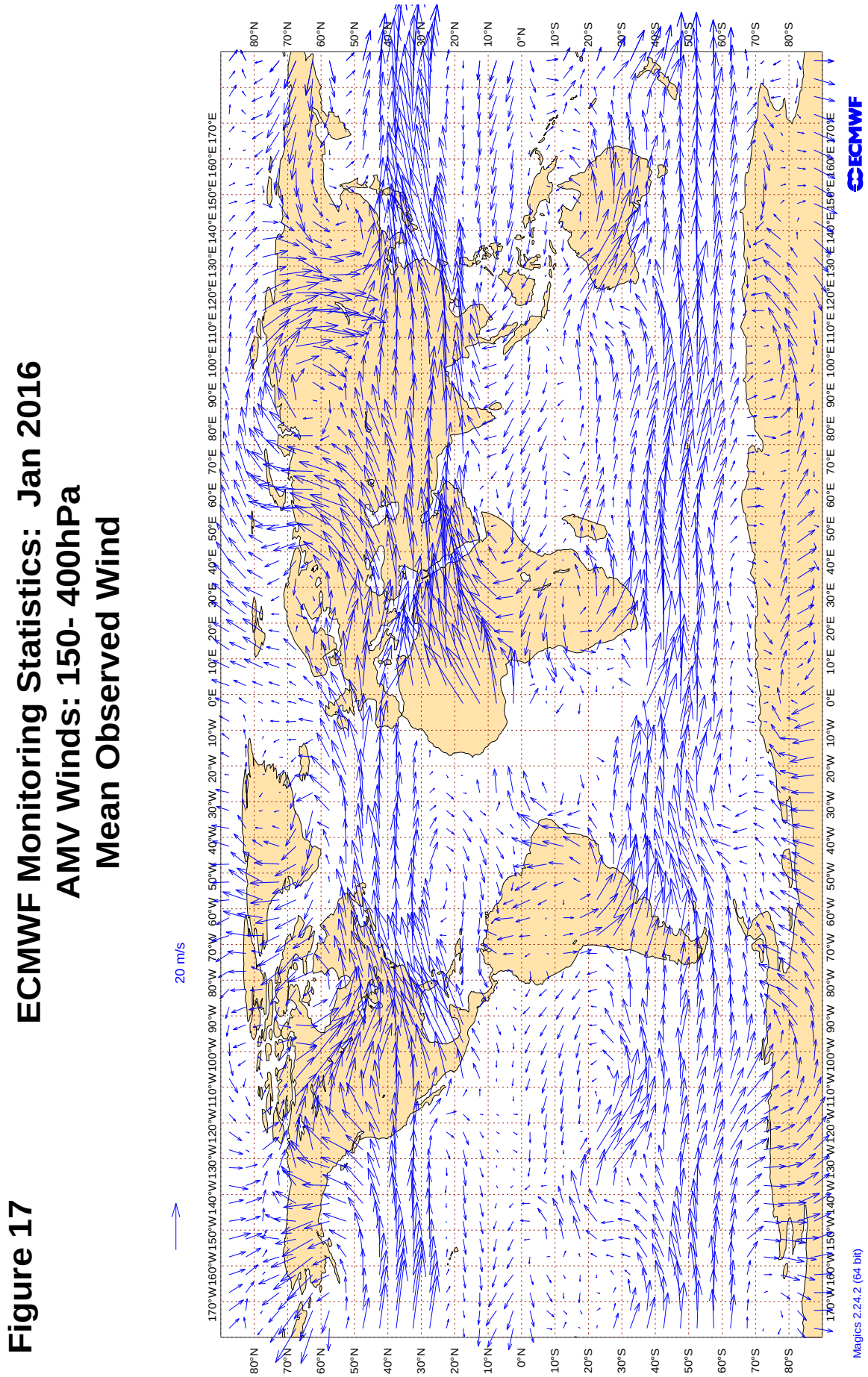


Figure 17

3.2.31 Figure 18 - AIRCRAFT Winds: 150- 300hPa

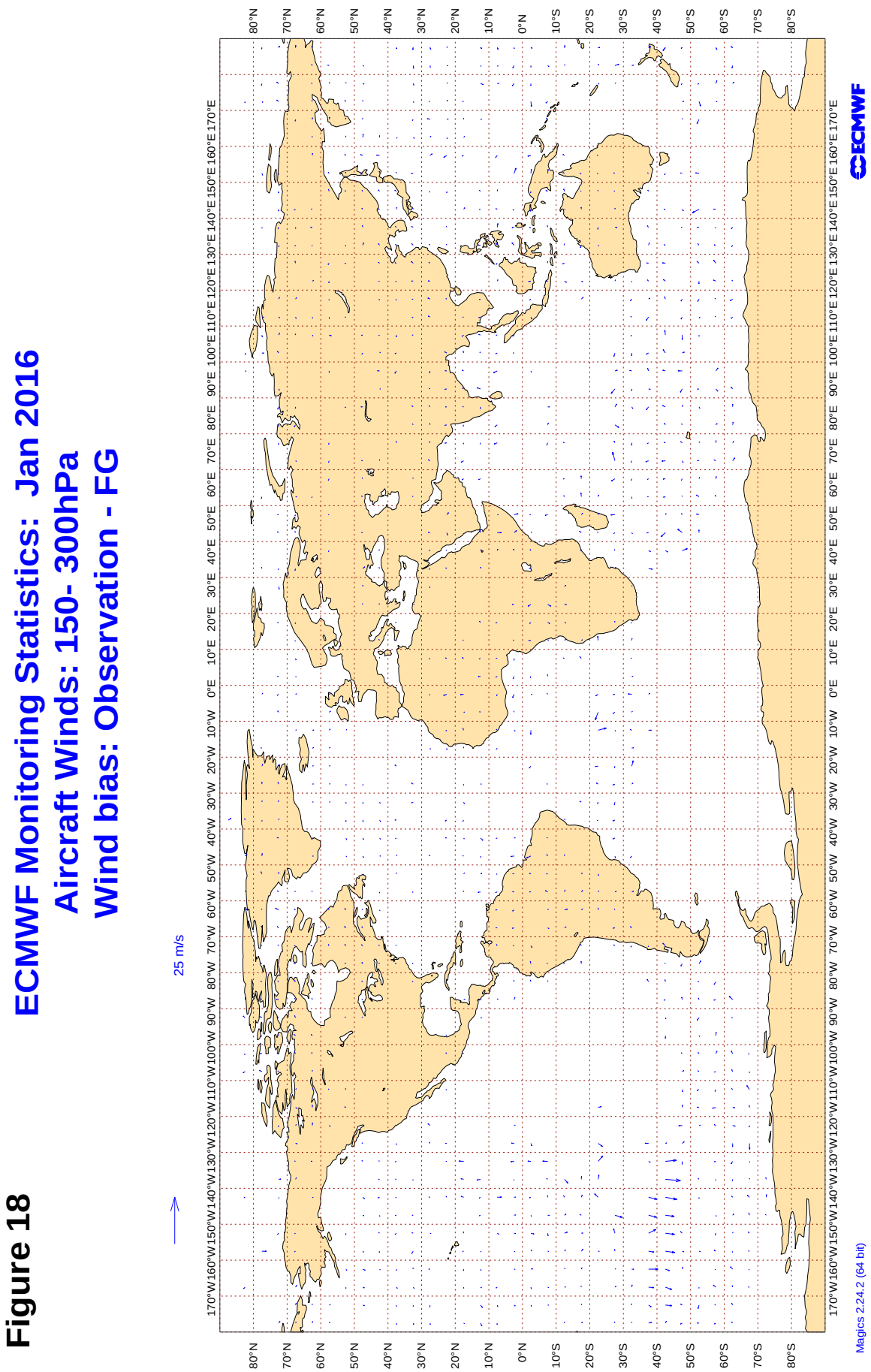


Figure 18

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

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
MONITORING CENTRE : ECMWF
ELEMENT MONITORED : VECTOR WIND (M/S)
AREA : GLOBAL
PERIOD : JAN 2016
STANDARD OF COMPARISON: FIRST-GUESS FIELD

SELECTION CRITERIA: NO. OF OBS. >= 20

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

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
AAB	99	V	300-150	33	0	0	4.5	-0.5
AAL	99	V	300-150	24561	0	0	4.5	0.0
AAR	99	V	300-150	221	0	1	4.8	-1.3
AAY	99	V	300-150	233	1	0	6.6	0.1
ABW	99	V	300-150	641	0	0	4.9	-1.0
ABX	99	V	300-150	156	1	1	8.2	-0.4
ACA	99	V	300-150	12940	3	0	5.6	-0.1
ACI	99	V	300-150	2680	0	0	3.9	0.3
AEA	99	V	300-150	456	5	0	5.0	0.2
AFL	99	V	300-150	1021	0	0	4.0	0.6
AFR	99	V	300-150	17299	0	0	4.3	0.2
AHY	99	V	300-150	108	2	0	12.3	-0.1
AIC	99	V	300-150	981	0	0	4.3	-0.5
AMX	99	V	300-150	1216	13	0	9.2	0.0
ANZ	99	V	300-150	18081	1	0	6.1	0.5
AOJ	99	V	300-150	54	20	0	10.7	0.2
ASA	99	V	300-150	7562	1	0	5.8	0.4
ASY	99	V	300-150	265	0	0	6.5	2.5
AUA	99	V	300-150	2037	0	0	4.8	-0.8
AVA	99	V	300-150	372	0	0	4.2	0.3
AVN	99	V	300-150	137	1	0	6.9	0.5
AXM	99	V	300-150	166	0	0	5.1	0.6
AZA	99	V	300-150	2978	0	0	4.2	0.3
AZG	99	V	300-150	44	0	0	5.2	-0.6
BAW	99	V	300-150	30434	1	0	4.9	-0.0
BEL	99	V	300-150	569	0	0	3.9	0.1

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
BER	99	V	300-150	3968	0	0	4.1	0.2
BLX	99	V	300-150	141	0	0	4.5	-1.0
BMW	99	V	300-150	28	0	0	2.7	0.7
BOX	99	V	300-150	346	0	0	3.9	-0.2
BOX	99	V	300-150	56	0	0	4.1	-1.1
CAL	99	V	300-150	496	0	0	4.8	0.2
CAO	99	V	300-150	178	0	0	4.7	-0.4
CAZ	99	V	300-150	22	0	0	4.0	-0.7
CCA	99	V	300-150	706	0	0	3.7	0.4
CES	99	V	300-150	1239	0	0	3.8	0.1
CFC	99	V	300-150	102	0	0	5.2	-0.0
CFG	99	V	300-150	2734	0	0	4.8	-0.3
CJT	99	V	300-150	94	0	0	4.5	-0.2
CKS	99	V	300-150	1236	0	0	5.3	-0.5
CLE	99	V	300-150	43	0	0	10.1	0.5
CLX	99	V	300-150	1995	0	0	4.4	-0.4
CMB	99	V	300-150	406	0	0	4.7	-0.6
CNV	99	V	300-150	105	0	0	3.9	0.3
CPA	99	V	300-150	292	0	0	4.4	0.4
CRL	99	V	300-150	638	0	0	4.7	-0.2
CSN	99	V	300-150	757	2	0	5.9	0.4
CTM	99	V	300-150	32	0	0	3.6	0.0
DAH	99	V	300-150	415	0	0	4.5	0.2
DAL	99	V	300-150	33300	0	0	4.5	-0.2
DCS	99	V	300-150	26	35	0	9.7	-0.3
DHK	99	V	300-150	978	0	0	4.8	-0.7
DLH	99	V	300-150	15276	0	0	4.2	-0.1
DUB	99	V	300-150	34	0	0	4.6	-0.5
EDG	99	V	300-150	23	13	9	7.6	-0.6
EDW	99	V	300-150	408	0	0	4.4	0.3
EIN	99	V	300-150	4572	0	0	4.0	-0.0
EJM	99	V	300-150	227	32	0	11.1	-0.4
ELY	99	V	300-150	1233	0	0	4.7	-0.6
ETD	99	V	300-150	1606	2	0	5.8	-0.2
ETH	99	V	300-150	1322	7	0	8.5	-0.1
EVA	99	V	300-150	26	8	0	5.3	-2.0
EVE	99	V	300-150	24	0	0	4.0	1.1
EWG	99	V	300-150	855	0	0	5.0	-0.0
FDX	99	V	300-150	3318	0	0	4.6	-0.1
FIN	99	V	300-150	502	0	0	3.5	0.1
FJI	99	V	300-150	5108	0	0	5.0	0.5
FPG	99	V	300-150	39	0	0	2.9	-0.3
FUM	99	V	300-150	28	0	0	4.1	0.2

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
FWI	99	V	300-150	1446	0	0	4.6	-0.0
FWK	99	V	300-150	22	0	0	3.2	-0.6
FYG	99	V	300-150	50	0	0	4.0	0.0
GAF	99	V	300-150	41	0	0	4.7	0.8
GEC	99	V	300-150	957	0	0	5.0	-0.0
GLO	99	V	300-150	30	7	0	8.5	-1.0
GRL	99	V	300-150	40	0	0	5.9	-0.3
GTI	99	V	300-150	1494	0	0	4.9	-0.8
HAL	99	V	300-150	3318	0	0	4.9	0.6
HZM	99	V	300-150	24	0	0	3.0	-0.4
HZS	99	V	300-150	34	0	0	3.4	-1.0
IAM	99	V	300-150	22	0	0	4.7	-0.8
IBE	99	V	300-150	1050	0	0	4.5	0.2
ICL	99	V	300-150	230	0	0	5.1	-1.6
ICV	99	V	300-150	203	0	0	5.2	-1.4
IJM	99	V	300-150	32	16	0	3.5	-0.7
JAF	99	V	300-150	550	6	0	7.2	-0.1
JAI	99	V	300-150	1299	0	0	4.0	0.1
JAS	99	V	300-150	31	19	3	15.5	0.6
JBU	99	V	300-150	31	0	161	5.8	0.6
JJA	99	V	300-150	52	0	2	5.4	-0.5
JME	99	V	300-150	26	0	0	6.5	0.4
JST	99	V	300-150	2861	1	0	7.2	0.3
JUV	99	V	300-150	27	0	0	4.3	-1.6
KAC	99	V	300-150	301	0	0	4.3	0.5
KAI	99	V	300-150	86	0	0	6.2	0.0
KAL	99	V	300-150	997	0	1	4.1	0.3
KAY	99	V	300-150	71	0	0	2.8	-0.0
KIW	99	V	300-150	62	0	0	4.4	-1.7
KLM	99	V	300-150	9999	0	0	4.3	-0.1
LAE	99	V	300-150	99	0	0	3.7	0.0
LAN	99	V	300-150	1420	9	0	11.3	0.0
LCO	99	V	300-150	41	0	0	4.8	-0.6
LMJ	99	V	300-150	27	0	0	5.6	-0.8
LOB	99	V	300-150	20	0	0	16.5	2.5
LOT	99	V	300-150	905	12	0	11.8	-0.2
LXJ	99	V	300-150	68	13	6	20.7	0.3
MAS	99	V	300-150	251	0	0	4.5	1.3
MMD	99	V	300-150	90	0	0	3.7	0.3
MPH	99	V	300-150	282	0	0	4.8	-1.3
MSR	99	V	300-150	428	0	0	4.2	-0.1
NAX	99	V	300-150	2682	14	0	10.3	-0.4
NCA	99	V	300-150	169	1	0	4.2	-0.4

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
NEV	99	V	300-150	23	0	0	4.8	1.6
NJE	99	V	300-150	246	32	0	10.6	-0.2
NOS	99	V	300-150	569	0	0	5.5	-0.7
NWS	99	V	300-150	306	0	0	3.9	0.2
OAE	99	V	300-150	324	0	1	4.3	0.3
ORB	99	V	300-150	105	0	0	4.4	0.3
PAC	99	V	300-150	196	0	0	4.4	-0.3
PAL	99	V	300-150	67	0	1	6.7	0.5
PIA	99	V	300-150	137	0	0	3.9	0.5
PLM	99	V	300-150	43	0	0	7.3	-1.7
PVG	99	V	300-150	25	0	0	5.0	1.3
QFA	99	V	300-150	19074	0	0	4.4	0.5
QTR	99	V	300-150	2605	0	0	5.0	-0.4
RAM	99	V	300-150	73	15	0	6.5	0.9
RCH	99	V	300-150	3153	0	0	5.4	-0.0
RJA	99	V	300-150	954	10	0	9.4	-0.2
ROJ	99	V	300-150	28	11	0	17.5	0.6
ROU	99	V	300-150	263	0	2	4.1	-0.2
RRR	99	V	300-150	95	0	0	3.5	0.4
SAM	99	V	300-150	213	24	0	7.0	0.2
SAS	99	V	300-150	1629	0	0	3.4	-0.2
SIA	99	V	300-150	1378	0	0	4.2	0.1
SLM	99	V	300-150	47	0	4	3.7	0.1
SOL	99	V	300-150	35	0	0	4.8	0.4
SOO	99	V	300-150	316	0	0	4.7	-0.3
SPA	99	V	300-150	88	0	0	4.6	0.0
SQC	99	V	300-150	390	0	0	5.2	-0.9
SVA	99	V	300-150	1794	0	0	4.3	-0.0
SVW	99	V	300-150	72	50	0	19.1	0.3
SWR	99	V	300-150	6671	0	0	4.2	0.1
SXN	99	V	300-150	50	0	0	4.0	0.3
TAM	99	V	300-150	242	0	1	4.2	0.6
TAP	99	V	300-150	217	1	0	4.4	-0.5
TAY	99	V	300-150	794	0	0	4.8	-0.3
TCV	99	V	300-150	77	4	0	8.8	-0.3
TCX	99	V	300-150	1635	0	0	4.3	0.3
TFL	99	V	300-150	1347	13	0	7.9	-0.0
TGM	99	V	300-150	33	30	0	3.2	-0.1
THA	99	V	300-150	145	0	0	4.3	0.7
THT	99	V	300-150	2757	0	0	4.9	0.8
THY	99	V	300-150	4349	0	0	4.3	-0.1
TOM	99	V	300-150	3438	9	0	8.1	0.2
TSC	99	V	300-150	1682	0	0	4.1	-0.1

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
TWB	99	V	300-150	39	0	5	5.0	-0.7
TWY	99	V	300-150	103	10	0	9.4	-0.8
UAE	99	V	300-150	6017	0	0	4.7	-0.1
UAL	99	V	300-150	42461	1	3	5.3	0.0
UPS	99	V	300-150	3012	0	0	4.6	-0.1
VCN	99	V	300-150	40	0	0	4.0	0.6
VIR	99	V	300-150	12659	1	0	5.0	-0.1
VJT	99	V	300-150	275	62	0	23.5	-0.0
VKG	99	V	300-150	626	0	0	4.0	0.3
VMP	99	V	300-150	70	39	0	11.3	-0.5
VOZ	99	V	300-150	5228	0	0	4.1	0.5
VVR	99	V	300-150	24	0	0	2.7	0.6
WGT	99	V	300-150	115	0	0	4.0	-0.3
WJA	99	V	300-150	2052	2	1	6.1	0.5
XLF	99	V	300-150	1129	0	0	4.6	0.4

4 EUCOS Area Monitoring Statistics

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

Tables 13, 14 (50 hPa level), 15, 16 (100 hPa level) 17, 18 (500 hPa level) 19 and 20 (850 hPa level) provide quality statistics for all TEMPSHIPS and PILOTSHIPS received during the month in the area $10\,^{\circ}$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                : JAN 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	50	25	13.7	10.6
01001	00	Z	50	26	11.8	6.7
01028	00	Z	50	24	7.7	1.5
01028	12	Z	50	25	14.7	2.5
01400	12	Z	50	20	36.6	24.6
01400	00	Z	50	22	36.0	18.4
01415	12	Z	50	31	25.3	12.7
01415	00	Z	50	30	20.4	4.4
02365	00	Z	50	35	21.6	6.7
02365	12	Z	50	36	19.9	14.8
02591	12	Z	50	40	29.7	26.3
02591	00	Z	50	42	25.0	20.2
02836	00	Z	50	39	19.1	0.1
02836	12	Z	50	42	18.0	9.1
02963	12	Z	50	33	17.8	10.8
02963	00	Z	50	34	24.4	15.1
03005	00	Z	50	29	22.7	2.1
03005	12	Z	50	30	23.2	10.9
03238	12	Z	50	10	36.7	26.5
03238	00	Z	50	27	18.8	1.4
03808	12	Z	50	30	22.8	17.6
03808	00	Z	50	28	16.7	8.5
03918	00	Z	50	26	24.1	12.5
03918	12	Z	50	18	39.4	27.2
03953	12	Z	50	16	24.4	17.9
03953	00	Z	50	16	24.8	19.0
04018	12	Z	50	20	18.6	5.9
04018	00	Z	50	17	20.9	2.1
04220	12	Z	50	29	16.4	6.8
04220	00	Z	50	27	17.3	10.6
04270	00	Z	50	29	16.9	2.8
04270	12	Z	50	22	20.6	0.8
04320	12	Z	50	29	8.0	4.4
04320	00	Z	50	30	11.2	8.1
04339	00	Z	50	30	20.0	10.1
04339	12	Z	50	29	9.4	7.3
04360	12	Z	50	5	12.1	-0.1
04360	00	Z	50	7	10.6	5.1
06011	12	Z	50	18	59.9	33.8

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	50	15	22.6	-1.0
06260	00	Z	50	31	27.4	14.7
06260	12	Z	50	5	30.5	28.3
06610	12	Z	50	31	24.8	9.4
06610	00	Z	50	30	21.9	7.7
07110	00	Z	50	28	22.6	15.1
07110	12	Z	50	28	34.0	29.2
07510	00	Z	50	25	27.7	24.2
07510	12	Z	50	21	49.9	44.9
07645	00	Z	50	17	16.2	0.7
07645	12	Z	50	25	23.7	8.7
07761	00	Z	50	30	20.5	8.2
07761	12	Z	50	28	39.4	30.7
08001	00	Z	50	25	22.9	13.6
08001	12	Z	50	27	37.1	32.1
08221	12	Z	50	31	30.1	26.6
08221	00	Z	50	31	19.9	13.6
08302	00	Z	50	30	15.7	12.9
08302	12	Z	50	31	17.0	14.6
08508	12	Z	50	26	33.3	30.6
08522	12	Z	50	27	23.7	20.1
08579	12	Z	50	30	29.0	25.8
10035	12	Z	50	30	27.0	18.6
10035	00	Z	50	30	16.0	6.0
10393	12	Z	50	31	30.3	21.0
10393	00	Z	50	30	18.5	8.3
10410	12	Z	50	30	21.6	15.4
10410	00	Z	50	29	15.2	5.6
10739	12	Z	50	31	33.9	28.8
10739	00	Z	50	30	39.6	24.8
11035	12	Z	50	31	31.3	25.7
11035	00	Z	50	30	29.7	22.9
12982	12	Z	50	31	49.9	47.2
12982	00	Z	50	28	19.1	8.0
16044	00	Z	50	31	20.5	13.5
16044	12	Z	50	31	20.9	14.9
16080	12	Z	50	31	31.7	5.7
16080	00	Z	50	31	17.6	6.9
16245	00	Z	50	30	12.9	3.4
16245	12	Z	50	30	13.4	2.9
16320	12	Z	50	29	21.1	14.5
16320	00	Z	50	30	21.2	9.9
16429	00	Z	50	30	12.3	8.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	50	30	15.0	8.8
16622	00	Z	50	24	41.4	37.8
16754	00	Z	50	8	19.8	15.9
17607	12	Z	50	16	20.2	-11.0
26435	00	Z	50	13	16.8	6.3
60018	00	Z	50	31	16.8	15.2
60018	12	Z	50	30	22.0	17.3
ASDE01	12	Z	50	3	16.4	9.8
ASDE01	00	Z	50	4	24.6	0.1
ASDE03	12	Z	50	4	16.1	9.6
ASDE03	00	Z	50	5	22.0	-10.1
ASDE04	12	Z	50	6	46.3	44.3
ASDE04	00	Z	50	5	31.6	30.6
ASDE09	12	Z	50	4	69.7	68.7
ASDK01	12	Z	50	0	0.0	0.0
ASDK01	00	Z	50	0	0.0	0.0
ASDK03	00	Z	50	1	26.2	26.2
ASDK1	12	Z	50	0	0.0	0.0
ASDK1	00	Z	50	0	0.0	0.0
ASDK3	00	Z	50	1	29.3	29.3
ASES01	12	Z	50	16	31.0	30.0
ASEU01	12	Z	50	1	2.1	2.1
ASEU02	12	Z	50	7	57.3	57.2
ASEU02	00	Z	50	5	33.5	33.0
ASEU03	00	Z	50	0	0.0	0.0
ASEU03	12	Z	50	2	66.2	64.3
ASEU04	12	Z	50	3	8.8	6.7
ASEU04	00	Z	50	4	30.8	-2.9
ASEU06	12	Z	50	5	39.4	31.3
ASEU06	00	Z	50	3	26.0	23.5
ASFR1	12	Z	50	10	27.1	21.9
ASFR1	00	Z	50	11	29.7	27.8
ASFR2	12	Z	50	11	33.3	32.0
ASFR2	00	Z	50	9	30.9	28.6
ASFR3	12	Z	50	9	36.5	34.5
ASFR3	00	Z	50	8	19.2	18.2
ASFR4	12	Z	50	8	41.3	38.7
ASFR4	00	Z	50	9	36.1	31.2

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	50	22	3.3	-0.7	-0.8
01001	00	V	50	14	3.9	-1.1	-0.3
01028	00	V	50	16	3.0	-0.2	0.5
01028	12	V	50	20	3.7	-1.1	-0.5
01400	12	V	50	11	3.6	0.2	-0.1
01400	00	V	50	10	4.0	0.2	0.2
01415	12	V	50	30	4.1	1.5	-0.3
01415	00	V	50	29	3.6	0.7	0.6
02365	00	V	50	22	4.0	0.2	-0.6
02365	12	V	50	27	4.7	1.6	-0.9
02591	12	V	50	29	4.0	1.1	0.5
02591	00	V	50	29	4.6	1.1	0.0
02836	00	V	50	23	4.0	-0.3	-0.8
02836	12	V	50	24	4.0	0.8	-0.3
02963	12	V	50	30	4.7	2.3	0.0
02963	00	V	50	29	4.9	0.5	-0.1
03005	00	V	50	23	4.2	-0.9	-0.4
03005	12	V	50	30	3.4	0.2	-0.9
03238	12	V	50	10	4.4	-0.6	-0.2
03238	00	V	50	27	5.2	0.6	0.4
03808	12	V	50	30	6.6	2.0	1.5
03808	00	V	50	25	5.3	0.5	-1.4
03918	00	V	50	26	4.6	-1.1	-0.1
03918	12	V	50	18	3.6	-0.1	-1.1
03953	12	V	50	16	5.1	0.1	1.6
03953	00	V	50	16	5.0	-0.3	-1.0
04018	12	V	50	20	3.6	0.0	-1.0
04018	00	V	50	13	3.3	-0.2	0.8
04220	12	V	50	29	3.9	0.5	-0.2
04220	00	V	50	25	3.6	-0.7	0.5
04270	00	V	50	29	3.5	-0.4	-0.9
04270	12	V	50	21	3.5	-1.1	0.7
04320	12	V	50	29	3.6	-0.2	-0.8
04320	00	V	50	29	3.6	-0.8	-0.2
04339	00	V	50	30	3.6	-0.7	-0.1
04339	12	V	50	28	3.1	0.1	-0.7
04360	12	V	50	5	4.7	1.4	1.3
04360	00	V	50	7	4.5	-0.3	0.7
06011	12	V	50	18	3.7	1.1	0.7

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	50	15	4.4	0.0	-0.1
06260	00	V	50	30	4.5	1.3	0.2
06260	12	V	50	5	3.4	0.1	-0.7
06610	12	V	50	31	6.8	0.7	0.4
06610	00	V	50	28	6.4	-0.5	0.4
07110	00	V	50	26	4.4	0.0	0.8
07110	12	V	50	28	5.3	1.1	0.2
07510	00	V	50	23	4.8	1.1	0.5
07510	12	V	50	21	4.3	-0.1	1.7
07645	00	V	50	17	5.3	-1.4	0.7
07645	12	V	50	24	5.2	0.6	0.2
07761	00	V	50	29	5.3	0.5	0.1
07761	12	V	50	28	7.2	1.5	0.3
08001	00	V	50	22	5.9	0.8	0.9
08001	12	V	50	24	5.9	0.1	0.0
08221	12	V	50	31	4.9	0.0	0.6
08221	00	V	50	30	5.1	0.4	-0.4
08302	00	V	50	30	5.9	-0.7	1.8
08302	12	V	50	31	4.0	-0.3	1.1
08508	12	V	50	24	3.8	-0.6	0.5
08522	12	V	50	27	3.9	-0.1	0.1
08579	12	V	50	30	4.0	-0.5	0.1
10035	12	V	50	30	5.5	0.9	1.3
10035	00	V	50	30	4.3	0.6	0.0
10393	12	V	50	31	4.4	0.5	1.3
10393	00	V	50	29	4.1	0.0	-0.8
10410	12	V	50	29	4.8	0.9	0.4
10410	00	V	50	27	4.6	0.7	-0.6
10739	12	V	50	31	5.8	0.8	0.1
10739	00	V	50	29	5.4	0.0	1.9
11035	12	V	50	31	6.0	0.9	-1.0
11035	00	V	50	30	5.4	0.3	0.5
12982	12	V	50	30	4.5	0.8	-2.0
12982	00	V	50	28	4.4	0.6	-0.5
16044	00	V	50	31	5.2	-0.3	0.6
16044	12	V	50	31	5.2	1.7	-0.6
16080	12	V	50	31	5.3	0.8	-0.2
16080	00	V	50	30	5.2	0.6	0.6
16245	00	V	50	28	7.8	-0.8	1.2
16245	12	V	50	29	4.7	0.7	-0.2
16320	12	V	50	29	5.3	0.1	0.0
16320	00	V	50	29	5.2	0.1	-0.1
16429	00	V	50	30	4.6	0.3	0.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	50	29	5.5	1.1	-1.0
16622	00	V	50	20	5.4	-1.3	1.6
16754	00	V	50	7	3.3	0.8	-1.6
17607	12	V	50	13	4.6	0.9	0.5
26435	00	V	50	12	4.6	-1.0	0.7
60018	00	V	50	31	3.7	0.6	0.3
60018	12	V	50	30	4.3	0.7	0.9
ASDE01	12	V	50	3	7.0	-3.6	1.1
ASDE01	00	V	50	4	4.3	-2.1	-0.8
ASDE03	12	V	50	4	6.0	1.6	0.5
ASDE03	00	V	50	5	7.0	1.4	0.4
ASDE04	12	V	50	6	2.9	-1.6	0.4
ASDE04	00	V	50	4	3.2	0.5	-0.3
ASDE09	12	V	50	4	5.8	0.0	4.1
ASDK01	12	V	50	0	0.0	0.0	0.0
ASDK01	00	V	50	0	0.0	0.0	0.0
ASDK03	00	V	50	1	3.8	-1.3	3.6
ASDK1	12	V	50	0	0.0	0.0	0.0
ASDK1	00	V	50	0	0.0	0.0	0.0
ASDK3	00	V	50	1	2.9	-0.6	2.8
ASES01	12	V	50	16	4.7	1.2	1.0
ASEU01	12	V	50	1	2.8	1.9	-2.1
ASEU02	12	V	50	7	5.4	-1.5	2.5
ASEU02	00	V	50	5	3.5	-0.3	-1.1
ASEU03	00	V	50	0	0.0	0.0	0.0
ASEU03	12	V	50	1	6.6	-4.3	5.0
ASEU04	12	V	50	2	5.1	2.7	3.6
ASEU04	00	V	50	4	4.3	0.8	-0.8
ASEU06	12	V	50	4	5.4	-2.9	1.4
ASEU06	00	V	50	2	4.0	0.7	-3.9
ASFR1	12	V	50	10	3.3	0.2	0.5
ASFR1	00	V	50	11	3.2	0.4	-0.2
ASFR2	12	V	50	11	4.6	-1.0	2.0
ASFR2	00	V	50	9	3.9	1.4	1.1
ASFR3	12	V	50	9	4.3	-1.8	1.4
ASFR3	00	V	50	8	4.8	0.7	1.1
ASFR4	12	V	50	8	4.5	-1.0	-1.4
ASFR4	00	V	50	9	4.0	-0.8	0.6

4.3 Table 15 - Radiosonde Monitoring Statistics (EUCOS): 100 hPa Geopotential height (metres)

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
         LEVEL                 : 100 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : JAN 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	100	33	11.0	7.4
01001	00	Z	100	32	9.3	5.3
01028	00	Z	100	32	7.7	-0.6
01028	12	Z	100	29	10.5	2.6
01400	12	Z	100	21	22.9	15.2
01400	00	Z	100	23	19.5	9.3
01415	12	Z	100	31	14.7	9.2
01415	00	Z	100	31	16.4	1.1
02365	00	Z	100	44	7.7	1.6
02365	12	Z	100	37	9.0	5.8
02591	12	Z	100	40	16.3	14.6
02591	00	Z	100	43	13.4	10.4
02836	00	Z	100	46	9.0	-2.2
02836	12	Z	100	44	7.6	4.1
02963	12	Z	100	34	10.4	4.7
02963	00	Z	100	36	9.4	4.9
03005	00	Z	100	32	11.2	-2.9
03005	12	Z	100	30	12.5	4.9
03238	12	Z	100	12	22.3	17.0
03238	00	Z	100	29	13.0	1.8
03808	12	Z	100	30	16.8	11.6
03808	00	Z	100	31	11.6	0.9
03918	00	Z	100	31	14.5	5.6
03918	12	Z	100	19	20.1	13.4
03953	12	Z	100	30	16.3	8.2
03953	00	Z	100	32	15.2	7.2
04018	12	Z	100	26	11.0	7.2
04018	00	Z	100	24	12.8	2.7
04220	12	Z	100	31	15.3	8.1
04220	00	Z	100	30	10.6	7.3
04270	00	Z	100	29	12.1	2.9
04270	12	Z	100	28	13.7	4.0
04320	12	Z	100	30	7.8	4.3
04320	00	Z	100	30	9.8	6.8
04339	00	Z	100	30	17.1	10.5
04339	12	Z	100	29	10.8	7.4
04360	12	Z	100	23	14.4	10.7
04360	00	Z	100	23	19.2	15.6
06011	12	Z	100	26	28.6	16.8

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	100	26	13.4	-1.9
06260	00	Z	100	32	17.4	5.7
06260	12	Z	100	5	9.8	8.4
06610	12	Z	100	31	17.9	6.1
06610	00	Z	100	31	14.8	2.3
07110	00	Z	100	31	14.3	7.7
07110	12	Z	100	30	21.9	17.0
07510	00	Z	100	29	20.1	16.3
07510	12	Z	100	28	28.5	26.3
07645	00	Z	100	26	12.5	-6.6
07645	12	Z	100	29	14.5	5.8
07761	00	Z	100	30	13.7	-0.7
07761	12	Z	100	29	25.5	13.4
08001	00	Z	100	30	14.9	11.5
08001	12	Z	100	31	25.9	22.3
08221	12	Z	100	31	22.6	19.8
08221	00	Z	100	31	12.9	10.5
08302	00	Z	100	31	8.2	4.6
08302	12	Z	100	33	10.6	7.7
08508	12	Z	100	28	16.1	10.9
08522	12	Z	100	29	16.0	10.6
08579	12	Z	100	31	17.2	13.4
10035	12	Z	100	33	15.1	10.2
10035	00	Z	100	31	10.8	0.8
10393	12	Z	100	31	17.2	8.9
10393	00	Z	100	31	8.6	0.5
10410	12	Z	100	30	11.0	5.2
10410	00	Z	100	30	9.8	-2.5
10739	12	Z	100	31	21.3	17.9
10739	00	Z	100	31	22.9	6.5
11035	12	Z	100	31	22.2	17.8
11035	00	Z	100	31	20.1	15.1
12982	12	Z	100	30	28.6	26.5
12982	00	Z	100	29	12.2	0.0
16044	00	Z	100	31	12.5	4.7
16044	12	Z	100	31	15.4	8.5
16080	12	Z	100	31	32.2	-0.2
16080	00	Z	100	31	8.7	-1.7
16245	00	Z	100	31	12.5	-5.3
16245	12	Z	100	31	10.6	-0.8
16320	12	Z	100	30	14.6	6.4
16320	00	Z	100	30	16.4	1.9
16429	00	Z	100	31	9.7	4.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	100	31	10.7	1.2
16622	00	Z	100	27	32.6	26.4
16754	00	Z	100	8	12.6	8.0
17607	12	Z	100	33	11.9	-4.0
26435	00	Z	100	13	9.2	0.7
60018	00	Z	100	31	8.6	6.9
60018	12	Z	100	30	14.6	10.2
ASDE01	12	Z	100	6	18.9	9.0
ASDE01	00	Z	100	7	15.3	-8.7
ASDE03	12	Z	100	5	20.4	10.0
ASDE03	00	Z	100	6	10.3	-7.2
ASDE04	12	Z	100	7	34.7	33.2
ASDE04	00	Z	100	7	26.7	25.8
ASDE09	12	Z	100	8	27.4	24.3
ASDK01	12	Z	100	2	18.8	18.8
ASDK01	00	Z	100	5	24.1	16.1
ASDK03	00	Z	100	2	27.1	27.1
ASDK1	12	Z	100	2	19.2	18.6
ASDK1	00	Z	100	5	20.4	12.5
ASDK3	00	Z	100	1	28.8	28.8
ASES01	12	Z	100	18	21.4	20.5
ASEU01	12	Z	100	1	1.1	-1.1
ASEU02	12	Z	100	9	45.2	44.7
ASEU02	00	Z	100	8	29.2	28.8
ASEU03	00	Z	100	3	21.3	19.8
ASEU03	12	Z	100	2	38.7	38.2
ASEU04	12	Z	100	5	3.3	-1.7
ASEU04	00	Z	100	5	37.2	-11.8
ASEU06	12	Z	100	6	22.1	12.7
ASEU06	00	Z	100	4	28.9	17.9
ASFR1	12	Z	100	11	19.9	16.5
ASFR1	00	Z	100	12	23.1	19.1
ASFR2	12	Z	100	11	18.2	16.9
ASFR2	00	Z	100	10	19.4	18.2
ASFR3	12	Z	100	10	21.3	20.0
ASFR3	00	Z	100	10	13.8	8.3
ASFR4	12	Z	100	10	24.4	22.6
ASFR4	00	Z	100	11	21.1	16.9

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	100	31	3.4	0.4	0.7
01001	00	V	100	31	2.5	-0.1	-0.7
01028	00	V	100	28	2.5	-0.1	0.4
01028	12	V	100	28	1.8	0.0	0.4
01400	12	V	100	16	2.7	0.2	0.1
01400	00	V	100	19	3.9	0.0	0.0
01415	12	V	100	30	4.3	0.1	-0.6
01415	00	V	100	30	3.9	0.4	-0.5
02365	00	V	100	30	2.8	0.1	-0.3
02365	12	V	100	28	4.1	0.8	-0.1
02591	12	V	100	31	3.7	0.2	0.5
02591	00	V	100	30	2.6	0.2	0.1
02836	00	V	100	31	3.1	-0.3	-0.7
02836	12	V	100	30	3.6	0.2	-0.1
02963	12	V	100	31	2.6	0.8	0.0
02963	00	V	100	31	3.0	-0.1	-0.2
03005	00	V	100	25	3.6	1.0	-0.3
03005	12	V	100	30	3.9	0.7	-0.4
03238	12	V	100	12	4.2	1.5	-1.4
03238	00	V	100	29	4.0	-0.2	0.2
03808	12	V	100	30	4.0	0.6	-0.3
03808	00	V	100	28	4.0	0.1	0.1
03918	00	V	100	30	4.3	0.6	0.4
03918	12	V	100	19	4.6	1.0	0.2
03953	12	V	100	30	4.1	0.0	1.2
03953	00	V	100	31	4.4	0.4	-0.2
04018	12	V	100	26	3.1	0.4	-1.0
04018	00	V	100	20	2.9	0.0	0.0
04220	12	V	100	30	3.5	-0.1	0.7
04220	00	V	100	29	3.1	-0.6	0.0
04270	00	V	100	29	4.0	0.4	0.5
04270	12	V	100	27	4.4	-1.5	0.3
04320	12	V	100	30	3.5	-0.6	-0.5
04320	00	V	100	30	2.9	0.5	-0.2
04339	00	V	100	30	3.1	-0.2	0.3
04339	12	V	100	29	3.4	0.5	-0.5
04360	12	V	100	23	3.5	0.0	0.1
04360	00	V	100	23	2.9	-0.6	0.0
06011	12	V	100	26	3.6	0.6	-0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	100	26	3.0	-0.2	-0.3
06260	00	V	100	31	4.2	1.0	0.0
06260	12	V	100	5	3.6	1.0	0.9
06610	12	V	100	31	5.4	-0.2	0.5
06610	00	V	100	29	4.3	0.4	0.5
07110	00	V	100	29	4.2	0.0	0.2
07110	12	V	100	30	4.2	0.2	0.1
07510	00	V	100	22	4.6	1.0	-0.9
07510	12	V	100	24	4.3	0.6	-0.1
07645	00	V	100	21	4.8	-0.5	-0.6
07645	12	V	100	29	5.0	-0.6	0.7
07761	00	V	100	24	4.9	0.5	-1.8
07761	12	V	100	24	6.3	1.5	-1.1
08001	00	V	100	29	5.9	-0.5	0.4
08001	12	V	100	30	4.9	-0.5	0.2
08221	12	V	100	31	5.6	-1.4	0.5
08221	00	V	100	30	4.2	-0.5	0.1
08302	00	V	100	31	4.1	-0.2	-1.7
08302	12	V	100	31	5.0	-0.6	-0.9
08508	12	V	100	26	4.0	0.3	0.1
08522	12	V	100	27	4.3	-1.2	0.0
08579	12	V	100	30	4.6	-0.8	0.2
10035	12	V	100	31	4.2	-0.4	-0.1
10035	00	V	100	31	4.0	0.7	-0.1
10393	12	V	100	31	4.0	1.2	-0.4
10393	00	V	100	30	3.9	-0.9	-0.3
10410	12	V	100	30	4.2	0.6	-0.7
10410	00	V	100	30	3.6	0.4	0.6
10739	12	V	100	31	4.5	0.0	0.4
10739	00	V	100	31	4.5	0.8	-0.5
11035	12	V	100	31	5.0	0.4	1.1
11035	00	V	100	31	4.4	0.3	1.0
12982	12	V	100	30	3.5	0.4	-0.5
12982	00	V	100	29	4.4	1.0	0.0
16044	00	V	100	31	4.8	-0.3	0.4
16044	12	V	100	31	4.6	-0.7	0.1
16080	12	V	100	31	4.9	0.3	1.3
16080	00	V	100	31	4.9	0.6	-0.4
16245	00	V	100	29	4.2	0.8	0.2
16245	12	V	100	30	5.0	1.4	0.5
16320	12	V	100	30	5.0	0.7	-0.5
16320	00	V	100	29	4.8	0.0	0.6
16429	00	V	100	30	4.9	-0.2	-0.8

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	100	31	4.7	1.2	0.2
16622	00	V	100	23	6.0	-1.0	-0.7
16754	00	V	100	7	4.6	-0.2	0.3
17607	12	V	100	18	4.0	0.3	0.2
26435	00	V	100	13	3.5	-1.0	-0.3
60018	00	V	100	31	4.6	0.3	-0.1
60018	12	V	100	30	4.3	-0.1	0.8
ASDE01	12	V	100	5	4.9	-1.6	-0.4
ASDE01	00	V	100	6	4.3	-1.5	0.7
ASDE03	12	V	100	5	3.9	1.9	-1.5
ASDE03	00	V	100	5	4.5	0.0	2.4
ASDE04	12	V	100	6	6.4	-1.9	-1.1
ASDE04	00	V	100	5	4.7	-1.9	-0.1
ASDE09	12	V	100	5	3.5	2.3	0.5
ASDK01	12	V	100	2	2.2	-0.9	-1.2
ASDK01	00	V	100	5	3.9	-1.3	-0.9
ASDK03	00	V	100	1	2.8	-2.2	1.8
ASDK1	12	V	100	2	3.0	-1.1	-1.1
ASDK1	00	V	100	5	3.8	-1.5	-1.1
ASDK3	00	V	100	1	1.4	-0.9	-1.1
ASES01	12	V	100	16	4.9	-0.3	1.4
ASEU01	12	V	100	1	1.5	1.3	-0.7
ASEU02	12	V	100	7	3.1	-1.0	-0.2
ASEU02	00	V	100	5	4.7	1.1	-1.4
ASEU03	00	V	100	3	3.5	-2.6	1.2
ASEU03	12	V	100	2	5.4	-4.7	-0.9
ASEU04	12	V	100	4	4.5	-0.3	0.1
ASEU04	00	V	100	4	5.2	0.8	-0.9
ASEU06	12	V	100	5	1.7	-1.1	0.7
ASEU06	00	V	100	3	2.1	0.4	-0.3
ASFR1	12	V	100	9	3.2	-0.2	0.5
ASFR1	00	V	100	12	3.2	-1.2	0.1
ASFR2	12	V	100	11	4.2	0.2	-0.6
ASFR2	00	V	100	10	3.7	-0.7	0.1
ASFR3	12	V	100	10	3.3	-0.1	0.7
ASFR3	00	V	100	9	4.5	-0.5	1.2
ASFR4	12	V	100	10	5.2	2.0	1.4
ASFR4	00	V	100	9	4.7	-2.0	2.2

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	500	33	5.9	3.7
01001	00	Z	500	32	6.5	5.2
01028	00	Z	500	33	4.3	2.7
01028	12	Z	500	33	6.0	2.3
01400	12	Z	500	22	10.2	4.1
01400	00	Z	500	23	11.5	6.9
01415	12	Z	500	31	4.9	3.7
01415	00	Z	500	31	5.9	3.8
02365	00	Z	500	44	4.6	2.0
02365	12	Z	500	39	5.1	3.1
02591	12	Z	500	40	9.0	8.0
02591	00	Z	500	43	8.1	7.3
02836	00	Z	500	46	4.0	1.3
02836	12	Z	500	44	3.0	0.8
02963	12	Z	500	34	3.6	2.3
02963	00	Z	500	36	3.8	1.8
03005	00	Z	500	34	5.6	1.1
03005	12	Z	500	30	6.5	3.2
03238	12	Z	500	12	8.5	7.2
03238	00	Z	500	30	7.6	5.5
03808	12	Z	500	31	8.5	6.2
03808	00	Z	500	32	7.6	5.5
03918	00	Z	500	31	8.8	7.2
03918	12	Z	500	19	10.1	7.8
03953	12	Z	500	31	9.1	5.8
03953	00	Z	500	32	9.1	4.3
04018	12	Z	500	27	8.0	5.4
04018	00	Z	500	24	7.1	4.3
04220	12	Z	500	31	16.7	8.8
04220	00	Z	500	31	8.3	5.7
04270	00	Z	500	30	8.9	-0.1
04270	12	Z	500	30	8.6	1.3
04320	12	Z	500	30	7.2	6.2
04320	00	Z	500	30	9.1	7.3
04339	00	Z	500	29	14.4	8.5
04339	12	Z	500	29	7.5	5.6
04360	12	Z	500	27	8.1	4.3
04360	00	Z	500	26	5.8	2.5
06011	12	Z	500	29	23.3	1.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	500	30	7.8	2.2
06260	00	Z	500	32	15.3	5.5
06260	12	Z	500	5	3.4	1.3
06610	12	Z	500	31	6.1	3.8
06610	00	Z	500	31	7.1	5.0
07110	00	Z	500	31	7.9	3.8
07110	12	Z	500	31	8.3	5.6
07510	00	Z	500	33	6.8	3.4
07510	12	Z	500	32	9.0	7.8
07645	00	Z	500	31	6.9	-2.6
07645	12	Z	500	32	7.4	-1.7
07761	00	Z	500	32	8.3	-3.1
07761	12	Z	500	31	10.9	2.8
08001	00	Z	500	30	10.1	9.1
08001	12	Z	500	31	13.3	12.5
08221	12	Z	500	31	10.7	9.6
08221	00	Z	500	31	9.0	7.9
08302	00	Z	500	31	4.9	2.9
08302	12	Z	500	33	6.2	3.5
08508	12	Z	500	28	14.4	11.1
08522	12	Z	500	30	12.1	10.9
08579	12	Z	500	31	13.8	9.4
10035	12	Z	500	33	6.1	3.4
10035	00	Z	500	31	4.9	1.5
10393	12	Z	500	31	12.5	2.8
10393	00	Z	500	32	2.8	-0.7
10410	12	Z	500	30	4.3	1.0
10410	00	Z	500	31	4.4	-1.8
10739	12	Z	500	31	10.0	9.6
10739	00	Z	500	32	12.6	8.4
11035	12	Z	500	31	11.2	8.2
11035	00	Z	500	31	9.6	5.8
12982	12	Z	500	30	7.8	5.8
12982	00	Z	500	31	6.2	1.2
16044	00	Z	500	31	6.8	3.2
16044	12	Z	500	31	5.8	2.6
16080	12	Z	500	31	6.5	-2.3
16080	00	Z	500	31	6.4	-4.8
16245	00	Z	500	31	8.0	-5.4
16245	12	Z	500	31	8.3	-6.0
16320	12	Z	500	30	10.9	0.7
16320	00	Z	500	30	9.2	0.7
16429	00	Z	500	31	5.3	-1.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	500	33	8.3	-1.6
16622	00	Z	500	31	18.1	13.5
16754	00	Z	500	8	10.9	-1.2
17607	12	Z	500	33	6.0	3.3
26435	00	Z	500	14	6.0	0.0
60018	00	Z	500	31	4.6	3.5
60018	12	Z	500	30	7.0	5.8
ASDE01	12	Z	500	8	16.3	-11.4
ASDE01	00	Z	500	7	17.1	-12.7
ASDE03	12	Z	500	6	6.1	-0.3
ASDE03	00	Z	500	8	10.3	-4.7
ASDE04	12	Z	500	7	23.7	23.2
ASDE04	00	Z	500	7	20.4	19.0
ASDE09	12	Z	500	8	10.0	6.4
ASDK01	12	Z	500	2	32.1	32.0
ASDK01	00	Z	500	5	26.9	25.5
ASDK03	00	Z	500	2	20.2	20.2
ASDK1	12	Z	500	2	36.5	36.3
ASDK1	00	Z	500	5	24.9	23.2
ASDK3	00	Z	500	1	23.4	23.4
ASES01	12	Z	500	20	8.9	8.5
ASEU01	12	Z	500	2	4.6	-4.6
ASEU02	12	Z	500	9	31.5	30.9
ASEU02	00	Z	500	8	26.0	25.5
ASEU03	00	Z	500	3	8.6	7.4
ASEU03	12	Z	500	3	12.3	8.8
ASEU04	12	Z	500	5	3.2	-2.0
ASEU04	00	Z	500	6	51.7	-18.0
ASEU06	12	Z	500	6	11.2	4.3
ASEU06	00	Z	500	4	15.9	-11.3
ASFR1	12	Z	500	12	8.2	1.1
ASFR1	00	Z	500	13	3.9	2.0
ASFR2	12	Z	500	11	8.5	6.4
ASFR2	00	Z	500	11	11.4	10.4
ASFR3	12	Z	500	10	5.4	2.7
ASFR3	00	Z	500	13	4.7	-2.0
ASFR4	12	Z	500	11	5.2	2.1
ASFR4	00	Z	500	11	5.2	-0.2

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	500	31	3.0	-0.5	0.3
01001	00	V	500	31	2.3	-0.2	0.3
01028	00	V	500	29	2.7	0.2	-0.2
01028	12	V	500	31	2.3	-0.4	0.0
01400	12	V	500	22	2.9	0.0	-0.3
01400	00	V	500	23	2.8	-0.2	-0.2
01415	12	V	500	30	3.2	0.4	-0.8
01415	00	V	500	30	3.8	0.1	-0.1
02365	00	V	500	30	3.3	0.5	-0.3
02365	12	V	500	30	3.1	0.4	-0.1
02591	12	V	500	31	2.6	0.0	-0.3
02591	00	V	500	30	2.6	0.0	-0.3
02836	00	V	500	31	2.8	0.2	-0.7
02836	12	V	500	31	2.6	0.0	0.1
02963	12	V	500	31	3.0	-0.1	-0.7
02963	00	V	500	31	2.7	0.2	0.3
03005	00	V	500	28	4.4	0.1	-0.9
03005	12	V	500	30	4.3	0.6	-0.6
03238	12	V	500	12	3.9	0.7	-1.6
03238	00	V	500	30	3.2	-0.4	-0.1
03808	12	V	500	30	4.2	0.1	-1.3
03808	00	V	500	29	5.4	1.3	0.3
03918	00	V	500	30	4.0	1.0	0.0
03918	12	V	500	19	3.9	0.6	0.2
03953	12	V	500	31	4.1	0.0	-0.8
03953	00	V	500	31	4.4	-0.2	-0.1
04018	12	V	500	27	4.2	0.1	-0.8
04018	00	V	500	23	3.3	-0.4	0.2
04220	12	V	500	31	4.1	0.1	0.6
04220	00	V	500	31	3.9	0.0	-0.4
04270	00	V	500	30	5.3	-2.1	0.8
04270	12	V	500	30	4.3	-0.5	-0.7
04320	12	V	500	30	3.0	0.5	-0.2
04320	00	V	500	30	3.0	0.5	-0.2
04339	00	V	500	29	3.2	-0.3	0.2
04339	12	V	500	29	3.3	-0.2	0.6
04360	12	V	500	27	3.1	0.0	-0.1
04360	00	V	500	26	3.9	0.2	0.6
06011	12	V	500	29	3.5	-0.4	0.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	500	30	3.4	0.4	-0.5
06260	00	V	500	31	2.8	0.0	-0.2
06260	12	V	500	5	2.7	0.6	0.4
06610	12	V	500	31	3.8	1.3	-0.2
06610	00	V	500	29	3.8	-0.2	-0.7
07110	00	V	500	30	4.3	0.6	0.1
07110	12	V	500	31	3.9	0.0	-0.1
07510	00	V	500	30	4.0	0.0	0.2
07510	12	V	500	31	4.2	-1.1	0.6
07645	00	V	500	30	4.2	0.8	0.3
07645	12	V	500	31	3.7	0.7	0.7
07761	00	V	500	30	3.3	-0.3	0.3
07761	12	V	500	31	3.5	0.7	0.3
08001	00	V	500	29	3.7	0.0	-0.2
08001	12	V	500	31	3.6	0.8	0.0
08221	12	V	500	31	3.1	-1.1	-0.2
08221	00	V	500	31	2.8	0.6	0.0
08302	00	V	500	31	2.8	-0.2	0.0
08302	12	V	500	31	3.3	0.0	0.3
08508	12	V	500	28	4.2	0.9	0.6
08522	12	V	500	30	2.8	0.5	-0.7
08579	12	V	500	31	4.2	-0.3	-0.8
10035	12	V	500	31	2.8	0.1	-0.7
10035	00	V	500	31	3.5	0.4	-0.4
10393	12	V	500	31	2.9	-0.3	-0.4
10393	00	V	500	31	2.7	0.5	0.0
10410	12	V	500	30	3.4	0.7	-0.1
10410	00	V	500	30	3.2	0.1	0.5
10739	12	V	500	31	3.3	-0.1	-0.4
10739	00	V	500	31	2.8	1.0	0.4
11035	12	V	500	31	3.3	0.2	0.6
11035	00	V	500	31	2.7	0.2	-0.8
12982	12	V	500	30	3.3	0.1	-0.1
12982	00	V	500	30	3.9	0.1	0.5
16044	00	V	500	31	2.8	0.4	0.3
16044	12	V	500	31	3.5	-0.4	-1.1
16080	12	V	500	31	3.5	-0.6	-0.9
16080	00	V	500	31	3.7	0.3	-0.5
16245	00	V	500	29	3.9	-0.7	-0.4
16245	12	V	500	31	3.1	0.4	-0.3
16320	12	V	500	30	3.0	-0.1	-0.1
16320	00	V	500	29	3.7	0.3	0.3
16429	00	V	500	31	2.8	-0.2	0.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	500	31	3.5	0.5	0.3
16622	00	V	500	26	5.6	0.4	0.3
16754	00	V	500	8	3.3	-0.1	0.3
17607	12	V	500	18	3.6	0.3	-0.2
26435	00	V	500	14	2.7	-1.0	-0.2
60018	00	V	500	31	2.8	-0.4	-0.1
60018	12	V	500	30	2.9	-0.1	0.2
ASDE01	12	V	500	7	3.2	0.2	1.4
ASDE01	00	V	500	6	2.7	-0.3	0.6
ASDE03	12	V	500	6	3.5	-1.7	-0.5
ASDE03	00	V	500	7	3.9	1.7	-0.3
ASDE04	12	V	500	6	3.6	-1.6	-0.4
ASDE04	00	V	500	5	1.9	1.1	0.1
ASDE09	12	V	500	6	3.1	1.1	-1.5
ASDK01	12	V	500	2	1.5	-1.5	0.3
ASDK01	00	V	500	5	7.5	-4.0	2.5
ASDK03	00	V	500	1	1.8	1.4	1.2
ASDK1	12	V	500	2	2.1	-2.1	0.2
ASDK1	00	V	500	5	8.3	-4.7	2.5
ASDK3	00	V	500	1	1.4	1.4	-0.2
ASES01	12	V	500	18	2.8	-0.5	0.8
ASEU01	12	V	500	2	5.3	4.7	-1.8
ASEU02	12	V	500	7	3.3	-0.9	1.2
ASEU02	00	V	500	5	2.9	0.0	-1.5
ASEU03	00	V	500	3	2.2	-1.0	0.4
ASEU03	12	V	500	3	7.8	-2.8	-4.2
ASEU04	12	V	500	4	9.2	-0.6	-3.9
ASEU04	00	V	500	5	3.0	0.1	0.7
ASEU06	12	V	500	6	5.7	-1.2	3.4
ASEU06	00	V	500	4	5.8	0.3	-3.2
ASFR1	12	V	500	12	4.2	-0.9	0.5
ASFR1	00	V	500	13	4.1	-0.2	1.4
ASFR2	12	V	500	11	2.9	0.1	0.0
ASFR2	00	V	500	11	2.9	0.5	-0.2
ASFR3	12	V	500	10	2.8	-0.9	0.5
ASFR3	00	V	500	12	4.4	1.1	-0.1
ASFR4	12	V	500	11	3.6	0.0	-0.1
ASFR4	00	V	500	9	3.8	-0.2	1.0

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	850	33	3.2	0.7
01001	00	Z	850	33	3.0	1.2
01028	00	Z	850	33	2.8	0.0
01028	12	Z	850	33	3.9	-1.4
01400	12	Z	850	22	7.5	2.1
01400	00	Z	850	23	9.9	3.5
01415	12	Z	850	31	3.8	3.1
01415	00	Z	850	31	5.0	4.4
02365	00	Z	850	44	3.6	2.1
02365	12	Z	850	39	4.4	2.3
02591	12	Z	850	40	6.9	6.4
02591	00	Z	850	43	8.5	8.1
02836	00	Z	850	46	2.9	1.6
02836	12	Z	850	44	2.1	0.6
02963	12	Z	850	34	2.8	1.2
02963	00	Z	850	36	3.9	2.7
03005	00	Z	850	34	4.1	1.1
03005	12	Z	850	30	4.9	-0.8
03238	12	Z	850	12	6.4	5.3
03238	00	Z	850	30	6.2	5.6
03808	12	Z	850	32	5.2	3.9
03808	00	Z	850	32	4.3	2.9
03918	00	Z	850	31	5.8	4.9
03918	12	Z	850	19	6.6	5.6
03953	12	Z	850	31	6.5	4.3
03953	00	Z	850	32	6.9	2.7
04018	12	Z	850	27	3.4	1.0
04018	00	Z	850	24	3.8	1.3
04220	12	Z	850	31	14.1	3.8
04220	00	Z	850	31	4.2	1.6
04270	00	Z	850	30	7.1	2.3
04270	12	Z	850	30	5.8	2.2
04320	12	Z	850	30	5.3	0.6
04320	00	Z	850	30	4.6	2.2
04339	00	Z	850	29	14.1	4.1
04339	12	Z	850	29	6.2	1.4
04360	12	Z	850	28	6.4	-1.0
04360	00	Z	850	26	6.1	-2.3
06011	12	Z	850	29	14.0	1.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	850	30	6.4	3.9
06260	00	Z	850	32	15.3	3.8
06260	12	Z	850	5	1.6	-0.5
06610	12	Z	850	31	4.9	4.0
06610	00	Z	850	31	4.7	3.5
07110	00	Z	850	31	3.7	2.5
07110	12	Z	850	31	4.7	3.8
07510	00	Z	850	33	4.3	-2.6
07510	12	Z	850	32	3.5	-1.8
07645	00	Z	850	31	3.6	-1.9
07645	12	Z	850	32	3.6	-1.4
07761	00	Z	850	32	3.5	-2.3
07761	12	Z	850	32	3.6	-0.1
08001	00	Z	850	30	7.8	6.8
08001	12	Z	850	31	7.9	7.2
08221	12	Z	850	31	5.6	4.6
08221	00	Z	850	31	4.7	4.3
08302	00	Z	850	31	3.1	-2.0
08302	12	Z	850	33	3.0	-2.2
08508	12	Z	850	28	9.6	5.6
08522	12	Z	850	30	5.4	4.6
08579	12	Z	850	31	10.0	3.0
10035	12	Z	850	33	3.7	0.9
10035	00	Z	850	31	4.0	1.5
10393	12	Z	850	31	12.9	2.7
10393	00	Z	850	32	2.0	0.0
10410	12	Z	850	31	2.8	-1.2
10410	00	Z	850	31	2.9	-1.8
10739	12	Z	850	31	8.5	7.6
10739	00	Z	850	32	8.2	7.5
11035	12	Z	850	31	8.6	7.1
11035	00	Z	850	31	8.3	6.8
12982	12	Z	850	30	4.6	2.9
12982	00	Z	850	31	4.1	-0.2
16044	00	Z	850	31	3.2	-0.2
16044	12	Z	850	31	3.9	-2.0
16080	12	Z	850	31	8.0	-5.5
16080	00	Z	850	31	6.7	-5.3
16245	00	Z	850	31	9.3	-8.0
16245	12	Z	850	31	10.2	-9.0
16320	12	Z	850	30	8.2	-0.1
16320	00	Z	850	30	8.6	-1.2
16429	00	Z	850	31	5.8	-3.8

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	850	35	6.7	-5.0
16622	00	Z	850	31	12.5	9.2
16754	00	Z	850	8	5.4	0.9
17607	12	Z	850	34	4.2	2.6
26435	00	Z	850	15	2.4	0.6
60018	00	Z	850	31	2.3	-0.3
60018	12	Z	850	30	3.1	-1.6
ASDE01	12	Z	850	8	25.4	-17.9
ASDE01	00	Z	850	8	20.0	-15.3
ASDE03	12	Z	850	6	8.2	-6.8
ASDE03	00	Z	850	8	10.9	-6.3
ASDE04	12	Z	850	7	19.6	18.9
ASDE04	00	Z	850	7	18.9	16.8
ASDE09	12	Z	850	8	12.0	2.6
ASDK01	12	Z	850	2	28.0	28.0
ASDK01	00	Z	850	5	23.5	21.9
ASDK03	00	Z	850	2	23.0	23.0
ASDK1	12	Z	850	2	29.7	29.7
ASDK1	00	Z	850	5	23.4	21.6
ASDK3	00	Z	850	1	29.0	29.0
ASES01	12	Z	850	20	2.7	1.5
ASEU01	12	Z	850	2	3.2	2.5
ASEU02	12	Z	850	9	23.7	23.1
ASEU02	00	Z	850	8	21.7	21.3
ASEU03	00	Z	850	3	9.7	4.1
ASEU03	12	Z	850	3	9.6	4.4
ASEU04	12	Z	850	5	8.1	-7.2
ASEU04	00	Z	850	7	11.5	-6.8
ASEU06	12	Z	850	6	7.7	-2.8
ASEU06	00	Z	850	4	19.5	1.1
ASFR1	12	Z	850	12	7.3	-6.3
ASFR1	00	Z	850	13	5.9	-4.7
ASFR2	12	Z	850	11	7.3	5.6
ASFR2	00	Z	850	11	7.7	7.2
ASFR3	12	Z	850	10	4.5	-0.6
ASFR3	00	Z	850	13	2.5	0.4
ASFR4	12	Z	850	11	5.2	-4.3
ASFR4	00	Z	850	11	4.3	-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                : JAN 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	850	31	4.4	1.3	-0.1
01001	00	V	850	31	3.5	0.2	-0.9
01028	00	V	850	29	2.5	-0.1	-0.2
01028	12	V	850	31	2.6	-0.2	-0.1
01400	12	V	850	22	2.8	0.1	0.2
01400	00	V	850	23	2.9	1.1	-0.6
01415	12	V	850	30	3.3	-0.6	0.5
01415	00	V	850	30	3.0	0.0	0.6
02365	00	V	850	30	2.8	0.5	0.2
02365	12	V	850	30	2.5	0.2	0.7
02591	12	V	850	31	2.7	-0.3	-0.1
02591	00	V	850	30	2.8	-0.6	-0.7
02836	00	V	850	31	2.6	0.1	-0.5
02836	12	V	850	31	2.6	-0.2	-0.2
02963	12	V	850	31	2.9	0.0	-0.8
02963	00	V	850	31	2.9	0.2	0.1
03005	00	V	850	28	3.8	-0.1	-0.2
03005	12	V	850	30	3.5	0.5	0.2
03238	12	V	850	12	3.8	-1.4	-0.4
03238	00	V	850	30	3.0	-0.1	-0.3
03808	12	V	850	30	2.9	-0.1	0.1
03808	00	V	850	29	3.0	0.1	-0.5
03918	00	V	850	30	2.8	0.1	0.0
03918	12	V	850	19	3.8	0.7	0.3
03953	12	V	850	31	3.1	0.6	0.2
03953	00	V	850	31	3.7	-0.6	0.5
04018	12	V	850	27	4.2	0.2	-0.4
04018	00	V	850	23	2.8	-0.1	0.3
04220	12	V	850	31	3.3	0.9	-0.1
04220	00	V	850	31	3.7	0.0	-0.6
04270	00	V	850	30	4.5	0.2	0.3
04270	12	V	850	30	5.8	0.9	0.1
04320	12	V	850	30	4.2	0.6	0.5
04320	00	V	850	30	3.3	-0.5	-0.6
04339	00	V	850	29	5.7	0.4	3.3
04339	12	V	850	29	5.7	0.7	2.7
04360	12	V	850	28	7.2	3.8	0.7
04360	00	V	850	26	6.6	2.9	1.2
06011	12	V	850	29	3.3	-0.5	-0.5

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	850	30	2.5	-0.4	-0.7
06260	00	V	850	31	3.2	-0.2	-0.2
06260	12	V	850	5	3.1	0.9	-0.9
06610	12	V	850	31	2.6	0.0	-0.6
06610	00	V	850	29	3.5	0.1	0.0
07110	00	V	850	30	3.2	-0.4	0.4
07110	12	V	850	31	3.1	0.8	0.6
07510	00	V	850	30	3.5	-0.3	0.6
07510	12	V	850	31	3.9	-0.3	0.9
07645	00	V	850	30	3.7	0.0	0.6
07645	12	V	850	31	4.2	0.5	0.5
07761	00	V	850	31	3.3	-0.6	0.0
07761	12	V	850	31	4.4	0.0	0.1
08001	00	V	850	29	3.4	0.1	-0.2
08001	12	V	850	31	3.6	0.5	0.3
08221	12	V	850	31	3.3	0.1	-0.1
08221	00	V	850	31	2.9	0.4	-0.4
08302	00	V	850	31	2.9	0.1	0.3
08302	12	V	850	31	3.4	-0.3	0.8
08508	12	V	850	28	3.2	-0.2	0.1
08522	12	V	850	30	3.8	0.3	0.5
08579	12	V	850	31	3.8	1.5	-0.3
10035	12	V	850	31	2.1	0.3	0.0
10035	00	V	850	31	2.9	-0.2	-0.3
10393	12	V	850	31	2.6	0.0	-0.6
10393	00	V	850	31	2.5	-0.6	-0.3
10410	12	V	850	30	2.2	-0.2	-0.1
10410	00	V	850	30	2.2	-0.3	0.4
10739	12	V	850	31	4.3	0.3	-1.0
10739	00	V	850	31	2.6	0.2	-0.2
11035	12	V	850	31	3.0	0.4	0.0
11035	00	V	850	31	3.4	1.1	0.0
12982	12	V	850	30	3.3	-0.4	-0.4
12982	00	V	850	30	3.4	0.8	-0.9
16044	00	V	850	31	3.5	1.2	0.5
16044	12	V	850	31	3.5	0.8	0.5
16080	12	V	850	31	4.5	1.1	0.1
16080	00	V	850	31	3.0	0.7	0.1
16245	00	V	850	29	2.5	0.4	0.2
16245	12	V	850	31	4.1	-0.3	0.6
16320	12	V	850	30	4.5	-0.4	0.3
16320	00	V	850	29	3.1	0.1	0.0
16429	00	V	850	31	3.1	-0.3	1.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	850	31	2.8	0.0	0.5
16622	00	V	850	28	5.5	0.7	1.3
16754	00	V	850	8	2.8	0.1	-0.2
17607	12	V	850	18	3.3	0.6	-0.4
26435	00	V	850	15	3.0	-0.7	0.2
60018	00	V	850	31	2.6	0.3	-0.4
60018	12	V	850	30	3.3	1.0	-0.3
ASDE01	12	V	850	7	3.2	-1.1	1.6
ASDE01	00	V	850	7	4.1	0.5	-0.2
ASDE03	12	V	850	6	4.8	-0.8	0.1
ASDE03	00	V	850	7	6.9	3.4	-2.3
ASDE04	12	V	850	6	4.5	-0.7	-1.5
ASDE04	00	V	850	5	3.0	1.7	1.2
ASDE09	12	V	850	6	1.4	-0.4	-0.8
ASDK01	12	V	850	2	2.3	0.5	-1.6
ASDK01	00	V	850	5	2.9	-0.4	-0.5
ASDK03	00	V	850	1	3.9	0.8	3.8
ASDK1	12	V	850	2	2.8	0.7	-2.1
ASDK1	00	V	850	5	2.7	-0.1	-0.6
ASDK3	00	V	850	1	1.7	0.5	1.6
ASES01	12	V	850	18	3.0	-0.1	-1.2
ASEU01	12	V	850	2	7.8	-3.5	2.5
ASEU02	12	V	850	7	2.4	0.6	0.7
ASEU02	00	V	850	5	3.0	0.2	0.5
ASEU03	00	V	850	3	3.7	2.3	0.2
ASEU03	12	V	850	3	3.5	1.7	-0.3
ASEU04	12	V	850	4	2.7	-0.3	0.0
ASEU04	00	V	850	6	3.0	-1.1	1.2
ASEU06	12	V	850	6	4.5	-1.0	-0.1
ASEU06	00	V	850	4	4.3	1.0	-1.0
ASFR1	12	V	850	12	3.7	-0.6	-0.4
ASFR1	00	V	850	13	3.0	0.0	-0.5
ASFR2	12	V	850	11	3.4	0.8	0.3
ASFR2	00	V	850	11	2.6	0.1	0.7
ASFR3	12	V	850	10	3.5	0.2	0.3
ASFR3	00	V	850	12	3.2	-0.7	-0.9
ASFR4	12	V	850	11	2.7	-0.2	-1.2
ASFR4	00	V	850	9	4.3	-0.9	-1.2

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

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


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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
001	99	P	SUR	74	32	3	0	1.7	0.3	1.7
03380	99	P	SUR	54	0	742	0	0.4	-0.2	0.5
13008	99	P	SUR	15	-38	105	0	0.3	-0.0	0.3
13515	99	P	SUR	28	-54	537	0	0.3	0.0	0.3
13517	99	P	SUR	16	-53	440	0	0.3	0.0	0.3
13519	99	P	SUR	20	-44	278	0	0.3	0.2	0.3
13530	99	P	SUR	14	-24	202	0	0.3	0.0	0.3
13569	99	P	SUR	30	-34	375	4	0.3	-0.2	0.4
13570	99	P	SUR	38	-19	652	0	0.4	0.5	0.7
13572	99	P	SUR	33	-25	458	1	0.4	-0.0	0.4
13633	99	P	SUR	31	-23	526	0	0.3	-0.7	0.8
13660	99	P	SUR	31	-51	744	0	1.8	-0.4	1.9
13661	99	P	SUR	16	-35	744	0	1.5	-0.6	1.6
13665	99	P	SUR	25	-22	744	0	0.4	0.3	0.5
13868	99	P	SUR	34	-12	744	0	0.3	0.4	0.5
13869	99	P	SUR	23	-42	744	0	0.3	0.2	0.4
13870	99	P	SUR	32	-11	6	0	0.3	1.1	1.1
13871	99	P	SUR	29	-36	741	0	0.4	0.5	0.6
13872	99	P	SUR	27	-30	744	0	0.4	0.5	0.6
2086	99	P	SUR	55	6	1	0	0.0	-0.6	0.6
21942	99	P	SUR	30	-44	649	0	0.5	0.2	0.6
25540	99	P	SUR	67	-33	84	0	0.6	-0.2	0.6
25575	99	P	SUR	73	-20	648	2	0.6	0.0	0.6
25617	99	P	SUR	75	-15	744	0	0.7	-0.4	0.8
25618	99	P	SUR	77	-10	736	0	0.6	0.2	0.6
26537	99	P	SUR	72	14	711	0	1.3	0.2	1.3
26545	99	P	SUR	83	5	698	459	6.8	-4.9	8.3
26546	99	P	SUR	79	-6	729	0	0.5	0.8	1.0
31601	99	P	SUR	42	32	3	0	6.5	-4.4	7.8
31863	99	P	SUR	25	-57	659	0	0.3	0.5	0.5
41040	99	P	SUR	15	-53	735	0	0.3	-0.7	0.7
41041	99	P	SUR	14	-46	743	0	0.3	-0.4	0.5
41043	99	P	SUR	21	-65	740	0	0.3	-0.3	0.5
41044	99	P	SUR	22	-59	744	0	0.3	-0.3	0.4
41046	99	P	SUR	24	-68	754	0	0.4	-0.2	0.4
41048	99	P	SUR	32	-70	755	0	0.7	-1.0	1.2

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
41049	99	P	SUR	28	-63	740	0	0.5	-0.5	0.7
41051	99	P	SUR	18	-65	1630	0	0.3	-0.2	0.4
41052	99	P	SUR	18	-65	2095	0	0.3	-1.2	1.2
41053	99	P	SUR	19	-66	2015	0	0.4	-0.4	0.6
41056	99	P	SUR	18	-66	1801	0	0.4	-0.9	1.0
41139	99	P	SUR	20	-38	217	0	0.4	-0.2	0.4
41300	99	P	SUR	16	-58	508	1	0.6	-0.1	0.7
41564	99	P	SUR	29	-35	173	0	0.3	0.4	0.5
41594	99	P	SUR	29	-65	529	0	0.5	-0.5	0.7
41597	99	P	SUR	25	-59	744	0	0.3	0.1	0.3
41598	99	P	SUR	26	-59	744	0	0.9	0.2	0.9
41635	99	P	SUR	21	-49	744	0	0.3	0.5	0.6
41638	99	P	SUR	16	-55	134	0	0.2	0.2	0.3
41706	99	P	SUR	32	-58	744	0	1.1	-0.3	1.1
41707	99	P	SUR	14	-61	741	0	0.3	-1.0	1.0
41708	99	P	SUR	14	-40	744	0	0.3	0.3	0.4
41711	99	P	SUR	34	-26	744	0	0.4	-0.2	0.4
41729	99	P	SUR	36	-58	744	0	0.8	-0.6	1.0
41731	99	P	SUR	26	-56	744	0	0.3	0.1	0.3
41936	99	P	SUR	30	-67	661	0	0.4	-1.2	1.3
41970	99	P	SUR	35	-67	744	0	0.6	-0.4	0.8
41972	99	P	SUR	34	-46	744	0	0.6	-0.3	0.6
41975	99	P	SUR	31	-24	584	0	0.3	0.0	0.3
42059	99	P	SUR	15	-68	740	0	0.3	-0.1	0.3
42060	99	P	SUR	16	-63	745	0	0.3	-0.0	0.3
42085	99	P	SUR	18	-67	1821	0	0.4	-0.9	1.0
44005	99	P	SUR	43	-69	785	0	0.6	-0.9	1.1
44008	99	P	SUR	41	-69	744	0	0.8	-0.9	1.2
44011	99	P	SUR	41	-67	744	0	0.8	-1.2	1.4
44018	99	P	SUR	42	-70	744	0	0.7	-0.5	0.8
44024	99	P	SUR	42	-66	751	0	0.7	-1.0	1.3
44027	99	P	SUR	44	-67	751	0	0.7	-0.4	0.8
44032	99	P	SUR	44	-69	704	0	0.6	-1.3	1.4
44033	99	P	SUR	44	-69	740	0	0.5	-1.4	1.5
44034	99	P	SUR	44	-68	706	0	0.8	-0.6	1.0
44037	99	P	SUR	44	-68	518	0	0.6	-0.3	0.7
44137	99	P	SUR	42	-62	750	0	0.8	-0.3	0.8
44139	99	P	SUR	44	-57	720	0	0.7	-0.1	0.7
44141	99	P	SUR	43	-58	704	0	0.7	-0.2	0.8
44150	99	P	SUR	43	-64	682	0	0.7	-0.3	0.8
44251	99	P	SUR	46	-53	721	0	0.6	0.2	0.6
44255	99	P	SUR	47	-57	615	0	0.6	0.0	0.6
44258	99	P	SUR	45	-63	21	0	0.5	-0.2	0.5

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
44513	99	P	SUR	53	-16	744	0	0.7	0.4	0.8
44515	99	P	SUR	49	-43	744	0	0.7	0.0	0.7
44516	99	P	SUR	43	-45	547	0	0.7	-0.0	0.7
44517	99	P	SUR	42	-17	744	0	0.6	0.3	0.6
44521	99	P	SUR	39	-60	526	0	0.7	-1.1	1.3
44546	99	P	SUR	28	-49	744	0	0.3	-0.1	0.4
44547	99	P	SUR	63	-11	744	0	0.7	0.3	0.8
44548	99	P	SUR	62	-20	744	0	0.6	0.4	0.7
44549	99	P	SUR	57	-6	684	0	1.1	-0.2	1.1
44551	99	P	SUR	65	0	744	0	0.6	0.2	0.6
44557	99	P	SUR	39	-45	744	0	0.7	0.2	0.7
44558	99	P	SUR	30	-43	514	0	0.4	0.6	0.7
44601	99	P	SUR	51	-8	744	0	0.6	-0.7	0.9
44608	99	P	SUR	48	-11	744	0	0.8	-0.1	0.8
44609	99	P	SUR	50	-12	744	0	0.6	0.2	0.6
44613	99	P	SUR	25	-38	744	0	1.2	-0.2	1.2
44614	99	P	SUR	52	-15	742	0	0.7	-0.6	0.9
44623	99	P	SUR	63	-36	678	0	0.6	-0.0	0.6
44624	99	P	SUR	25	-38	735	0	0.4	-0.2	0.5
44625	99	P	SUR	58	-43	696	0	0.6	0.2	0.6
44670	99	P	SUR	50	-52	715	0	0.6	0.3	0.7
44739	99	P	SUR	38	-40	744	0	0.6	0.3	0.7
44740	99	P	SUR	28	-59	744	0	0.5	-0.5	0.7
44744	99	P	SUR	45	-37	745	0	1.1	-0.8	1.3
44746	99	P	SUR	37	-41	744	0	0.7	0.2	0.8
44747	99	P	SUR	45	-32	744	0	0.7	-0.4	0.8
44760	99	P	SUR	54	-39	744	0	0.7	-0.8	1.1
44761	99	P	SUR	56	-23	744	0	0.6	-0.4	0.7
44762	99	P	SUR	46	-46	72	0	0.7	0.2	0.7
44763	99	P	SUR	64	-28	744	0	0.6	0.2	0.6
44764	99	P	SUR	55	-22	744	0	0.6	-0.5	0.8
44765	99	P	SUR	46	-46	734	0	0.8	0.2	0.8
44766	99	P	SUR	44	-52	744	0	0.7	0.0	0.7
44768	99	P	SUR	36	-41	744	0	0.7	0.4	0.8
44769	99	P	SUR	35	-66	744	0	0.7	-0.7	0.9
44772	99	P	SUR	53	-47	744	0	0.7	-0.1	0.7
44773	99	P	SUR	51	-43	504	25	1.7	-1.0	2.0
44774	99	P	SUR	34	-47	474	0	0.6	0.0	0.6
44775	99	P	SUR	33	-68	744	0	0.5	-0.0	0.5
44776	99	P	SUR	39	-32	743	0	0.6	0.4	0.7
44777	99	P	SUR	48	-49	744	0	0.6	0.3	0.6
44778	99	P	SUR	36	-44	743	0	0.6	0.1	0.6
44779	99	P	SUR	47	-52	744	0	0.7	0.2	0.7

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
44835	99	P	SUR	36	-23	744	0	0.4	-0.4	0.6
44836	99	P	SUR	63	-6	744	0	0.5	0.1	0.5
44837	99	P	SUR	24	-34	744	0	0.4	-0.1	0.4
44839	99	P	SUR	32	-19	744	0	0.4	-0.0	0.4
44846	99	P	SUR	38	-22	744	0	0.4	0.5	0.6
44848	99	P	SUR	37	-22	742	0	0.4	0.2	0.5
44863	99	P	SUR	28	-52	744	0	0.3	-0.6	0.7
44866	99	P	SUR	67	2	744	0	0.6	-0.2	0.6
44867	99	P	SUR	59	-20	744	18	1.9	-0.4	2.0
44868	99	P	SUR	24	-48	744	0	0.4	0.1	0.4
44869	99	P	SUR	37	-36	88	0	5.0	-0.4	5.0
44871	99	P	SUR	50	-5	328	32	3.4	0.2	3.4
44872	99	P	SUR	64	-13	744	9	1.9	-0.6	2.0
44873	99	P	SUR	36	-36	744	0	0.7	0.6	1.0
44874	99	P	SUR	44	-40	744	0	0.7	-0.0	0.7
44878	99	P	SUR	41	-11	744	0	0.5	-0.1	0.5
44880	99	P	SUR	51	-12	740	0	0.5	-0.3	0.6
44885	99	P	SUR	37	-17	744	0	0.4	-0.1	0.4
44887	99	P	SUR	35	-47	744	0	0.7	-0.4	0.8
44888	99	P	SUR	41	-12	744	0	0.5	-0.3	0.6
44889	99	P	SUR	32	-53	744	0	0.6	-0.3	0.7
44891	99	P	SUR	28	-52	744	0	0.3	-0.2	0.4
44896	99	P	SUR	30	-51	561	0	0.7	-0.7	1.0
47503	99	P	SUR	64	-33	584	581	3.6	-6.1	7.1
47509	99	P	SUR	85	-29	733	0	0.6	0.1	0.6
47539	99	P	SUR	46	-48	696	0	0.7	0.3	0.8
47540	99	P	SUR	50	-52	697	0	0.8	0.6	1.0
47546	99	P	SUR	48	-51	705	0	0.6	0.5	0.7
47549	99	P	SUR	49	-50	700	0	0.6	0.2	0.6
47551	99	P	SUR	58	-60	743	0	0.8	-1.5	1.6
47552	99	P	SUR	67	-63	688	0	0.5	-1.5	1.6
47555	99	P	SUR	49	-53	744	0	0.5	0.5	0.8
47557	99	P	SUR	51	-54	682	0	0.9	0.3	0.9
47560	99	P	SUR	50	-51	744	0	0.6	0.6	0.8
47562	99	P	SUR	52	-50	694	0	0.6	0.5	0.8
47567	99	P	SUR	51	-54	705	0	0.6	0.0	0.6
47568	99	P	SUR	49	-51	705	0	0.6	1.0	1.2
47569	99	P	SUR	47	-48	649	0	0.6	0.9	1.1
47574	99	P	SUR	51	-51	678	0	0.6	0.2	0.6
47584	99	P	SUR	49	-51	698	0	0.6	0.4	0.7
47589	99	P	SUR	67	-63	700	0	0.6	-1.8	1.9
48520	99	P	SUR	88	-42	550	0	0.5	0.3	0.6
48568	99	P	SUR	59	-20	695	0	0.5	-0.5	0.8

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
61001	99	P	SUR	43	8	738	0	0.6	0.2	0.7
62001	99	P	SUR	45	-5	1041	0	0.5	-0.1	0.5
62027	99	P	SUR	49	-2	244	0	0.6	-0.1	0.6
62029	99	P	SUR	49	-12	409	0	0.7	-0.3	0.7
62030	99	P	SUR	50	-4	1106	0	0.5	0.1	0.5
62052	99	P	SUR	49	-6	1	0	0.0	-8.7	8.7
62081	99	P	SUR	51	-13	744	0	0.7	-0.4	0.8
62086	99	P	SUR	55	6	720	3	0.6	-0.5	0.8
62091	99	P	SUR	53	-5	726	1	1.2	-0.3	1.3
62093	99	P	SUR	55	-10	728	30	3.0	0.5	3.0
62095	99	P	SUR	53	-16	1391	0	0.7	0.0	0.7
62102	99	P	SUR	58	2	720	0	1.2	0.5	1.3
62103	99	P	SUR	50	-3	744	0	0.5	0.3	0.6
62104	99	P	SUR	57	1	741	0	0.7	0.2	0.7
62105	99	P	SUR	55	-13	443	1	0.6	0.0	0.6
62107	99	P	SUR	50	-6	1437	6	0.8	0.2	0.9
62111	99	P	SUR	58	0	743	0	0.5	1.3	1.4
62112	99	P	SUR	58	0	743	0	0.5	0.2	0.5
62113	99	P	SUR	58	0	743	0	0.7	0.3	0.8
62114	99	P	SUR	58	0	1482	0	0.5	0.0	0.5
62115	99	P	SUR	58	-3	743	0	0.7	0.0	0.7
62116	99	P	SUR	58	1	742	0	0.7	0.1	0.7
62117	99	P	SUR	58	0	626	0	0.6	0.3	0.6
62118	99	P	SUR	58	1	742	0	0.4	0.4	0.6
62119	99	P	SUR	57	2	742	0	0.6	0.0	0.6
62120	99	P	SUR	56	2	722	0	0.5	-0.0	0.5
62121	99	P	SUR	54	3	737	0	0.7	0.6	1.0
62122	99	P	SUR	57	2	1468	0	0.6	-0.0	0.6
62123	99	P	SUR	56	2	1481	0	0.6	0.0	0.6
62124	99	P	SUR	54	-4	743	0	0.7	-0.1	0.7
62127	99	P	SUR	54	1	742	0	0.5	0.4	0.6
62128	99	P	SUR	59	1	736	0	0.6	-0.1	0.6
62129	99	P	SUR	58	0	743	0	0.8	0.1	0.8
62130	99	P	SUR	59	1	741	0	0.6	-0.5	0.8
62131	99	P	SUR	54	1	737	0	0.7	0.5	0.8
62132	99	P	SUR	56	2	726	0	0.6	0.3	0.6
62133	99	P	SUR	57	1	743	0	1.1	0.5	1.2
62134	99	P	SUR	58	1	736	0	0.5	0.2	0.5
62135	99	P	SUR	54	2	742	0	0.6	0.2	0.6
62136	99	P	SUR	54	3	743	0	0.7	0.7	1.0
62137	99	P	SUR	57	2	703	5	0.4	-0.2	0.5
62138	99	P	SUR	54	0	1482	0	0.7	0.9	1.1
62139	99	P	SUR	53	2	1482	0	0.4	0.1	0.5

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62140	99	P	SUR	57	1	1473	0	0.6	0.1	0.6
62141	99	P	SUR	56	-3	659	0	1.0	-2.1	2.4
62143	99	P	SUR	58	2	743	0	0.6	0.5	0.7
62144	99	P	SUR	53	2	743	0	0.5	0.2	0.5
62145	99	P	SUR	53	3	1482	0	0.5	0.3	0.5
62146	99	P	SUR	57	2	743	0	0.7	0.4	0.8
62148	99	P	SUR	54	2	743	0	0.4	1.2	1.2
62149	99	P	SUR	54	1	735	0	0.5	0.7	0.9
62150	99	P	SUR	54	1	733	0	0.4	1.2	1.2
62151	99	P	SUR	57	2	1480	0	0.5	0.3	0.6
62152	99	P	SUR	57	2	743	0	0.6	0.5	0.8
62153	99	P	SUR	57	2	1468	0	0.5	0.1	0.5
62154	99	P	SUR	56	2	741	0	0.5	-0.1	0.5
62155	99	P	SUR	58	1	736	0	0.5	0.3	0.6
62157	99	P	SUR	58	0	743	0	0.4	-0.0	0.5
62159	99	P	SUR	58	-4	738	0	0.6	-2.4	2.4
62160	99	P	SUR	57	2	1365	0	0.7	-0.0	0.7
62161	99	P	SUR	58	1	418	0	0.8	-0.3	0.8
62162	99	P	SUR	57	1	726	0	0.6	-0.1	0.6
62163	99	P	SUR	48	-8	744	0	0.5	-0.1	0.5
62164	99	P	SUR	57	1	743	0	0.4	0.2	0.5
62165	99	P	SUR	54	1	743	0	0.5	0.3	0.6
62166	99	P	SUR	53	3	507	0	0.4	0.4	0.6
62167	99	P	SUR	53	2	1444	0	0.4	0.0	0.4
62168	99	P	SUR	58	1	421	0	0.5	-0.0	0.5
62170	99	P	SUR	51	2	744	0	1.0	-1.0	1.4
62198	99	P	SUR	52	2	784	0	0.5	0.3	0.6
62296	99	P	SUR	53	2	128	0	0.4	-0.3	0.5
62297	99	P	SUR	59	2	1478	0	0.5	-0.1	0.5
62301	99	P	SUR	52	-5	743	0	0.5	0.0	0.5
62302	99	P	SUR	61	-2	264	0	0.5	-0.2	0.6
62303	99	P	SUR	52	-5	223	0	0.6	-0.0	0.6
62304	99	P	SUR	51	2	802	1	0.5	0.2	0.5
62305	99	P	SUR	50	0	823	3	0.6	0.3	0.6
62513	99	P	SUR	59	-42	744	0	0.8	-0.2	0.8
62516	99	P	SUR	23	-53	616	0	1.7	-0.3	1.8
62539	99	P	SUR	61	-9	744	0	0.6	-0.1	0.6
62552	99	P	SUR	51	-2	160	0	0.6	0.2	0.6
62553	99	P	SUR	56	-31	744	0	0.8	0.0	0.8
62554	99	P	SUR	47	-17	744	0	0.6	0.2	0.6
62555	99	P	SUR	47	-14	744	0	0.6	0.1	0.6
62556	99	P	SUR	41	-33	744	0	0.6	0.7	0.9
62557	99	P	SUR	48	-28	744	0	0.6	-0.2	0.6

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62695	99	P	SUR	25	-49	744	0	2.2	-0.7	2.3
62713	99	P	SUR	29	-58	743	0	0.4	-0.5	0.7
62714	99	P	SUR	32	-54	737	0	0.5	-0.5	0.7
62940	99	P	SUR	37	-32	744	0	0.5	-0.2	0.6
62941	99	P	SUR	36	-17	744	0	0.4	-0.1	0.4
63055	99	P	SUR	61	2	743	0	0.7	-0.1	0.7
63056	99	P	SUR	60	2	736	0	0.6	0.4	0.7
63057	99	P	SUR	59	2	743	0	0.5	-0.1	0.5
63058	99	P	SUR	53	2	2224	0	0.5	0.2	0.6
63059	99	P	SUR	58	-1	742	0	0.5	0.2	0.5
63101	99	P	SUR	61	1	743	0	0.8	0.1	0.8
63102	99	P	SUR	61	1	742	0	0.7	0.1	0.7
63103	99	P	SUR	61	1	743	0	0.6	0.1	0.6
63104	99	P	SUR	61	2	737	0	0.6	-0.1	0.7
63105	99	P	SUR	61	2	743	0	0.5	-0.1	0.5
63107	99	P	SUR	61	2	743	0	0.5	-0.3	0.6
63108	99	P	SUR	61	2	741	0	0.7	-0.2	0.7
63109	99	P	SUR	60	2	742	0	0.5	-0.3	0.6
63110	99	P	SUR	60	2	742	0	0.8	0.0	0.8
63111	99	P	SUR	61	2	1478	0	0.7	-0.5	0.9
63112	99	P	SUR	61	1	736	0	0.5	-0.5	0.7
63114	99	P	SUR	61	2	1466	0	0.5	-0.5	0.7
63115	99	P	SUR	62	1	736	0	0.5	-0.2	0.5
63116	99	P	SUR	58	-3	684	0	0.8	-2.1	2.2
63117	99	P	SUR	61	1	1482	0	0.8	0.4	0.9
63118	99	P	SUR	58	-3	661	0	1.4	0.4	1.5
63119	99	P	SUR	58	0	93	0	1.2	-0.6	1.3
63120	99	P	SUR	54	2	742	0	0.5	0.3	0.6
63546	99	P	SUR	64	-22	643	49	4.5	-0.7	4.5
63560	99	P	SUR	72	-5	509	0	0.5	-0.2	0.5
63561	99	P	SUR	72	-4	681	0	0.4	0.1	0.5
63645	99	P	SUR	76	19	503	14	2.4	-0.2	2.4
63923	99	P	SUR	77	-10	554	531	2.2	-7.8	8.1
64041	99	P	SUR	61	-3	736	0	0.6	-0.2	0.6
64045	99	P	SUR	59	-12	1478	0	0.6	0.1	0.6
64046	99	P	SUR	61	-4	686	0	0.5	-0.0	0.5
64049	99	P	SUR	56	-3	226	0	0.4	-2.0	2.0
64519	99	P	SUR	75	17	732	0	0.5	0.4	0.6
64521	99	P	SUR	73	24	744	2	1.3	0.1	1.3
64522	99	P	SUR	79	7	319	0	2.3	-0.0	2.3
64523	99	P	SUR	69	0	715	0	2.1	0.3	2.2
64524	99	P	SUR	67	13	744	0	0.5	0.0	0.5
64525	99	P	SUR	68	-20	744	19	1.6	0.1	1.6

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	60	-54	744	0	1.4	0.2	1.4
64528	99	P	SUR	65	9	742	0	0.7	0.4	0.8
64530	99	P	SUR	73	9	744	0	0.5	0.4	0.7
64532	99	P	SUR	53	-26	569	6	0.7	-13.0	13.0
64537	99	P	SUR	76	-12	238	0	0.6	-0.1	0.7
64538	99	P	SUR	77	-14	700	0	0.7	0.6	0.9
64547	99	P	SUR	68	6	743	0	0.5	0.3	0.6
64549	99	P	SUR	64	-18	744	0	0.5	-0.2	0.6
64550	99	P	SUR	63	-26	216	88	1.5	-0.3	1.5
64551	99	P	SUR	56	-39	738	0	1.0	0.6	1.2
64553	99	P	SUR	64	1	744	0	0.5	0.1	0.5
64554	99	P	SUR	63	-20	744	0	0.5	0.5	0.7
64555	99	P	SUR	62	-8	744	0	0.6	0.2	0.6
64560	99	P	SUR	62	-17	744	0	0.6	0.3	0.6
64606	99	P	SUR	72	25	744	0	1.5	0.5	1.5
64621	99	P	SUR	64	-25	744	0	0.5	0.1	0.5
64623	99	P	SUR	70	-8	744	0	0.7	-0.3	0.8
64666	99	P	SUR	76	2	624	3	2.3	0.5	2.3
64667	99	P	SUR	61	-1	703	0	0.5	-0.4	0.7
64668	99	P	SUR	67	-31	648	6	2.7	0.0	2.7
64694	99	P	SUR	62	-33	744	0	1.2	-0.3	1.2
64748	99	P	SUR	88	-53	691	0	0.5	-0.2	0.5
64749	99	P	SUR	87	-20	676	0	0.6	-0.6	0.8
64751	99	P	SUR	86	9	681	0	0.7	-0.5	0.8
65511	99	P	SUR	66	-56	167	26	4.9	2.9	5.7
65514	99	P	SUR	57	-57	744	8	1.5	0.7	1.7
65519	99	P	SUR	58	-39	744	0	0.7	0.2	0.7
65596	99	P	SUR	53	-32	742	0	0.9	-0.1	0.9
65599	99	P	SUR	52	-41	744	0	0.8	-0.3	0.8
65601	99	P	SUR	59	-55	744	0	0.7	0.1	0.8
65602	99	P	SUR	56	-37	744	0	0.8	-0.5	0.9
65603	99	P	SUR	68	-54	615	0	1.5	-0.0	1.5

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                : JAN 2016
                   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
001	99	SPEED	SUR	74	32	3	0	0	1.6	-2.3	2.8
13002	99	SPEED	SUR	20	-23	234	0	0	1.0	0.4	1.1
13008	99	SPEED	SUR	15	-38	105	0	0	0.9	0.3	1.0
2086	99	SPEED	SUR	55	6	1	0	0	0.0	-18.7	18.7
31601	99	SPEED	SUR	42	32	3	0	0	1.7	-0.8	1.9
41026	99	SPEED	SUR	11	-38	68	0	0	0.8	0.2	0.8
41040	99	SPEED	SUR	15	-53	735	0	0	0.9	-0.1	1.0
41041	99	SPEED	SUR	14	-46	743	0	0	0.8	-0.2	0.8
41043	99	SPEED	SUR	21	-65	740	0	0	1.4	-0.0	1.4
41044	99	SPEED	SUR	22	-59	744	0	0	1.0	-0.1	1.0
41046	99	SPEED	SUR	24	-68	754	0	0	1.1	0.2	1.2
41048	99	SPEED	SUR	32	-70	755	0	0	1.7	-0.4	1.8
41049	99	SPEED	SUR	28	-63	740	0	0	1.2	-0.0	1.2
41051	99	SPEED	SUR	18	-65	1630	0	0	1.2	-0.1	1.2
41052	99	SPEED	SUR	18	-65	2095	0	0	1.0	-0.2	1.0
41053	99	SPEED	SUR	19	-66	2015	0	0	1.5	-0.7	1.7
41056	99	SPEED	SUR	18	-66	1810	0	0	1.1	-0.1	1.1
41139	99	SPEED	SUR	20	-38	217	0	0	0.9	-0.0	0.9
41300	99	SPEED	SUR	16	-58	506	0	0	1.1	0.4	1.2
42059	99	SPEED	SUR	15	-68	740	0	0	0.9	0.2	0.9
42060	99	SPEED	SUR	16	-63	746	0	0	1.1	0.2	1.1
42085	99	SPEED	SUR	18	-67	1826	0	0	1.3	0.4	1.4
44005	99	SPEED	SUR	43	-69	785	0	0	1.2	0.4	1.2
44008	99	SPEED	SUR	41	-69	744	0	0	1.7	0.3	1.7
44011	99	SPEED	SUR	41	-67	468	0	0	2.3	-0.4	2.3
44018	99	SPEED	SUR	42	-70	744	0	0	1.2	0.7	1.4
44024	99	SPEED	SUR	42	-66	757	0	0	1.5	0.2	1.5
44027	99	SPEED	SUR	44	-67	752	0	0	1.3	0.8	1.5
44032	99	SPEED	SUR	44	-69	742	0	0	1.3	0.3	1.3
44033	99	SPEED	SUR	44	-69	742	0	0	1.9	2.5	3.2
44034	99	SPEED	SUR	44	-68	742	0	0	1.3	0.4	1.4
44037	99	SPEED	SUR	44	-68	518	0	0	1.3	0.6	1.4
44137	99	SPEED	SUR	42	-62	750	0	0	1.8	0.3	1.8
44139	99	SPEED	SUR	44	-57	727	0	0	1.7	0.1	1.7

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
44141	99	SPEED	SUR	43	-58	711	1	0	1.9	0.3	2.0
44150	99	SPEED	SUR	43	-64	688	0	0	1.7	0.5	1.8
44251	99	SPEED	SUR	46	-53	725	0	0	1.5	-0.4	1.5
44255	99	SPEED	SUR	47	-57	623	0	0	1.6	0.7	1.8
44258	99	SPEED	SUR	45	-63	34	0	0	1.2	-0.3	1.3
61001	99	SPEED	SUR	43	8	737	0	0	2.1	-0.1	2.2
62001	99	SPEED	SUR	45	-5	1041	0	0	1.4	-0.3	1.4
62027	99	SPEED	SUR	49	-2	219	0	0	1.2	0.3	1.3
62029	99	SPEED	SUR	49	-12	409	0	0	1.8	-0.0	1.8
62081	99	SPEED	SUR	51	-13	744	0	0	1.4	0.1	1.4
62086	99	SPEED	SUR	55	6	728	2	0	5.2	-9.0	10.4
62091	99	SPEED	SUR	53	-5	726	0	0	1.5	0.0	1.5
62093	99	SPEED	SUR	55	-10	728	0	0	1.6	-0.4	1.7
62102	99	SPEED	SUR	58	2	743	0	0	1.9	-0.0	1.9
62103	99	SPEED	SUR	50	-3	744	0	0	2.0	1.1	2.3
62104	99	SPEED	SUR	57	1	741	0	0	1.6	-0.8	1.8
62105	99	SPEED	SUR	55	-13	615	0	0	1.8	0.4	1.9
62107	99	SPEED	SUR	50	-6	1433	0	0	1.8	0.5	1.9
62111	99	SPEED	SUR	58	0	743	0	0	1.9	0.3	1.9
62112	99	SPEED	SUR	58	0	743	0	0	3.0	-2.1	3.7
62113	99	SPEED	SUR	58	0	343	18	0	2.3	-0.1	2.3
62114	99	SPEED	SUR	58	0	1482	0	0	1.6	0.1	1.6
62117	99	SPEED	SUR	58	0	626	0	0	1.6	-0.4	1.7
62118	99	SPEED	SUR	58	1	742	0	0	1.9	0.6	2.0
62119	99	SPEED	SUR	57	2	742	0	0	1.8	-1.3	2.2
62120	99	SPEED	SUR	56	2	743	0	0	1.4	0.1	1.4
62121	99	SPEED	SUR	54	3	737	0	0	1.9	-0.7	2.0
62122	99	SPEED	SUR	57	2	1468	0	0	1.7	0.1	1.7
62123	99	SPEED	SUR	56	2	1479	0	0	1.3	0.3	1.4
62128	99	SPEED	SUR	59	1	736	0	0	2.0	0.4	2.0
62129	99	SPEED	SUR	58	0	743	0	0	1.4	-0.7	1.6
62131	99	SPEED	SUR	54	1	737	0	0	2.6	-1.2	2.8
62132	99	SPEED	SUR	56	2	740	0	0	2.4	-2.0	3.1
62133	99	SPEED	SUR	57	1	743	0	0	1.6	-0.2	1.6
62134	99	SPEED	SUR	58	1	736	0	0	1.7	-0.3	1.7
62140	99	SPEED	SUR	57	1	1442	0	0	1.5	-0.2	1.5
62143	99	SPEED	SUR	58	2	743	0	0	2.3	-1.1	2.5
62144	99	SPEED	SUR	53	2	743	0	0	2.4	-0.8	2.5
62145	99	SPEED	SUR	53	3	1482	0	0	2.3	-1.0	2.5
62146	99	SPEED	SUR	57	2	743	0	0	4.3	-4.2	6.0
62148	99	SPEED	SUR	54	2	743	0	0	2.0	-0.5	2.0

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
62149	99	SPEED	SUR	54	1	735	0	0	1.5	0.3	1.6
62150	99	SPEED	SUR	54	1	733	0	0	2.4	-1.0	2.6
62152	99	SPEED	SUR	57	2	743	0	0	1.9	-1.1	2.2
62153	99	SPEED	SUR	57	2	1468	0	0	4.7	-5.2	7.0
62154	99	SPEED	SUR	56	2	743	0	0	1.6	-0.6	1.7
62155	99	SPEED	SUR	58	1	720	0	0	1.7	0.1	1.7
62163	99	SPEED	SUR	48	-8	743	0	0	1.2	-0.2	1.2
62164	99	SPEED	SUR	57	1	743	0	0	1.6	-1.8	2.4
62165	99	SPEED	SUR	54	1	743	0	0	1.9	-1.2	2.2
62170	99	SPEED	SUR	51	2	744	0	0	2.2	1.9	2.9
62198	99	SPEED	SUR	52	2	784	0	0	1.8	1.7	2.4
62301	99	SPEED	SUR	52	-5	743	0	0	1.1	-0.0	1.1
62303	99	SPEED	SUR	52	-5	223	0	0	1.4	0.6	1.6
62304	99	SPEED	SUR	51	2	802	0	0	2.4	1.9	3.1
62305	99	SPEED	SUR	50	0	790	1	0	2.0	0.8	2.2
62442	99	SPEED	SUR	49	-16	744	0	0	1.5	-0.0	1.5
63055	99	SPEED	SUR	61	2	743	0	0	1.8	-1.5	2.3
63056	99	SPEED	SUR	60	2	735	0	0	1.6	-0.4	1.7
63057	99	SPEED	SUR	59	2	743	0	0	2.3	0.1	2.3
63058	99	SPEED	SUR	53	2	743	0	0	1.5	-0.1	1.5
63101	99	SPEED	SUR	61	1	742	0	0	1.7	-1.1	2.0
63104	99	SPEED	SUR	61	2	736	0	0	1.6	-0.7	1.8
63105	99	SPEED	SUR	61	2	743	0	0	1.7	-0.6	1.8
63106	99	SPEED	SUR	61	2	710	0	0	1.6	-0.8	1.8
63107	99	SPEED	SUR	61	2	742	0	0	1.7	-0.7	1.8
63108	99	SPEED	SUR	61	2	741	0	0	1.8	-0.5	1.9
63109	99	SPEED	SUR	60	2	739	0	0	1.7	-0.0	1.7
63110	99	SPEED	SUR	60	2	742	0	0	1.9	-0.6	2.0
63112	99	SPEED	SUR	61	1	736	0	0	1.8	-1.0	2.0
63113	99	SPEED	SUR	61	2	743	0	0	1.6	-0.9	1.8
63114	99	SPEED	SUR	61	2	1466	0	0	1.9	-0.3	1.9
63115	99	SPEED	SUR	62	1	736	0	0	1.7	-1.0	2.0
63117	99	SPEED	SUR	61	1	1482	0	0	1.6	-0.7	1.8
63119	99	SPEED	SUR	58	0	93	0	0	2.1	-0.7	2.2
64041	99	SPEED	SUR	61	-3	736	0	0	1.7	-0.6	1.8
64046	99	SPEED	SUR	61	-4	686	0	0	1.7	0.9	1.9
66021	99	SPEED	SUR	55	14	740	0	0	1.4	0.4	1.4
66024	99	SPEED	SUR	55	13	687	0	0	1.4	0.2	1.4

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                 : JAN 2016
         STANDARD OF COMPARISON: FIRST-GUESS FIELD


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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
13002	99	DIRN	SUR	20	-23	226	0	0	14.1	14.2	20.0
13008	99	DIRN	SUR	15	-38	101	0	0	8.1	3.7	8.9
41001	99	DIRN	SUR	35	-73	908	0	0	18.1	6.0	19.1
41002	99	DIRN	SUR	32	-75	682	0	0	19.7	-1.3	19.8
41004	99	DIRN	SUR	33	-79	639	0	0	22.6	6.8	23.7
41008	99	DIRN	SUR	31	-81	569	0	0	14.9	1.3	14.9
41009	99	DIRN	SUR	29	-80	737	0	0	29.3	7.5	30.2
41013	99	DIRN	SUR	33	-78	1089	0	0	19.7	10.3	22.2
41024	99	DIRN	SUR	34	-79	526	0	0	21.8	1.7	21.8
41025	99	DIRN	SUR	35	-75	688	0	0	22.8	4.5	23.3
41026	99	DIRN	SUR	11	-38	66	0	0	12.2	-4.7	13.1
41029	99	DIRN	SUR	33	-80	571	0	0	25.8	0.6	25.8
41033	99	DIRN	SUR	32	-80	567	0	0	29.6	1.5	29.7
41037	99	DIRN	SUR	34	-77	634	0	0	18.5	-6.1	19.5
41038	99	DIRN	SUR	34	-78	249	0	0	23.8	-9.2	25.5
41040	99	DIRN	SUR	15	-53	687	0	0	11.3	1.5	11.4
41041	99	DIRN	SUR	14	-46	700	0	0	9.5	3.0	9.9
41043	99	DIRN	SUR	21	-65	605	0	0	17.7	3.0	17.9
41044	99	DIRN	SUR	22	-59	638	0	0	13.1	-1.3	13.2
41046	99	DIRN	SUR	24	-68	605	0	0	15.6	0.2	15.6
41047	99	DIRN	SUR	28	-72	638	0	0	18.4	1.7	18.5
41048	99	DIRN	SUR	32	-70	659	0	0	18.4	7.3	19.8
41049	99	DIRN	SUR	28	-63	653	0	0	15.1	9.5	17.8
41051	99	DIRN	SUR	18	-65	1512	0	0	16.5	-10.1	19.4
41052	99	DIRN	SUR	18	-65	1935	0	0	14.2	4.2	14.8
41053	99	DIRN	SUR	19	-66	1126	0	0	25.8	-5.9	26.4
41056	99	DIRN	SUR	18	-66	1580	0	0	17.1	2.6	17.3
41064	99	DIRN	SUR	34	-77	280	0	0	34.2	-14.5	37.1
41139	99	DIRN	SUR	20	-38	206	0	0	12.6	1.2	12.6
41300	99	DIRN	SUR	16	-58	452	0	0	12.4	-1.9	12.5
42013	99	DIRN	SUR	27	-83	1017	0	0	21.1	-5.6	21.8
42022	99	DIRN	SUR	28	-84	982	0	0	20.6	0.3	20.6

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
42023	99	DIRN	SUR	26	-83	1108	0	0	23.5	-5.2	24.0
42036	99	DIRN	SUR	29	-85	656	1	0	20.2	-0.0	20.2
42056	99	DIRN	SUR	20	-85	657	0	0	16.6	4.6	17.3
42057	99	DIRN	SUR	17	-82	637	0	0	14.4	-0.6	14.4
42058	99	DIRN	SUR	15	-75	741	0	0	8.2	1.5	8.3
42059	99	DIRN	SUR	15	-68	740	0	0	10.4	-3.2	10.9
42060	99	DIRN	SUR	16	-63	706	0	0	13.0	4.0	13.6
42085	99	DIRN	SUR	18	-67	1610	0	0	19.0	7.7	20.5
44005	99	DIRN	SUR	43	-69	739	0	0	11.7	3.2	12.1
44007	99	DIRN	SUR	44	-70	671	0	0	18.2	9.9	20.7
44008	99	DIRN	SUR	41	-69	682	0	0	18.3	7.1	19.7
44009	99	DIRN	SUR	39	-75	507	0	0	13.9	13.5	19.4
44011	99	DIRN	SUR	41	-67	427	0	0	15.1	-1.4	15.2
44013	99	DIRN	SUR	42	-71	690	0	0	14.2	-1.3	14.3
44014	99	DIRN	SUR	37	-75	722	0	0	15.5	1.9	15.7
44017	99	DIRN	SUR	41	-72	675	0	0	13.2	2.7	13.5
44018	99	DIRN	SUR	42	-70	693	0	0	12.2	-2.9	12.5
44020	99	DIRN	SUR	41	-70	671	0	0	15.6	4.5	16.2
44022	99	DIRN	SUR	41	-74	96	0	0	46.4	26.9	53.7
44024	99	DIRN	SUR	42	-66	697	0	0	14.2	1.8	14.3
44025	99	DIRN	SUR	40	-73	684	0	0	14.9	-0.9	14.9
44027	99	DIRN	SUR	44	-67	723	0	0	11.8	7.1	13.8
44029	99	DIRN	SUR	43	-71	1128	0	0	14.2	5.9	15.4
44030	99	DIRN	SUR	43	-70	682	0	0	19.0	6.3	20.0
44032	99	DIRN	SUR	44	-69	681	0	0	12.0	6.6	13.7
44033	99	DIRN	SUR	44	-69	645	0	0	15.1	0.7	15.1
44034	99	DIRN	SUR	44	-68	698	0	0	13.0	1.6	13.1
44037	99	DIRN	SUR	44	-68	486	0	0	13.3	3.7	13.8
44039	99	DIRN	SUR	41	-73	718	0	0	16.2	0.9	16.2
44041	99	DIRN	SUR	37	-77	86	0	0	22.6	6.8	23.6
44042	99	DIRN	SUR	38	-76	754	0	0	16.0	-11.0	19.4
44058	99	DIRN	SUR	38	-76	1024	0	0	17.2	-7.0	18.6
44059	99	DIRN	SUR	37	-76	306	0	0	18.2	-25.8	31.5
44060	99	DIRN	SUR	41	-72	724	0	0	14.5	0.8	14.5
44062	99	DIRN	SUR	39	-76	752	0	0	17.0	-10.7	20.1
44065	99	DIRN	SUR	40	-74	665	0	0	16.4	3.0	16.6
44066	99	DIRN	SUR	40	-73	505	0	0	10.2	2.6	10.5
44069	99	DIRN	SUR	41	-73	357	0	0	16.4	-14.6	22.0
44137	99	DIRN	SUR	42	-62	721	0	0	14.2	2.6	14.4
44139	99	DIRN	SUR	44	-57	696	0	0	16.4	12.0	20.3
44141	99	DIRN	SUR	43	-58	676	1	0	18.6	0.7	18.6

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
44150	99	DIRN	SUR	43	-64	653	0	0	16.3	1.7	16.4
44251	99	DIRN	SUR	46	-53	687	0	0	12.2	10.0	15.7
44255	99	DIRN	SUR	47	-57	566	0	0	15.5	6.7	16.9
44258	99	DIRN	SUR	45	-63	29	0	0	11.6	2.5	11.9
62001	99	DIRN	SUR	45	-5	946	0	0	15.6	8.5	17.8
62027	99	DIRN	SUR	49	-2	214	0	0	26.8	-1.6	26.9
62029	99	DIRN	SUR	49	-12	407	0	0	9.9	3.7	10.5
62081	99	DIRN	SUR	51	-13	728	0	0	12.6	9.5	15.8
62091	99	DIRN	SUR	53	-5	680	0	0	12.9	4.0	13.5
62093	99	DIRN	SUR	55	-10	660	0	0	14.9	-5.9	16.0
62103	99	DIRN	SUR	50	-3	729	0	0	16.3	0.6	16.3
62105	99	DIRN	SUR	55	-13	571	0	0	17.5	2.5	17.7
62107	99	DIRN	SUR	50	-6	1411	0	0	14.4	-0.9	14.4
62111	99	DIRN	SUR	58	0	690	0	0	12.8	6.3	14.2
62112	99	DIRN	SUR	58	0	685	0	0	11.5	2.9	11.9
62114	99	DIRN	SUR	58	0	1394	0	0	11.1	7.8	13.6
62117	99	DIRN	SUR	58	0	573	0	0	10.1	5.1	11.3
62163	99	DIRN	SUR	48	-8	729	0	0	10.8	3.7	11.4
62301	99	DIRN	SUR	52	-5	698	0	0	13.9	-6.2	15.2
62303	99	DIRN	SUR	52	-5	199	0	0	13.3	2.9	13.6
62305	99	DIRN	SUR	50	0	757	1	0	13.0	2.2	13.2
62442	99	DIRN	SUR	49	-16	717	0	0	13.3	-3.6	13.8
64041	99	DIRN	SUR	61	-3	684	0	0	13.4	16.1	21.0
64046	99	DIRN	SUR	61	-4	649	0	0	15.5	-2.7	15.7

4.12 Table 24 - List of Assimilated BUFR Encoded Radiosonde Stations

ASDE04	ASDK01	ASDK02	ASDK03	ASES01	ASEU01	ASEU02	ASEU04	DBLK
01001	01004	01010	01028	01241	01400	01415	01492	02185
02365	02527	02591	02836	02935	02963	03953	06260	08001
08023	08221	08302	08430	10035	10113	10184	10238	10304
10393	10410	10618	10739	10868	10954	10962	60018	

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

ASDE01	ASDE03	ASDE04	ASDE09	ASDK01	ASDK02	ASDK03	ASES01	ASEU01
ASEU02	ASEU03	ASEU04	ASEU06	ASFR3	ASFR4	DBLK	17196	41169
47155	89859	94653	94767					

5 Annex - Explanations of figures and tables

5.1 General

All information presented in this report is based on data received at ECMWF before the appropriate analysis. Approximate cut-off times (UTC) are shown below:

Analysis	Obs Time	Cut-off
0000	2101-0300	1530 (16 hours)
1200	0901-1500	1900 (7 hours)

5.2 Data Availability

For each observation type/parameter the average number of reports received per day is displayed in boxes of 5 degrees square. The numbers plotted are the nearest integer values - e.g. if 40 reports were received during the month then the average daily value plotted will be 1. If the average number is greater than 1000 then 999 will be plotted. If the average number is less than 0.5 then the digit 0 will be plotted. If no observations were received then the box will be left blank.

5.3 Data Quality

The information presented on data quality is based on differences between observations and the values of the most recent ECMWF forecast ("first guess") of the same parameter. Depending on the time of the observation, the forecast range is between 9 and 15 hours. The ability of a modern data assimilation system to provide the diagnostic facilities to monitor the performance of the observational network is demonstrated by A. Hollingsworth et. al., Monthly Weather Review, Vol 114, No. 5, May 1986.

It should be noted that:

(i) all results are based on software that may undergo further development;

(ii) although the quality of the ECMWF first-guess fields is of a generally high standard this is only true to a limited extent in the tropics, where small-scale processes such as convection are of much greater importance than in mid-latitudes, and the observations will sometimes not be representative of the scales of motion given by the first-guess;

(iii) the first-guess fields themselves will vary in accuracy depending on the density and quality of data, particularly in the upstream regions and over Antarctica and the southern hemisphere mid-latitudes. Direct comparisons between stations (or airlines) should preferably be restricted to observations in a reasonably homogeneous climatic region.

Tables 1-9 contain lists of SHIPs (including fixed marine platforms), DRIFTERs, TEMPs and TEMPs/PILOTs believed to have supplied suspect reports of surface pressure, geopotential height or wind during the month. The format of the tables is according to Recommendation 3 CBS-Ext(85) and the criteria for stations or data platforms to be classified as suspect are given at the top of each table. For tables 7 and 8 data for the worst

standard pressure level are shown. Units of RMS, standard deviation and bias are hPa in tables 1 and 4, m in table 7 and ms^{-1} in tables 2, 5 and 8. In tables 7 and 8 the station position is indicated; in the case of TEMPSHIPs and PILOTSHIPs this position is obtained from the first report of the month. The gross error limits for first-guess deviations of geopotential in table 7 are as follows:

Level	Geop
1000	100m
925	100m
850	100m
700	100m
500	150m
400	175m
300	200m
250	225m
200	250m
150	275m
100	300m
70	375m
50	400m
30	450m

The corresponding limits for wind (table 8) are:

Level	Wind
1000	$35ms^{-1}$
925	$35ms^{-1}$
850	$35ms^{-1}$
700	$40ms^{-1}$
500	$45ms^{-1}$
400	$50ms^{-1}$
300	$60ms^{-1}$
250	$60ms^{-1}$
200	$50ms^{-1}$
150	$50ms^{-1}$
100	$45ms^{-1}$

In table 7 the weighted RMS values at standard levels are calculated using the following weights:

Level	Weight
1000	3.70
925	3.55
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

Tables 10 and 11 provide geopotential and wind quality statistics (100 hPa level) for TEMPSHIPs and PILOTSHIPs received during the month. Units and display format are identical to those in tables 7 and 8 respectively. Tables 13, 14 (50 hPa), 15 and 16 (100 hPa), 17 and 18 (500hPa), 19 and 20 (850hPa) provide similar radiosonde statistics for the EUCOS area.

Tables 21-23 are similar to tables 4-6 with data coverage restricted to the EUCOS area.

Figures 14-18 show global charts of SATOB and aircraft wind quality, where the statistics have been averaged over latitude/longitude boxes of 5 degrees square, and the mean observed minus first-guess (or 'bias') wind vectors have been plotted. All observations in the specified layers have been used. For comparison the mean observed wind (from the SATOB reports only) for each layer is shown in figures 14 and 15. A reference value of wind speed is plotted in the top right corner of each figure. An arrow is only plotted if 10 or more observations have been received in that 5 degree square.

Table 12 provides quality statistics of aircraft wind observations in the layer 300-150 hPa stratified by airline carrier. The format and specifications of the table have been defined by NMC Washington, the lead centre for the monitoring of aircraft and satellite data.

Table 24 shows list of Assimilated BUFR Encoded Radiosonde Stations monitored within the month.

Table 25 shows list of BUFR Encoded Radiosonde Stations with no TAC Counterpart monitored within the month.