ECMWF Global Data Monitoring Report

March 2019

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

Contents

Summary of Revisions (in reverse order)

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

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

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

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

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

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

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

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

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

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

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

1 Introduction

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

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

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

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

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

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

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

2 Data summary - History of events

2.1 Radiosondes

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

Ident	Time	Feb	Mar	Ident	Time	Feb	Mar
04417	(00)	27	5	12425	(00)	0	18
04417	(12)	28	5	12425	(12)	0	19
08430	(00)	21	2	16716	(12)	12	24
13388	(00)	28	1	17240	(00)	0	31
13388	(12)	28	1	17516	(00)	7	28
17095	(00)	28	0	20674	(00)	7	23
17095	(12)	27	0	20674	(12)	5	23
42724	(12)	12	1	47104	(00)	6	25
42886	(00)	15	0	47104	(12)	8	25
42971	(12)	13	0	47169	(00)	10	22
43295	(00)	25	14	47169	(12)	8	20
43346	(12)	12	0	61052	(00)	7	30
60096	(12)	28	1	65344	(12)	2	30
64870	(12)	12	0	67083	(00)	8	31
72476	(00)	28	13	70026	(12)	16	30
72476	(12)	27	13	76458	(12)	1	25
74004	(12)	28	9	76526	(12)	0	11
83566	(00)	27	6	78384	(00)	15	31
83566	(12)	27	5	82281	(00)	2	30
89002	(00)	14	0	82281	(12)	2	31
89009	(12)	23	2	82983	(12)	3	28
89022	(00)	11	0	83650	(12)	0	13
89022	(12)	16	0	85469	(00)	1	29
89056	(00)	22	0	91366	(12)	0	12
89592	(12)	15	0	-	-	-	-
89625	(00)	15	0	-	-	-	-
89642	(12)	14	0	-	-	-	-
89664	(12)	21	2	-	-	-	-
91643	(00)	16	1	-	-	-	-

2.2 Drifting Buoys

Surface pressure observations from **1821** drifting buoys were received during the month.

3 Global monitoring statistics

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

3.1 Data Availability

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

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

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

3.2 Data Quality

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

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

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

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

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

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

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

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

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

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

3.2.1 Figure 1 - Availability - SYNOP PRESSURE

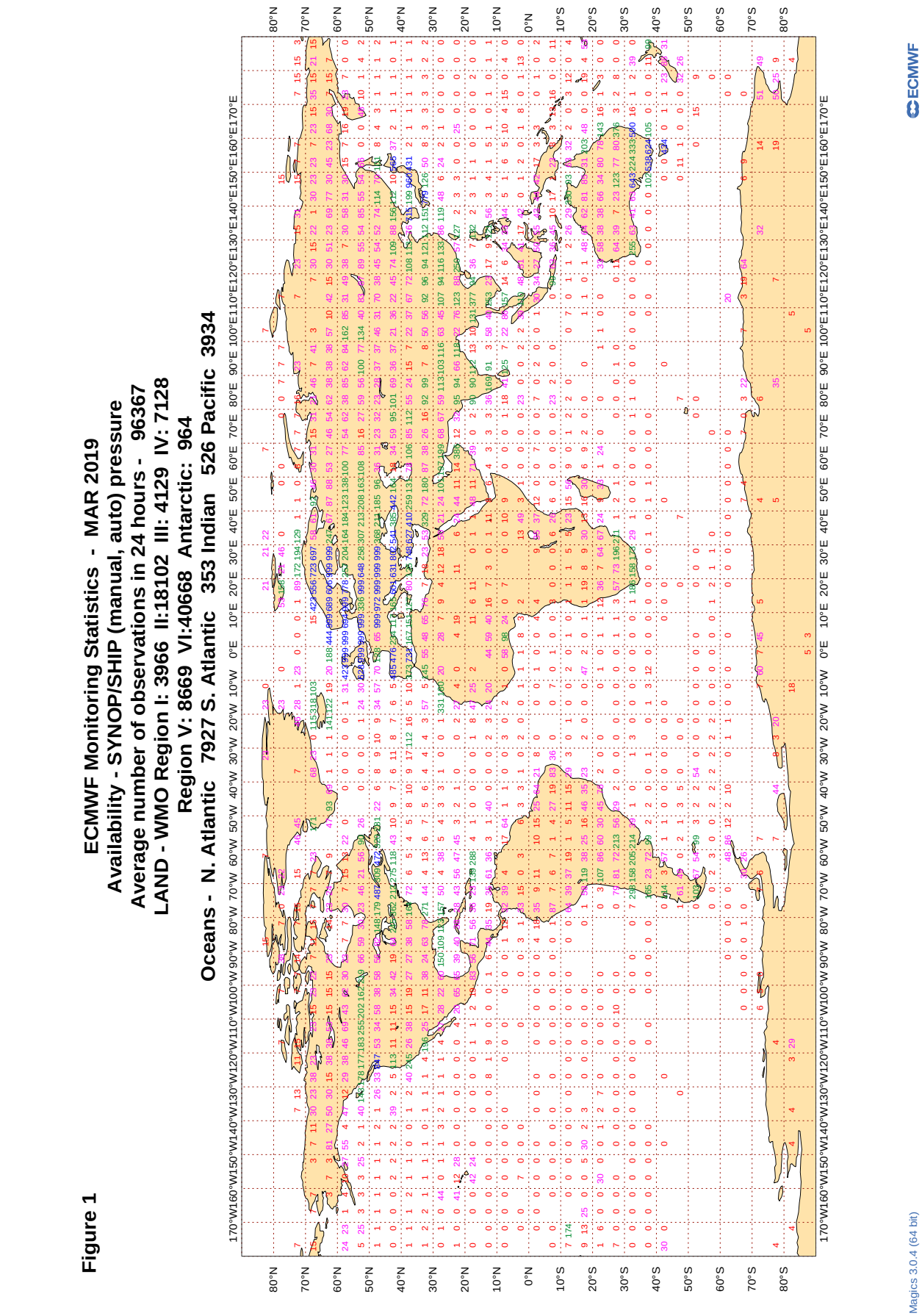


Figure 1

3.2.2 Figure 2 - Availability - DRIFTER PRESSURE

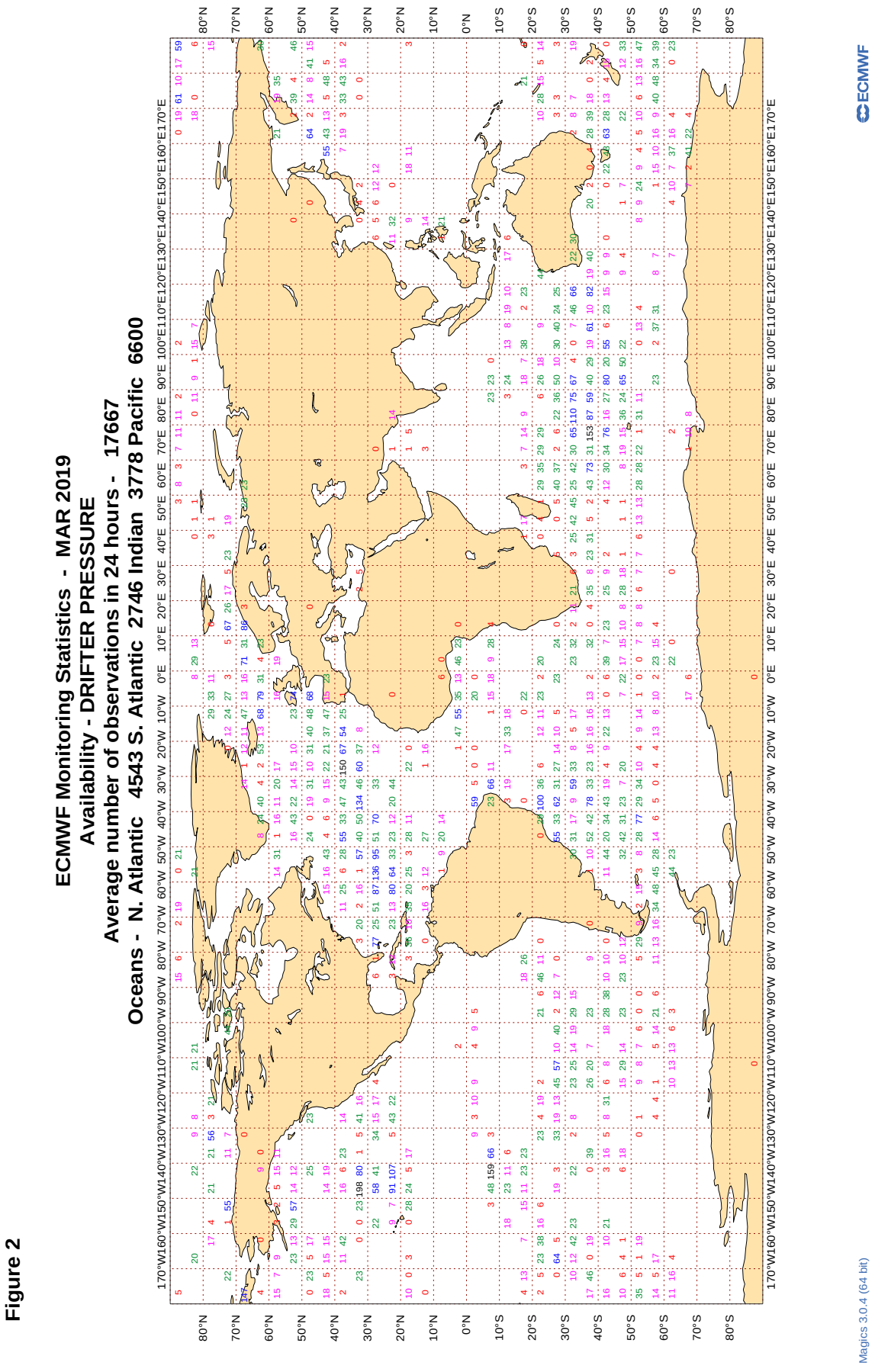


Figure 2

3.2.3 Figure 3 - Availability - TEMP 500 hPa geopotential

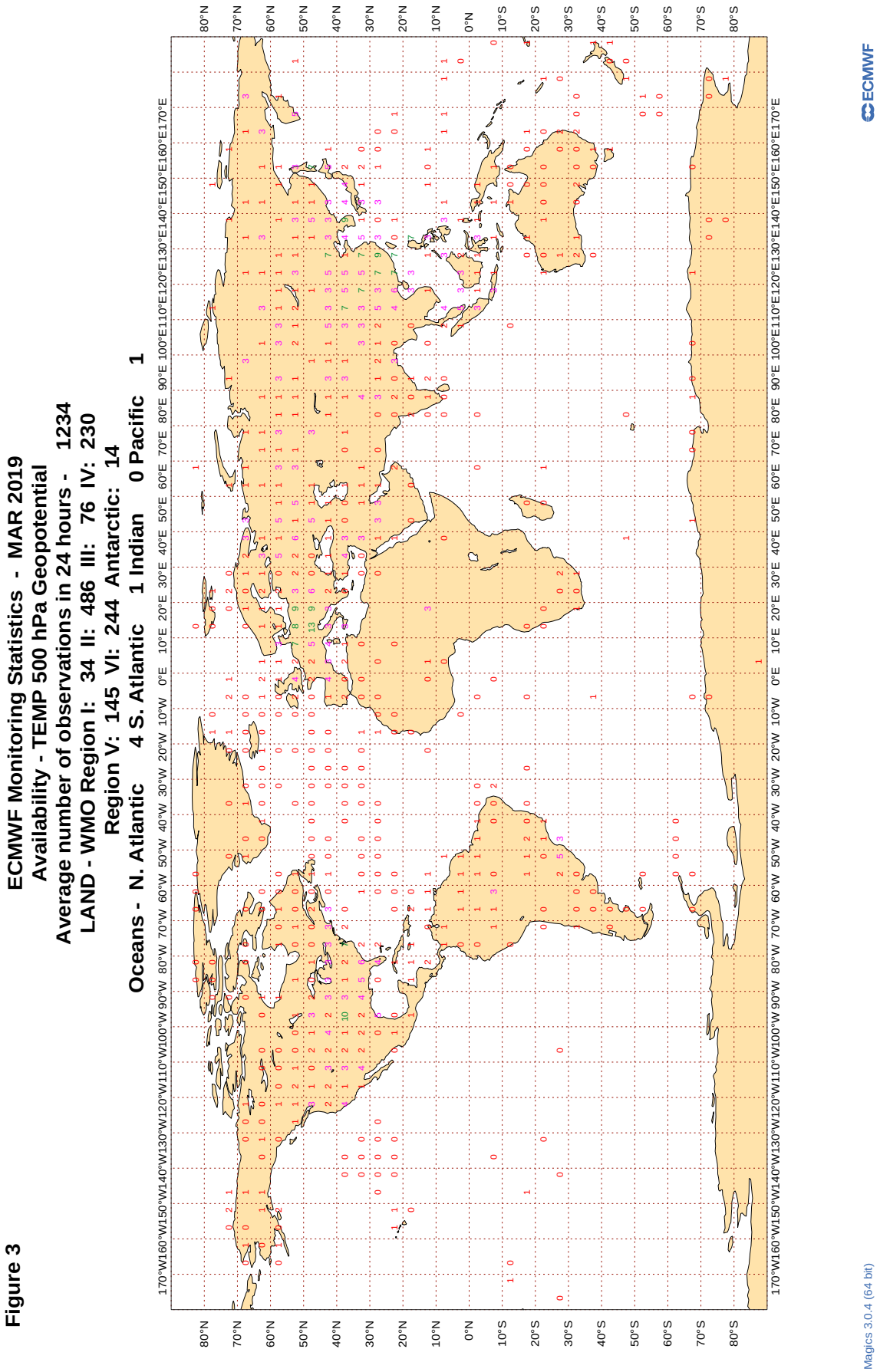


Figure 3

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

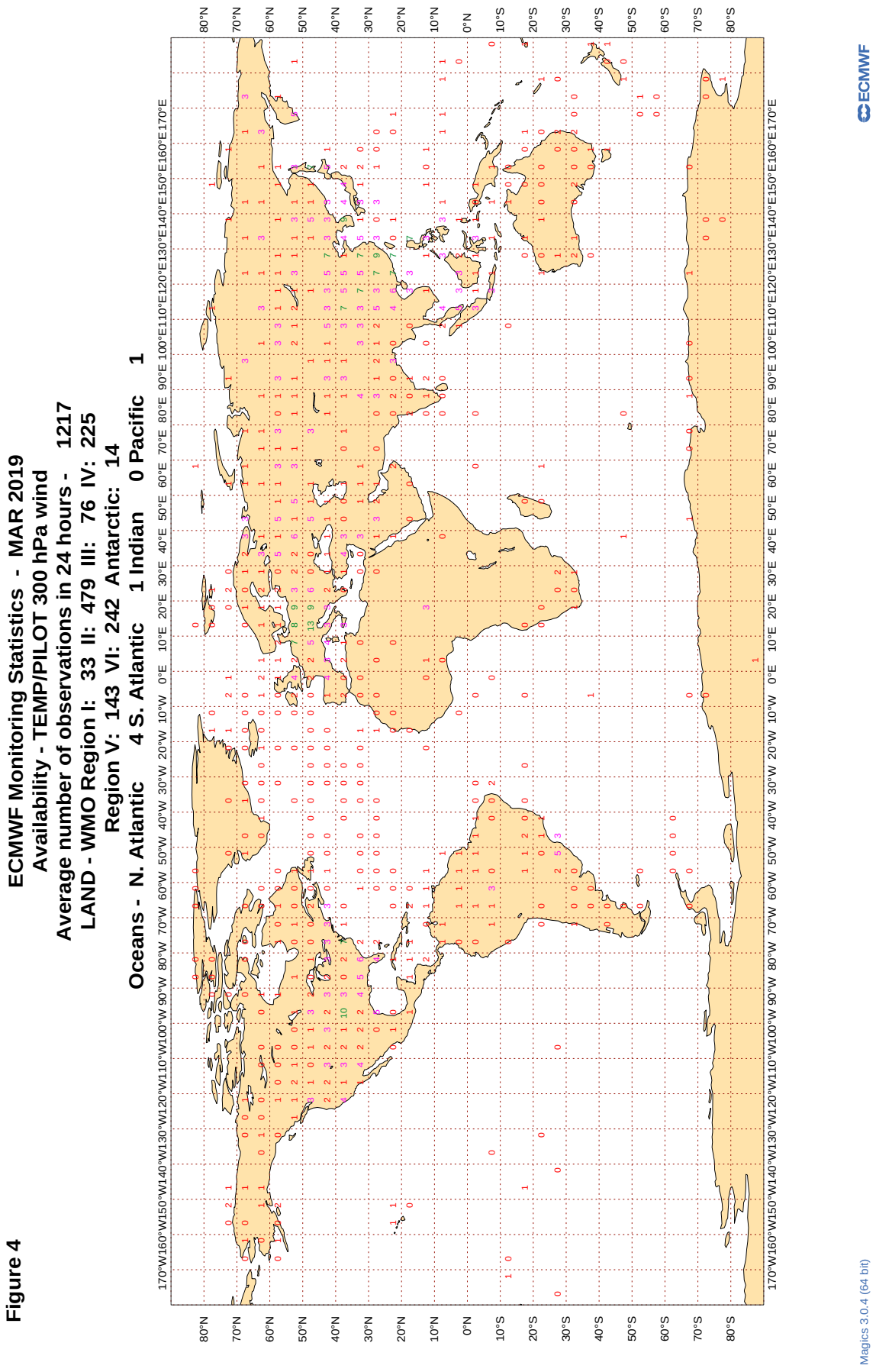


Figure 4

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

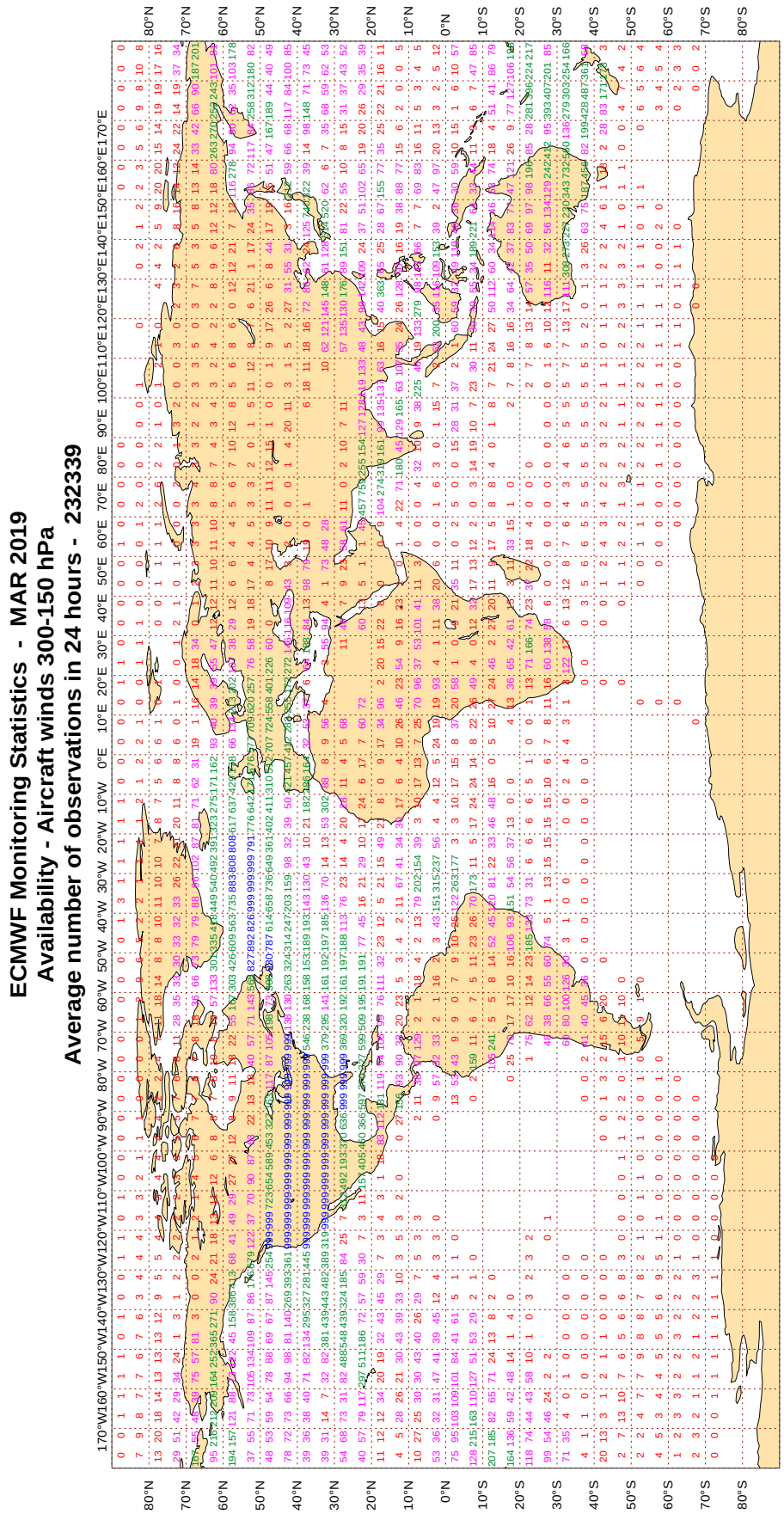


Figure 5

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

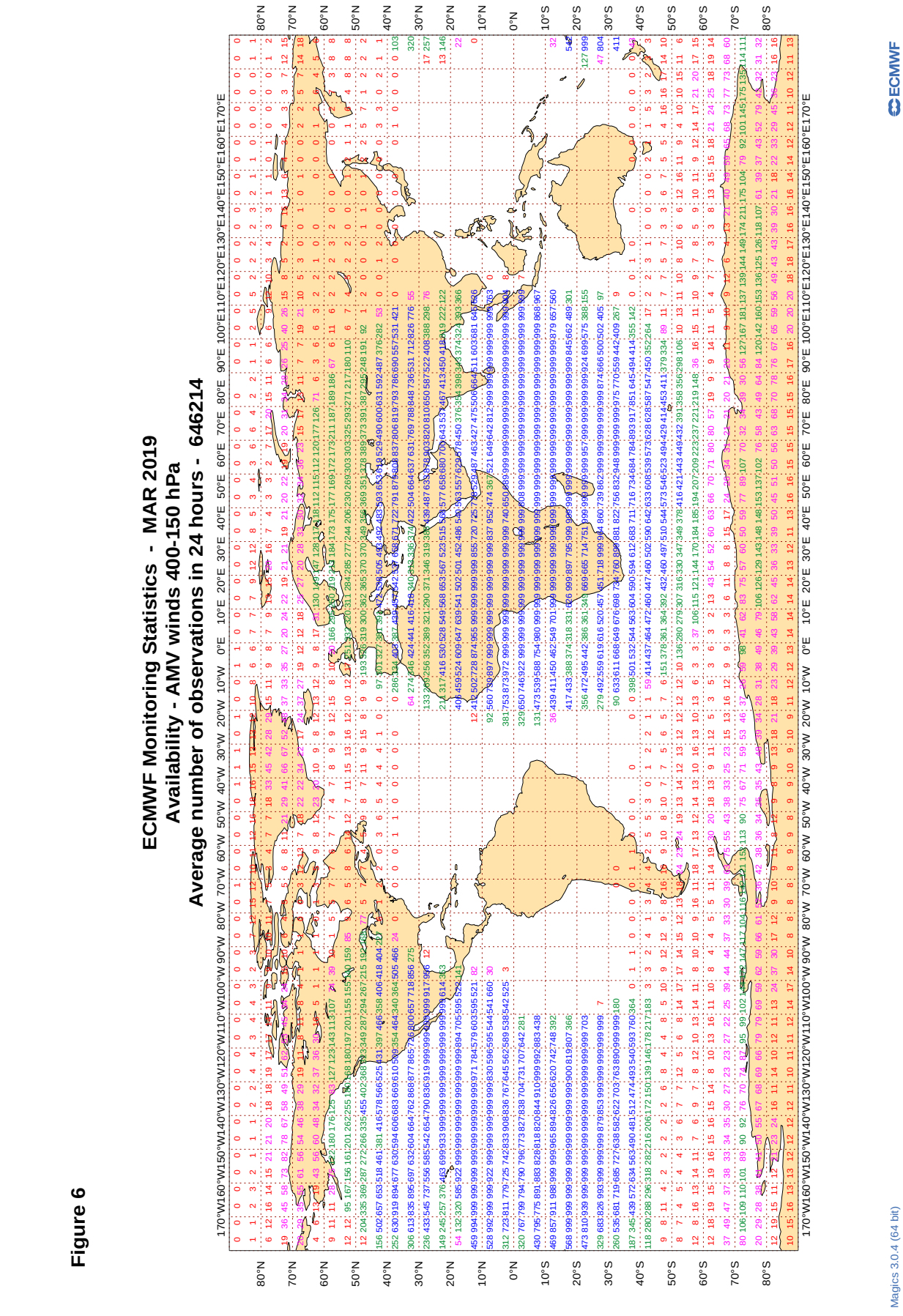


Figure 6

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

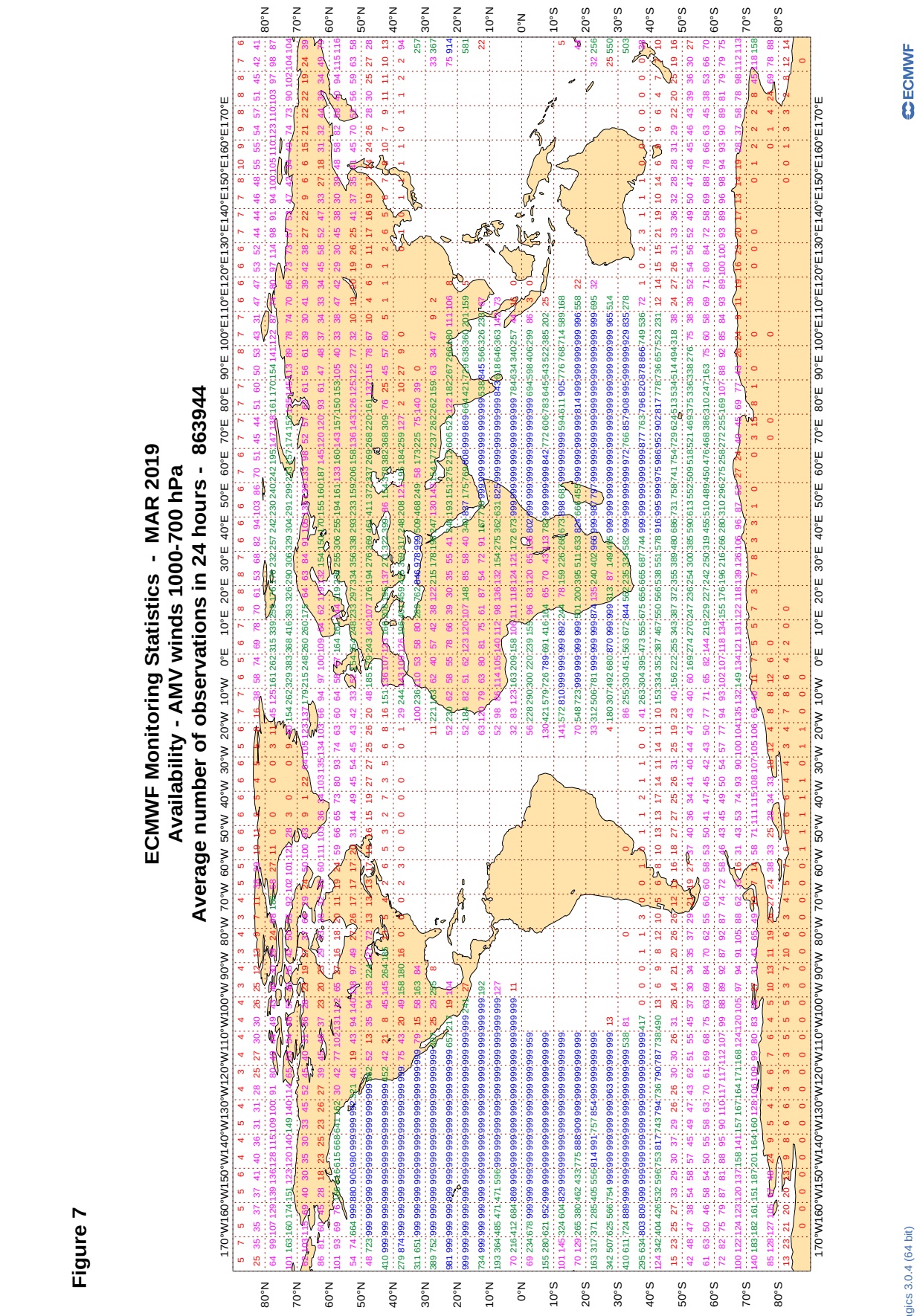


Figure 7

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

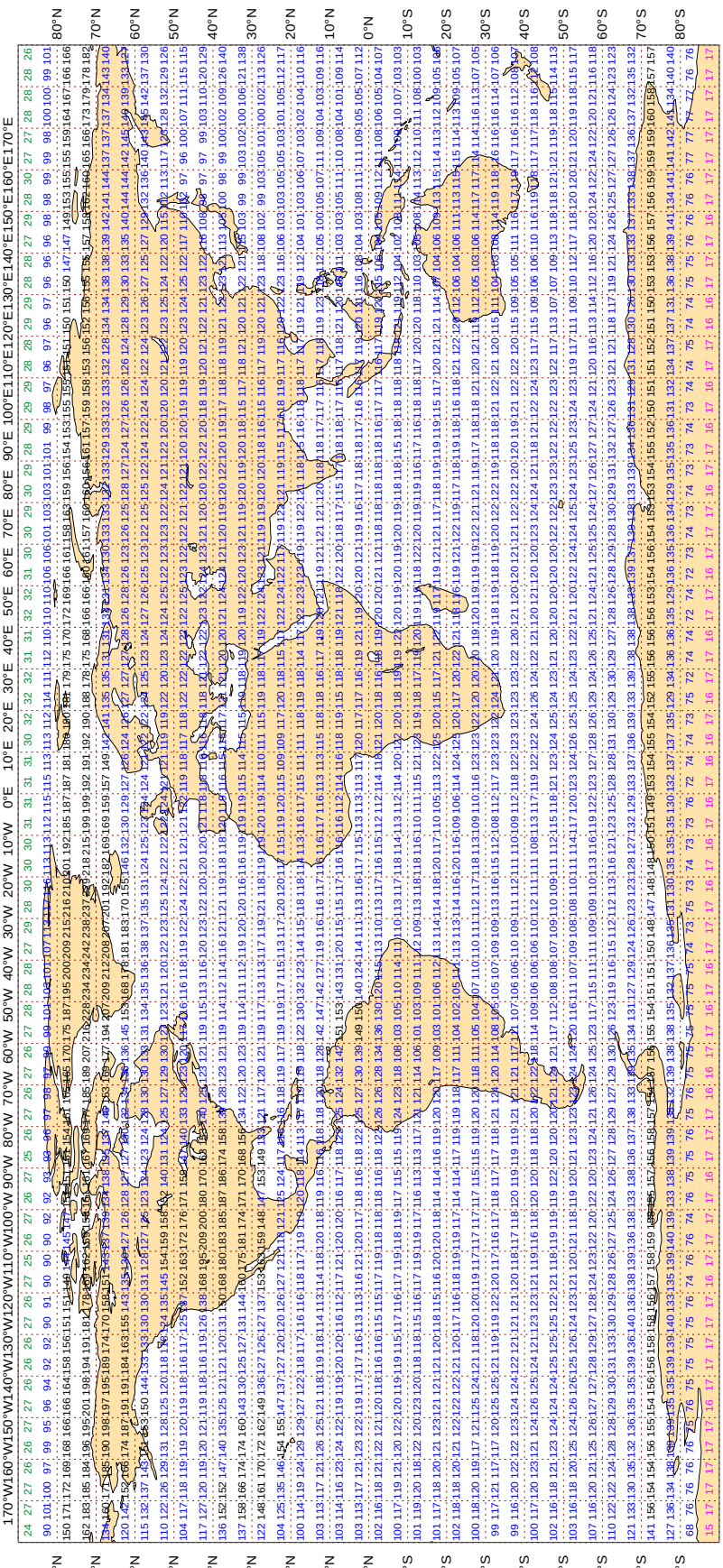
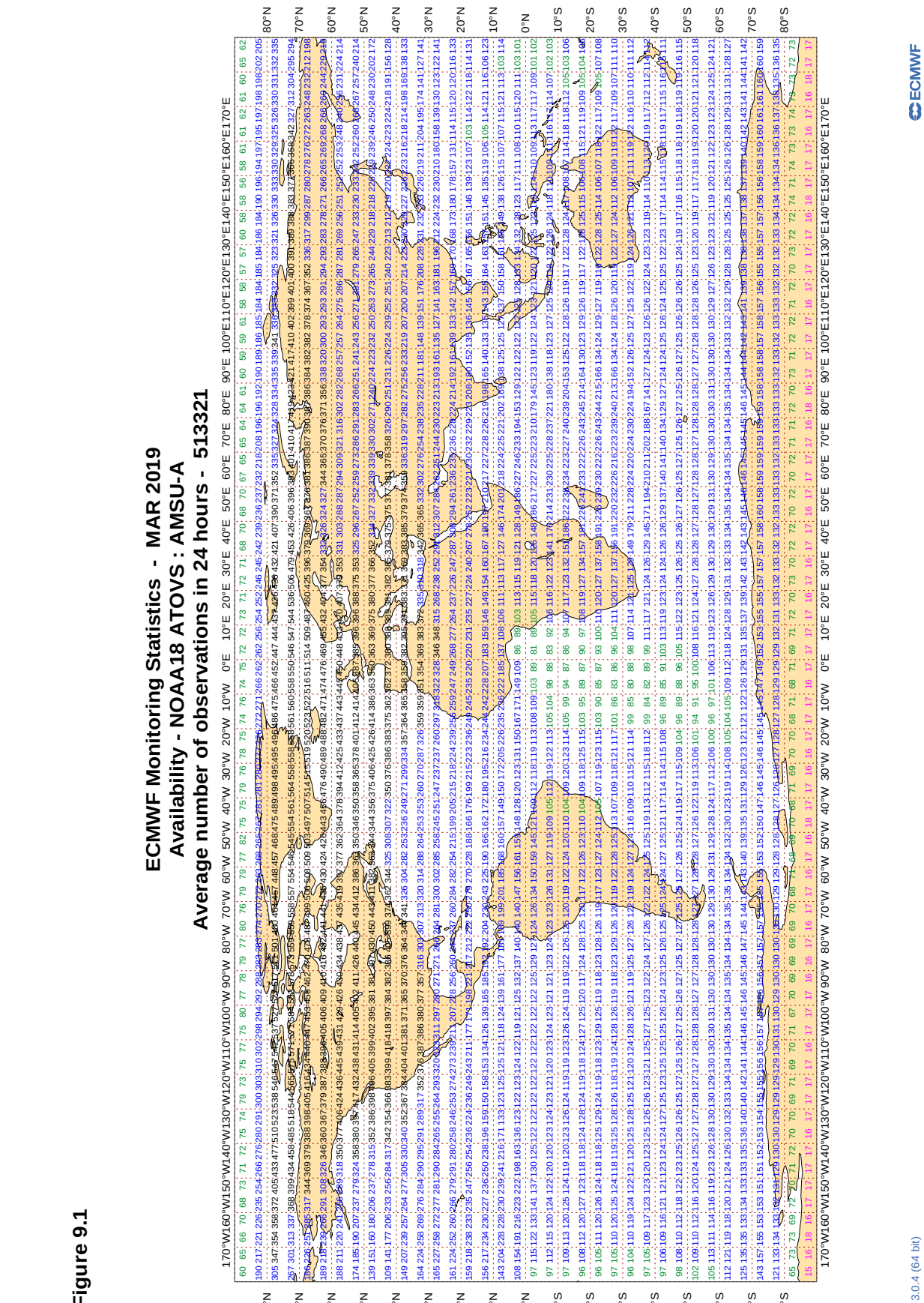


Figure 8

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



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

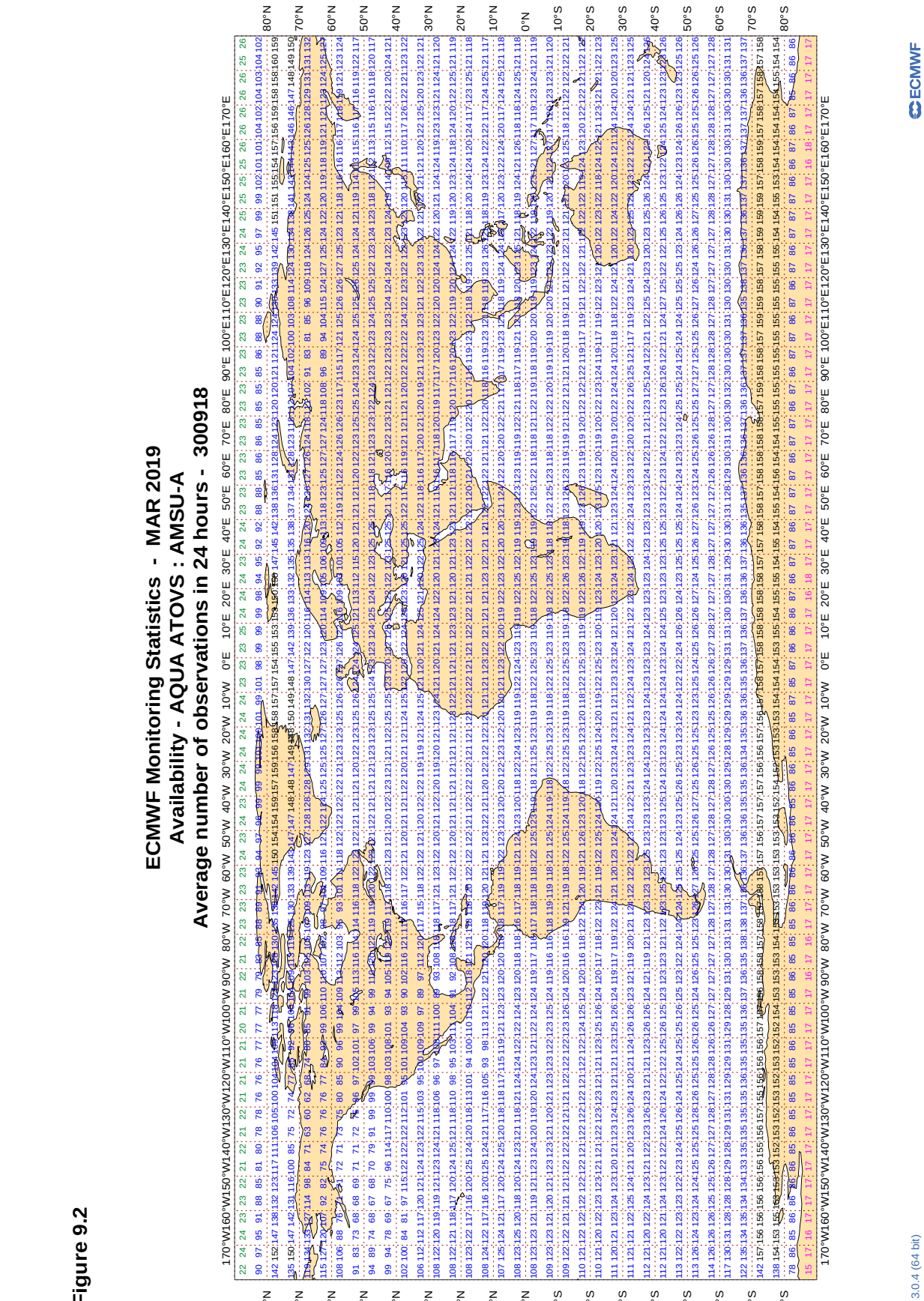


Figure 9.2

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

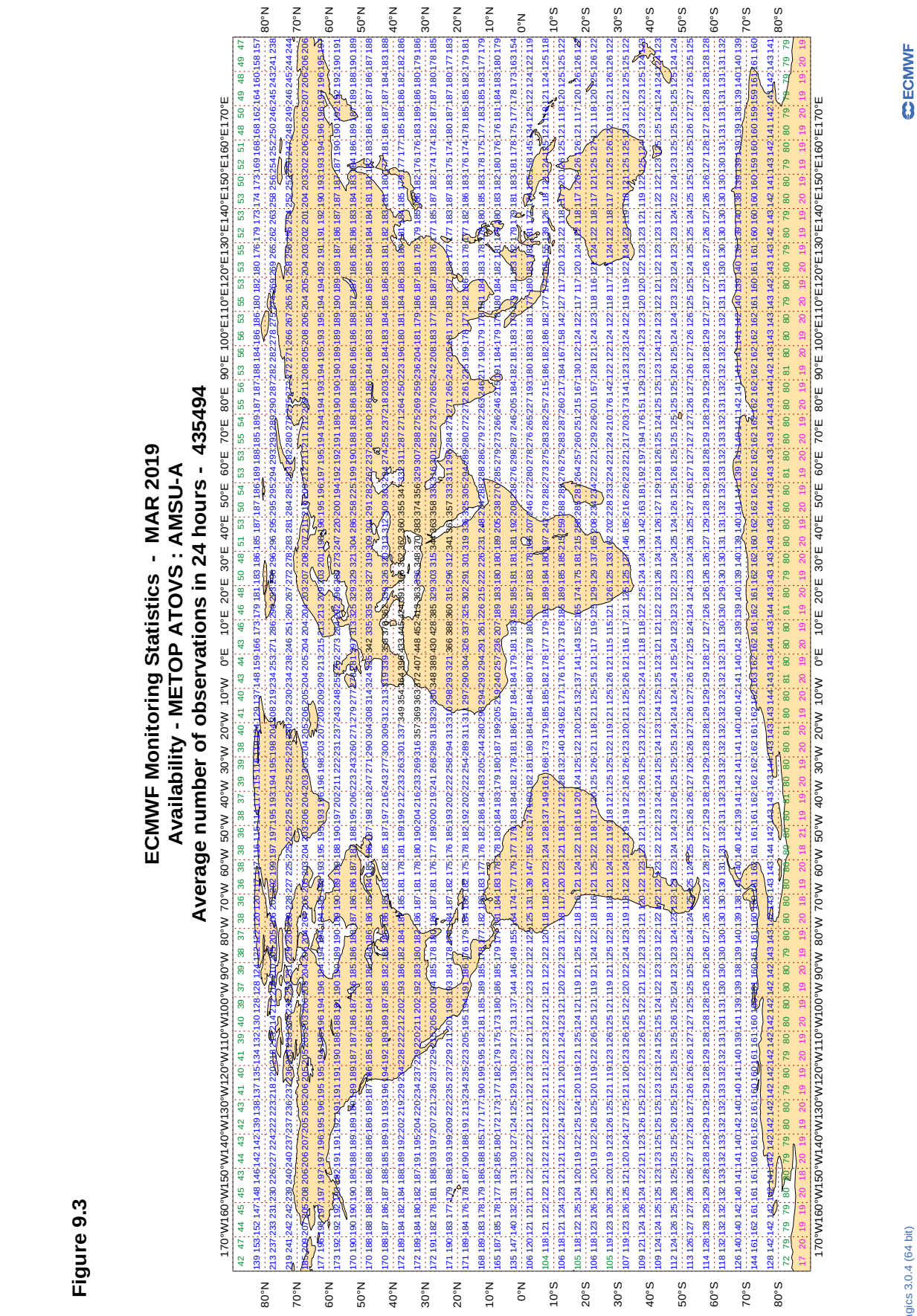


Figure 9.3

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

```
          LIST OF SUSPECT STATIONS        : SHIPS + FIXED MARINE PLATFORMS
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : SURFACE PRESSURE (HPA)
                    AREA                  : GLOBAL
                    PERIOD                : MAR 2019
                    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
3FFA5	99	P	SUR	72	0	2.1	3.9	4.4
7KDT	99	P	SUR	19	0	0.8	-5.8	5.9
9HA4330	99	P	SUR	27	0	1.6	-3.6	4.0
9HJB9	99	P	SUR	38	0	0.4	10.2	10.2
9HJD9	99	P	SUR	15	0	0.5	5.0	5.0
9V9793	99	P	SUR	31	0	0.5	6.1	6.1
A8ZA8	99	P	SUR	25	0	0.7	3.0	3.1
AUXE	99	P	SUR	67	0	0.5	3.0	3.1
AUYP	99	P	SUR	46	0	2.8	3.3	4.3
BKIZ	99	P	SUR	18	0	0.8	4.2	4.2
C6AB8	99	P	SUR	31	1	3.7	4.5	5.8
C6BX8	99	P	SUR	51	0	0.4	4.1	4.1
C6FR3	99	P	SUR	23	0	0.9	-3.0	3.2
C6FV8	99	P	SUR	33	0	0.5	-4.9	5.0
C6UC3	99	P	SUR	37	0	1.1	7.9	8.0
CQHW	99	P	SUR	40	0	0.8	-4.4	4.5
D5HF3	99	P	SUR	51	0	1.2	3.0	3.2
D5TB2	99	P	SUR	60	0	1.2	4.1	4.2
LOCX	99	P	SUR	54	2	0.7	-12.9	12.9
OZ2049	99	P	SUR	35	0	0.8	-5.8	5.9
PCSZ	99	P	SUR	45	1	2.0	3.3	3.8
S6LT4	99	P	SUR	74	0	1.0	-5.7	5.7
UAEV	99	P	SUR	36	0	1.4	4.0	4.2
UASP	99	P	SUR	45	15	2.5	-1.9	3.1
UFJN	99	P	SUR	88	0	1.5	-3.9	4.2
V7DI8	99	P	SUR	37	0	0.8	6.8	6.8
VRFI7	99	P	SUR	59	0	1.6	3.0	3.4
VRFX2	99	P	SUR	19	1	1.8	-3.8	4.2
VRID2	99	P	SUR	90	0	2.7	5.6	6.3
VRKC2	99	P	SUR	19	0	0.4	-6.5	6.5
VRMW7	99	P	SUR	26	0	2.5	4.0	4.7
VRNY5	99	P	SUR	28	0	3.3	3.6	4.9

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

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	SD	BIAS	RMS
VRRB5	99	P	SUR	87	0	1.9	-3.5	4.0
VRRD7	99	P	SUR	81	2	3.6	-4.6	5.8
VRRI4	99	P	SUR	34	0	2.1	3.5	4.1
VRVQ9	99	P	SUR	15	0	2.5	-5.0	5.6
VWTI	99	P	SUR	101	0	1.4	6.2	6.4
WADN	99	P	SUR	38	0	0.6	3.4	3.4
WCAJ	99	P	SUR	16	0	2.0	3.6	4.2
WDG3440	99	P	SUR	24	0	1.0	-3.4	3.6
WDG8555	99	P	SUR	21	0	1.7	4.0	4.4
WSNA	99	P	SUR	24	0	0.5	6.0	6.0

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

```
          LIST OF SUSPECT STATIONS        : SHIPS + FIXED MARINE PLATFORMS
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND SPEED (M/S)
                    AREA                  : GLOBAL
                    PERIOD                : MAR 2019
                    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

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                : MAR 2019
                    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
46118	99	DIRN	SUR	19	0	0	91.9	-1.9	92.0

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                 : MAR 2019
                    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
1701545	99	P	SUR	-40	-5	230	0	2.1	5.4	5.8
2301709	99	P	SUR	-34	71	6065	6063	0.0	-3.4	3.4
2301714	99	P	SUR	14	64	392	76	7.9	-1.6	8.1
3101535	99	P	SUR	-49	-47	699	0	1.5	4.4	4.7
4701658	99	P	SUR	70	-98	661	661	0.0	0.0	0.0
4800282	99	P	SUR	71	-156	624	624	0.0	0.0	0.0
4800769	99	P	SUR	70	-101	695	388	7.9	-0.8	8.0
4801625	99	P	SUR	79	178	693	138	8.3	-0.7	8.3
4801652	99	P	SUR	81	-169	664	583	2.6	-11.2	11.5
4802000	99	P	SUR	79	-118	596	528	5.4	-8.5	10.1
48282	99	P	SUR	71	-156	587	587	0.0	0.0	0.0
48769	99	P	SUR	70	-101	649	364	7.8	-1.0	7.9
5401636	99	P	SUR	-16	-152	142	0	1.8	-4.5	4.9
6102501	99	P	SUR	33	23	280	0	6.0	-4.9	7.7
6203578	99	P	SUR	63	-21	654	195	5.0	3.3	6.0
7401506	99	P	SUR	-36	38	674	0	2.2	4.6	5.1

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                : MAR 2019
                    STANDARD OF COMPARISON: FIRST-GUESS FIELD


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


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

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

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

```
          LIST OF SUSPECT STATIONS         : DRIFTER
                    MONITORING CENTRE      : ECMWF
                    ELEMENT MONITORED      : WIND DIRECTION (DEGREES)
                    PERIOD                 : MAR 2019
                    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
1300010	99	DIRN	SUR	0	0	131	0	0	57.7	-26.0	63.3
13010	99	DIRN	SUR	0	0	126	0	0	57.8	-26.6	63.6
1500002	99	DIRN	SUR	0	-10	94	0	0	90.2	6.3	90.5
15002	99	DIRN	SUR	0	-10	85	0	0	91.1	15.9	92.5
2200108	99	DIRN	SUR	36	126	533	0	0	20.1	-20.3	28.6
2300007	99	DIRN	SUR	8	89	456	0	0	45.8	78.2	90.7
23004	99	DIRN	SUR	8	73	69	0	0	71.2	-13.5	72.5
23094	99	DIRN	SUR	14	84	45	0	0	12.0	-25.9	28.5
23451	99	DIRN	SUR	15	69	94	0	0	15.9	23.1	28.1
23456	99	DIRN	SUR	19	67	107	0	0	126.5	-108.4	166.6
23492	99	DIRN	SUR	11	72	75	0	0	15.6	-69.6	71.3
23497	99	DIRN	SUR	11	72	31	0	0	38.7	-29.4	48.6
3100003	99	DIRN	SUR	-8	-31	236	0	0	18.0	24.1	30.1
3100231	99	DIRN	SUR	-27	-47	185	1	0	124.1	102.1	160.7
31003	99	DIRN	SUR	-8	-31	225	0	0	18.3	23.3	29.6
31231	99	DIRN	SUR	-27	-47	185	2	0	123.1	103.3	160.7
4100013	99	DIRN	SUR	33	-78	3531	0	0	26.0	23.3	34.8
41013	99	DIRN	SUR	33	-78	917	0	0	25.8	22.8	34.4
44139	99	DIRN	SUR	44	-57	681	0	0	11.2	-25.3	27.7
4600005	99	DIRN	SUR	46	-131	787	0	0	28.5	25.0	37.9
4600083	99	DIRN	SUR	58	-138	556	0	0	19.9	21.2	29.1
4600092	99	DIRN	SUR	37	-122	493	0	0	27.5	30.7	41.2
4600118	99	DIRN	SUR	49	-123	166	0	0	69.4	-28.5	75.0
46005	99	DIRN	SUR	46	-131	462	0	0	29.0	25.2	38.4
46083	99	DIRN	SUR	58	-138	560	0	0	21.3	21.2	30.1
46092	99	DIRN	SUR	37	-122	734	0	0	28.4	27.1	39.2
46118	99	DIRN	SUR	49	-123	181	0	0	66.9	-26.4	71.9
5300040	99	DIRN	SUR	-8	95	330	0	0	158.2	29.2	160.9
5300056	99	DIRN	SUR	-5	95	378	0	0	161.8	-14.2	162.4
53040	99	DIRN	SUR	-8	95	323	0	0	157.8	32.4	161.1
53056	99	DIRN	SUR	-5	95	369	0	0	162.3	-8.7	162.6

```
LIST OF SUSPECT STATIONS        : DRIFTER
          MONITORING CENTRE     : ECMWF
          ELEMENT MONITORED     : WIND DIRECTION (DEGREES)
          (CONTINUED)
```

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
6200024	99	DIRN	SUR	44	-3	323	0	0	72.1	-47.7	86.5
6200200	99	DIRN	SUR	36	-8	435	17	0	172.1	-6.8	172.2

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                : MAR 2019
                    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
01400	00	Z	1000	57	3	20	0	4.0	79.4	79.5
01400	12	Z	1000	57	3	28	0	5.6	79.0	79.2
23330	00	Z	30	67	67	30	0	101.7	-217.7	240.3
25403	00	Z	250	66	151	30	2	80.6	-0.5	80.6
27038	12	Z	30	59	40	30	0	41.6	190.3	194.8
28695	12	Z	300	55	73	14	0	73.7	42.1	84.9
28695	00	Z	400	55	73	15	0	64.6	13.4	66.0

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                : MAR 2019
                    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
```

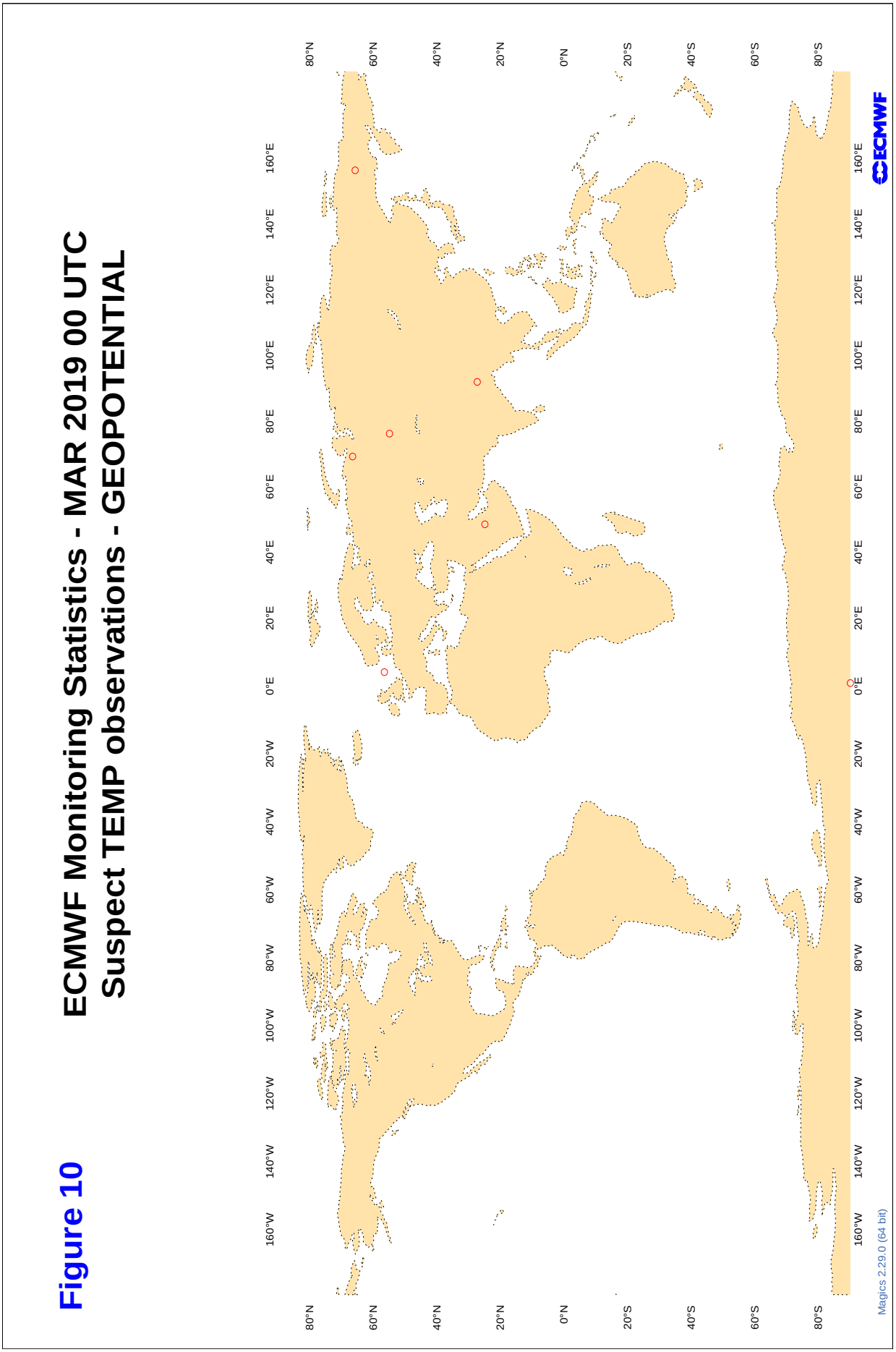
WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	UBIAS	VBIAS	RMS
42369	00	V	100	27	81	14	0	-6.5	-1.0	18.4
55299	00	V	250	31	92	27	2	-4.2	1.2	15.3
55299	12	V	100	31	92	24	2	-2.0	0.0	17.1
56964	00	V	100	23	101	16	3	-13.3	-2.5	23.2

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

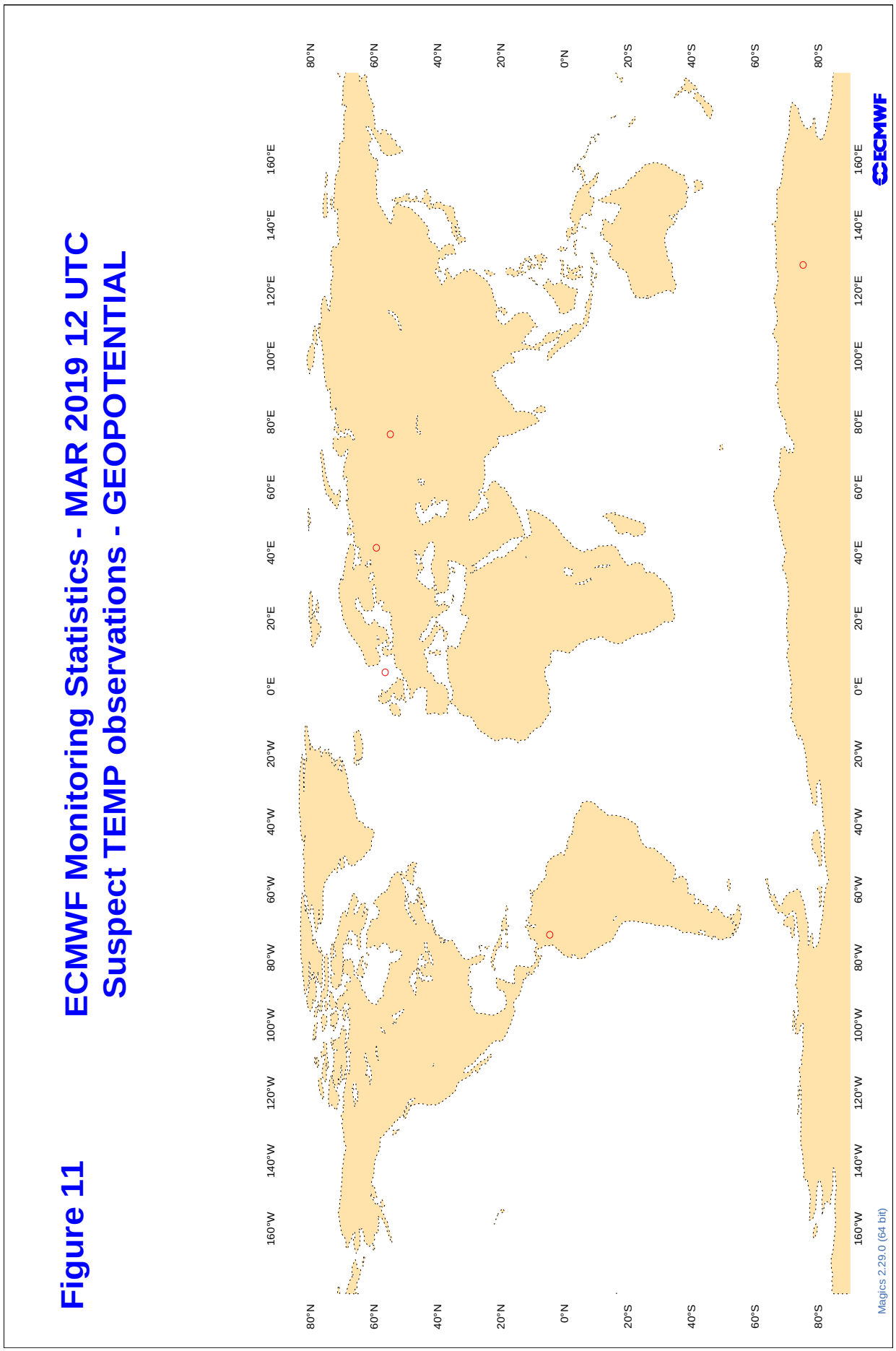
```
          LIST OF SUSPECT STATIONS        : RADIOSONDES
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND DIRECTION (DEGREES)
                    AREA                  : GLOBAL
                    PERIOD                : MAR 2019
                    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
48565	00	DD	8	98	16	13.0	2.1	12.0
56146	12	DD	32	100	30	10.8	7.7	13.0
56146	00	DD	32	100	29	10.2	5.5	9.1

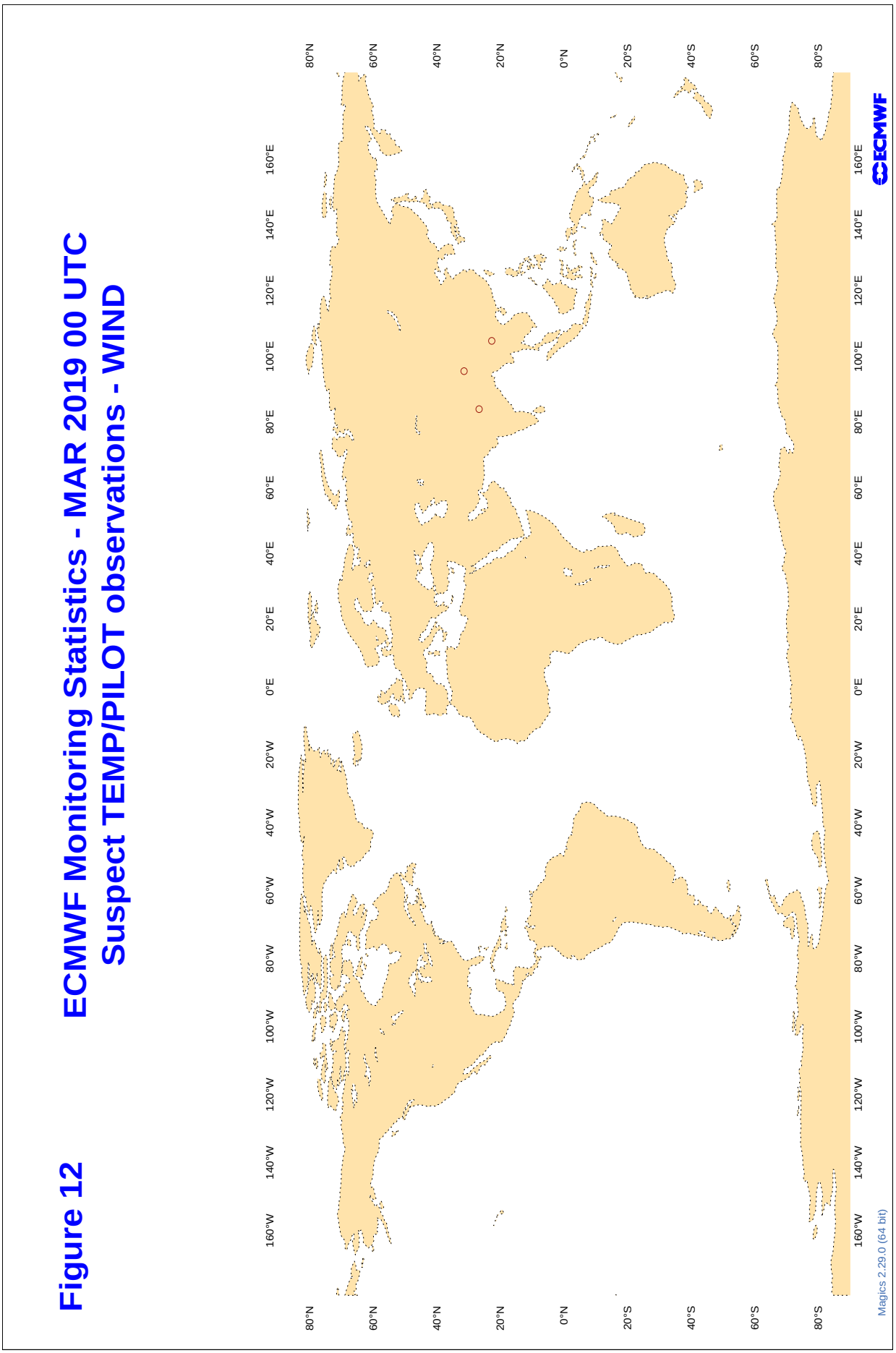
3.2.21 Figure 10 - Suspect TEMP observations - geopotential : 00 UTC



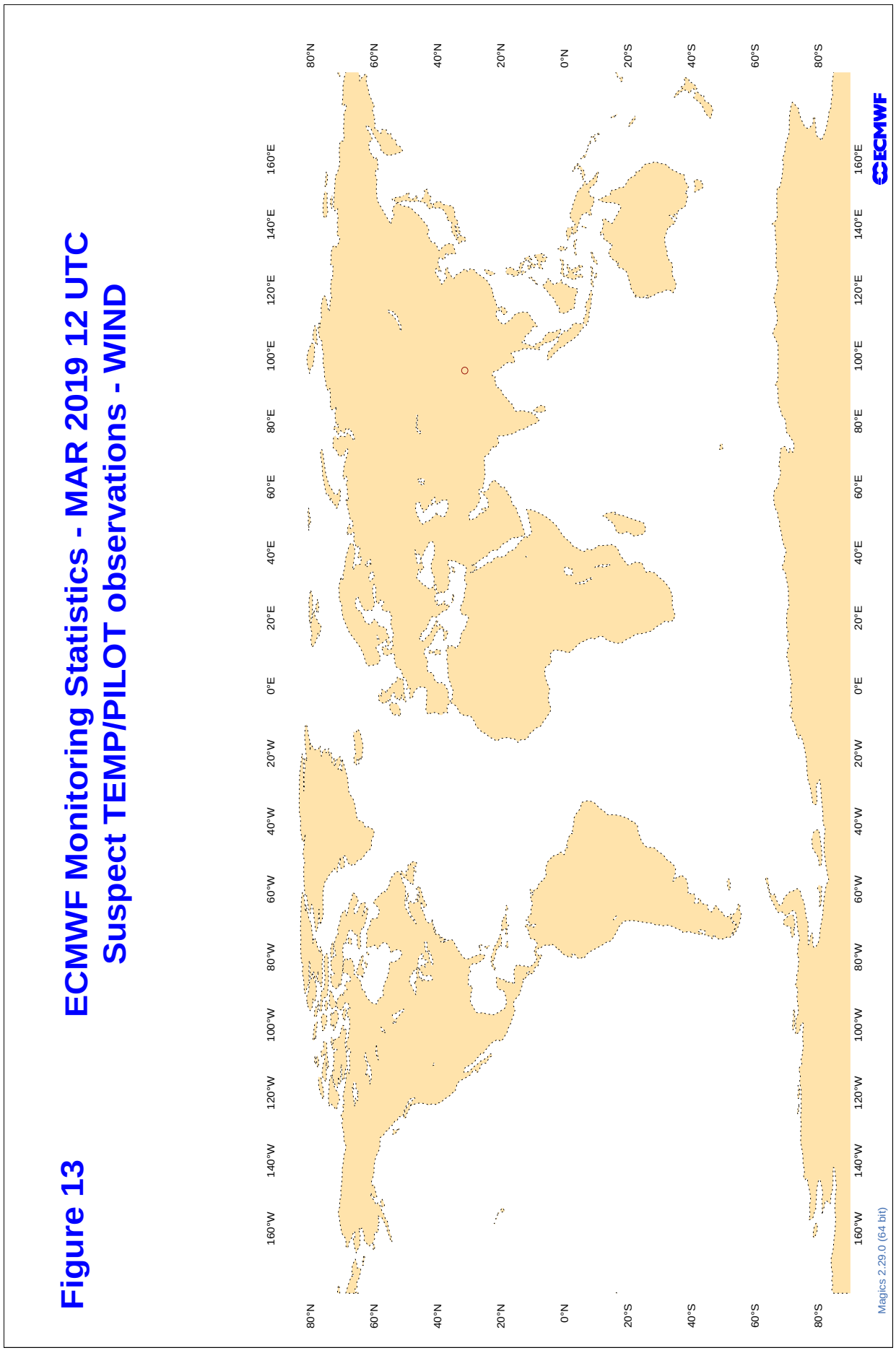
3.2.22 Figure 11 - Suspect TEMP observations - geopotential : 12 UTC



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                : MAR 2019
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
7JUNA4	00	Z	100	0	0.0	0.0
7JUNA4	12	Z	100	0	0.0	0.0
DBLK	12	Z	100	29	7.0	1.8
FHM5UJ	00	Z	100	8	28.3	17.2
FHM5UJ	12	Z	100	8	24.3	14.3
JGQH	00	Z	100	0	0.0	0.0
JGQH	12	Z	100	1	0.5	-0.5
QCY3TG	00	Z	100	12	21.5	17.7
QCY3TG	12	Z	100	12	22.0	18.8
USBOD	00	Z	100	2	21.5	21.5
USBOD	12	Z	100	3	4.4	4.4
USUKI	00	Z	100	2	4.3	0.8
USUKI	12	Z	100	5	14.9	1.4
VKB4L5	00	Z	100	6	45.0	44.7
VKB4L5	12	Z	100	5	43.2	43.0
XKQLWQ	12	Z	100	14	41.7	41.0
XQFJRG	00	Z	100	2	7.6	-7.4
XQFJRG	12	Z	100	2	10.3	1.1
XWHDEA	12	Z	100	0	0.0	0.0
YLV96W	00	Z	100	6	9.3	-0.2
YLV96W	12	Z	100	3	37.9	25.4
ZVQEQC	12	Z	100	15	28.3	24.5

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                : MAR 2019
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
7JUNA4	00	V	100	0	0.0	0.0	0.0
7JUNA4	12	V	100	0	0.0	0.0	0.0
DBLK	12	V	100	29	2.7	-0.7	0.1
FHM5UJ	00	V	100	8	3.9	0.6	1.3
FHM5UJ	12	V	100	8	3.2	0.7	-0.5
JGQH	00	V	100	0	0.0	0.0	0.0
JGQH	12	V	100	1	3.8	3.5	-1.5
QCY3TG	00	V	100	12	4.4	0.2	0.3
QCY3TG	12	V	100	12	3.8	-0.8	0.8
USBOD	00	V	100	2	10.2	-7.2	-0.6
USBOD	12	V	100	2	8.2	-6.2	-4.6
USUKI	00	V	100	2	9.9	-6.6	-0.8
USUKI	12	V	100	2	4.0	-2.0	-3.1
VKB4L5	00	V	100	6	4.0	-1.0	-2.4
VKB4L5	12	V	100	5	4.8	1.5	-3.2
XKQLWQ	12	V	100	14	4.1	1.1	-0.5
XQFJRG	00	V	100	2	5.3	1.0	-2.6
XQFJRG	12	V	100	2	4.9	-2.8	-3.5
XWHDEA	12	V	100	0	0.0	0.0	0.0
YLV96W	00	V	100	6	3.8	1.5	2.0
YLV96W	12	V	100	3	3.5	-0.7	1.3
ZVQEQC	12	V	100	15	4.7	-1.0	0.7

3.2.27 Figure 14 - SATOB Winds: 700-1000hPa

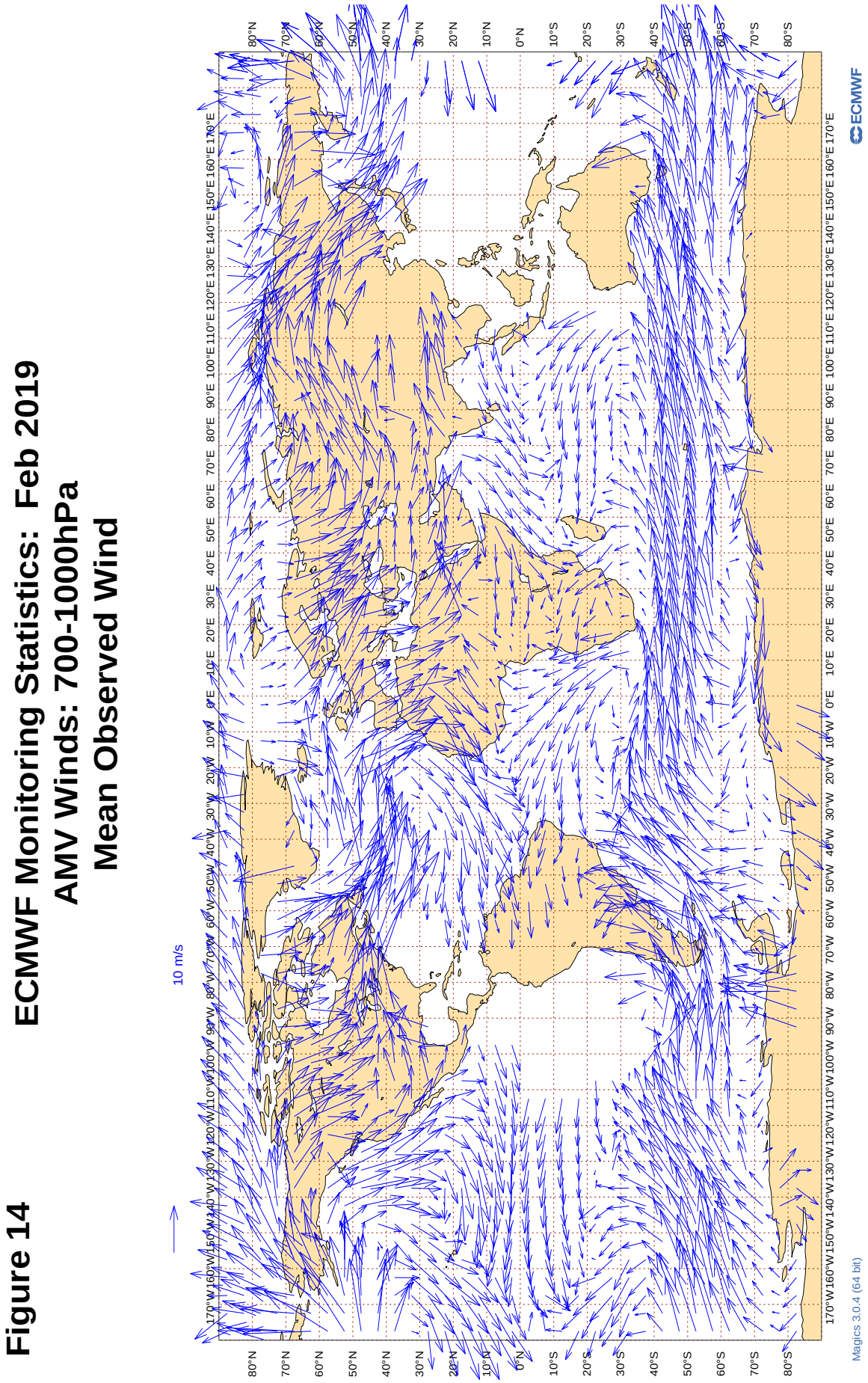


Figure 14

3.2.28 Figure 15 - SATOB Winds: 150- 400hPa

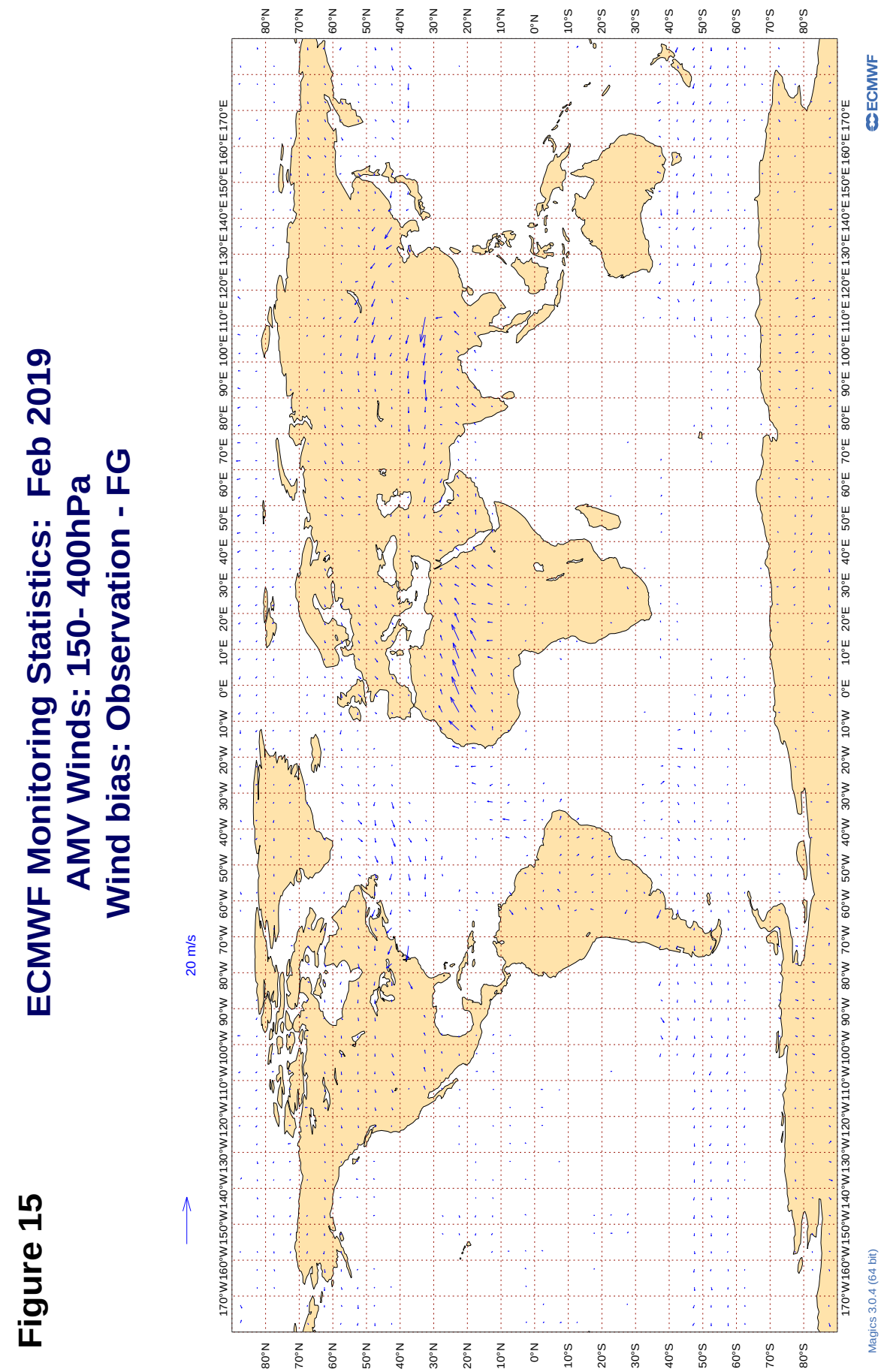


Figure 15

3.2.29 Figure 16 - SATOB Winds: 700-1000hPa

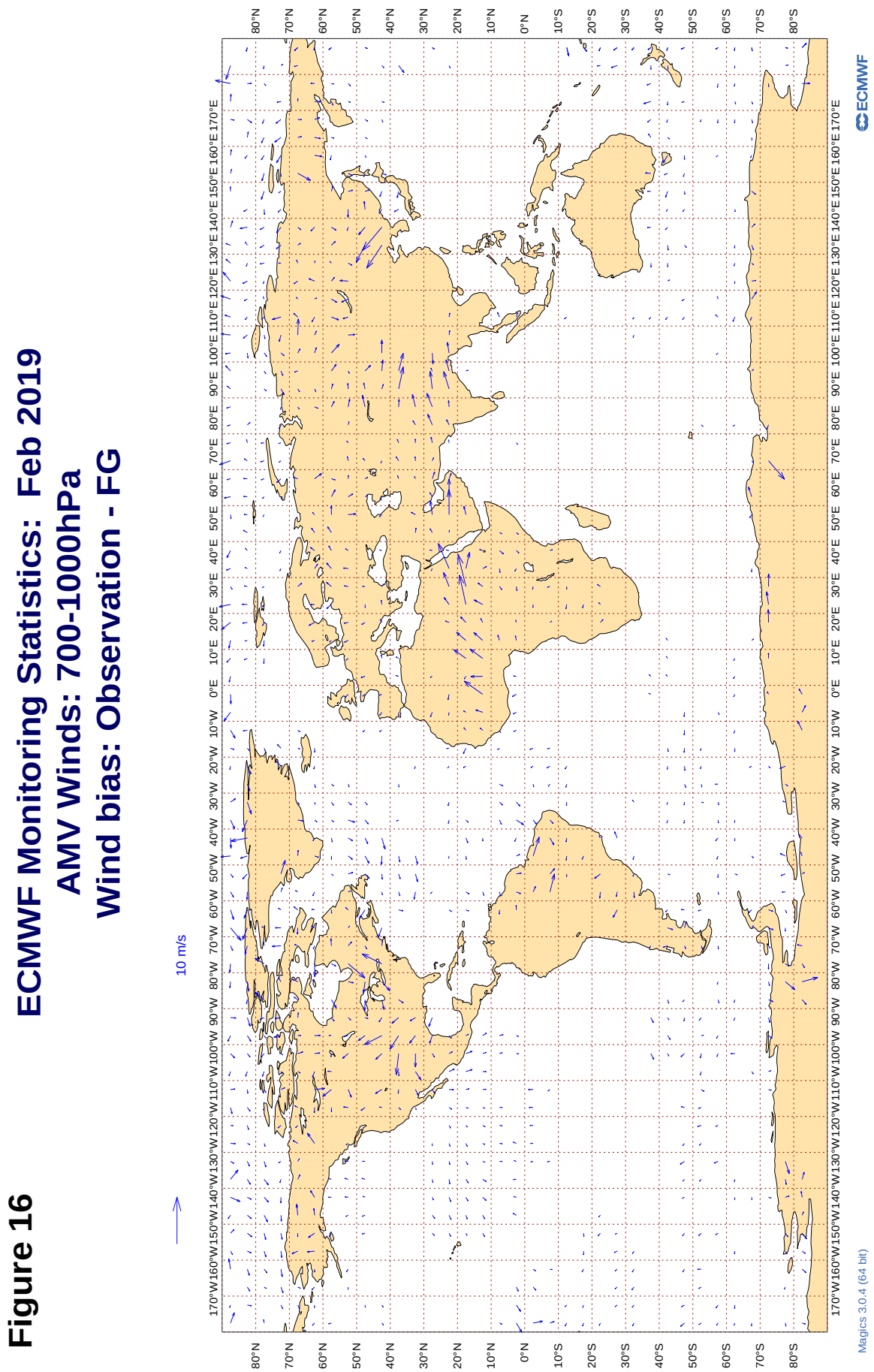


Figure 16

3.2.30 Figure 17 - SATOB Winds: 150- 400hPa

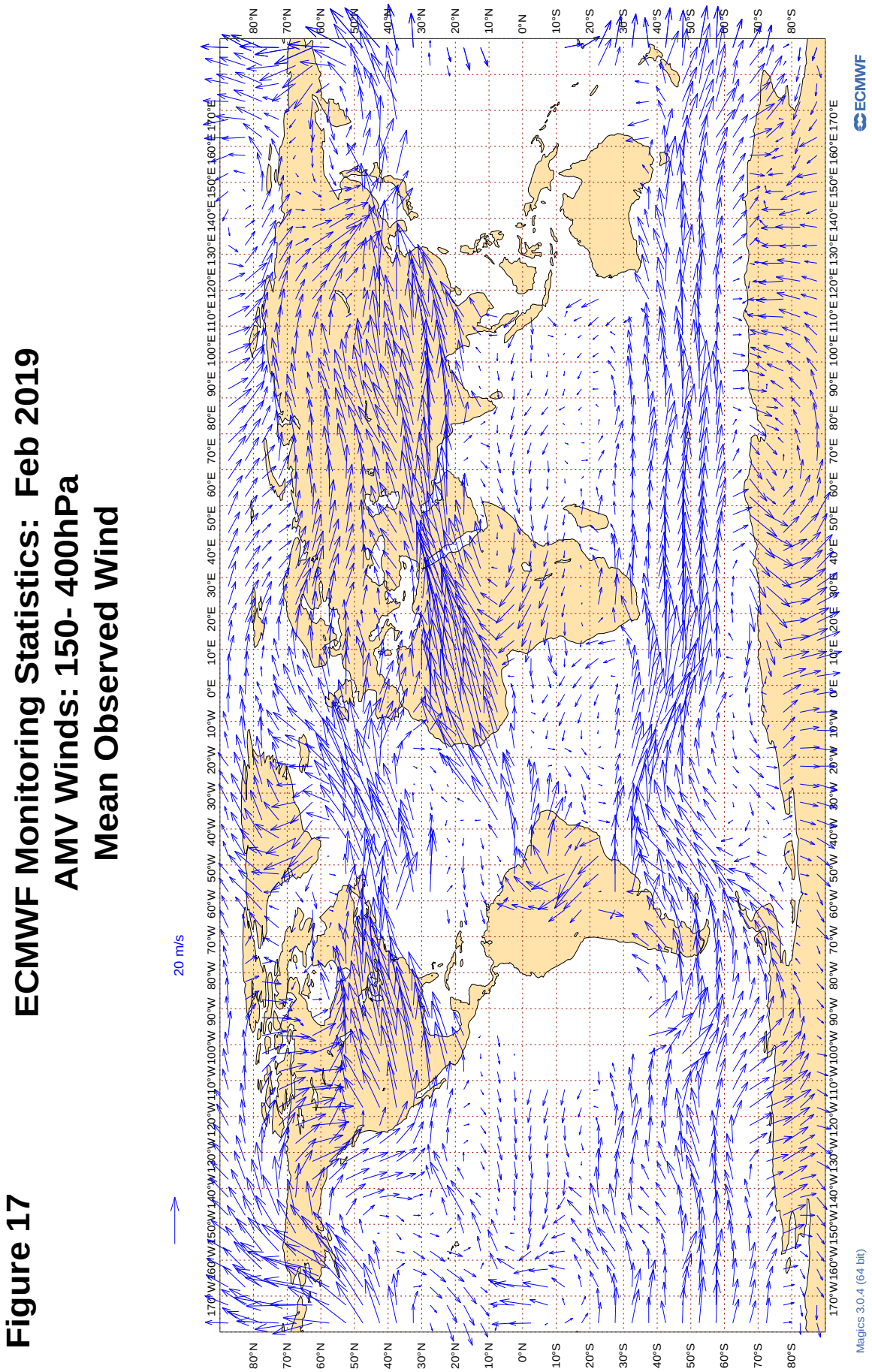


Figure 17

3.2.31 Figure 18 - AIRCRAFT Winds: 150- 300hPa

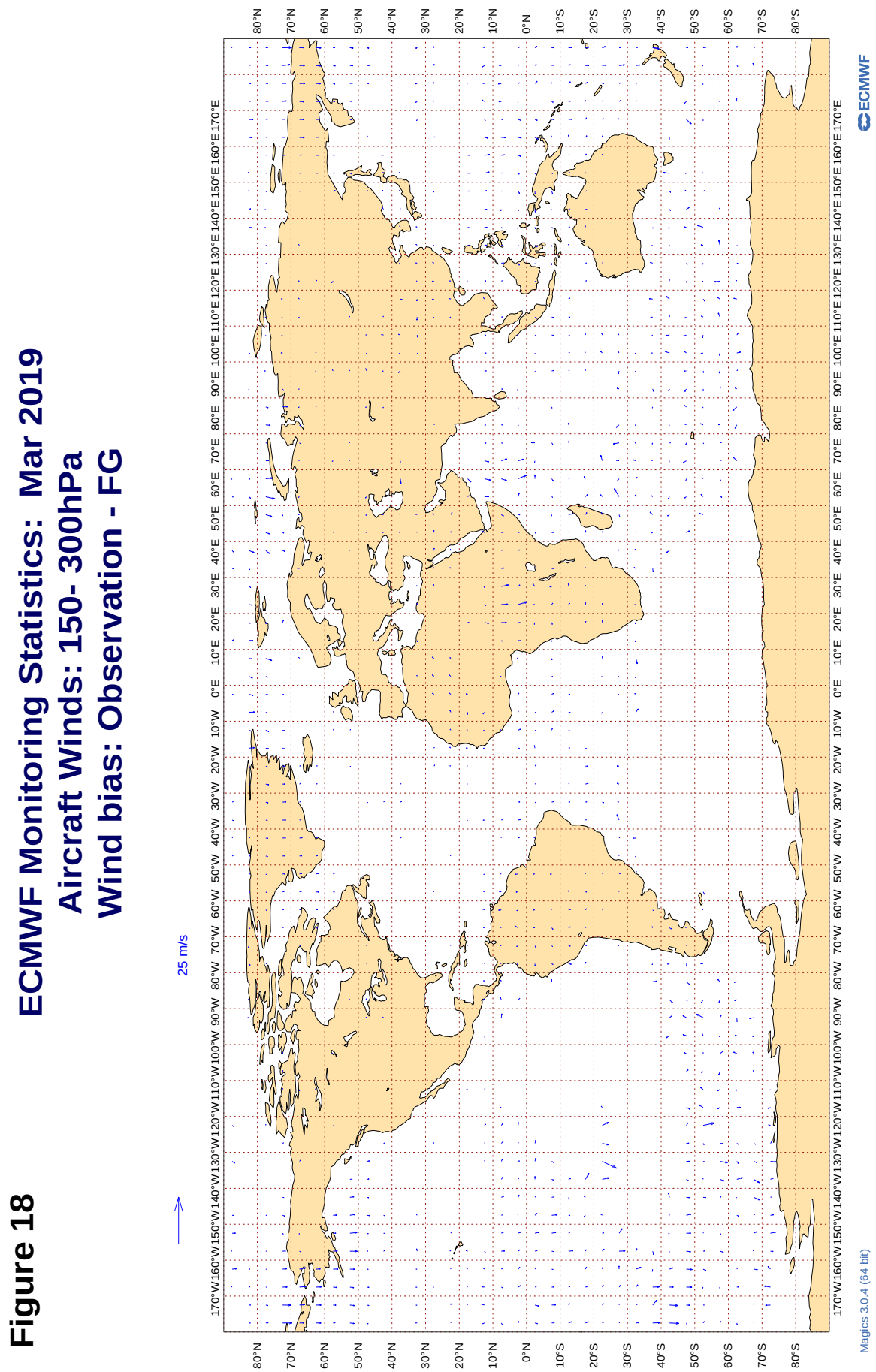


Figure 18

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 : MAR 2019
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	37	0	0	4.1	1.3
AAL	99	V	300-150	41426	2	0	6.2	0.3
AAR	99	V	300-150	268	0	0	4.1	-1.7
ABD	99	V	300-150	671	0	0	4.2	-0.2
ABP	99	V	300-150	67	0	0	3.3	0.5
ABW	99	V	300-150	768	0	0	3.6	-0.5
ACA	99	V	300-150	27204	6	0	6.3	0.2
ACI	99	V	300-150	2677	0	0	4.5	0.8
AEA	99	V	300-150	154	0	6	5.3	-0.7
AFL	99	V	300-150	2157	0	0	3.3	0.5
AFR	99	V	300-150	25265	1	0	4.2	0.2
AHY	99	V	300-150	189	19	0	7.9	-0.3
AIC	99	V	300-150	3286	0	0	3.7	0.3
AIZ	99	V	300-150	39	0	0	5.2	-1.2
ALK	99	V	300-150	754	0	0	3.2	0.2
AMX	99	V	300-150	3088	16	0	8.9	-0.0
ANZ	99	V	300-150	27586	2	0	6.5	0.7
ASA	99	V	300-150	105	2	0	5.7	0.7
ASL	99	V	300-150	358	0	0	3.6	0.4
ASY	99	V	300-150	487	0	0	5.6	1.1
ATN	99	V	300-150	198	0	1	6.1	-0.4
AUA	99	V	300-150	3820	0	0	4.0	0.1
AUH	99	V	300-150	44	11	0	4.9	0.5
AUI	99	V	300-150	399	0	0	3.4	0.3
AVA	99	V	300-150	690	2	1	6.7	-0.2

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
AXB	99	V	300-150	23	0	0	3.1	1.8
AXM	99	V	300-150	224	0	1	4.2	0.9
AYY	99	V	300-150	56	0	0	5.0	2.0
AZA	99	V	300-150	5264	0	0	3.9	0.3
AZG	99	V	300-150	271	0	0	3.4	0.0
BAH	99	V	300-150	28	0	0	3.5	0.7
BAW	99	V	300-150	49339	3	0	4.8	0.2
BBC	99	V	300-150	366	1	0	3.4	0.6
BEL	99	V	300-150	1551	0	0	3.7	0.1
BLU	99	V	300-150	50	0	12	5.5	0.1
BOS	99	V	300-150	968	0	0	3.9	0.4
BOX	99	V	300-150	2353	0	0	3.7	0.0
BOX	99	V	300-150	51	0	0	2.9	0.1
CAL	99	V	300-150	532	0	0	4.1	0.4
CAZ	99	V	300-150	50	0	0	3.7	0.5
CCA	99	V	300-150	1595	6	0	9.4	0.7
CEB	99	V	300-150	73	0	0	3.2	0.5
CEF	99	V	300-150	20	0	0	2.4	0.5
CES	99	V	300-150	1746	0	0	3.8	0.6
CFC	99	V	300-150	165	0	0	3.8	0.6
CFG	99	V	300-150	4485	0	0	4.0	-0.1
CHH	99	V	300-150	317	5	0	10.3	0.6
CJT	99	V	300-150	257	0	0	3.7	0.3
CKS	99	V	300-150	1333	0	0	3.5	-0.0
CLE	99	V	300-150	33	0	0	5.3	0.8
CLU	99	V	300-150	786	0	0	3.9	-0.3
CLX	99	V	300-150	3440	0	0	4.0	-0.3
CMB	99	V	300-150	1153	0	0	3.9	0.1
CNK	99	V	300-150	50	0	0	4.1	-0.4
CNV	99	V	300-150	88	0	0	4.2	0.2
CPA	99	V	300-150	896	0	0	4.9	0.2
CRK	99	V	300-150	478	0	0	4.0	0.6
CRL	99	V	300-150	914	0	1	4.2	0.0
CSC	99	V	300-150	192	0	0	4.1	-0.0
CSN	99	V	300-150	1039	4	0	7.8	0.4
CTM	99	V	300-150	68	0	0	4.8	-0.5
CXA	99	V	300-150	24	8	0	13.6	-0.1
DAH	99	V	300-150	606	0	0	3.7	0.1
DAL	99	V	300-150	49868	0	0	3.8	0.2
DCM	99	V	300-150	22	0	0	4.0	-0.1
DCS	99	V	300-150	49	0	0	4.1	0.2
DGX	99	V	300-150	24	0	0	2.9	0.0
DHK	99	V	300-150	1284	0	0	4.8	-0.2

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
DJT	99	V	300-150	1485	0	0	4.3	0.3
DLH	99	V	300-150	28272	0	0	3.7	0.1
DSO	99	V	300-150	41	0	0	3.5	0.1
DUB	99	V	300-150	30	0	0	3.6	0.6
EAV	99	V	300-150	48	0	0	3.3	-0.2
EDC	99	V	300-150	165	10	0	3.8	-0.4
EDG	99	V	300-150	138	18	1	15.2	0.1
EDW	99	V	300-150	1465	0	0	3.9	0.3
EIN	99	V	300-150	13033	0	0	3.7	0.2
EJM	99	V	300-150	810	0	0	3.8	-0.0
ELY	99	V	300-150	3366	13	0	6.6	-0.1
ETD	99	V	300-150	5621	3	0	4.7	0.2
ETH	99	V	300-150	3315	5	0	6.4	0.3
EUW	99	V	300-150	33	0	0	3.2	0.1
EVA	99	V	300-150	166	0	0	3.1	0.3
EVE	99	V	300-150	54	0	0	3.7	-0.1
EWG	99	V	300-150	5634	0	0	3.9	0.3
FBU	99	V	300-150	503	0	0	5.0	0.9
FDX	99	V	300-150	6058	0	0	3.7	0.2
FIN	99	V	300-150	1229	0	0	3.3	0.5
FJI	99	V	300-150	6583	0	0	5.1	1.0
FPG	99	V	300-150	31	0	0	3.9	0.7
FRV	99	V	300-150	24	0	0	4.4	1.3
FWI	99	V	300-150	1857	0	1	3.8	0.3
FWK	99	V	300-150	38	0	0	3.6	-0.8
FYG	99	V	300-150	79	0	0	4.1	0.5
FYL	99	V	300-150	47	0	0	5.5	-0.5
GAF	99	V	300-150	61	0	0	3.5	0.9
GAJ	99	V	300-150	31	0	0	4.0	-0.9
GCR	99	V	300-150	39	0	0	5.4	0.6
GEC	99	V	300-150	2618	0	0	3.7	0.1
GES	99	V	300-150	220	0	0	3.8	0.3
GFA	99	V	300-150	539	0	0	3.4	0.2
GIA	99	V	300-150	333	0	0	3.1	0.4
GLJ	99	V	300-150	43	0	0	3.8	1.8
GLO	99	V	300-150	28	0	4	9.5	0.0
GMA	99	V	300-150	56	0	0	4.4	0.2
GTH	99	V	300-150	69	0	0	3.7	0.1
GTI	99	V	300-150	3386	0	0	4.1	-0.2
HAL	99	V	300-150	4089	0	0	4.9	1.1
HDM	99	V	300-150	33	0	0	4.3	0.8
HRT	99	V	300-150	115	25	0	3.4	0.4
HUA	99	V	300-150	28	0	0	3.6	-1.3

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
HVN	99	V	300-150	34	3	0	3.6	-1.1
HWA	99	V	300-150	21	0	0	3.2	-0.8
HZS	99	V	300-150	66	0	0	3.4	-0.4
IBE	99	V	300-150	2221	0	1	3.8	0.2
IBK	99	V	300-150	1593	10	0	4.3	0.5
ICE	99	V	300-150	369	0	3	3.8	0.2
ICL	99	V	300-150	954	0	0	5.3	-0.5
ICV	99	V	300-150	305	0	0	4.2	-0.5
ISS	99	V	300-150	1492	0	0	3.8	0.2
JAF	99	V	300-150	1055	13	0	8.5	-0.2
JAI	99	V	300-150	1287	0	0	3.5	0.3
JAS	99	V	300-150	136	0	0	3.8	0.4
JET	99	V	300-150	81	0	0	4.3	-1.0
JJA	99	V	300-150	52	0	6	3.2	0.6
JME	99	V	300-150	69	0	0	4.2	-0.3
JST	99	V	300-150	1312	4	0	10.1	0.8
KAC	99	V	300-150	1482	0	0	3.5	0.3
KAI	99	V	300-150	66	0	0	7.0	-0.4
KAL	99	V	300-150	1946	0	0	4.2	0.8
KAY	99	V	300-150	111	0	0	3.8	-0.8
KCE	99	V	300-150	31	0	0	3.8	-0.1
KIW	99	V	300-150	32	0	0	4.2	1.3
KLM	99	V	300-150	16591	5	0	5.3	0.0
KNT	99	V	300-150	25	0	0	3.5	-0.1
KQA	99	V	300-150	262	6	0	8.1	0.2
KRF	99	V	300-150	24	0	0	3.2	-0.2
KTK	99	V	300-150	383	0	1	3.5	0.4
LAN	99	V	300-150	2535	15	0	10.9	0.4
LCO	99	V	300-150	53	0	0	3.6	-1.1
LEA	99	V	300-150	82	0	0	4.3	0.3
LHO	99	V	300-150	53	0	0	4.5	0.8
LNI	99	V	300-150	153	0	0	3.1	0.3
LNX	99	V	300-150	34	0	0	3.4	0.0
LOT	99	V	300-150	3421	15	0	8.4	-0.0
LUC	99	V	300-150	45	0	0	3.9	-1.4
MAS	99	V	300-150	708	0	0	3.7	0.6
MAU	99	V	300-150	72	0	0	4.7	0.4
MED	99	V	300-150	47	0	0	5.3	1.6
MHV	99	V	300-150	49	0	0	3.3	0.9
MJF	99	V	300-150	24	0	0	3.1	-0.1
MMD	99	V	300-150	415	0	0	3.7	0.0
MPH	99	V	300-150	562	0	0	4.2	-0.8
MSR	99	V	300-150	1320	0	0	3.5	0.2

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
MXD	99	V	300-150	23	0	9	3.8	-0.6
NAX	99	V	300-150	9788	16	0	8.2	0.0
NCA	99	V	300-150	97	0	0	3.7	-0.9
NJE	99	V	300-150	235	0	0	3.6	-0.4
NOS	99	V	300-150	701	7	0	7.3	-0.1
NRS	99	V	300-150	8304	18	0	8.4	0.0
NWS	99	V	300-150	671	0	0	3.5	0.6
OAE	99	V	300-150	1444	0	0	4.3	0.2
OLI	99	V	300-150	26	0	0	4.4	0.8
OMA	99	V	300-150	470	1	0	4.5	0.5
PAC	99	V	300-150	229	0	1	4.4	0.4
PAL	99	V	300-150	1007	0	0	4.4	0.6
PAT	99	V	300-150	38	0	0	4.6	-0.4
PIA	99	V	300-150	169	0	0	3.0	0.4
PLM	99	V	300-150	30	0	0	4.0	-0.4
PNC	99	V	300-150	34	0	0	2.9	0.8
PRD	99	V	300-150	20	0	5	3.1	-0.5
PVJ	99	V	300-150	33	0	0	3.8	-0.4
QAF	99	V	300-150	37	0	0	4.1	-0.0
QFA	99	V	300-150	21278	1	0	6.7	0.7
QQE	99	V	300-150	72	0	0	3.6	0.5
QTR	99	V	300-150	15587	0	0	4.1	0.2
RAM	99	V	300-150	534	7	0	5.1	0.1
RBA	99	V	300-150	133	1	0	8.8	0.3
RCH	99	V	300-150	4376	0	0	4.7	0.3
RDN	99	V	300-150	38	0	0	4.5	0.3
RJA	99	V	300-150	1148	17	0	9.8	-0.0
ROJ	99	V	300-150	74	0	0	3.5	-0.2
ROM	99	V	300-150	33	0	0	3.8	-0.1
RRR	99	V	300-150	228	0	0	3.3	0.4
RZO	99	V	300-150	100	0	7	4.6	0.8
SAM	99	V	300-150	225	0	0	4.4	0.9
SAS	99	V	300-150	3972	0	0	3.2	0.2
SAZ	99	V	300-150	54	0	0	3.8	-0.3
SCX	99	V	300-150	75	0	0	6.3	0.7
SDM	99	V	300-150	370	0	0	3.8	0.7
SHE	99	V	300-150	135	0	0	3.8	0.6
SIA	99	V	300-150	4945	0	0	3.8	0.0
SIO	99	V	300-150	56	0	0	3.1	0.5
SIS	99	V	300-150	26	0	0	4.3	1.5
SJE	99	V	300-150	34	0	0	2.8	-0.2
SLM	99	V	300-150	190	0	0	3.4	0.2
SOO	99	V	300-150	693	0	0	3.5	-0.2

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
SPA	99	V	300-150	171	0	0	3.9	0.2
SVA	99	V	300-150	4716	0	0	4.5	0.3
SVW	99	V	300-150	217	0	0	3.5	0.0
SWR	99	V	300-150	10134	0	1	3.9	0.2
TAM	99	V	300-150	56	0	2	3.1	0.4
TAP	99	V	300-150	906	0	1	4.2	0.2
TAR	99	V	300-150	300	0	0	3.7	-0.2
TAY	99	V	300-150	516	0	0	4.1	0.2
TCX	99	V	300-150	2304	0	0	3.8	0.1
TEU	99	V	300-150	47	0	0	4.8	1.0
TFL	99	V	300-150	1540	9	0	7.5	-0.1
TGW	99	V	300-150	90	0	0	5.4	0.2
THA	99	V	300-150	894	2	0	5.7	0.3
THT	99	V	300-150	2743	1	0	6.1	0.8
THY	99	V	300-150	9031	0	0	3.7	0.2
TMN	99	V	300-150	210	0	0	4.5	0.3
TOM	99	V	300-150	4545	9	0	8.1	-0.1
TOW	99	V	300-150	77	0	0	3.9	0.2
TPA	99	V	300-150	259	0	0	3.3	0.0
TRK	99	V	300-150	25	0	0	4.9	-1.9
TSC	99	V	300-150	3452	0	0	3.8	0.1
TVP	99	V	300-150	225	0	0	4.0	0.1
TWB	99	V	300-150	33	0	6	3.8	0.9
TWY	99	V	300-150	260	0	0	3.7	-0.1
UAE	99	V	300-150	16034	0	0	3.7	0.2
UAL	99	V	300-150	72235	2	2	6.2	0.3
ULC	99	V	300-150	130	0	0	3.5	0.4
UPS	99	V	300-150	4200	0	0	4.4	0.5
UZB	99	V	300-150	204	4	0	9.3	0.5
VAJ	99	V	300-150	27	0	0	3.6	0.4
VAL	99	V	300-150	38	0	0	3.3	-0.0
VCG	99	V	300-150	34	0	0	3.8	1.4
VCN	99	V	300-150	31	0	0	3.3	0.4
VIR	99	V	300-150	20406	3	0	4.6	0.1
VJT	99	V	300-150	989	0	0	3.6	0.2
VKG	99	V	300-150	413	0	0	3.5	0.1
VOZ	99	V	300-150	6758	0	0	4.7	0.6
WGT	99	V	300-150	102	0	0	3.8	0.2
WJA	99	V	300-150	3002	0	0	5.5	0.5
WOW	99	V	300-150	3335	0	0	3.4	0.3
XAX	99	V	300-150	90	0	0	3.2	0.2
XLF	99	V	300-150	1000	0	0	3.8	0.7

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)

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RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
         LEVEL                 :  50 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : MAR 2019
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
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WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	50	30	13.8	10.8
01001	00	Z	50	28	13.5	9.7
01028	12	Z	50	31	20.3	13.8
01028	00	Z	50	30	15.5	13.9
01400	00	Z	50	20	94.4	93.9
01400	12	Z	50	24	88.2	87.7
01415	00	Z	50	29	19.9	15.9
01415	12	Z	50	28	15.8	12.5
02365	12	Z	50	24	14.5	10.3
02365	00	Z	50	23	16.9	14.1
02591	00	Z	50	24	22.8	21.2
02591	12	Z	50	18	19.1	17.3
02836	12	Z	50	31	16.3	13.0
02836	00	Z	50	31	17.0	13.3
02963	12	Z	50	30	13.2	11.4
02963	00	Z	50	29	14.4	12.8
03005	12	Z	50	30	12.8	7.9
03005	00	Z	50	31	14.3	10.8
03238	12	Z	50	3	16.7	16.1
03238	00	Z	50	31	18.1	14.0
03808	12	Z	50	28	15.3	11.4
03808	00	Z	50	30	16.7	15.4
03918	00	Z	50	25	21.6	19.1
03918	12	Z	50	8	16.5	14.7
03953	12	Z	50	30	39.9	35.8
03953	00	Z	50	29	27.4	23.5
04018	00	Z	50	28	18.7	10.4
04018	12	Z	50	29	12.8	10.5
04220	12	Z	50	31	17.7	11.9
04220	00	Z	50	31	15.4	14.4
04270	12	Z	50	31	21.7	8.4
04270	00	Z	50	31	22.9	8.2
04320	00	Z	50	30	16.6	15.5
04320	12	Z	50	31	17.5	14.4
04339	00	Z	50	31	16.7	15.6
04339	12	Z	50	31	24.8	18.2
04360	00	Z	50	30	14.0	6.6
04360	12	Z	50	29	17.8	13.5
06011	00	Z	50	29	16.1	9.5

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	50	27	16.3	10.4
06260	12	Z	50	4	16.3	16.0
06260	00	Z	50	29	18.1	16.8
06610	12	Z	50	31	21.2	18.1
06610	00	Z	50	30	21.3	18.4
07110	12	Z	50	30	19.3	15.6
07110	00	Z	50	29	29.3	21.0
07510	00	Z	50	29	29.7	28.7
07510	12	Z	50	28	37.9	34.3
07645	12	Z	50	30	20.1	17.4
07645	00	Z	50	28	24.2	22.4
07761	12	Z	50	29	34.2	28.9
07761	00	Z	50	31	43.7	39.0
08001	00	Z	50	30	23.4	22.3
08001	12	Z	50	30	28.8	25.1
08221	00	Z	50	29	24.8	23.3
08221	12	Z	50	31	19.7	18.4
08302	12	Z	50	31	16.8	14.5
08302	00	Z	50	31	21.4	20.9
08508	12	Z	50	26	19.1	17.8
08522	12	Z	50	31	21.4	18.9
08579	12	Z	50	31	23.6	21.2
10035	12	Z	50	30	16.1	13.4
10393	12	Z	50	31	17.9	14.4
10393	00	Z	50	31	16.7	15.5
10410	12	Z	50	31	12.9	10.2
10410	00	Z	50	29	17.2	12.6
10739	00	Z	50	31	17.8	15.2
10739	12	Z	50	31	17.4	16.1
11035	00	Z	50	28	23.2	20.3
11035	12	Z	50	31	34.5	31.0
12982	00	Z	50	27	25.4	22.8
12982	12	Z	50	24	45.7	42.2
16080	00	Z	50	31	18.3	16.1
16080	12	Z	50	31	11.6	8.3
16245	12	Z	50	29	21.4	15.6
16245	00	Z	50	31	20.1	19.0
16320	12	Z	50	31	20.5	18.2
16320	00	Z	50	28	25.6	23.5
16429	12	Z	50	31	17.9	16.9
16429	00	Z	50	30	23.7	22.9
16622	00	Z	50	22	24.5	22.0
16754	00	Z	50	24	27.1	26.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	50	30	17.1	14.8
26435	12	Z	50	11	11.6	10.1
60018	12	Z	50	31	19.5	18.4
60018	00	Z	50	31	25.2	24.6
7JUNA4	00	Z	50	0	0.0	0.0
7JUNA4	12	Z	50	0	0.0	0.0
FHM5UJ	00	Z	50	7	23.4	20.9
FHM5UJ	12	Z	50	8	21.1	18.1
QCY3TG	00	Z	50	8	31.6	28.2
QCY3TG	12	Z	50	10	33.4	31.1
VKB4L5	00	Z	50	5	52.7	52.5
VKB4L5	12	Z	50	5	47.8	47.8
XKQLWQ	12	Z	50	14	46.0	45.4
XQFJRG	00	Z	50	2	16.6	-16.3
XQFJRG	12	Z	50	2	18.9	18.1
XWHDEA	12	Z	50	0	0.0	0.0
YLV96W	00	Z	50	5	15.8	14.8
YLV96W	12	Z	50	1	19.9	19.9

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

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RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : WIND (M/S)
         LEVEL                 :  50 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : MAR 2019
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	50	30	3.2	-0.3	-0.3
01001	00	V	50	27	4.0	0.8	0.1
01028	12	V	50	31	3.7	0.0	-0.2
01028	00	V	50	29	4.1	0.1	0.2
01400	00	V	50	19	4.6	-1.1	0.0
01400	12	V	50	23	3.9	-0.5	0.1
01415	00	V	50	25	4.0	1.1	-1.1
01415	12	V	50	28	4.9	0.9	0.1
02365	12	V	50	23	3.5	0.8	-0.6
02365	00	V	50	19	3.5	0.6	0.0
02591	00	V	50	18	5.0	1.1	-0.7
02591	12	V	50	15	4.0	-1.8	0.7
02836	12	V	50	31	4.0	0.6	-0.1
02836	00	V	50	30	4.5	0.2	-0.8
02963	12	V	50	28	4.0	-0.5	-0.3
02963	00	V	50	26	4.4	0.4	0.3
03005	12	V	50	29	4.0	0.4	0.1
03005	00	V	50	30	3.9	1.3	-0.4
03238	12	V	50	3	4.0	1.9	-1.2
03238	00	V	50	28	3.9	0.3	-0.2
03808	12	V	50	27	4.5	0.9	-0.7
03808	00	V	50	28	4.2	0.1	0.6
03918	00	V	50	24	4.3	0.7	0.8
03918	12	V	50	8	2.8	0.5	-0.7
03953	12	V	50	30	4.2	0.7	0.0
03953	00	V	50	28	3.6	0.2	-0.2
04018	00	V	50	26	5.7	0.1	-0.3
04018	12	V	50	29	4.0	-0.2	-0.5
04220	12	V	50	31	3.3	0.0	0.6
04220	00	V	50	30	3.5	0.6	0.3
04270	12	V	50	29	5.3	1.1	-0.6
04270	00	V	50	30	5.2	0.1	0.4
04320	00	V	50	28	3.1	0.1	0.1
04320	12	V	50	31	3.0	0.7	0.2
04339	00	V	50	29	3.7	-0.8	-0.5
04339	12	V	50	31	3.9	-0.7	0.4
04360	00	V	50	29	3.3	-0.5	-0.5
04360	12	V	50	29	3.7	-0.1	0.1
06011	00	V	50	28	3.2	-0.9	0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	50	27	4.1	0.6	-0.4
06260	12	V	50	4	4.8	2.1	-1.5
06260	00	V	50	28	3.8	0.3	-0.2
06610	12	V	50	31	4.9	0.0	0.1
06610	00	V	50	29	5.8	1.0	-0.2
07110	12	V	50	30	3.1	0.5	-0.2
07110	00	V	50	27	3.5	-0.2	0.7
07510	00	V	50	28	4.3	0.3	-0.7
07510	12	V	50	28	3.1	0.5	0.3
07645	12	V	50	30	5.2	0.1	-0.8
07645	00	V	50	27	4.2	-0.7	-0.6
07761	12	V	50	29	4.2	0.8	-0.5
07761	00	V	50	30	4.8	0.4	-0.2
08001	00	V	50	23	4.0	-0.1	0.9
08001	12	V	50	26	2.6	0.5	0.7
08221	00	V	50	28	3.3	-0.3	0.3
08221	12	V	50	31	4.0	0.7	0.0
08302	12	V	50	31	3.4	0.8	0.1
08302	00	V	50	29	3.5	-0.2	0.3
08508	12	V	50	26	3.9	0.6	-0.1
08522	12	V	50	31	3.1	0.2	0.4
08579	12	V	50	30	3.7	1.1	0.3
10035	12	V	50	30	4.4	0.4	-0.5
10393	12	V	50	31	4.0	-0.6	-0.8
10393	00	V	50	30	4.7	-0.1	-0.2
10410	12	V	50	29	4.1	-0.3	0.3
10410	00	V	50	28	3.4	-0.5	-0.6
10739	00	V	50	29	4.3	-0.1	0.7
10739	12	V	50	31	4.4	-0.4	0.7
11035	00	V	50	26	5.1	-0.3	0.6
11035	12	V	50	31	3.8	-0.4	0.0
12982	00	V	50	27	3.6	1.2	0.3
12982	12	V	50	24	4.0	-0.3	0.1
16080	00	V	50	30	4.5	-0.7	-0.5
16080	12	V	50	31	3.8	-0.4	-0.5
16245	12	V	50	28	5.2	1.1	-0.1
16245	00	V	50	29	4.0	0.9	-0.2
16320	12	V	50	31	4.3	1.4	-0.4
16320	00	V	50	27	4.4	0.3	0.4
16429	12	V	50	30	4.5	0.3	0.2
16429	00	V	50	28	4.3	0.6	0.1
16622	00	V	50	20	4.9	1.1	-0.3
16754	00	V	50	17	3.5	0.6	-1.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	50	8	4.6	-0.3	-1.8
26435	12	V	50	9	3.7	0.6	-0.1
60018	12	V	50	31	4.0	1.2	-0.4
60018	00	V	50	30	4.2	-0.5	1.0
7JUNA4	00	V	50	0	0.0	0.0	0.0
7JUNA4	12	V	50	0	0.0	0.0	0.0
FHM5UJ	00	V	50	7	2.7	0.1	0.7
FHM5UJ	12	V	50	7	4.0	2.1	0.1
QCY3TG	00	V	50	8	2.0	-0.5	-0.1
QCY3TG	12	V	50	10	3.1	0.1	-0.4
VKB4L5	00	V	50	5	2.6	0.8	0.5
VKB4L5	12	V	50	5	3.4	-2.3	1.4
XKQLWQ	12	V	50	14	3.7	0.3	-0.2
XQFJRG	00	V	50	1	3.5	-3.3	1.3
XQFJRG	12	V	50	1	2.9	0.1	-2.9
XWHDEA	12	V	50	0	0.0	0.0	0.0
YLV96W	00	V	50	5	4.4	0.1	1.8
YLV96W	12	V	50	1	1.7	-1.1	1.3

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

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
         LEVEL                 : 100 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : MAR 2019
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	100	31	6.6	2.2
01001	00	Z	100	29	6.6	1.9
01028	12	Z	100	31	14.5	4.5
01028	00	Z	100	31	6.2	3.9
01400	00	Z	100	20	81.9	81.5
01400	12	Z	100	27	80.5	80.0
01415	00	Z	100	29	7.1	2.6
01415	12	Z	100	28	6.6	3.3
02365	12	Z	100	26	7.5	0.7
02365	00	Z	100	27	8.5	6.1
02591	00	Z	100	26	12.9	10.5
02591	12	Z	100	26	11.1	7.3
02836	12	Z	100	31	6.7	2.6
02836	00	Z	100	31	4.7	1.4
02963	12	Z	100	31	4.7	2.1
02963	00	Z	100	31	5.9	3.4
03005	12	Z	100	31	7.4	0.0
03005	00	Z	100	31	7.0	3.1
03238	12	Z	100	3	8.9	5.6
03238	00	Z	100	31	10.0	6.9
03808	12	Z	100	31	9.9	4.6
03808	00	Z	100	31	7.7	6.4
03918	00	Z	100	27	11.7	9.4
03918	12	Z	100	8	6.9	6.0
03953	12	Z	100	31	23.5	20.2
03953	00	Z	100	29	15.8	12.9
04018	00	Z	100	30	10.8	-0.8
04018	12	Z	100	30	6.2	-0.4
04220	12	Z	100	31	11.4	3.7
04220	00	Z	100	31	6.0	3.9
04270	12	Z	100	31	15.0	4.0
04270	00	Z	100	31	10.6	2.2
04320	00	Z	100	30	7.9	6.6
04320	12	Z	100	31	9.1	4.5
04339	00	Z	100	31	6.5	4.1
04339	12	Z	100	31	18.2	9.1
04360	00	Z	100	30	9.7	-5.2
04360	12	Z	100	31	9.3	-1.9
06011	00	Z	100	30	10.2	4.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	100	32	11.3	0.4
06260	12	Z	100	6	11.4	11.1
06260	00	Z	100	29	7.5	4.7
06610	12	Z	100	31	12.5	7.4
06610	00	Z	100	31	10.0	5.3
07110	12	Z	100	30	10.5	4.9
07110	00	Z	100	29	11.4	6.4
07510	00	Z	100	30	16.7	14.4
07510	12	Z	100	29	24.1	21.1
07645	12	Z	100	30	13.3	9.1
07645	00	Z	100	30	10.5	7.7
07761	12	Z	100	30	21.1	16.2
07761	00	Z	100	31	28.3	21.8
08001	00	Z	100	31	11.8	10.0
08001	12	Z	100	31	14.3	11.1
08221	00	Z	100	31	15.1	13.5
08221	12	Z	100	31	11.6	10.6
08302	12	Z	100	31	9.1	5.9
08302	00	Z	100	31	10.8	9.8
08508	12	Z	100	28	10.3	9.4
08522	12	Z	100	31	11.8	10.1
08579	12	Z	100	31	12.1	9.9
10035	12	Z	100	30	8.9	5.4
10393	12	Z	100	31	7.9	4.4
10393	00	Z	100	31	7.7	5.2
10410	12	Z	100	31	5.2	-0.8
10410	00	Z	100	30	8.8	1.1
10739	00	Z	100	31	12.0	5.1
10739	12	Z	100	31	8.3	6.5
11035	00	Z	100	29	14.2	9.2
11035	12	Z	100	31	22.0	18.9
12982	00	Z	100	27	11.7	10.6
12982	12	Z	100	24	23.4	21.8
16080	00	Z	100	31	9.4	4.0
16080	12	Z	100	31	5.7	0.6
16245	12	Z	100	30	13.5	5.9
16245	00	Z	100	31	9.1	7.2
16320	12	Z	100	31	12.5	9.4
16320	00	Z	100	30	14.7	12.4
16429	12	Z	100	31	10.7	8.1
16429	00	Z	100	31	11.7	9.9
16622	00	Z	100	28	14.5	10.8
16754	00	Z	100	29	13.0	11.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	100	30	9.0	5.7
26435	12	Z	100	11	5.2	1.8
60018	12	Z	100	31	13.4	11.4
60018	00	Z	100	31	15.5	14.6
7JUNA4	00	Z	100	0	0.0	0.0
7JUNA4	12	Z	100	0	0.0	0.0
FHM5UJ	00	Z	100	8	28.3	17.2
FHM5UJ	12	Z	100	8	24.3	14.3
QCY3TG	00	Z	100	12	21.5	17.7
QCY3TG	12	Z	100	12	22.0	18.8
VKB4L5	00	Z	100	6	45.0	44.7
VKB4L5	12	Z	100	5	43.2	43.0
XKQLWQ	12	Z	100	14	41.7	41.0
XQFJRG	00	Z	100	2	7.6	-7.4
XQFJRG	12	Z	100	2	10.3	1.1
XWHDEA	12	Z	100	0	0.0	0.0
YLV96W	00	Z	100	6	9.3	-0.2
YLV96W	12	Z	100	3	37.9	25.4

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                : MAR 2019
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	100	31	3.0	0.2	-0.2
01001	00	V	100	27	2.9	0.1	-0.3
01028	12	V	100	31	2.5	0.2	0.2
01028	00	V	100	30	3.3	-0.3	-0.4
01400	00	V	100	20	3.3	0.1	0.2
01400	12	V	100	27	2.8	-0.1	0.0
01415	00	V	100	27	3.5	0.7	0.2
01415	12	V	100	28	3.6	0.2	-0.9
02365	12	V	100	26	3.5	0.3	-0.4
02365	00	V	100	26	3.4	-0.1	0.1
02591	00	V	100	25	3.7	-0.4	-0.9
02591	12	V	100	24	2.6	0.5	-0.1
02836	12	V	100	31	3.7	0.9	-0.6
02836	00	V	100	30	3.0	0.3	0.0
02963	12	V	100	31	3.0	-0.1	-0.5
02963	00	V	100	30	3.3	0.3	-0.2
03005	12	V	100	31	3.9	-0.5	0.2
03005	00	V	100	30	3.5	-0.7	0.0
03238	12	V	100	3	2.6	-1.0	-2.0
03238	00	V	100	29	4.0	-0.7	-0.4
03808	12	V	100	30	3.1	0.3	-0.1
03808	00	V	100	30	3.3	0.5	-0.2
03918	00	V	100	26	3.2	0.0	0.2
03918	12	V	100	8	3.3	0.0	-0.6
03953	12	V	100	31	4.1	-0.1	0.2
03953	00	V	100	28	3.1	-0.1	-0.5
04018	00	V	100	29	3.6	0.0	0.7
04018	12	V	100	29	3.0	0.1	0.3
04220	12	V	100	31	2.3	0.4	0.0
04220	00	V	100	30	3.3	0.0	-0.1
04270	12	V	100	31	8.0	-2.7	0.5
04270	00	V	100	30	4.1	-0.1	-0.2
04320	00	V	100	29	2.6	0.5	-0.3
04320	12	V	100	31	3.0	0.6	0.2
04339	00	V	100	30	2.6	0.6	0.1
04339	12	V	100	31	3.4	0.8	0.8
04360	00	V	100	29	3.5	0.5	0.8
04360	12	V	100	31	3.5	0.2	-0.2
06011	00	V	100	29	3.0	0.0	0.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	100	31	3.0	-0.2	-0.3
06260	12	V	100	5	4.7	-2.5	1.2
06260	00	V	100	28	3.4	0.6	-0.2
06610	12	V	100	31	3.9	0.9	-0.3
06610	00	V	100	29	4.8	1.2	-1.2
07110	12	V	100	30	3.2	0.4	0.3
07110	00	V	100	27	3.1	0.3	0.3
07510	00	V	100	29	3.3	-0.1	-0.3
07510	12	V	100	29	3.8	0.2	-0.3
07645	12	V	100	30	3.3	0.6	0.9
07645	00	V	100	29	4.9	-0.1	-0.4
07761	12	V	100	30	4.5	0.4	0.5
07761	00	V	100	30	4.2	1.3	0.1
08001	00	V	100	30	3.4	0.0	0.5
08001	12	V	100	31	3.3	-0.5	0.4
08221	00	V	100	29	3.8	0.7	0.6
08221	12	V	100	31	3.6	0.1	0.1
08302	12	V	100	31	3.7	1.1	0.4
08302	00	V	100	29	4.0	0.8	-0.2
08508	12	V	100	28	4.0	0.2	-0.3
08522	12	V	100	31	3.3	0.7	-0.6
08579	12	V	100	31	3.6	0.2	0.4
10035	12	V	100	30	3.3	0.2	0.1
10393	12	V	100	31	3.1	0.1	-1.2
10393	00	V	100	30	3.2	-0.3	-0.1
10410	12	V	100	31	3.3	-0.1	0.8
10410	00	V	100	29	2.8	0.3	-0.1
10739	00	V	100	29	4.6	-1.3	0.2
10739	12	V	100	31	3.2	0.8	0.0
11035	00	V	100	27	4.0	0.0	0.2
11035	12	V	100	31	4.0	1.2	0.5
12982	00	V	100	27	3.5	0.0	0.2
12982	12	V	100	24	3.7	-0.2	-0.9
16080	00	V	100	30	4.2	0.4	0.0
16080	12	V	100	31	3.8	0.0	0.1
16245	12	V	100	30	4.4	0.9	0.6
16245	00	V	100	30	4.4	0.6	-0.7
16320	12	V	100	31	3.3	0.2	0.1
16320	00	V	100	29	3.7	0.0	-0.4
16429	12	V	100	31	4.7	0.1	1.5
16429	00	V	100	30	4.5	0.1	0.9
16622	00	V	100	24	3.7	0.0	0.4
16754	00	V	100	24	4.0	0.8	-0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	100	18	6.3	1.0	-0.8
26435	12	V	100	11	3.2	0.2	1.0
60018	12	V	100	31	4.9	2.0	0.3
60018	00	V	100	30	3.8	0.7	0.9
7JUNA4	00	V	100	0	0.0	0.0	0.0
7JUNA4	12	V	100	0	0.0	0.0	0.0
FHM5UJ	00	V	100	8	3.9	0.6	1.3
FHM5UJ	12	V	100	8	3.2	0.7	-0.5
QCY3TG	00	V	100	12	4.4	0.2	0.3
QCY3TG	12	V	100	12	3.8	-0.8	0.8
VKB4L5	00	V	100	6	4.0	-1.0	-2.4
VKB4L5	12	V	100	5	4.8	1.5	-3.2
XKQLWQ	12	V	100	14	4.1	1.1	-0.5
XQFJRG	00	V	100	2	5.3	1.0	-2.6
XQFJRG	12	V	100	2	4.9	-2.8	-3.5
XWHDEA	12	V	100	0	0.0	0.0	0.0
YLV96W	00	V	100	6	3.8	1.5	2.0
YLV96W	12	V	100	3	3.5	-0.7	1.3

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                : MAR 2019
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	500	31	5.6	-1.4
01001	00	Z	500	30	4.6	0.5
01028	12	Z	500	31	15.4	3.7
01028	00	Z	500	31	4.3	1.6
01400	00	Z	500	20	79.2	79.0
01400	12	Z	500	28	80.4	80.2
01415	00	Z	500	29	5.9	2.7
01415	12	Z	500	28	5.4	4.2
02365	12	Z	500	26	4.1	2.4
02365	00	Z	500	27	3.9	2.0
02591	00	Z	500	26	8.9	8.5
02591	12	Z	500	26	9.5	8.9
02836	12	Z	500	31	3.3	0.0
02836	00	Z	500	31	3.6	1.0
02963	12	Z	500	31	3.6	2.1
02963	00	Z	500	31	4.2	2.1
03005	12	Z	500	31	4.4	-0.3
03005	00	Z	500	31	4.8	-1.2
03238	12	Z	500	3	4.6	4.1
03238	00	Z	500	31	5.5	3.5
03808	12	Z	500	31	6.2	4.7
03808	00	Z	500	31	6.0	4.7
03918	00	Z	500	27	9.3	9.0
03918	12	Z	500	8	10.1	9.4
03953	12	Z	500	31	19.1	11.3
03953	00	Z	500	31	6.5	4.3
04018	00	Z	500	30	3.5	2.4
04018	12	Z	500	30	4.5	0.2
04220	12	Z	500	31	12.5	1.9
04220	00	Z	500	31	4.3	0.2
04270	12	Z	500	31	6.4	-0.5
04270	00	Z	500	31	3.8	-1.2
04320	00	Z	500	31	3.1	1.0
04320	12	Z	500	31	5.5	1.3
04339	00	Z	500	31	5.1	2.7
04339	12	Z	500	31	15.9	6.4
04360	00	Z	500	31	12.9	-11.2
04360	12	Z	500	31	11.2	-9.8
06011	00	Z	500	31	7.6	5.9

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	500	32	8.1	2.5
06260	12	Z	500	6	4.2	3.0
06260	00	Z	500	29	4.8	2.1
06610	12	Z	500	31	4.5	3.7
06610	00	Z	500	31	5.6	4.2
07110	12	Z	500	31	3.8	1.9
07110	00	Z	500	30	4.5	-0.5
07510	00	Z	500	30	5.4	4.4
07510	12	Z	500	30	8.7	7.8
07645	12	Z	500	31	5.4	4.3
07645	00	Z	500	30	3.6	0.0
07761	12	Z	500	31	8.0	6.9
07761	00	Z	500	31	5.2	2.6
08001	00	Z	500	31	5.6	5.3
08001	12	Z	500	31	9.0	8.3
08221	00	Z	500	31	8.9	8.2
08221	12	Z	500	31	9.2	8.8
08302	12	Z	500	31	4.3	2.1
08302	00	Z	500	31	3.7	2.4
08508	12	Z	500	28	7.0	6.1
08522	12	Z	500	31	8.3	7.6
08579	12	Z	500	31	9.1	8.4
10035	12	Z	500	30	7.1	5.5
10393	12	Z	500	31	3.3	1.6
10393	00	Z	500	31	3.2	2.1
10410	12	Z	500	31	3.9	0.7
10410	00	Z	500	30	3.8	2.4
10739	00	Z	500	32	6.7	5.5
10739	12	Z	500	31	6.7	5.6
11035	00	Z	500	29	8.4	6.0
11035	12	Z	500	31	13.1	10.7
12982	00	Z	500	28	4.6	3.9
12982	12	Z	500	24	7.4	6.5
16080	00	Z	500	31	2.4	-0.2
16080	12	Z	500	31	3.3	-0.4
16245	12	Z	500	31	4.0	0.4
16245	00	Z	500	31	3.0	0.2
16320	12	Z	500	31	11.3	7.2
16320	00	Z	500	30	9.2	5.1
16429	12	Z	500	31	5.7	4.6
16429	00	Z	500	31	5.3	3.9
16622	00	Z	500	30	7.5	4.5
16754	00	Z	500	30	4.2	2.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	500	30	4.0	3.2
26435	12	Z	500	12	3.8	1.6
60018	12	Z	500	31	7.4	6.5
60018	00	Z	500	31	6.2	5.3
7JUNA4	00	Z	500	3	7.8	0.6
7JUNA4	12	Z	500	9	9.8	6.6
FHM5UJ	00	Z	500	8	14.1	8.0
FHM5UJ	12	Z	500	11	13.2	7.7
QCY3TG	00	Z	500	13	9.4	7.7
QCY3TG	12	Z	500	12	10.3	9.0
VKB4L5	00	Z	500	6	38.0	37.8
VKB4L5	12	Z	500	5	39.5	39.2
XKQLWQ	12	Z	500	16	20.1	19.2
XQFJRG	00	Z	500	4	7.7	-6.9
XQFJRG	12	Z	500	3	11.8	-7.2
XWHDEA	12	Z	500	1	2.1	2.1
YLV96W	00	Z	500	8	5.3	3.4
YLV96W	12	Z	500	6	4.4	-0.4

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                : MAR 2019
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	500	31	3.1	0.1	0.8
01001	00	V	500	29	3.9	-0.3	-0.3
01028	12	V	500	31	2.6	-0.2	-0.2
01028	00	V	500	30	2.7	0.0	-0.6
01400	00	V	500	20	2.5	0.0	0.8
01400	12	V	500	28	4.4	0.2	-0.2
01415	00	V	500	27	2.3	0.2	0.2
01415	12	V	500	28	3.1	0.4	0.5
02365	12	V	500	26	3.2	0.9	0.3
02365	00	V	500	26	3.5	0.9	0.1
02591	00	V	500	25	2.7	0.3	0.3
02591	12	V	500	26	3.2	-0.3	-0.8
02836	12	V	500	31	4.0	-0.3	-0.6
02836	00	V	500	30	2.6	-0.1	-0.3
02963	12	V	500	31	3.4	-0.3	0.4
02963	00	V	500	30	3.6	0.5	0.7
03005	12	V	500	31	3.1	0.0	0.0
03005	00	V	500	30	3.4	0.2	0.2
03238	12	V	500	3	1.5	0.3	-0.3
03238	00	V	500	29	3.3	0.6	0.1
03808	12	V	500	31	2.4	0.5	0.1
03808	00	V	500	30	3.1	0.5	0.2
03918	00	V	500	26	3.3	-0.6	0.4
03918	12	V	500	8	3.0	0.9	-0.3
03953	12	V	500	31	3.5	0.5	-1.0
03953	00	V	500	30	2.8	-0.1	0.0
04018	00	V	500	30	3.8	-0.4	0.4
04018	12	V	500	30	3.9	0.3	0.3
04220	12	V	500	31	2.5	0.3	-0.2
04220	00	V	500	30	2.9	-0.5	0.5
04270	12	V	500	31	2.9	0.1	-0.2
04270	00	V	500	30	3.5	0.6	0.0
04320	00	V	500	30	3.3	0.3	0.4
04320	12	V	500	31	3.4	-0.1	1.0
04339	00	V	500	30	3.0	0.4	0.1
04339	12	V	500	31	2.9	-0.3	0.1
04360	00	V	500	30	3.6	0.5	1.1
04360	12	V	500	31	4.2	0.2	0.0
06011	00	V	500	30	3.4	0.2	0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	500	31	3.7	0.1	-0.3
06260	12	V	500	6	4.0	1.1	-1.9
06260	00	V	500	28	2.8	0.7	-0.2
06610	12	V	500	31	3.1	-0.2	-0.3
06610	00	V	500	30	3.4	0.1	-0.3
07110	12	V	500	31	2.8	0.2	-0.1
07110	00	V	500	29	2.6	-0.3	0.5
07510	00	V	500	29	2.8	0.1	-0.3
07510	12	V	500	30	2.5	0.0	-0.3
07645	12	V	500	31	2.1	0.0	-0.1
07645	00	V	500	29	2.6	-0.2	-0.2
07761	12	V	500	31	3.1	0.2	-0.5
07761	00	V	500	30	3.0	0.5	-0.1
08001	00	V	500	30	2.3	-0.2	0.3
08001	12	V	500	31	2.7	-0.1	-0.1
08221	00	V	500	30	2.2	-0.1	0.3
08221	12	V	500	31	2.5	0.1	-0.1
08302	12	V	500	31	2.5	0.1	-0.4
08302	00	V	500	29	2.1	0.3	-0.2
08508	12	V	500	28	3.0	1.0	0.2
08522	12	V	500	31	2.8	0.8	-0.1
08579	12	V	500	31	2.7	0.1	0.1
10035	12	V	500	30	3.3	0.2	-0.6
10393	12	V	500	31	3.1	-0.1	-0.4
10393	00	V	500	30	2.4	0.4	0.0
10410	12	V	500	31	2.5	-0.2	-0.4
10410	00	V	500	29	2.8	-0.2	0.5
10739	00	V	500	30	4.1	0.6	-0.5
10739	12	V	500	31	3.8	1.1	-0.5
11035	00	V	500	27	3.0	-0.3	-0.6
11035	12	V	500	31	3.1	-0.1	-0.7
12982	00	V	500	28	3.5	-0.3	-0.3
12982	12	V	500	24	2.8	-0.2	0.3
16080	00	V	500	30	3.4	0.7	-1.2
16080	12	V	500	31	2.8	-0.1	-0.4
16245	12	V	500	31	2.6	0.8	0.1
16245	00	V	500	30	2.8	0.3	-0.3
16320	12	V	500	31	2.8	0.6	0.1
16320	00	V	500	29	3.5	0.5	0.0
16429	12	V	500	31	3.3	0.9	0.3
16429	00	V	500	30	3.1	0.6	0.7
16622	00	V	500	29	2.9	0.9	0.3
16754	00	V	500	28	4.2	0.3	0.8

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	500	28	6.6	-0.1	-1.5
26435	12	V	500	12	2.4	0.2	0.9
60018	12	V	500	31	3.6	0.7	0.7
60018	00	V	500	30	2.6	0.3	-0.1
7JUNA4	00	V	500	3	6.5	-3.8	-0.3
7JUNA4	12	V	500	9	5.6	-2.4	0.9
FHM5UJ	00	V	500	8	3.5	0.3	-0.3
FHM5UJ	12	V	500	11	3.6	1.3	-0.7
QCY3TG	00	V	500	13	3.3	-0.3	-0.3
QCY3TG	12	V	500	12	2.1	-0.1	-0.1
VKB4L5	00	V	500	6	2.4	0.6	-0.4
VKB4L5	12	V	500	5	1.6	-0.3	0.5
XKQLWQ	12	V	500	16	2.1	0.0	0.1
XQFJRG	00	V	500	4	2.4	-1.0	0.0
XQFJRG	12	V	500	3	3.7	-0.1	-1.0
XWHDEA	12	V	500	1	2.2	-2.0	-0.9
YLV96W	00	V	500	8	3.5	0.1	0.5
YLV96W	12	V	500	6	3.0	-0.5	-0.9

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                : MAR 2019
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	850	31	4.2	-2.5
01001	00	Z	850	30	3.3	-1.4
01028	12	Z	850	31	14.3	4.1
01028	00	Z	850	31	3.0	0.6
01400	00	Z	850	20	80.3	80.2
01400	12	Z	850	28	79.6	79.4
01415	00	Z	850	29	4.9	2.8
01415	12	Z	850	28	5.5	4.5
02365	12	Z	850	26	3.9	3.1
02365	00	Z	850	27	4.2	2.7
02591	00	Z	850	26	9.2	8.9
02591	12	Z	850	26	9.8	9.5
02836	12	Z	850	31	3.1	2.0
02836	00	Z	850	31	2.9	2.0
02963	12	Z	850	31	3.8	3.0
02963	00	Z	850	31	3.6	3.2
03005	12	Z	850	31	3.0	-0.3
03005	00	Z	850	31	4.1	-0.6
03238	12	Z	850	3	2.2	2.1
03238	00	Z	850	31	5.2	4.3
03808	12	Z	850	31	4.5	3.3
03808	00	Z	850	31	4.3	3.8
03918	00	Z	850	27	8.5	8.1
03918	12	Z	850	8	8.6	7.6
03953	12	Z	850	31	6.2	5.4
03953	00	Z	850	31	5.3	4.2
04018	00	Z	850	30	4.2	-0.5
04018	12	Z	850	30	3.6	-0.6
04220	12	Z	850	31	14.6	3.5
04220	00	Z	850	31	3.2	1.4
04270	12	Z	850	31	4.5	-0.2
04270	00	Z	850	31	3.4	0.6
04320	00	Z	850	31	3.5	-0.3
04320	12	Z	850	31	5.8	-2.6
04339	00	Z	850	31	5.2	0.6
04339	12	Z	850	31	16.0	1.9
04360	00	Z	850	31	13.3	-10.3
04360	12	Z	850	31	14.5	-12.0
06011	00	Z	850	31	10.1	6.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	850	32	10.2	3.7
06260	12	Z	850	6	3.7	2.9
06260	00	Z	850	29	3.1	2.0
06610	12	Z	850	31	4.5	2.5
06610	00	Z	850	31	5.0	3.7
07110	12	Z	850	31	2.9	1.3
07110	00	Z	850	30	2.5	-0.5
07510	00	Z	850	30	3.7	2.7
07510	12	Z	850	30	4.8	3.9
07645	12	Z	850	31	3.6	0.9
07645	00	Z	850	30	3.4	-0.5
07761	12	Z	850	31	5.9	4.7
07761	00	Z	850	31	4.4	2.9
08001	00	Z	850	31	4.0	3.1
08001	12	Z	850	31	4.7	4.3
08221	00	Z	850	31	4.9	4.2
08221	12	Z	850	31	6.1	5.4
08302	12	Z	850	31	3.0	-1.1
08302	00	Z	850	31	3.0	-1.1
08508	12	Z	850	29	4.3	3.1
08522	12	Z	850	31	4.5	3.9
08579	12	Z	850	31	4.8	4.3
10035	12	Z	850	30	7.1	6.6
10393	12	Z	850	31	2.9	2.3
10393	00	Z	850	31	3.5	2.4
10410	12	Z	850	31	3.1	1.9
10410	00	Z	850	30	3.4	1.4
10739	00	Z	850	32	6.5	5.9
10739	12	Z	850	31	5.5	4.6
11035	00	Z	850	29	9.9	9.3
11035	12	Z	850	31	13.2	11.7
12982	00	Z	850	28	3.7	2.3
12982	12	Z	850	24	5.8	5.3
16080	00	Z	850	31	3.8	-1.2
16080	12	Z	850	31	4.4	-0.9
16245	12	Z	850	31	2.9	0.2
16245	00	Z	850	31	3.0	0.5
16320	12	Z	850	31	11.3	6.0
16320	00	Z	850	30	9.4	4.5
16429	12	Z	850	31	5.2	4.1
16429	00	Z	850	31	4.4	3.4
16622	00	Z	850	30	3.5	2.4
16754	00	Z	850	30	3.5	0.7

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	850	31	3.5	2.4
26435	12	Z	850	12	4.5	3.6
60018	12	Z	850	31	4.0	2.5
60018	00	Z	850	31	2.9	1.2
7JUNA4	00	Z	850	3	2.6	1.8
7JUNA4	12	Z	850	9	3.6	2.1
FHM5UJ	00	Z	850	8	14.0	11.4
FHM5UJ	12	Z	850	11	12.9	7.3
QCY3TG	00	Z	850	13	4.7	4.0
QCY3TG	12	Z	850	12	6.1	5.0
VKB4L5	00	Z	850	6	34.5	34.3
VKB4L5	12	Z	850	5	32.9	32.6
XKQLWQ	12	Z	850	16	14.2	12.4
XQFJRG	00	Z	850	4	12.8	-10.9
XQFJRG	12	Z	850	3	11.4	-9.2
XWHDEA	12	Z	850	1	9.9	-9.9
YLV96W	00	Z	850	9	4.6	-1.3
YLV96W	12	Z	850	9	9.8	-5.1

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                : MAR 2019
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	850	31	3.0	0.0	-0.3
01001	00	V	850	29	4.6	0.4	-0.2
01028	12	V	850	31	3.4	-0.1	-0.6
01028	00	V	850	30	3.3	0.1	-0.9
01400	00	V	850	20	2.5	0.2	0.5
01400	12	V	850	28	2.5	0.7	-0.5
01415	00	V	850	27	2.3	0.2	-0.1
01415	12	V	850	28	2.8	0.4	0.6
02365	12	V	850	26	3.6	-0.2	0.8
02365	00	V	850	26	2.9	0.0	-0.2
02591	00	V	850	25	2.5	0.1	-0.1
02591	12	V	850	26	3.1	0.0	-0.7
02836	12	V	850	31	3.2	0.8	-0.5
02836	00	V	850	30	3.7	0.2	0.6
02963	12	V	850	31	2.8	0.2	-0.6
02963	00	V	850	30	2.7	0.1	0.2
03005	12	V	850	31	3.0	-0.3	-0.1
03005	00	V	850	30	2.6	-0.2	0.4
03238	12	V	850	3	2.3	-0.4	1.5
03238	00	V	850	29	3.4	0.5	-0.3
03808	12	V	850	31	2.5	-0.2	-0.1
03808	00	V	850	30	2.7	-0.5	-0.7
03918	00	V	850	26	3.3	-0.1	-0.1
03918	12	V	850	8	3.1	0.1	0.3
03953	12	V	850	31	4.2	-0.3	0.2
03953	00	V	850	30	2.9	0.5	0.2
04018	00	V	850	30	3.7	-0.1	-0.1
04018	12	V	850	30	3.2	0.6	0.2
04220	12	V	850	31	3.3	0.6	0.6
04220	00	V	850	30	2.9	-0.5	-0.4
04270	12	V	850	31	4.8	-0.3	-0.1
04270	00	V	850	30	5.2	0.2	0.8
04320	00	V	850	30	3.0	0.6	-0.4
04320	12	V	850	31	4.7	0.3	0.8
04339	00	V	850	30	5.2	1.8	1.2
04339	12	V	850	31	4.1	0.5	0.1
04360	00	V	850	30	5.0	1.9	0.1
04360	12	V	850	31	6.6	2.5	0.8
06011	00	V	850	30	3.3	0.1	0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	850	31	5.2	0.5	0.0
06260	12	V	850	6	2.8	0.9	1.7
06260	00	V	850	28	2.5	0.1	-0.6
06610	12	V	850	31	3.0	0.1	0.8
06610	00	V	850	30	3.0	0.2	-0.4
07110	12	V	850	31	3.2	0.2	0.6
07110	00	V	850	29	2.6	0.1	-0.1
07510	00	V	850	29	2.4	0.2	-0.5
07510	12	V	850	30	2.6	0.4	0.0
07645	12	V	850	31	4.6	-1.5	-0.1
07645	00	V	850	29	3.5	-0.6	0.1
07761	12	V	850	31	4.5	-0.5	0.8
07761	00	V	850	30	4.7	0.6	1.5
08001	00	V	850	30	2.8	-0.2	-0.5
08001	12	V	850	31	3.0	0.3	0.7
08221	00	V	850	30	3.1	0.1	-0.5
08221	12	V	850	31	3.4	-0.2	0.3
08302	12	V	850	31	2.7	0.1	-0.4
08302	00	V	850	29	3.4	-0.1	-0.3
08508	12	V	850	29	3.2	-0.3	0.2
08522	12	V	850	31	3.3	0.3	-0.1
08579	12	V	850	31	2.5	-0.2	-0.2
10035	12	V	850	30	3.3	-0.3	0.2
10393	12	V	850	31	2.9	0.2	-0.2
10393	00	V	850	30	2.4	0.6	-0.6
10410	12	V	850	31	3.1	0.3	0.1
10410	00	V	850	29	2.4	0.0	0.6
10739	00	V	850	30	3.0	0.3	0.2
10739	12	V	850	31	4.2	-1.0	0.0
11035	00	V	850	27	3.2	0.1	-0.5
11035	12	V	850	31	3.8	1.2	-0.4
12982	00	V	850	28	2.6	-0.3	-0.2
12982	12	V	850	24	3.1	-0.6	0.1
16080	00	V	850	30	3.3	-0.3	-0.4
16080	12	V	850	31	3.0	-0.3	-0.2
16245	12	V	850	31	3.7	-0.6	0.4
16245	00	V	850	30	3.0	0.2	-1.0
16320	12	V	850	31	3.7	0.5	-0.3
16320	00	V	850	29	3.0	-0.4	-0.2
16429	12	V	850	31	2.7	-0.7	0.1
16429	00	V	850	30	3.3	0.0	0.1
16622	00	V	850	29	3.0	0.8	-0.7
16754	00	V	850	28	3.3	0.3	-0.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	850	31	3.2	1.6	0.2
26435	12	V	850	12	2.4	0.3	0.2
60018	12	V	850	31	3.8	0.1	0.6
60018	00	V	850	30	4.5	-0.2	1.1
7JUNA4	00	V	850	3	2.8	-1.8	-0.4
7JUNA4	12	V	850	9	4.4	-2.0	-0.4
FHM5UJ	00	V	850	8	2.9	0.0	-0.7
FHM5UJ	12	V	850	11	3.3	-0.2	1.8
QCY3TG	00	V	850	13	2.3	0.0	0.5
QCY3TG	12	V	850	12	2.4	0.3	-0.4
VKB4L5	00	V	850	6	1.6	0.4	-0.1
VKB4L5	12	V	850	5	1.1	-0.2	0.3
XKQLWQ	12	V	850	16	2.6	0.1	-0.8
XQFJRG	00	V	850	4	2.7	-0.7	-0.1
XQFJRG	12	V	850	3	2.2	1.3	0.8
XWHDEA	12	V	850	1	3.1	3.1	0.0
YLV96W	00	V	850	9	3.3	0.6	-1.1
YLV96W	12	V	850	9	4.2	1.6	-0.6

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                 : MAR 2019
         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
003	99	P	SUR	73	16	5	1	0.5	1.0	1.1
03380	99	P	SUR	54	0	759	0	0.4	-0.2	0.4
1300001	99	P	SUR	11	-23	640	0	0.3	0.0	0.3
1300008	99	P	SUR	15	-38	688	0	0.3	-0.2	0.4
1300130	99	P	SUR	28	-16	743	0	0.3	-0.0	0.3
1300131	99	P	SUR	28	-17	743	0	0.4	-0.1	0.4
1301569	99	P	SUR	20	-33	470	0	0.3	-0.1	0.3
1301603	99	P	SUR	25	-60	744	0	0.4	-0.2	0.4
1301605	99	P	SUR	22	-53	744	0	0.3	0.1	0.3
1301607	99	P	SUR	20	-44	744	0	0.3	0.4	0.5
1301608	99	P	SUR	26	-44	744	0	0.3	0.5	0.6
1301609	99	P	SUR	19	-57	744	0	0.2	0.3	0.4
1301610	99	P	SUR	22	-46	744	0	0.3	0.2	0.4
1301611	99	P	SUR	28	-35	744	0	0.3	0.3	0.4
1301612	99	P	SUR	22	-38	744	0	0.3	0.0	0.3
1301618	99	P	SUR	16	-26	729	0	0.3	0.6	0.7
1301619	99	P	SUR	37	-20	488	0	0.3	0.5	0.6
1402554	99	P	SUR	22	-63	708	0	1.0	0.3	1.1
1402559	99	P	SUR	31	-46	744	0	0.3	0.2	0.3
1501529	99	P	SUR	25	-34	740	0	0.3	0.2	0.3
1501531	99	P	SUR	21	-58	740	0	0.3	-0.3	0.5
1501534	99	P	SUR	21	-64	740	0	0.3	-1.1	1.2
1501581	99	P	SUR	13	-46	740	0	0.2	0.2	0.3
2601621	99	P	SUR	78	-7	531	0	0.8	-0.5	1.0
2601622	99	P	SUR	76	39	141	0	0.9	0.2	0.9
29124	99	P	SUR	30	-13	1	0	0.0	0.5	0.5
3100735	99	P	SUR	29	-59	744	0	0.9	0.0	0.9
3101532	99	P	SUR	12	-67	531	0	0.6	0.2	0.7
31735	99	P	SUR	29	-59	744	0	0.9	0.0	0.9
3301518	99	P	SUR	14	-69	740	0	0.3	0.6	0.7
3301520	99	P	SUR	15	-66	740	0	0.3	0.3	0.4
4100041	99	P	SUR	14	-46	4400	0	0.3	0.2	0.3
4100043	99	P	SUR	21	-65	4305	0	0.3	-0.0	0.3
4100044	99	P	SUR	22	-59	4292	0	0.3	0.1	0.3
4100046	99	P	SUR	24	-68	4398	0	0.3	0.5	0.6
4100049	99	P	SUR	27	-63	4202	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
4100052	99	P	SUR	18	-65	4413	0	0.3	-1.2	1.2
4100053	99	P	SUR	18	-66	4420	0	0.2	-0.7	0.8
4100056	99	P	SUR	18	-65	4401	0	0.3	-0.9	0.9
4100139	99	P	SUR	20	-38	644	0	0.3	-0.4	0.5
4100300	99	P	SUR	16	-57	743	0	0.3	-0.0	0.3
4100597	99	P	SUR	30	-38	488	0	1.9	0.0	1.9
4100729	99	P	SUR	37	-31	744	0	0.4	0.4	0.6
4100730	99	P	SUR	39	-27	744	0	0.4	0.6	0.7
4101529	99	P	SUR	24	-69	669	0	0.5	-0.4	0.6
4101530	99	P	SUR	33	-28	82	0	0.2	0.7	0.7
4101531	99	P	SUR	39	-15	636	0	0.3	0.8	0.9
4101532	99	P	SUR	39	-40	436	0	0.5	0.1	0.5
4101533	99	P	SUR	51	-46	462	0	0.5	0.6	0.8
4101534	99	P	SUR	50	-27	721	0	0.5	0.4	0.6
4101535	99	P	SUR	45	-38	252	0	0.5	-0.1	0.5
4101536	99	P	SUR	45	-25	694	0	0.4	0.2	0.5
4101537	99	P	SUR	41	-16	685	0	0.3	0.7	0.8
4101539	99	P	SUR	36	-63	742	0	0.6	-0.2	0.6
4101554	99	P	SUR	29	-61	735	0	0.3	0.2	0.4
4101556	99	P	SUR	45	-22	744	0	0.4	0.5	0.6
4101557	99	P	SUR	37	-29	743	0	0.3	0.4	0.5
4101558	99	P	SUR	25	-32	744	0	0.3	0.5	0.6
4101560	99	P	SUR	34	-45	740	0	0.3	0.5	0.6
4101562	99	P	SUR	34	-55	660	0	0.5	0.3	0.6
4101564	99	P	SUR	28	-45	730	0	0.3	-0.0	0.3
4101565	99	P	SUR	31	-37	694	0	0.3	0.5	0.6
4101566	99	P	SUR	26	-56	655	0	0.3	0.1	0.3
4101567	99	P	SUR	39	-50	206	0	0.5	0.3	0.6
4101568	99	P	SUR	34	-53	592	0	0.4	0.2	0.5
4101570	99	P	SUR	27	-56	741	0	0.3	0.2	0.4
4101572	99	P	SUR	49	-25	661	0	0.4	0.3	0.5
4101573	99	P	SUR	38	-47	742	0	0.4	0.2	0.4
4101575	99	P	SUR	40	-56	339	0	0.5	0.1	0.5
4101579	99	P	SUR	23	-63	744	0	2.3	-0.6	2.4
4101595	99	P	SUR	18	-65	447	25	1.4	0.2	1.4
4101596	99	P	SUR	62	-12	743	0	0.6	0.6	0.9
4101598	99	P	SUR	16	-55	742	0	0.3	0.3	0.4
4101606	99	P	SUR	44	-10	744	0	0.4	0.4	0.5
4101607	99	P	SUR	43	-12	744	0	0.3	0.3	0.5
4101608	99	P	SUR	65	-13	744	0	0.4	0.4	0.6
4101609	99	P	SUR	37	-21	744	0	0.3	0.4	0.5
4101610	99	P	SUR	66	-12	744	0	0.4	0.4	0.6
4101612	99	P	SUR	44	-2	744	0	0.4	0.8	0.9

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4101619	99	P	SUR	51	-13	744	0	0.5	0.1	0.5
4101620	99	P	SUR	51	-9	744	0	0.5	0.3	0.6
4101621	99	P	SUR	36	-32	584	0	0.3	0.3	0.5
4101622	99	P	SUR	70	-10	744	0	0.4	-0.0	0.4
4101623	99	P	SUR	55	-53	744	0	0.6	0.1	0.6
4101624	99	P	SUR	63	-38	592	5	4.0	2.0	4.5
4101625	99	P	SUR	59	-42	744	0	0.6	0.1	0.6
4101626	99	P	SUR	64	-36	307	0	1.8	1.1	2.1
4101627	99	P	SUR	56	-32	744	0	0.6	-0.1	0.6
4101700	99	P	SUR	25	-54	744	0	0.3	0.0	0.3
4101702	99	P	SUR	28	-60	744	0	0.3	-0.2	0.3
4101705	99	P	SUR	30	-33	744	0	0.3	0.1	0.3
4101706	99	P	SUR	36	-30	744	0	0.5	-0.4	0.6
4101707	99	P	SUR	34	-29	744	0	0.3	0.2	0.4
4101708	99	P	SUR	28	-42	742	0	0.3	-0.5	0.5
4101709	99	P	SUR	18	-66	743	0	0.3	-1.1	1.1
4101712	99	P	SUR	36	-29	731	0	0.4	0.4	0.6
4101713	99	P	SUR	35	-62	744	0	0.5	-0.3	0.6
4101714	99	P	SUR	32	-26	744	0	0.3	0.2	0.4
4101715	99	P	SUR	29	-55	744	0	0.4	0.0	0.4
4101716	99	P	SUR	25	-54	744	0	0.3	-1.0	1.0
4101717	99	P	SUR	26	-62	744	0	0.3	-0.3	0.4
4101718	99	P	SUR	34	-37	744	0	0.4	0.1	0.4
4101719	99	P	SUR	33	-51	744	0	0.4	-0.1	0.4
4101720	99	P	SUR	43	-53	744	0	0.8	0.9	1.2
4101721	99	P	SUR	36	-47	744	0	0.4	0.3	0.5
4101742	99	P	SUR	40	-41	623	7	2.6	0.1	2.6
4101743	99	P	SUR	29	-62	743	0	0.4	0.5	0.6
4101760	99	P	SUR	27	-54	719	1	0.8	0.2	0.8
4101762	99	P	SUR	26	-60	712	1	0.6	0.2	0.7
4101767	99	P	SUR	13	-23	611	0	1.0	1.0	1.4
41041	99	P	SUR	14	-46	1274	0	0.4	0.6	0.7
41043	99	P	SUR	21	-65	1315	0	0.4	0.4	0.5
41044	99	P	SUR	22	-59	1343	0	0.4	0.5	0.6
41046	99	P	SUR	24	-68	1273	0	0.4	0.9	1.0
41049	99	P	SUR	28	-63	1118	0	0.4	0.3	0.5
41052	99	P	SUR	18	-65	1976	0	0.3	-1.2	1.2
41053	99	P	SUR	19	-66	2020	0	0.3	-0.8	0.8
41056	99	P	SUR	18	-66	1836	0	0.4	-0.9	1.0
41300	99	P	SUR	16	-57	743	0	0.3	-0.0	0.3
41597	99	P	SUR	30	-38	488	0	1.9	0.0	1.9
41729	99	P	SUR	37	-31	744	0	0.4	0.4	0.6
41730	99	P	SUR	39	-27	744	0	0.4	0.6	0.7

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4200060	99	P	SUR	16	-63	4295	0	0.3	-0.2	0.3
4200085	99	P	SUR	18	-67	889	0	0.3	-0.9	0.9
4201527	99	P	SUR	40	-63	683	0	0.5	0.5	0.7
42060	99	P	SUR	16	-63	1341	0	0.4	0.2	0.4
42085	99	P	SUR	18	-67	858	0	0.3	-0.9	0.9
4400005	99	P	SUR	43	-69	706	0	0.6	-0.3	0.6
4400027	99	P	SUR	44	-67	726	0	0.6	-0.3	0.7
4400032	99	P	SUR	44	-69	635	0	0.5	-1.0	1.2
4400033	99	P	SUR	44	-69	732	0	0.5	-1.0	1.1
4400034	99	P	SUR	44	-68	694	0	0.5	-0.5	0.7
4400037	99	P	SUR	43	-68	705	0	0.5	-1.0	1.1
44005	99	P	SUR	43	-69	717	0	0.6	-0.3	0.6
4400513	99	P	SUR	54	-10	644	0	0.4	-0.5	0.7
4400517	99	P	SUR	26	-68	741	0	0.3	-0.1	0.3
4400521	99	P	SUR	35	-27	693	0	0.3	-0.8	0.8
4400746	99	P	SUR	33	-40	744	0	0.3	0.2	0.4
4400777	99	P	SUR	26	-46	744	0	0.3	0.2	0.4
4400778	99	P	SUR	24	-55	744	0	0.3	0.2	0.3
4400857	99	P	SUR	33	-41	744	0	0.3	0.3	0.5
4400874	99	P	SUR	35	-35	600	4	2.3	0.2	2.3
4401503	99	P	SUR	37	-52	744	0	0.4	-0.2	0.4
4401531	99	P	SUR	36	-40	744	0	0.4	0.2	0.4
4401536	99	P	SUR	36	-15	736	0	0.3	0.7	0.7
4401537	99	P	SUR	32	-39	598	0	0.4	-0.5	0.7
4401540	99	P	SUR	34	-52	743	0	0.5	-0.1	0.5
4401541	99	P	SUR	35	-25	744	0	0.3	0.0	0.3
4401544	99	P	SUR	35	-44	388	0	0.3	-0.8	0.9
4401549	99	P	SUR	59	-8	668	0	0.5	0.1	0.5
4401551	99	P	SUR	40	-25	744	0	1.4	0.3	1.4
4401553	99	P	SUR	73	11	698	2	2.5	-0.0	2.5
4401556	99	P	SUR	35	-27	744	0	0.5	0.5	0.7
4401557	99	P	SUR	37	-29	744	0	0.3	0.4	0.5
4401558	99	P	SUR	66	12	743	0	0.4	0.0	0.4
4401559	99	P	SUR	46	-11	744	0	0.8	0.8	1.1
4401561	99	P	SUR	28	-41	744	0	0.4	-0.1	0.4
4401562	99	P	SUR	36	-19	479	25	2.4	-0.4	2.4
4401563	99	P	SUR	27	-47	744	0	0.3	-0.5	0.6
4401564	99	P	SUR	39	-29	744	0	0.9	1.0	1.3
4401565	99	P	SUR	60	-16	743	0	0.5	0.2	0.6
4401567	99	P	SUR	51	-42	744	0	0.5	0.4	0.6
4401568	99	P	SUR	49	-38	744	0	0.5	0.2	0.6
4401569	99	P	SUR	53	-47	744	0	0.4	0.1	0.4
4401570	99	P	SUR	48	-20	744	0	0.5	0.3	0.6

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4401571	99	P	SUR	48	-16	636	0	0.5	0.2	0.6
4401572	99	P	SUR	46	-48	656	0	0.5	0.3	0.6
4401573	99	P	SUR	49	-39	744	0	0.6	0.2	0.7
4401574	99	P	SUR	54	-36	744	0	0.6	0.2	0.6
4401575	99	P	SUR	50	-47	744	0	0.5	0.8	0.9
4401605	99	P	SUR	66	12	691	0	0.4	-0.2	0.5
4401611	99	P	SUR	43	-62	690	0	0.6	0.4	0.7
4401613	99	P	SUR	40	-11	691	0	0.3	0.6	0.7
4401616	99	P	SUR	38	-38	690	0	0.5	0.0	0.5
4401633	99	P	SUR	33	-18	691	0	0.3	0.5	0.6
4401750	99	P	SUR	63	-10	640	0	0.5	-1.5	1.6
4401751	99	P	SUR	64	-2	688	0	0.4	0.5	0.7
4401753	99	P	SUR	63	-12	607	0	0.5	0.6	0.8
4401799	99	P	SUR	18	-48	695	0	0.3	0.2	0.4
4401802	99	P	SUR	42	-19	690	0	1.0	0.6	1.1
44027	99	P	SUR	44	-67	742	0	0.6	-0.3	0.7
44032	99	P	SUR	44	-69	635	0	0.5	-1.1	1.2
44033	99	P	SUR	44	-69	732	0	0.5	-1.0	1.1
44034	99	P	SUR	44	-68	694	0	0.5	-0.5	0.7
44037	99	P	SUR	44	-68	705	0	0.5	-1.0	1.1
44137	99	P	SUR	42	-62	755	0	0.7	-0.3	0.7
44139	99	P	SUR	44	-57	732	0	0.5	-0.1	0.5
44150	99	P	SUR	43	-64	721	0	0.7	-0.0	0.7
44258	99	P	SUR	45	-63	739	0	0.5	-0.1	0.5
44513	99	P	SUR	54	-10	644	0	0.4	-0.5	0.7
44517	99	P	SUR	26	-68	741	0	0.3	-0.1	0.3
44521	99	P	SUR	35	-27	689	0	0.3	-0.8	0.8
44746	99	P	SUR	33	-40	744	0	0.3	0.2	0.4
44777	99	P	SUR	26	-46	744	0	0.3	0.2	0.4
44778	99	P	SUR	24	-55	744	0	0.3	0.2	0.3
44857	99	P	SUR	33	-41	744	0	0.3	0.3	0.5
44874	99	P	SUR	35	-35	600	4	2.3	0.2	2.3
4700546	99	P	SUR	26	-53	682	0	0.3	0.1	0.3
4701669	99	P	SUR	43	-34	691	0	0.6	0.3	0.7
47546	99	P	SUR	26	-53	634	0	0.3	0.1	0.3
4802004	99	P	SUR	66	-15	476	0	0.5	-0.7	0.9
4802504	99	P	SUR	84	-59	691	0	0.6	0.3	0.7
4802505	99	P	SUR	85	-55	691	0	0.6	0.4	0.7
6100001	99	P	SUR	43	8	744	0	0.8	0.3	0.8
6100002	99	P	SUR	42	5	743	0	0.5	-0.1	0.5
61001	99	P	SUR	43	8	744	0	0.8	0.3	0.8
6100196	99	P	SUR	42	4	743	0	0.6	0.0	0.7
6100197	99	P	SUR	40	4	743	0	0.4	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
6100198	99	P	SUR	37	-2	731	0	0.4	0.4	0.5
61002	99	P	SUR	42	5	743	0	0.5	-0.1	0.5
6100280	99	P	SUR	41	1	742	0	0.5	0.3	0.5
6100281	99	P	SUR	40	0	743	0	0.5	0.2	0.6
6100417	99	P	SUR	38	0	743	0	0.4	0.2	0.5
6101007	99	P	SUR	36	25	193	0	0.6	-0.2	0.6
6102501	99	P	SUR	33	23	280	0	6.0	-4.9	7.7
6200024	99	P	SUR	44	-3	443	0	0.5	-0.0	0.5
6200025	99	P	SUR	44	-6	743	0	0.5	-0.2	0.5
6200082	99	P	SUR	44	-8	743	0	0.4	0.0	0.5
6200084	99	P	SUR	42	-9	743	0	0.5	-0.1	0.5
6200085	99	P	SUR	36	-7	743	0	0.4	0.4	0.6
6200091	99	P	SUR	53	-5	472	0	1.2	-0.1	1.2
6200093	99	P	SUR	55	-8	1	0	0.0	-0.3	0.3
6200094	99	P	SUR	52	-7	743	0	0.7	0.0	0.7
62001	99	P	SUR	45	-5	743	0	0.5	0.1	0.5
6200191	99	P	SUR	41	-10	540	0	0.5	0.4	0.6
6200192	99	P	SUR	40	-10	526	0	0.3	0.2	0.4
6200199	99	P	SUR	40	-9	535	0	0.3	-0.0	0.3
6200200	99	P	SUR	36	-8	547	0	0.5	0.0	0.5
6201030	99	P	SUR	44	-4	736	0	0.5	1.1	1.2
62029	99	P	SUR	49	-12	1439	0	0.5	-0.2	0.5
6203503	99	P	SUR	49	-14	744	0	0.5	-0.1	0.5
6203504	99	P	SUR	28	-64	37	0	0.2	-0.1	0.3
6203523	99	P	SUR	68	-2	704	0	0.4	-0.4	0.6
6203525	99	P	SUR	68	2	683	0	0.5	-0.5	0.7
6203527	99	P	SUR	63	-6	600	0	0.4	-2.5	2.5
6203528	99	P	SUR	29	-21	401	0	0.3	-0.0	0.3
6203529	99	P	SUR	29	-70	741	0	0.4	-0.6	0.7
6203575	99	P	SUR	64	-25	729	0	0.6	0.2	0.6
6203576	99	P	SUR	64	-35	722	0	0.6	0.5	0.8
6203577	99	P	SUR	63	-21	725	0	0.5	0.2	0.6
6203578	99	P	SUR	63	-21	654	195	5.0	3.3	6.0
6203601	99	P	SUR	46	-9	744	0	0.4	0.7	0.8
6203603	99	P	SUR	64	-29	744	0	0.9	0.3	0.9
6203607	99	P	SUR	34	-30	743	0	0.3	0.3	0.5
6203608	99	P	SUR	51	-9	743	0	0.5	0.4	0.6
6203609	99	P	SUR	48	-14	744	0	0.5	0.1	0.5
6203610	99	P	SUR	50	-8	680	0	0.4	0.3	0.5
6203706	99	P	SUR	25	-61	744	0	0.3	0.3	0.4
6203707	99	P	SUR	34	-38	744	0	0.4	0.4	0.5
6203708	99	P	SUR	34	-42	744	0	0.5	0.4	0.6
62050	99	P	SUR	50	-4	745	0	0.4	0.3	0.5

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62081	99	P	SUR	51	-13	640	0	0.5	-0.3	0.6
62087	99	P	SUR	54	9	428	0	0.4	-1.7	1.8
62091	99	P	SUR	53	-5	472	0	1.2	-0.1	1.2
62093	99	P	SUR	55	-8	1	0	0.0	-0.3	0.3
62094	99	P	SUR	52	-7	472	0	0.8	-0.0	0.8
62095	99	P	SUR	53	-16	710	0	0.5	-0.2	0.5
62102	99	P	SUR	58	2	759	0	0.4	0.2	0.5
62103	99	P	SUR	50	-3	748	0	0.5	0.5	0.7
62104	99	P	SUR	57	1	759	0	0.4	-0.1	0.4
62107	99	P	SUR	50	-6	1441	0	0.6	0.4	0.7
62112	99	P	SUR	58	0	758	0	0.4	0.3	0.5
62113	99	P	SUR	58	0	759	0	0.6	0.2	0.7
62114	99	P	SUR	58	0	1461	0	0.6	0.2	0.7
62115	99	P	SUR	58	-3	758	0	0.4	0.0	0.5
62116	99	P	SUR	58	1	759	0	0.5	0.0	0.5
62118	99	P	SUR	58	1	759	0	0.4	0.6	0.7
62119	99	P	SUR	57	2	750	0	0.5	0.5	0.7
62120	99	P	SUR	56	2	759	0	0.6	0.0	0.6
62121	99	P	SUR	54	3	378	0	1.7	0.7	1.8
62122	99	P	SUR	57	2	1461	0	0.5	0.2	0.5
62124	99	P	SUR	54	-4	714	0	0.4	0.0	0.4
62127	99	P	SUR	54	1	758	0	0.4	0.6	0.7
62129	99	P	SUR	58	0	759	0	0.6	0.3	0.7
62130	99	P	SUR	59	1	759	0	0.5	-0.1	0.5
62131	99	P	SUR	54	1	759	0	0.4	0.5	0.6
62132	99	P	SUR	56	2	759	0	0.7	0.8	1.1
62133	99	P	SUR	57	1	759	0	0.5	0.1	0.5
62134	99	P	SUR	58	1	759	0	0.4	0.8	0.9
62135	99	P	SUR	54	2	759	0	0.4	0.3	0.5
62136	99	P	SUR	54	3	758	0	0.4	0.7	0.8
62138	99	P	SUR	54	0	1458	0	0.6	1.1	1.3
62139	99	P	SUR	53	2	1458	0	0.4	0.4	0.5
62140	99	P	SUR	57	1	1461	0	0.5	0.1	0.5
62141	99	P	SUR	58	-4	705	0	0.5	-2.4	2.4
62143	99	P	SUR	58	2	759	0	0.8	0.9	1.2
62144	99	P	SUR	53	2	759	0	0.5	0.5	0.7
62145	99	P	SUR	53	3	1461	0	0.5	0.5	0.7
62146	99	P	SUR	57	2	662	0	0.7	0.4	0.8
62148	99	P	SUR	54	2	759	0	0.6	0.9	1.0
62149	99	P	SUR	54	1	759	0	0.4	0.8	0.8
62150	99	P	SUR	54	1	759	0	0.5	1.5	1.5
62151	99	P	SUR	57	2	1460	0	0.4	0.3	0.5
62152	99	P	SUR	57	2	759	0	0.5	0.7	0.9

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62153	99	P	SUR	57	2	1461	0	0.5	0.3	0.6
62154	99	P	SUR	56	2	759	0	0.4	0.1	0.4
62155	99	P	SUR	58	1	750	0	0.5	0.7	0.8
62157	99	P	SUR	58	0	759	0	0.4	0.0	0.4
62160	99	P	SUR	57	2	1461	0	0.4	0.3	0.5
62161	99	P	SUR	58	1	757	0	0.6	0.3	0.7
62162	99	P	SUR	57	1	753	0	0.4	0.0	0.4
62163	99	P	SUR	48	-8	744	0	0.6	0.4	0.7
62165	99	P	SUR	54	1	754	0	0.5	0.7	0.9
62168	99	P	SUR	58	1	753	0	0.4	0.2	0.4
62170	99	P	SUR	51	2	751	0	0.8	0.3	0.8
62296	99	P	SUR	53	2	759	0	0.3	0.1	0.3
62297	99	P	SUR	59	2	1457	0	0.5	0.2	0.5
62302	99	P	SUR	61	-2	758	0	0.7	-0.0	0.7
62304	99	P	SUR	51	2	750	0	0.4	0.4	0.6
62305	99	P	SUR	50	0	743	0	0.4	0.4	0.6
62442	99	P	SUR	49	-16	728	0	0.5	-0.1	0.5
6301558	99	P	SUR	78	-10	744	0	0.7	0.8	1.1
6301560	99	P	SUR	71	13	624	2	2.5	0.5	2.6
6301562	99	P	SUR	68	-11	743	0	1.2	0.0	1.2
6301563	99	P	SUR	76	-12	744	0	0.7	0.5	0.8
6301564	99	P	SUR	71	-3	519	0	3.0	0.2	3.0
6301592	99	P	SUR	82	7	383	0	0.5	-0.0	0.5
6301596	99	P	SUR	82	7	595	1	0.5	0.5	0.7
6301598	99	P	SUR	81	3	693	0	0.7	0.3	0.8
6301600	99	P	SUR	82	3	694	0	0.7	0.2	0.7
63055	99	P	SUR	61	2	759	0	0.5	0.2	0.6
63056	99	P	SUR	60	2	759	0	0.6	0.4	0.7
63057	99	P	SUR	59	2	759	0	0.5	0.0	0.5
63058	99	P	SUR	53	2	1240	0	0.3	0.3	0.4
63059	99	P	SUR	58	-1	758	0	0.4	0.5	0.6
63101	99	P	SUR	61	1	758	0	0.6	0.1	0.6
63102	99	P	SUR	61	1	758	0	0.5	0.3	0.6
63103	99	P	SUR	61	1	758	0	0.4	0.3	0.5
63104	99	P	SUR	61	2	759	0	0.6	-0.0	0.6
63105	99	P	SUR	61	2	675	0	0.6	-0.0	0.6
63108	99	P	SUR	61	2	759	0	0.6	0.2	0.6
63109	99	P	SUR	60	2	759	0	0.5	-0.2	0.5
63110	99	P	SUR	60	2	759	0	0.6	-0.2	0.6
63111	99	P	SUR	61	2	1447	0	0.5	-0.4	0.6
63112	99	P	SUR	61	1	758	0	0.4	-0.3	0.5
63115	99	P	SUR	62	1	758	0	0.5	0.1	0.5
63117	99	P	SUR	61	1	1459	0	0.6	0.5	0.7

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
63118	99	P	SUR	58	1	753	0	0.5	-0.1	0.5
63120	99	P	SUR	54	2	757	0	0.5	0.7	0.8
6400562	99	P	SUR	74	11	744	0	0.6	0.0	0.6
6401502	99	P	SUR	70	12	716	0	0.5	0.3	0.5
6401503	99	P	SUR	59	2	637	0	0.4	0.8	0.9
6401506	99	P	SUR	62	-6	666	0	0.5	0.4	0.6
6401531	99	P	SUR	56	-38	740	0	0.5	0.0	0.5
6401539	99	P	SUR	59	-59	740	19	1.8	0.5	1.9
6401550	99	P	SUR	68	12	736	0	0.4	-0.0	0.4
6401555	99	P	SUR	73	23	744	0	0.5	0.4	0.6
6401556	99	P	SUR	75	10	744	0	0.6	0.3	0.7
6401561	99	P	SUR	65	1	744	0	0.4	0.3	0.5
6401562	99	P	SUR	71	14	744	4	1.0	-0.3	1.0
6401565	99	P	SUR	71	30	736	0	0.5	-0.5	0.7
6401566	99	P	SUR	63	8	743	0	0.4	0.2	0.4
6401568	99	P	SUR	62	-6	744	0	0.5	0.3	0.5
6401569	99	P	SUR	64	-15	744	0	0.5	0.3	0.6
6401570	99	P	SUR	68	3	744	0	0.4	0.3	0.6
6401571	99	P	SUR	68	5	744	0	0.5	0.5	0.7
6401572	99	P	SUR	61	-42	565	0	0.7	0.2	0.7
6401654	99	P	SUR	78	-10	693	0	0.7	-0.4	0.8
64041	99	P	SUR	61	-3	758	0	0.6	-0.1	0.7
64045	99	P	SUR	59	-12	957	0	0.5	-0.4	0.6
64046	99	P	SUR	61	-4	736	0	0.5	-0.2	0.5
64562	99	P	SUR	74	11	744	0	0.6	0.0	0.6
6501556	99	P	SUR	69	13	744	0	0.5	0.3	0.6
66023	99	P	SUR	55	11	751	0	0.4	0.2	0.5

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

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          DRIFTER MONITORING STATISTICS (EUCOS)
                   MONITORING CENTRE     : ECMWF
                   ELEMENT MONITORED     : WIND SPEED (M/S)
                   AREA                  : 10N - 90N, 70W - 40E
                   PERIOD                : MAR 2019
                   STANDARD OF COMPARISON: FIRST-GUESS FIELD


TIME = 99 => AVERAGE OF ALL OBSERVATIONS


GROSS ERROR LIMIT FOR VECTOR WIND = 25 M/S
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WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
003	99	SPEED	SUR	73	16	5	0	0	1.3	0.8	1.5
1300001	99	SPEED	SUR	11	-23	640	0	0	0.8	0.5	0.9
1300002	99	SPEED	SUR	20	-23	646	0	0	0.8	0.4	0.9
1300008	99	SPEED	SUR	15	-38	688	0	0	0.9	0.2	0.9
1300131	99	SPEED	SUR	28	-17	740	0	0	1.9	1.5	2.4
29124	99	SPEED	SUR	30	-13	1	0	0	0.0	0.3	0.3
4100026	99	SPEED	SUR	12	-38	286	0	0	0.9	-0.0	0.9
4100041	99	SPEED	SUR	14	-46	4399	0	0	0.8	-0.2	0.9
4100043	99	SPEED	SUR	21	-65	4305	0	0	1.2	-0.1	1.2
4100044	99	SPEED	SUR	22	-59	4292	0	0	1.2	0.1	1.2
4100046	99	SPEED	SUR	24	-68	4397	0	0	1.4	-0.0	1.4
4100049	99	SPEED	SUR	27	-63	3840	0	0	1.4	-0.4	1.4
4100052	99	SPEED	SUR	18	-65	4413	0	0	0.8	-0.6	1.0
4100053	99	SPEED	SUR	18	-66	4420	0	0	1.4	1.2	1.8
4100056	99	SPEED	SUR	18	-65	4404	0	0	0.9	-0.6	1.1
4100139	99	SPEED	SUR	20	-38	644	0	0	1.0	-0.1	1.0
4100300	99	SPEED	SUR	16	-57	744	0	0	0.9	-0.4	1.0
41026	99	SPEED	SUR	12	-38	286	0	0	0.9	0.0	0.9
41041	99	SPEED	SUR	14	-46	1273	0	0	0.9	-0.4	1.0
41043	99	SPEED	SUR	21	-65	1332	0	0	1.3	-0.2	1.3
41044	99	SPEED	SUR	22	-59	1360	0	0	1.3	-0.2	1.3
41046	99	SPEED	SUR	24	-68	1272	0	0	1.5	-0.1	1.5
41049	99	SPEED	SUR	28	-63	1123	0	0	1.4	-0.5	1.5
41052	99	SPEED	SUR	18	-65	1976	0	0	0.8	-0.5	0.9
41053	99	SPEED	SUR	19	-66	2020	0	0	1.4	0.6	1.5
41056	99	SPEED	SUR	18	-66	1836	0	0	1.0	-0.4	1.0
41300	99	SPEED	SUR	16	-57	744	0	0	0.9	-0.4	1.0
4200060	99	SPEED	SUR	16	-63	4292	0	0	1.0	0.0	1.0
4200085	99	SPEED	SUR	18	-67	889	0	0	1.1	-0.4	1.1
42060	99	SPEED	SUR	16	-63	1353	0	0	1.1	-0.3	1.1
42085	99	SPEED	SUR	18	-67	858	0	0	1.0	-0.1	1.0
4400027	99	SPEED	SUR	44	-67	726	0	0	1.4	0.5	1.4
4400032	99	SPEED	SUR	44	-69	635	0	0	1.6	-0.0	1.6
4400033	99	SPEED	SUR	44	-69	733	0	0	1.8	0.0	1.8

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
4400034	99	SPEED	SUR	44	-68	734	0	0	1.4	-0.2	1.5
4400037	99	SPEED	SUR	43	-68	713	0	0	1.3	0.1	1.3
44027	99	SPEED	SUR	44	-67	742	0	0	1.4	0.5	1.5
44032	99	SPEED	SUR	44	-69	635	0	0	1.6	-0.0	1.6
44033	99	SPEED	SUR	44	-69	733	0	0	1.7	0.4	1.8
44034	99	SPEED	SUR	44	-68	734	0	0	1.5	-0.2	1.5
44037	99	SPEED	SUR	44	-68	712	0	0	1.3	0.2	1.3
44137	99	SPEED	SUR	42	-62	638	0	0	1.7	-0.5	1.8
44139	99	SPEED	SUR	44	-57	735	0	0	1.2	0.0	1.2
44150	99	SPEED	SUR	43	-64	720	0	0	1.5	-0.1	1.5
44258	99	SPEED	SUR	45	-63	739	0	0	2.1	0.1	2.1
6100001	99	SPEED	SUR	43	8	744	0	0	1.9	-0.3	1.9
6100002	99	SPEED	SUR	42	5	743	0	0	1.3	0.2	1.3
61001	99	SPEED	SUR	43	8	744	0	0	2.1	-1.2	2.4
6100196	99	SPEED	SUR	42	4	731	0	0	1.8	-0.7	2.0
6100197	99	SPEED	SUR	40	4	733	0	0	1.4	-0.4	1.4
6100198	99	SPEED	SUR	37	-2	50	0	0	1.2	-0.8	1.5
61002	99	SPEED	SUR	42	5	743	0	0	1.3	-0.4	1.4
6100280	99	SPEED	SUR	41	1	727	0	0	2.1	-0.7	2.2
6100281	99	SPEED	SUR	40	0	727	0	0	1.9	0.2	1.9
6100417	99	SPEED	SUR	38	0	738	0	0	1.3	-0.3	1.4
6101007	99	SPEED	SUR	36	25	193	0	0	2.2	-1.8	2.8
6101008	99	SPEED	SUR	37	22	63	0	0	2.4	-4.6	5.2
6200024	99	SPEED	SUR	44	-3	441	0	0	1.6	-0.5	1.7
6200082	99	SPEED	SUR	44	-8	741	0	0	1.2	-0.7	1.4
6200084	99	SPEED	SUR	42	-9	738	0	0	1.2	-0.2	1.2
6200085	99	SPEED	SUR	36	-7	742	0	0	1.2	-0.1	1.2
6200091	99	SPEED	SUR	53	-5	472	0	0	1.8	-0.1	1.8
6200093	99	SPEED	SUR	55	-8	1	0	0	0.0	-3.0	3.0
6200094	99	SPEED	SUR	52	-7	743	0	0	1.2	0.2	1.3
62001	99	SPEED	SUR	45	-5	743	0	0	1.2	0.6	1.3
6200192	99	SPEED	SUR	40	-10	530	0	0	1.1	-0.1	1.1
6200199	99	SPEED	SUR	40	-9	535	0	0	1.4	-0.2	1.4
6200200	99	SPEED	SUR	36	-8	499	17	0	1.2	0.1	1.2
6201030	99	SPEED	SUR	44	-4	731	0	0	1.4	-0.5	1.5
62029	99	SPEED	SUR	49	-12	1439	0	0	1.2	0.3	1.2
62050	99	SPEED	SUR	50	-4	745	0	0	1.2	0.2	1.2
62081	99	SPEED	SUR	51	-13	640	0	0	1.3	0.0	1.3
62087	99	SPEED	SUR	54	9	428	0	0	1.4	-0.3	1.5
62091	99	SPEED	SUR	53	-5	472	0	0	1.8	-0.0	1.8
62093	99	SPEED	SUR	55	-8	1	0	0	0.0	-2.7	2.7

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
62094	99	SPEED	SUR	52	-7	472	0	0	1.4	0.1	1.4
62095	99	SPEED	SUR	53	-16	669	0	0	1.2	0.2	1.2
62102	99	SPEED	SUR	58	2	759	0	0	1.6	-0.3	1.7
62103	99	SPEED	SUR	50	-3	746	0	0	1.7	1.2	2.1
62104	99	SPEED	SUR	57	1	759	0	0	1.4	-0.3	1.5
62107	99	SPEED	SUR	50	-6	1441	0	0	1.6	0.9	1.8
62112	99	SPEED	SUR	58	0	758	0	0	1.5	-0.5	1.6
62113	99	SPEED	SUR	58	0	759	0	0	2.0	0.2	2.0
62114	99	SPEED	SUR	58	0	1461	0	0	1.8	0.8	2.0
62118	99	SPEED	SUR	58	1	759	0	0	1.5	0.5	1.6
62119	99	SPEED	SUR	57	2	751	0	0	1.6	-0.2	1.6
62120	99	SPEED	SUR	56	2	759	0	0	1.4	0.5	1.5
62121	99	SPEED	SUR	54	3	759	0	0	1.5	0.2	1.5
62122	99	SPEED	SUR	57	2	1461	0	0	1.3	-0.2	1.3
62129	99	SPEED	SUR	58	0	759	0	0	1.7	0.1	1.7
62131	99	SPEED	SUR	54	1	759	0	0	1.5	0.2	1.5
62132	99	SPEED	SUR	56	2	737	0	0	2.7	-2.5	3.7
62133	99	SPEED	SUR	57	1	759	0	0	1.4	0.0	1.4
62134	99	SPEED	SUR	58	1	759	0	0	1.5	-0.2	1.5
62140	99	SPEED	SUR	57	1	1423	0	0	1.5	0.1	1.5
62143	99	SPEED	SUR	58	2	759	0	0	2.5	-1.3	2.8
62144	99	SPEED	SUR	53	2	759	0	0	1.8	-0.2	1.8
62145	99	SPEED	SUR	53	3	1461	0	0	1.6	1.3	2.0
62146	99	SPEED	SUR	57	2	659	0	0	1.5	0.2	1.5
62148	99	SPEED	SUR	54	2	759	0	0	2.3	-0.3	2.3
62149	99	SPEED	SUR	54	1	759	0	0	3.5	-1.8	3.9
62150	99	SPEED	SUR	54	1	759	0	0	2.0	-0.3	2.0
62152	99	SPEED	SUR	57	2	759	0	0	1.7	-1.5	2.2
62153	99	SPEED	SUR	57	2	1461	0	0	3.2	-2.5	4.1
62154	99	SPEED	SUR	56	2	752	0	0	1.4	-0.3	1.5
62155	99	SPEED	SUR	58	1	380	0	0	1.4	-0.2	1.4
62163	99	SPEED	SUR	48	-8	744	0	0	1.1	-0.1	1.2
62165	99	SPEED	SUR	54	1	755	0	0	2.2	-0.7	2.3
62170	99	SPEED	SUR	51	2	749	0	0	2.0	0.8	2.2
62304	99	SPEED	SUR	51	2	750	0	0	2.1	2.2	3.0
62305	99	SPEED	SUR	50	0	743	0	0	1.8	1.2	2.2
62442	99	SPEED	SUR	49	-16	725	0	0	1.2	-0.0	1.2
63055	99	SPEED	SUR	61	2	759	0	0	1.4	-0.8	1.6
63056	99	SPEED	SUR	60	2	758	0	0	1.6	-0.1	1.6
63057	99	SPEED	SUR	59	2	759	0	0	2.2	-0.2	2.2
63058	99	SPEED	SUR	53	2	1240	0	0	1.3	0.7	1.5

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
63101	99	SPEED	SUR	61	1	757	0	0	1.4	-0.7	1.6
63103	99	SPEED	SUR	61	1	758	0	0	1.7	-0.3	1.7
63104	99	SPEED	SUR	61	2	758	0	0	1.4	-0.6	1.5
63105	99	SPEED	SUR	61	2	675	0	0	1.7	-0.0	1.7
63106	99	SPEED	SUR	61	2	759	0	0	1.5	-0.1	1.5
63108	99	SPEED	SUR	61	2	759	0	0	2.0	-0.4	2.0
63109	99	SPEED	SUR	60	2	757	0	0	1.6	0.2	1.7
63110	99	SPEED	SUR	60	2	759	0	0	1.6	-0.7	1.8
63112	99	SPEED	SUR	61	1	758	0	0	1.4	-0.8	1.6
63113	99	SPEED	SUR	61	2	759	0	0	1.6	-0.5	1.6
63115	99	SPEED	SUR	62	1	758	0	0	1.6	-0.8	1.8
63117	99	SPEED	SUR	61	1	1459	0	0	1.4	-0.5	1.5
64041	99	SPEED	SUR	61	-3	754	0	0	1.6	-0.3	1.6
64045	99	SPEED	SUR	59	-12	957	0	0	1.4	0.1	1.4
64046	99	SPEED	SUR	61	-4	736	0	0	1.5	0.5	1.6
66021	99	SPEED	SUR	55	14	743	0	0	1.3	0.2	1.4
66023	99	SPEED	SUR	55	11	751	0	0	1.6	0.3	1.6

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

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DRIFTER MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : WIND DIRECTION (DEGREES)
         AREA                  : 10N - 90N, 70W - 40E
         PERIOD                : MAR 2019
         STANDARD OF COMPARISON: FIRST-GUESS FIELD


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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
1300001	99	DIRN	SUR	11	-23	639	0	0	7.3	0.4	7.3
1300002	99	DIRN	SUR	20	-23	631	0	0	7.6	1.1	7.7
1300008	99	DIRN	SUR	15	-38	688	0	0	9.2	2.8	9.6
1300131	99	DIRN	SUR	28	-17	416	0	0	16.6	5.4	17.5
4100002	99	DIRN	SUR	32	-75	1321	0	0	13.1	14.0	19.2
4100004	99	DIRN	SUR	33	-79	3692	0	0	15.2	6.0	16.4
4100008	99	DIRN	SUR	31	-81	574	0	0	16.6	6.1	17.7
4100009	99	DIRN	SUR	29	-80	3477	0	0	19.0	10.4	21.7
4100010	99	DIRN	SUR	29	-78	3877	0	0	15.3	10.6	18.6
4100013	99	DIRN	SUR	33	-78	3531	0	0	26.0	23.3	34.8
4100024	99	DIRN	SUR	34	-78	545	0	0	21.0	-5.4	21.6
4100026	99	DIRN	SUR	12	-38	286	0	0	8.9	1.0	8.9
4100029	99	DIRN	SUR	33	-80	504	0	0	19.0	-1.8	19.1
4100033	99	DIRN	SUR	32	-80	558	0	0	17.5	-0.9	17.6
4100037	99	DIRN	SUR	34	-77	563	0	0	18.0	-10.1	20.6
4100038	99	DIRN	SUR	34	-78	400	0	0	15.8	-4.3	16.4
4100041	99	DIRN	SUR	14	-46	4387	0	0	8.9	-12.3	15.2
4100043	99	DIRN	SUR	21	-65	3968	0	0	14.8	-9.1	17.4
4100044	99	DIRN	SUR	22	-59	3963	0	0	14.0	2.9	14.3
4100046	99	DIRN	SUR	24	-68	3642	0	0	19.5	3.1	19.8
4100047	99	DIRN	SUR	28	-71	3734	0	0	25.5	0.7	25.5
4100049	99	DIRN	SUR	27	-63	3397	0	0	19.0	8.4	20.8
4100052	99	DIRN	SUR	18	-65	4102	0	0	10.3	3.5	10.9
4100053	99	DIRN	SUR	18	-66	2499	0	0	18.4	6.4	19.5
4100056	99	DIRN	SUR	18	-65	3989	0	0	13.4	3.1	13.8
4100064	99	DIRN	SUR	34	-77	578	0	0	18.3	-17.9	25.6
4100139	99	DIRN	SUR	20	-38	611	0	0	11.2	2.3	11.4
41002	99	DIRN	SUR	32	-75	384	0	0	12.8	12.4	17.8
4100300	99	DIRN	SUR	16	-57	743	0	0	11.5	5.5	12.7
41004	99	DIRN	SUR	33	-79	947	0	0	15.2	4.3	15.8
41008	99	DIRN	SUR	31	-81	565	0	0	17.1	5.5	18.0
41009	99	DIRN	SUR	29	-80	887	0	0	19.5	7.8	21.0

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
41010	99	DIRN	SUR	29	-79	1191	0	0	15.5	9.6	18.2
41013	99	DIRN	SUR	33	-78	917	0	0	25.8	22.8	34.4
41024	99	DIRN	SUR	34	-79	546	0	0	23.1	-5.6	23.8
41026	99	DIRN	SUR	12	-38	285	0	0	9.3	0.3	9.3
41029	99	DIRN	SUR	33	-80	814	0	0	20.5	-1.9	20.6
41033	99	DIRN	SUR	32	-80	529	0	0	18.6	-0.9	18.6
41037	99	DIRN	SUR	34	-77	556	0	0	18.3	-10.4	21.0
41038	99	DIRN	SUR	34	-78	388	0	0	17.1	-4.7	17.7
41041	99	DIRN	SUR	14	-46	1264	0	0	9.6	-12.7	15.9
41043	99	DIRN	SUR	21	-65	1211	0	0	14.3	-11.0	18.1
41044	99	DIRN	SUR	22	-59	1233	0	0	15.3	0.2	15.3
41046	99	DIRN	SUR	24	-68	1021	0	0	20.2	2.3	20.3
41047	99	DIRN	SUR	28	-72	1054	0	0	28.0	-0.6	28.0
41049	99	DIRN	SUR	28	-63	992	0	0	19.2	7.8	20.8
41052	99	DIRN	SUR	18	-65	1800	0	0	10.7	2.9	11.1
41053	99	DIRN	SUR	19	-66	1237	0	0	18.6	3.3	18.9
41056	99	DIRN	SUR	18	-66	1650	0	0	13.3	3.7	13.8
41064	99	DIRN	SUR	34	-77	564	0	0	18.4	-19.1	26.5
41300	99	DIRN	SUR	16	-57	738	0	0	11.5	5.6	12.7
4200013	99	DIRN	SUR	27	-83	791	0	0	16.6	6.6	17.9
4200022	99	DIRN	SUR	28	-84	1061	0	0	11.8	5.3	12.9
4200023	99	DIRN	SUR	26	-83	579	0	0	20.2	1.4	20.2
4200057	99	DIRN	SUR	17	-81	3865	0	0	10.6	2.3	10.9
4200060	99	DIRN	SUR	16	-63	4094	0	0	11.2	6.6	13.0
4200085	99	DIRN	SUR	18	-67	802	0	0	20.5	17.7	27.1
42013	99	DIRN	SUR	27	-83	676	0	0	16.5	6.0	17.6
42022	99	DIRN	SUR	28	-84	985	0	0	12.0	4.3	12.7
42023	99	DIRN	SUR	26	-83	432	0	0	19.1	1.0	19.1
42057	99	DIRN	SUR	17	-81	1144	0	0	9.9	2.1	10.1
42060	99	DIRN	SUR	16	-63	1252	0	0	11.5	1.2	11.5
42085	99	DIRN	SUR	18	-67	778	0	0	19.1	14.1	23.7
4400007	99	DIRN	SUR	44	-70	613	0	0	18.1	0.9	18.1
4400013	99	DIRN	SUR	42	-71	636	0	0	19.5	13.4	23.7
4400014	99	DIRN	SUR	37	-75	605	0	0	20.8	4.8	21.4
4400017	99	DIRN	SUR	41	-72	631	0	0	15.4	11.0	19.0
4400018	99	DIRN	SUR	42	-70	631	0	0	14.1	9.9	17.2
4400020	99	DIRN	SUR	41	-70	3636	0	0	13.9	1.5	13.9
4400025	99	DIRN	SUR	40	-73	616	0	0	14.6	4.5	15.3
4400027	99	DIRN	SUR	44	-67	690	0	0	14.0	7.9	16.1
4400029	99	DIRN	SUR	43	-71	644	0	0	25.8	-3.6	26.0
4400030	99	DIRN	SUR	43	-70	613	0	0	16.7	0.1	16.7

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
4400032	99	DIRN	SUR	44	-69	563	0	0	13.2	11.3	17.4
4400033	99	DIRN	SUR	44	-69	630	0	0	19.6	-2.0	19.7
4400034	99	DIRN	SUR	44	-68	667	0	0	13.0	2.6	13.3
4400037	99	DIRN	SUR	43	-68	669	0	0	11.4	4.1	12.2
4400042	99	DIRN	SUR	38	-76	4204	0	0	29.0	-8.0	30.1
4400058	99	DIRN	SUR	38	-76	4533	0	0	25.9	-16.4	30.7
4400064	99	DIRN	SUR	37	-76	3041	0	0	22.9	-14.2	26.9
4400065	99	DIRN	SUR	40	-74	3692	0	0	18.6	7.5	20.0
44007	99	DIRN	SUR	44	-70	623	0	0	17.9	0.8	17.9
44013	99	DIRN	SUR	42	-71	631	0	0	19.9	12.0	23.2
44014	99	DIRN	SUR	37	-75	596	0	0	20.7	3.7	21.1
44017	99	DIRN	SUR	41	-72	619	0	0	14.5	10.3	17.8
44018	99	DIRN	SUR	42	-70	641	0	0	14.9	9.6	17.7
44020	99	DIRN	SUR	42	-70	999	0	0	13.8	0.3	13.8
44025	99	DIRN	SUR	40	-73	612	0	0	16.3	3.5	16.7
44027	99	DIRN	SUR	44	-67	700	0	0	14.1	7.0	15.8
44029	99	DIRN	SUR	43	-71	657	0	0	24.2	-3.6	24.5
44030	99	DIRN	SUR	43	-70	608	0	0	17.4	0.1	17.5
44032	99	DIRN	SUR	44	-69	550	0	0	13.4	11.0	17.3
44033	99	DIRN	SUR	44	-69	617	0	0	19.2	-1.7	19.3
44034	99	DIRN	SUR	44	-68	664	0	0	13.6	2.6	13.8
44037	99	DIRN	SUR	44	-68	662	0	0	12.0	3.9	12.6
44042	99	DIRN	SUR	38	-76	750	0	0	29.5	-8.5	30.7
44058	99	DIRN	SUR	38	-76	775	0	0	25.2	-16.8	30.3
44064	99	DIRN	SUR	37	-76	676	0	0	21.7	-14.9	26.3
44065	99	DIRN	SUR	40	-74	975	0	0	16.6	5.8	17.6
44137	99	DIRN	SUR	42	-62	534	0	0	16.9	6.8	18.2
44139	99	DIRN	SUR	44	-57	681	0	0	11.2	-25.3	27.7
44150	99	DIRN	SUR	43	-64	656	0	0	17.7	16.4	24.1
44258	99	DIRN	SUR	45	-63	629	0	0	16.6	7.3	18.2
6100198	99	DIRN	SUR	37	-2	32	0	0	13.1	-1.3	13.1
6100281	99	DIRN	SUR	40	0	355	0	0	37.2	-7.9	38.1
6100417	99	DIRN	SUR	38	0	535	0	0	14.7	9.1	17.3
6200024	99	DIRN	SUR	44	-3	323	0	0	72.1	-47.7	86.5
6200082	99	DIRN	SUR	44	-8	675	0	0	11.7	1.9	11.8
6200084	99	DIRN	SUR	42	-9	568	0	0	15.0	6.0	16.1
6200085	99	DIRN	SUR	36	-7	603	0	0	12.2	-0.8	12.2
6200091	99	DIRN	SUR	53	-5	431	0	0	17.0	1.1	17.0
6200094	99	DIRN	SUR	52	-7	675	0	0	11.8	-0.7	11.8
62001	99	DIRN	SUR	45	-5	672	0	0	12.1	3.9	12.7
6200192	99	DIRN	SUR	40	-10	450	0	0	15.6	-1.3	15.7

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
6200199	99	DIRN	SUR	40	-9	384	0	0	17.0	1.7	17.1
6200200	99	DIRN	SUR	36	-8	435	17	0	172.1	-6.8	172.2
6201030	99	DIRN	SUR	44	-4	543	0	0	19.0	-0.1	19.0
62029	99	DIRN	SUR	49	-12	1376	0	0	11.4	9.0	14.5
62050	99	DIRN	SUR	50	-4	622	0	0	13.0	1.0	13.0
62081	99	DIRN	SUR	51	-13	602	0	0	14.0	10.1	17.2
62091	99	DIRN	SUR	53	-5	430	0	0	15.4	0.3	15.4
62094	99	DIRN	SUR	52	-7	467	0	0	11.7	-0.8	11.7
62095	99	DIRN	SUR	53	-16	648	0	0	10.5	11.2	15.3
62103	99	DIRN	SUR	50	-3	666	0	0	15.8	1.8	15.9
62107	99	DIRN	SUR	50	-6	1266	0	0	16.2	-0.2	16.2
62112	99	DIRN	SUR	58	0	694	0	0	12.5	-1.5	12.6
62114	99	DIRN	SUR	58	0	1352	0	0	11.2	0.9	11.2
62163	99	DIRN	SUR	48	-8	677	0	0	10.2	-2.7	10.5
62305	99	DIRN	SUR	50	0	641	0	0	17.8	3.1	18.1
62442	99	DIRN	SUR	49	-16	718	0	0	12.4	-5.3	13.5
64041	99	DIRN	SUR	61	-3	669	0	0	12.6	8.5	15.2
64045	99	DIRN	SUR	59	-12	929	0	0	13.5	5.3	14.5
64046	99	DIRN	SUR	61	-4	657	0	0	14.5	-3.7	14.9

4.12 Table 24 - List of Assimilated BUFR Encoded Radiosonde Stations

DBLK	FHM5UJH	QCY3TGN	VKB4L5Q	XKQLWQB	XQFJRGX	XWHDEAD	YLV96WM	ZVQEQCM
7JUNA4N	01001	01004	01010	01028	01241	01400	01415	02185
02365	02527	02591	02836	02963	03005	03023	03238	03354
03502	03743	03808	03882	03918	03953	04018	04089	04220
04270	04320	04339	04360	04417	06011	06260	06458	06610
07110	07145	07510	07645	07761	08001	08023	08190	08221
08302	08383	08430	08508	08522	08579	10035	10113	10184
10238	10304	10393	10410	10548	10618	10739	10771	10868
10954	10962	11010	11035	11120	11240	11520	11747	11952
12120	12374	12425	12843	12982	13275	13388	14015	14240
14430	15420	15614	16045	16080	16113	16144	16245	16320
16429	16546	16622	16716	16754	17030	17064	17095	17130
17220	17281	17607	22008	26038	26435	27707	27713	33008
33041	40179	40186	43599	45004	47102	47104	47138	47155
47169	47186	47401	47412	47418	47582	47600	47646	47678
47741	47778	47807	47827	47909	47918	47945	47971	47991
48698	60018	60096	60155	61901	61980	61998	68263	68424
68442	68816	68842	70026	70133	70200	70219	70231	70261
70308	70316	70326	70350	70361	70398	71043	71081	71082
71109	71119	71600	71603	71722	71802	71811	71815	71816
71823	71836	71845	71867	71906	71907	71908	71909	71913
71917	71924	71925	71926	71934	71945	71957	71964	72201
72206	72208	72210	72214	72215	72230	72233	72235	72240
72248	72249	72250	72251	72261	72265	72274	72293	72317
72327	72340	72363	72364	72365	72376	72388	72426	72440
72451	72476	72489	72493	72501	72518	72520	72528	72558
72562	72572	72582	72597	72632	72634	72645	72649	72659
72662	72672	72681	72694	72712	72747	72764	72768	72776
72786	72797	73033	74389	74494	74560	76225	76458	76526
76612	76679	78897	78954	81405	85442	85586	85799	85934
87155	87344	87418	87576	87623	87715	87860	88889	89002
89062	89564	89571	89611	89625	89642	89859	91212	91285
91592	91765	91925	91938	91948	91958	93112	93417	93817
93844	93997	94120	94150	94170	94203	94294	94299	94302
94312	94326	94332	94374	94403	94430	94461	94510	94578
94610	94637	94638	94653	94659	94672	94711	94767	94776
94802	94821	94866	94910	94975	94995	94996	94998	95527
96996								

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

DBLK	FHM5UJH	QCY3TGN	VKB4L5Q	XKQLWQB	XQFJRGX	XWHDEAD	YLV96WM	ZVQEQCM
7JUNA4N	01001	01004	01010	01028	01241	01400	01415	02185
02365	02527	02591	02836	02963	03005	03023	03238	03354
03502	03743	03808	03882	03918	03953	04018	04089	04220
04270	04320	04339	04360	06260	06610	07110	07145	07510
07645	07761	08001	08023	08190	08221	08302	08430	08522
08579	10035	10113	10184	10238	10393	10410	10548	10618
10739	10771	10868	11010	11120	11240	11520	11952	12120
12374	12425	12843	13275	14015	14240	15420	15614	16045
16080	16245	16320	16429	16546	16716	16754	17607	22008
33008	40179	40186	45004	47104	47138	47155	47186	47401
47412	47418	47582	47600	47646	47678	47741	47778	47807
47827	47909	47918	47945	47971	47991	60018	61901	61980
61998	68263	68424	68442	68816	68842	70026	70133	70200
70231	70316	70326	70350	71043	71082	71600	71823	71845
71906	71907	71908	71913	71926	71934	71964	72201	72206
72208	72210	72214	72215	72230	72233	72235	72240	72248
72249	72250	72261	72265	72274	72293	72317	72327	72340
72363	72364	72365	72376	72388	72426	72440	72451	72476
72493	72501	72518	72520	72528	72558	72562	72572	72632
72634	72645	72649	72659	72662	72672	72681	72712	72764
72768	72776	72786	73033	74389	74560	76225	76526	76612
78897	81405	85442	85586	85799	85934	87860	89062	89564
89571	89611	89625	89642	89859	91212	91285	91592	91938
94120	94150	94203	94294	94302	94312	94326	94332	94374
94403	94430	94461	94510	94578	94610	94637	94638	94653
94659	94672	94711	94767	94776	94802	94821	94866	94910
94975	94995	94996	94998	95527				

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.