ECMWF Global Data Monitoring Report

December 2018

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	Nov	Dec	Ident	Time	Nov	Dec
01004	(00)	28	0	17130	(00)	11	26
17030	(00)	13	2	17220	(00)	9	31
17030	(12)	14	1	17220	(12)	9	30
17095	(00)	26	0	17240	(00)	12	31
26038	(00)	30	2	17240	(12)	10	31
43063	(00)	28	0	22008	(00)	0	19
43063	(12)	27	0	22008	(12)	0	19
48453	(00)	19	0	24122	(00)	0	19
48565	(00)	13	0	24122	(12)	0	19
68512	(12)	24	0	24947	(00)	0	19
71109	(00)	30	13	24947	(12)	0	19
71109	(12)	30	14	25403	(00)	0	17
71126	(12)	27	4	25403	(12)	0	19
71722	(00)	24	10	26075	(00)	0	17
71924	(00)	25	11	26075	(12)	0	18
72797	(00)	29	15	27713	(00)	0	18
74006	(00)	30	9	27713	(12)	0	18
76225	(12)	30	0	28695	(00)	0	16
78016	(00)	28	6	28695	(12)	0	14
78016	(12)	28	17	30557	(00)	0	16
78762	(12)	22	10	30557	(12)	0	16
78897	(00)	30	2	31510	(00)	10	29
83208	(00)	29	12	31510	(12)	11	31
83208	(12)	30	14	33837	(00)	0	14
85469	(00)	20	1	40800	(00)	15	31
89859	(00)	18	1	40848	(00)	16	31
98646	(00)	27	11	65344	(12)	7	23
98646	(12)	27	13	78486	(12)	4	30
-	-	-	-	82281	(00)	10	31
-	-	-	-	82281	(12)	11	31
-	-	-	-	84628	(12)	0	23
-	-	-	-	87860	(12)	4	22
-	-	-	-	89002	(00)	14	28
-	-	-	-	89022	(00)	0	14
-	-	-	-	89022	(12)	0	16
-	-	-	-	89592	(12)	16	31
-	-	-	-	89642	(12)	15	30
-	-	-	-	93997	(00)	3	27
-	-	-	-	96509	(12)	13	29
-	-	-	-	97072	(00)	0	27
-	-	-	-	97072	(12)	0	29
-	-	-	-	97502	(00)	1	24

2.2 Drifting Buoys

Surface pressure observations from **1184** 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

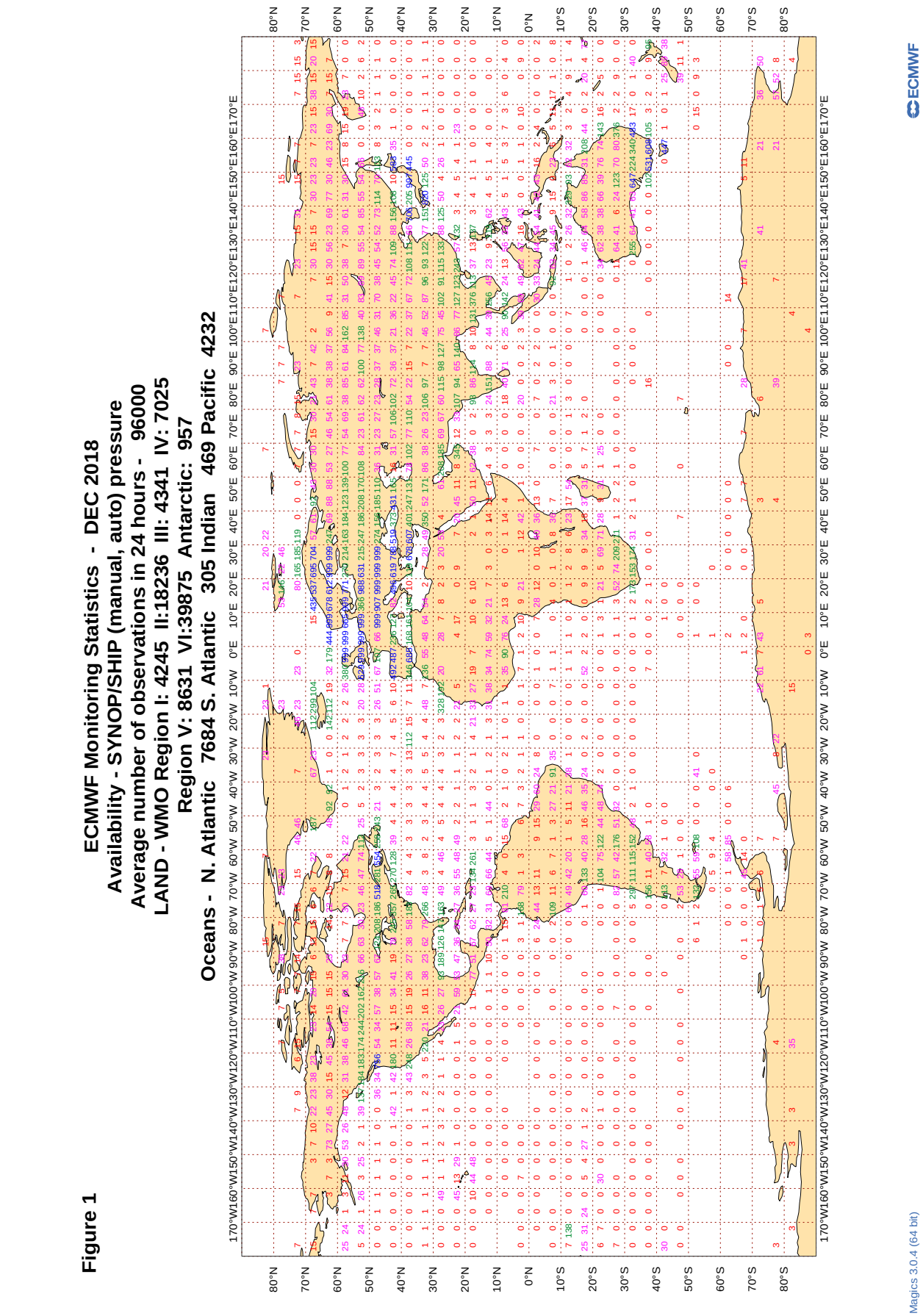


Figure 1

3.2.2 Figure 2 - Availability - DRIFTER PRESSURE

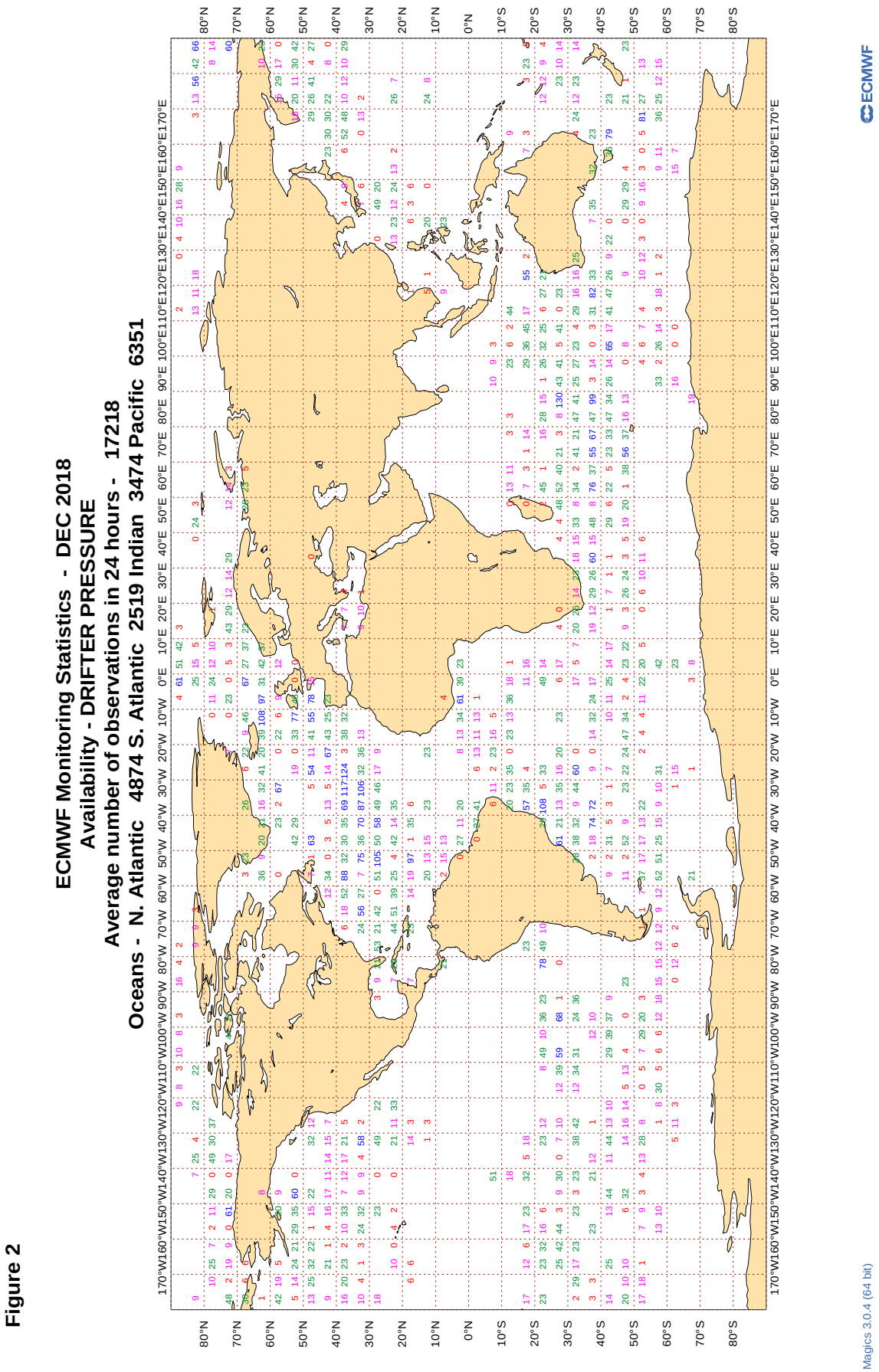


Figure 2

3.2.3 Figure 3 - Availability - TEMP 500 hPa geopotential

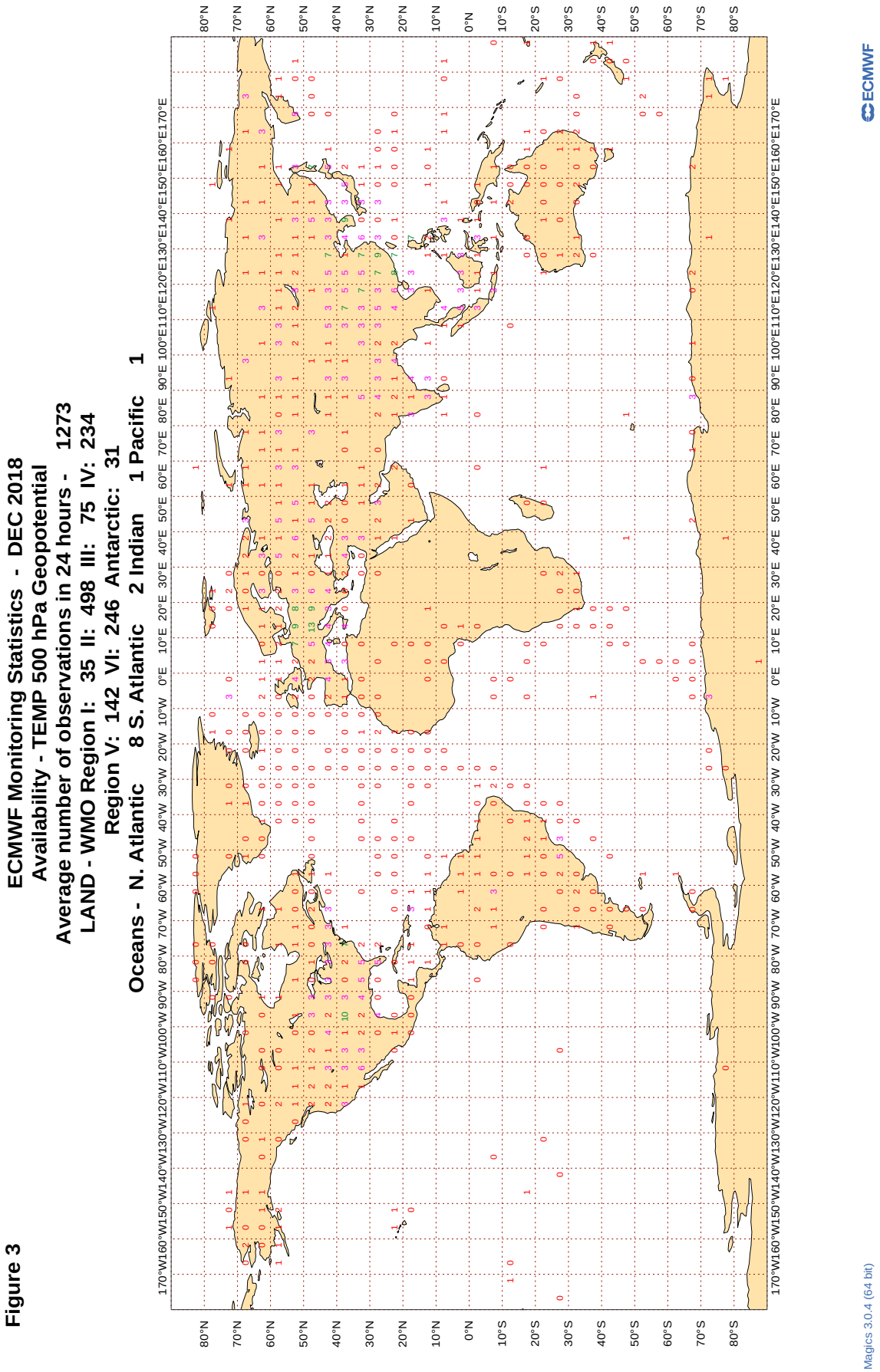


Figure 3

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

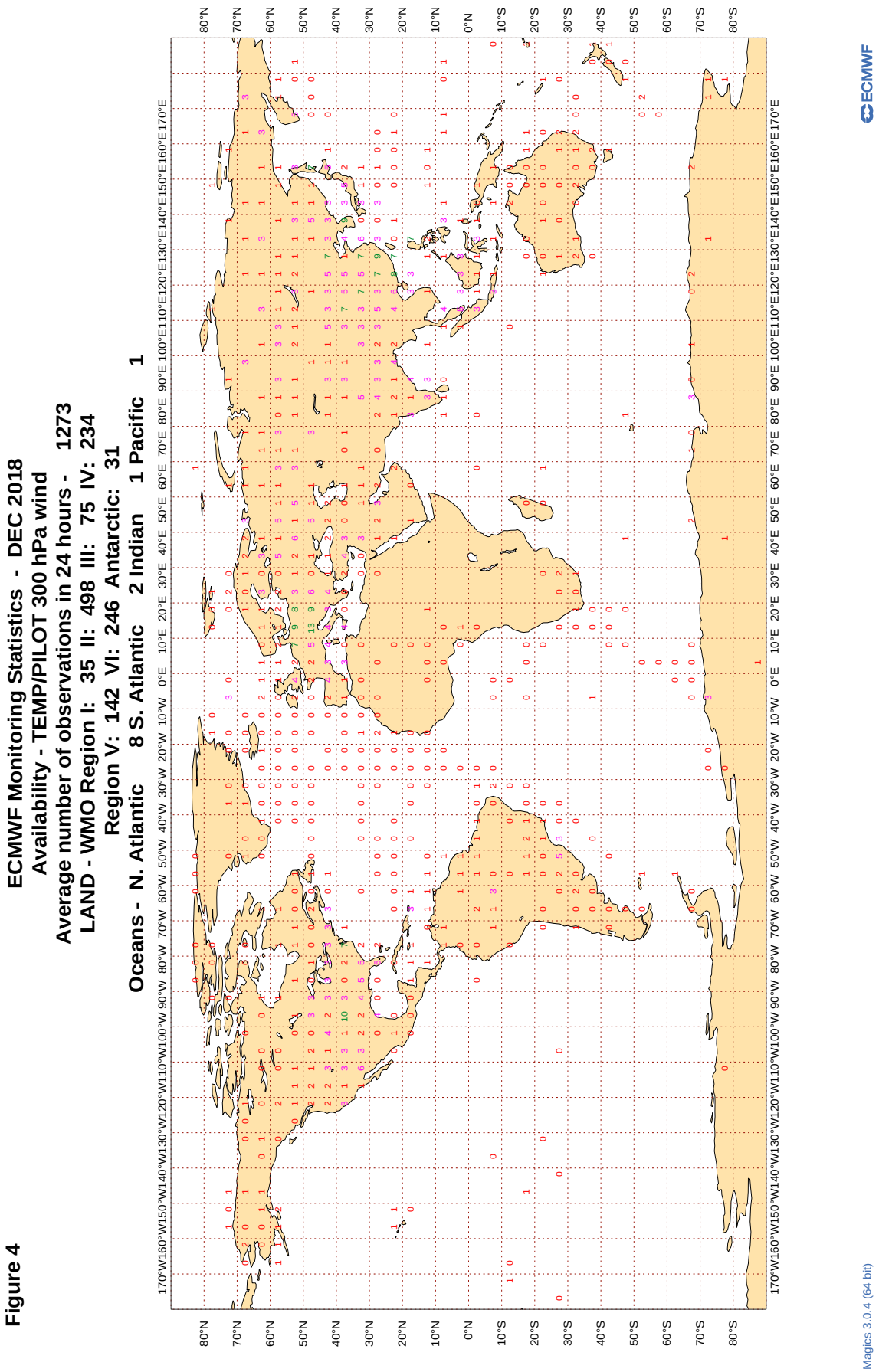


Figure 4

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

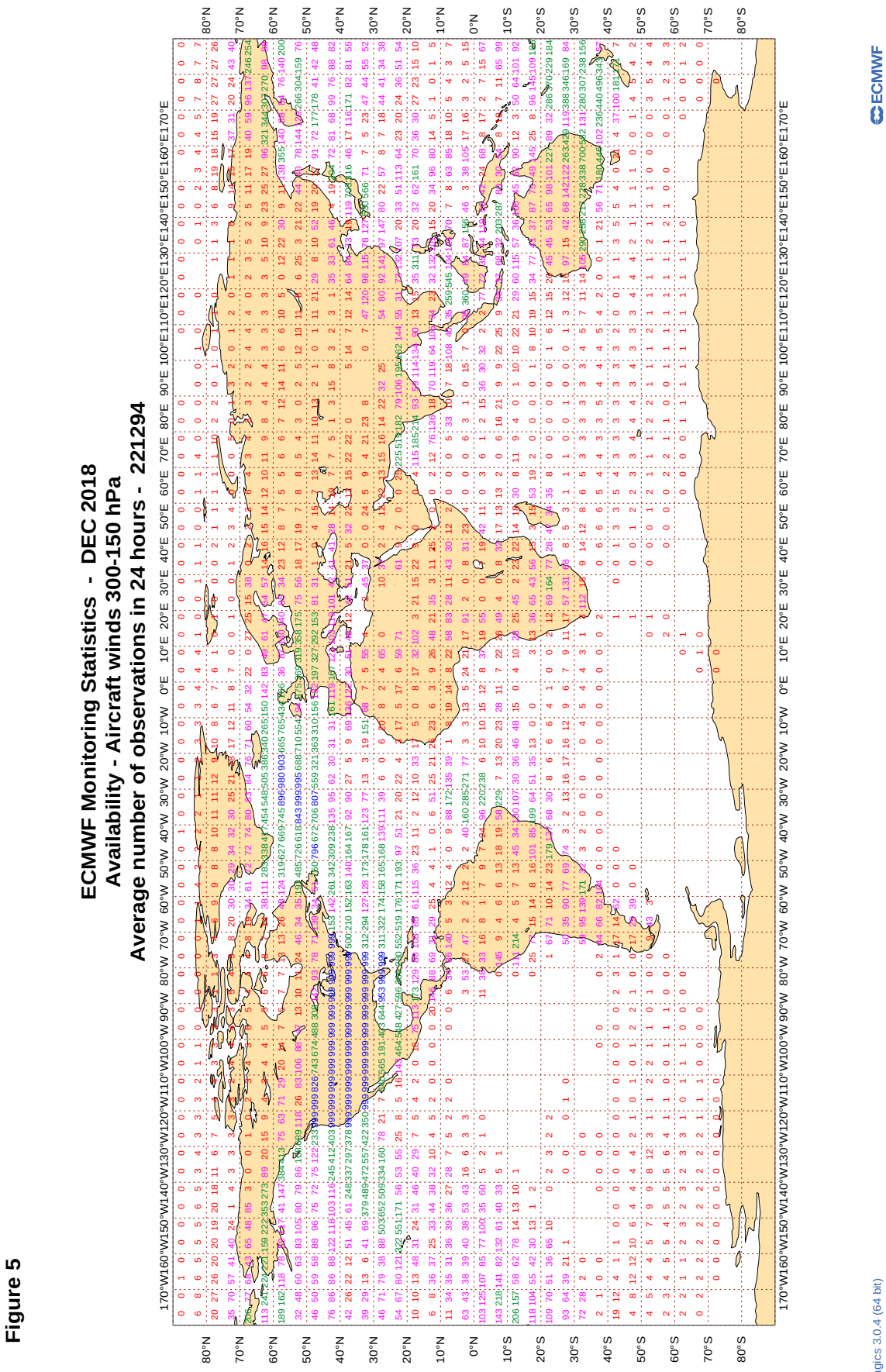


Figure 5

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

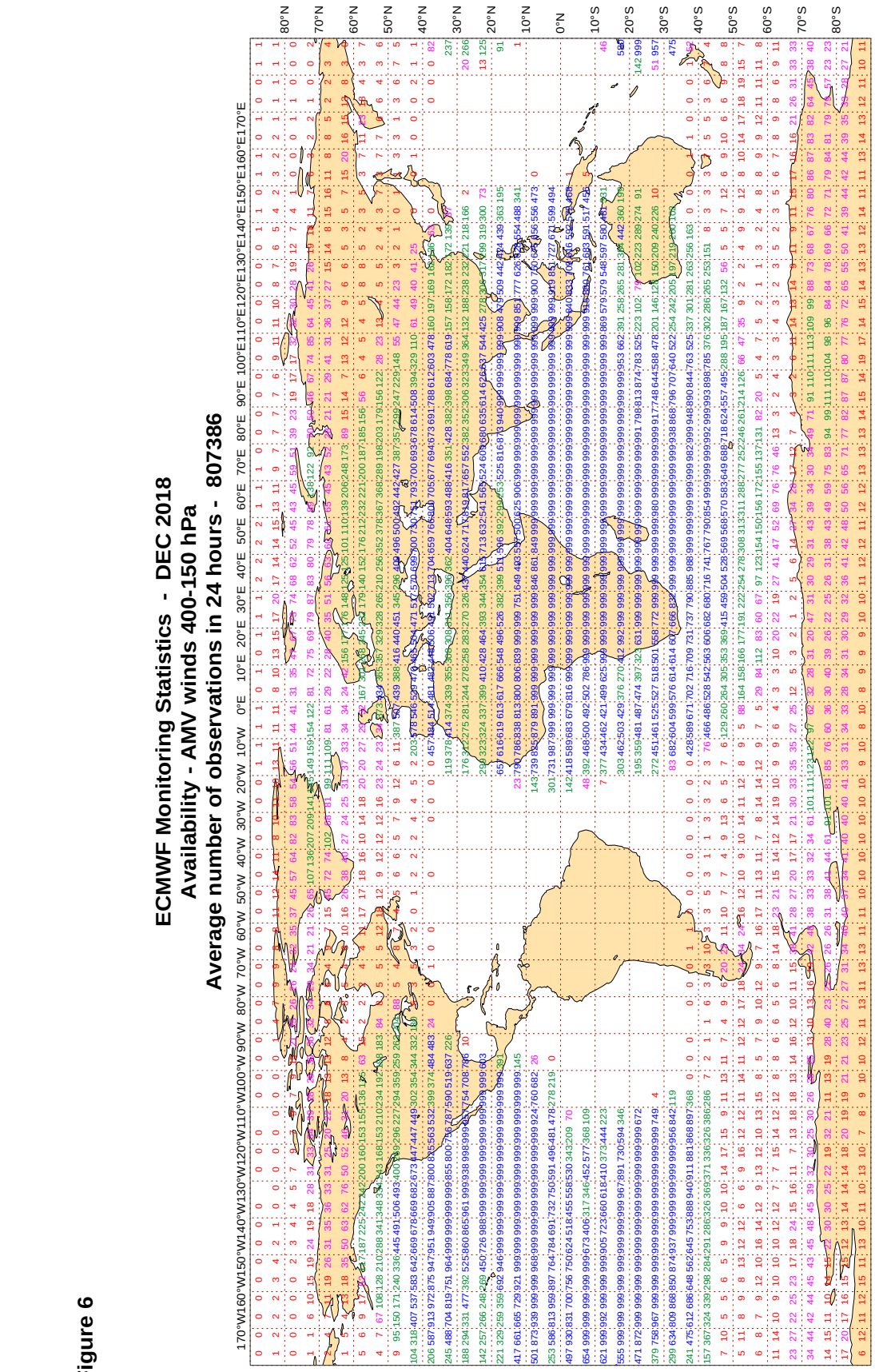


Figure 6

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

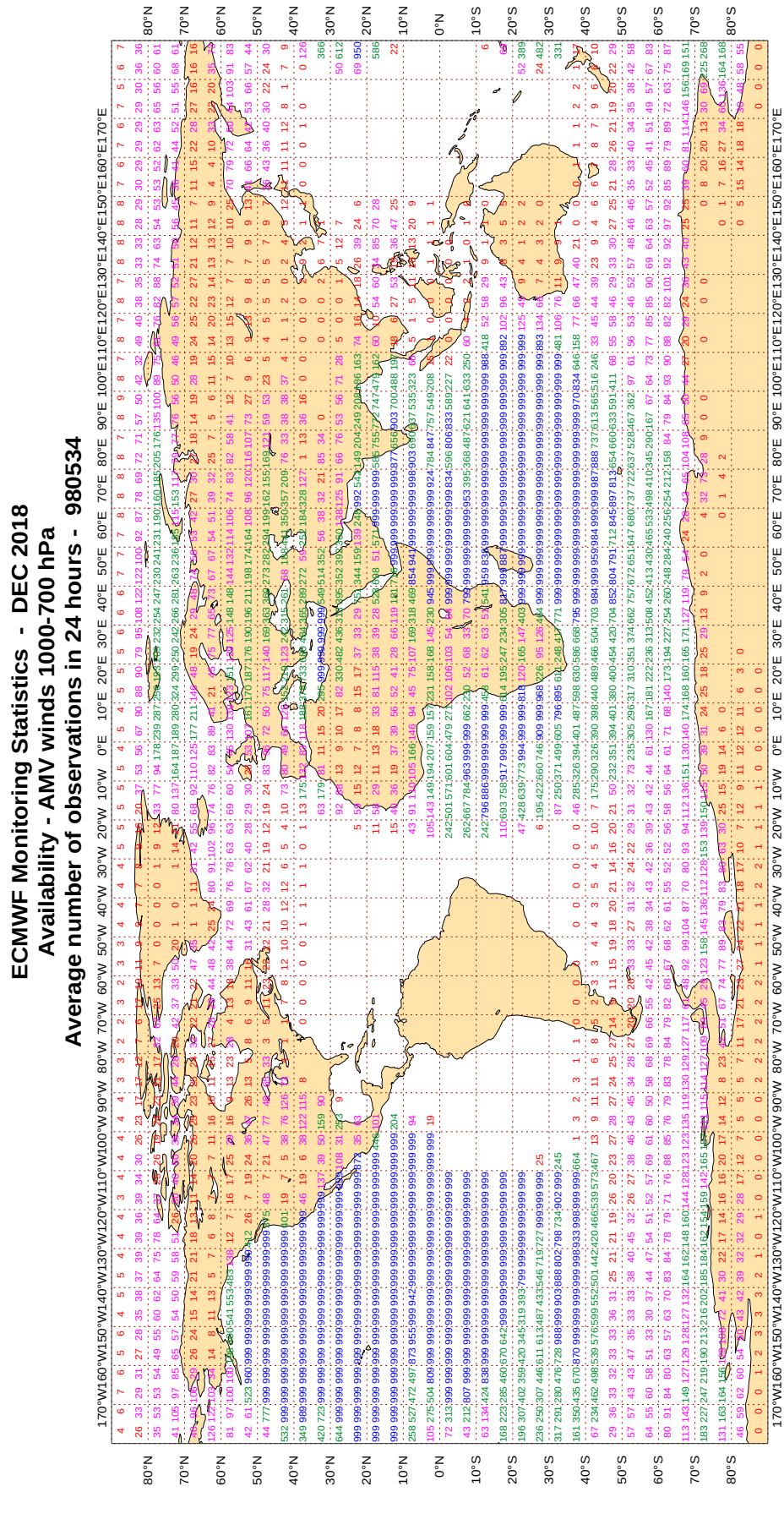
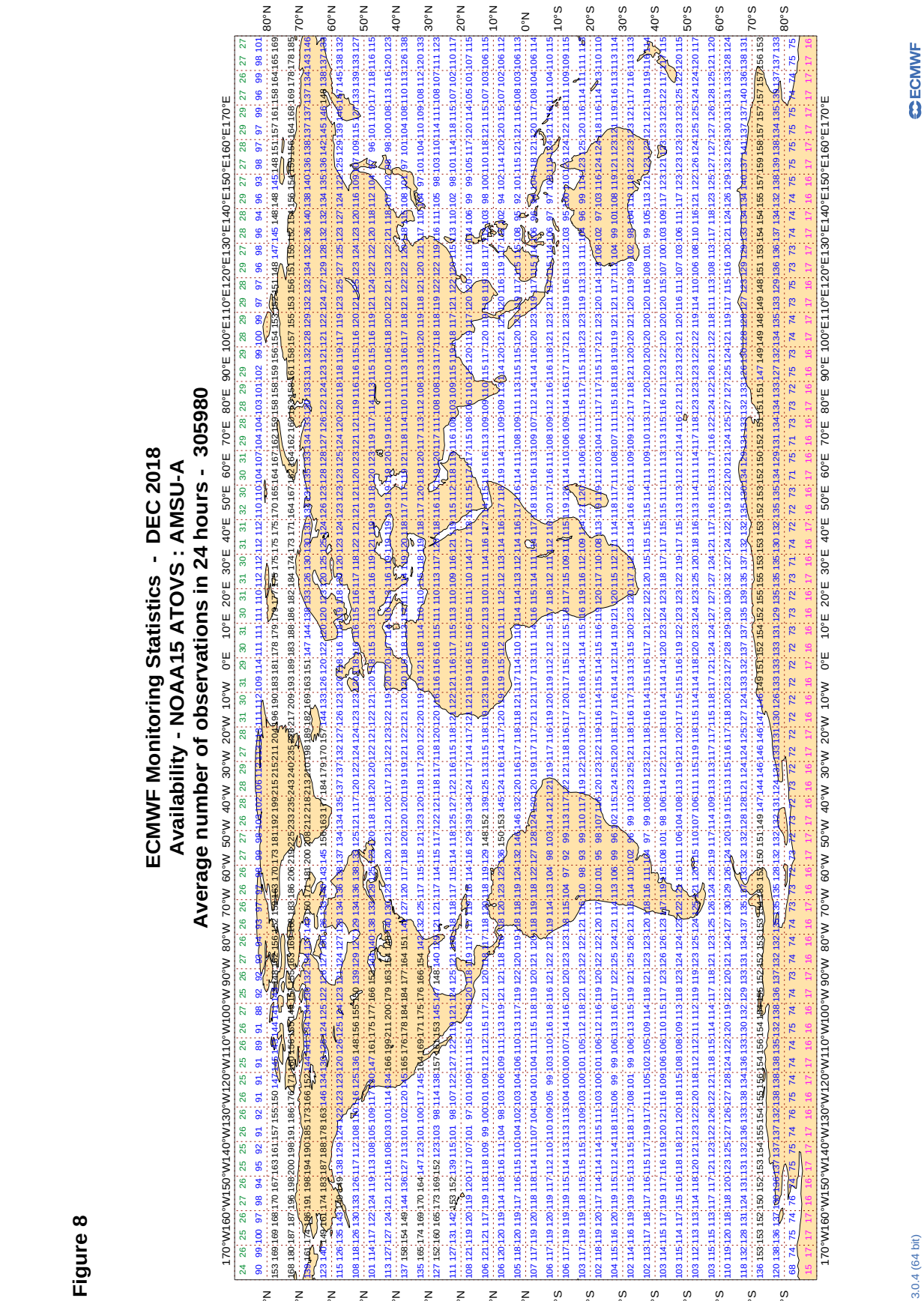


Figure 7

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

Figure 8



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

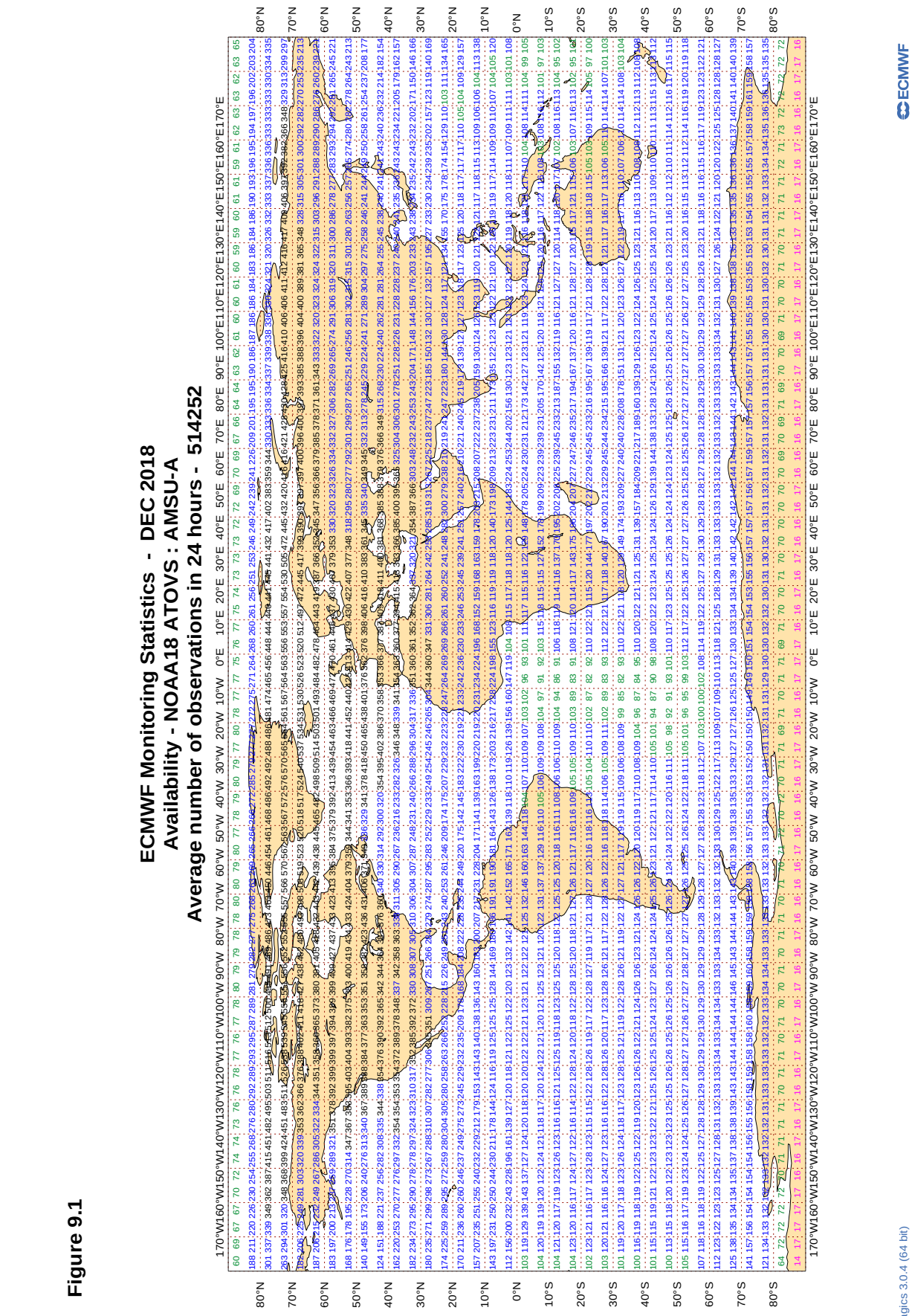


Figure 9.1

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

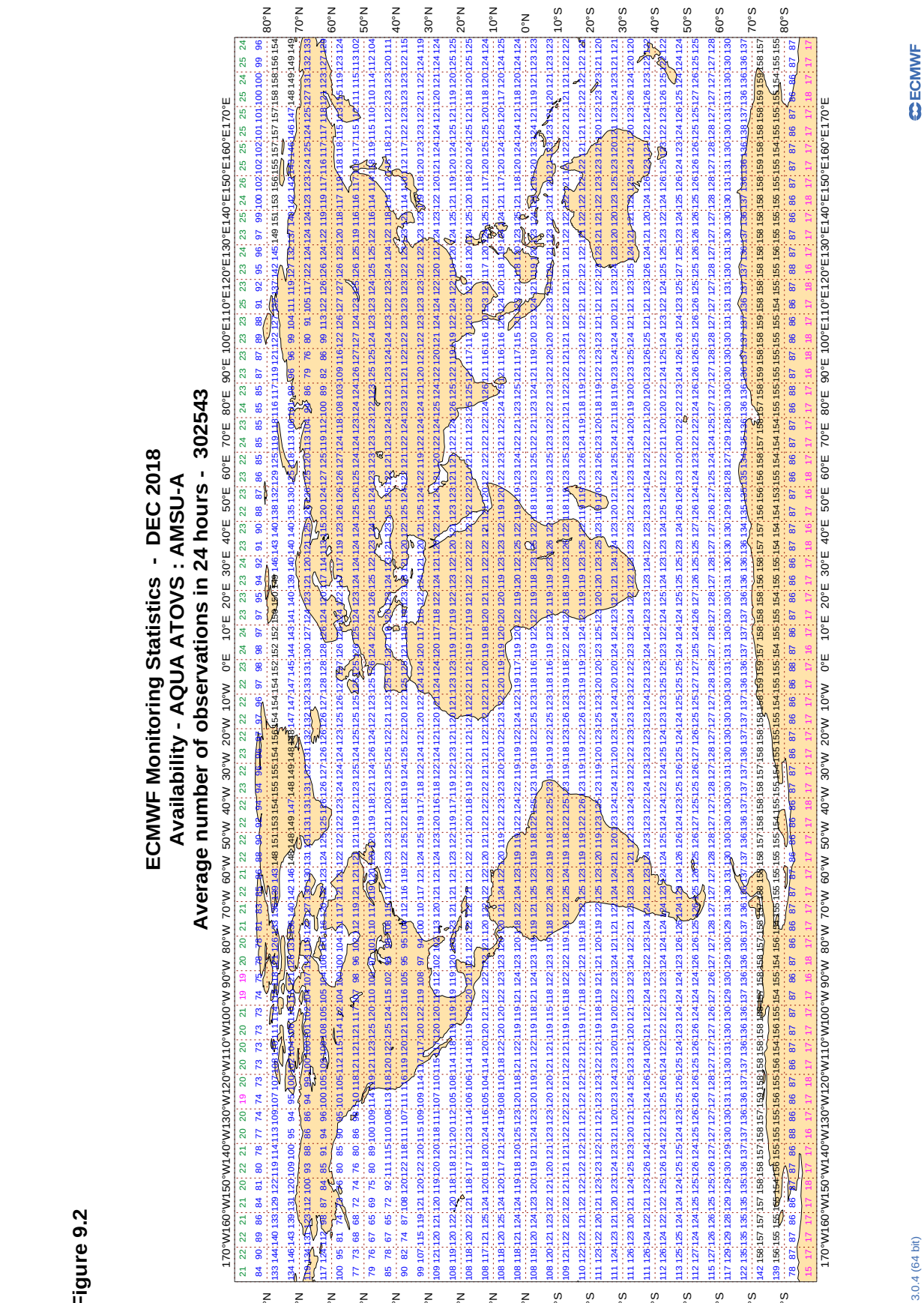


Figure 9.2

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

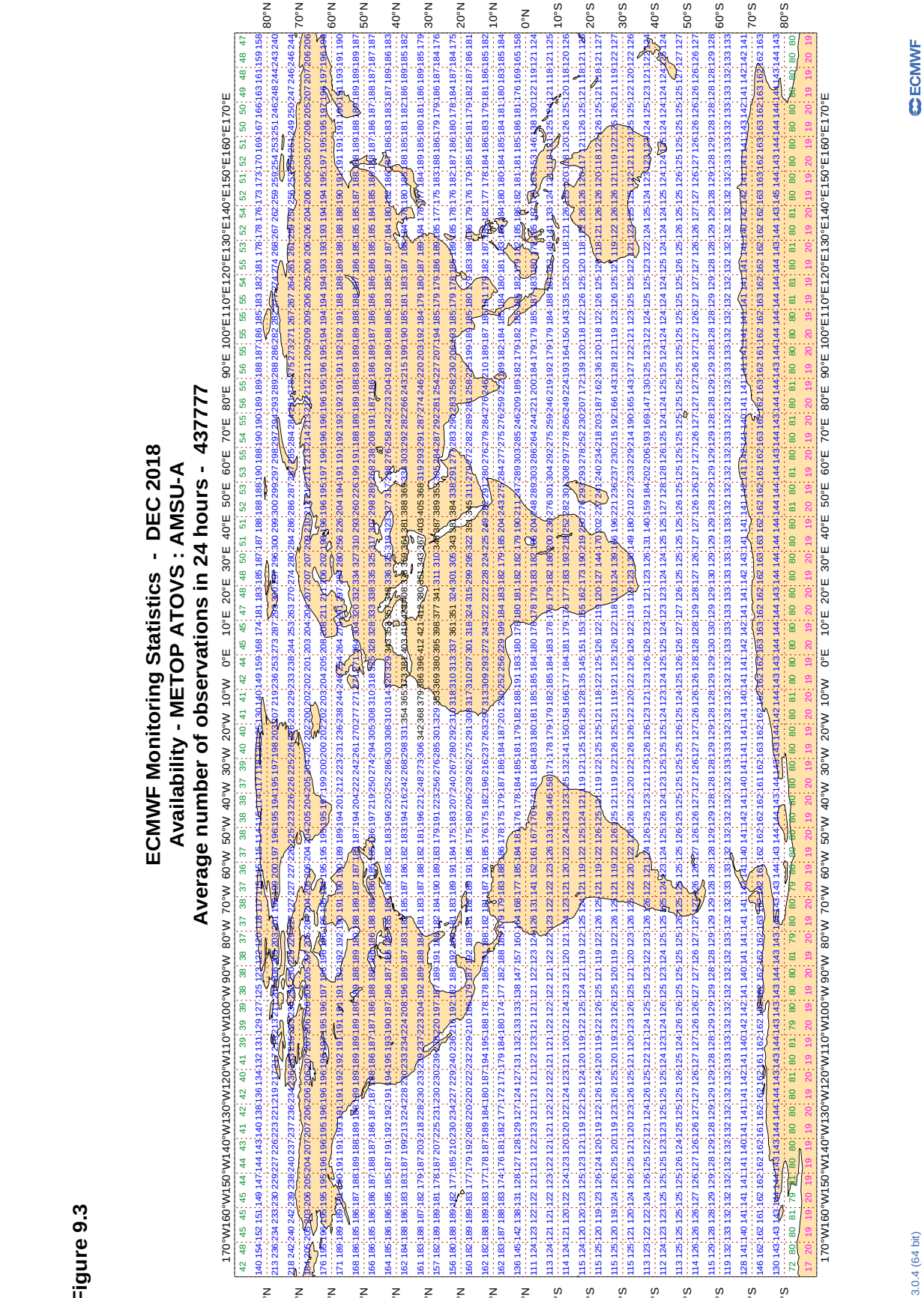


Figure 9.3

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

```
          LIST OF SUSPECT STATIONS        : SHIPS + FIXED MARINE PLATFORMS
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : SURFACE PRESSURE (HPA)
                    AREA                  : GLOBAL
                    PERIOD                : DEC 2018
                    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
3EUS	99	P	SUR	39	0	1.2	-3.2	3.4
3FFA5	99	P	SUR	62	0	2.1	4.3	4.7
5BZE2	99	P	SUR	31	0	2.7	5.0	5.7
9HA097	99	P	SUR	15	0	0.8	-3.4	3.5
9HA4612	99	P	SUR	25	0	2.1	4.2	4.7
9HA4870	99	P	SUR	17	0	1.1	3.0	3.2
9HJB9	99	P	SUR	46	0	1.1	10.0	10.0
9HJD9	99	P	SUR	41	0	0.7	5.3	5.3
9HYO7	99	P	SUR	28	0	3.2	-3.3	4.6
9V9040	99	P	SUR	93	3	3.4	-6.2	7.1
9V9925	99	P	SUR	48	0	5.3	2.1	5.7
9VAW6	99	P	SUR	46	0	1.2	-4.1	4.2
9VKQ2	99	P	SUR	42	0	1.2	4.4	4.5
AUCE	99	P	SUR	103	50	7.6	-5.4	9.3
AUYP	99	P	SUR	21	0	2.3	9.5	9.8
BNSK	99	P	SUR	16	11	0.2	1.2	1.3
C6BX8	99	P	SUR	16	0	0.4	4.3	4.4
C6FV8	99	P	SUR	44	0	0.9	-5.2	5.3
C6QM8	99	P	SUR	20	0	3.1	3.4	4.7
C6SY3	99	P	SUR	30	0	1.5	4.2	4.5
CQHW	99	P	SUR	30	0	0.8	-3.6	3.7
D5DY4	99	P	SUR	21	0	1.2	-7.6	7.7
LOCX	99	P	SUR	26	0	0.9	-13.0	13.0
ONDY	99	P	SUR	26	0	1.2	6.2	6.3
ONIK	99	P	SUR	19	0	2.2	6.4	6.8
OZ2049	99	P	SUR	32	0	0.7	-5.6	5.7
S6LT5	99	P	SUR	21	0	4.5	3.8	5.8
UBRW	99	P	SUR	33	24	6.1	-8.8	10.8
UBXS	99	P	SUR	52	0	2.0	-8.6	8.8
UFLT	99	P	SUR	37	0	1.2	-3.1	3.3
V7DR9	99	P	SUR	16	0	1.4	-5.1	5.3
V7GR8	99	P	SUR	101	0	1.3	3.4	3.6

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

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	SD	BIAS	RMS
VRDN3	99	P	SUR	15	0	0.9	-4.9	5.0
VRDW2	99	P	SUR	82	0	2.1	-3.0	3.7
VRFI7	99	P	SUR	62	0	1.5	4.3	4.6
VRFT7	99	P	SUR	81	0	0.7	-4.3	4.4
VRID2	99	P	SUR	76	0	2.5	5.6	6.1
VRJS2	99	P	SUR	53	0	2.2	-5.9	6.2
VRMW7	99	P	SUR	39	0	2.2	3.4	4.1
VRRD7	99	P	SUR	79	0	2.6	-3.3	4.2
VRRI4	99	P	SUR	43	0	1.7	4.5	4.8
VRVQ9	99	P	SUR	24	0	0.8	-4.7	4.8
VRXL8	99	P	SUR	16	0	1.5	3.3	3.6
VRZQ8	99	P	SUR	15	0	0.8	4.5	4.5
WADN	99	P	SUR	21	0	0.6	3.2	3.2
WDG8555	99	P	SUR	42	0	3.3	4.0	5.2

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                : DEC 2018
                    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                : DEC 2018
                    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
46092	99	DIRN	SUR	75	0	0	25.2	34.5	42.8
46118	99	DIRN	SUR	70	2	0	75.1	-57.9	94.8
46120	99	DIRN	SUR	21	0	0	81.8	78.2	113.2
66022	99	DIRN	SUR	98	1	0	78.8	39.1	88.0

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                 : DEC 2018
                    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
1701543	99	P	SUR	-38	13	366	3	2.7	5.8	6.4
2101521	99	P	SUR	43	-144	67	31	4.9	-5.9	7.7
2101525	99	P	SUR	38	-175	67	49	3.6	-9.2	9.8
2301709	99	P	SUR	-27	78	3301	2359	1.7	0.2	1.7
3101542	99	P	SUR	-23	-42	267	19	7.3	-3.8	8.3
3201535	99	P	SUR	-56	-41	111	7	8.0	3.6	8.8
4301559	99	P	SUR	32	-135	652	232	5.3	-7.0	8.8
4301562	99	P	SUR	14	-128	175	0	1.6	4.8	5.1
4601665	99	P	SUR	44	174	261	2	2.6	5.7	6.2
4701658	99	P	SUR	70	-98	692	380	9.0	-4.9	10.2
4800282	99	P	SUR	71	-156	617	617	0.0	0.0	0.0
4800769	99	P	SUR	70	-101	690	515	8.6	-2.5	9.0
4800770	99	P	SUR	71	-22	215	205	2.0	13.0	13.2
4801617	99	P	SUR	76	-156	92	87	1.0	13.5	13.6
4801625	99	P	SUR	78	173	730	65	6.7	4.6	8.1
4801652	99	P	SUR	78	-170	692	680	2.4	-11.0	11.2
4802000	99	P	SUR	78	-122	640	467	8.5	2.1	8.8
48282	99	P	SUR	71	-156	636	636	0.0	0.0	0.0
48769	99	P	SUR	70	-101	711	537	8.6	-2.5	8.9
48770	99	P	SUR	71	-22	224	214	2.1	13.0	13.2
5401553	99	P	SUR	-51	-134	117	16	4.0	-5.1	6.5
6200083	99	P	SUR	43	-9	738	253	5.2	-6.0	7.9
6301670	99	P	SUR	82	48	692	218	6.0	-2.5	6.5
7101509	99	P	SUR	-60	0	607	0	2.3	8.3	8.6
7101558	99	P	SUR	-65	-31	565	564	0.0	8.6	8.6
7401503	99	P	SUR	-37	-12	742	0	0.7	-5.5	5.5

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

```
          LIST OF SUSPECT STATIONS        : DRIFTER
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND SPEED (M/S)
                    AREA                  : GLOBAL
                    PERIOD                : DEC 2018
                    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
45154	99	SPEED	SUR	46	-83	67	0	0	3.8	-5.1	6.3
6101008	99	SPEED	SUR	37	22	55	0	0	3.0	-5.4	6.2

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

```
          LIST OF SUSPECT STATIONS         : DRIFTER
                    MONITORING CENTRE      : ECMWF
                    ELEMENT MONITORED      : WIND DIRECTION (DEGREES)
                    PERIOD                 : DEC 2018
                    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	220	0	0	48.1	-73.5	87.8
1300130	99	DIRN	SUR	28	-16	73	0	0	13.0	56.7	58.1
13010	99	DIRN	SUR	0	0	211	0	0	48.9	-73.5	88.2
15002	99	DIRN	SUR	0	-10	243	0	0	18.3	-21.1	27.9
2200108	99	DIRN	SUR	36	126	568	0	0	20.5	-33.5	39.2
2200184	99	DIRN	SUR	34	126	699	0	0	14.2	-56.2	58.0
2300015	99	DIRN	SUR	0	67	127	0	0	17.5	21.2	27.5
23015	99	DIRN	SUR	0	67	57	0	0	12.9	20.8	24.5
23091	99	DIRN	SUR	18	89	126	0	0	12.7	25.9	28.8
23095	99	DIRN	SUR	10	94	57	0	0	19.8	23.9	31.0
23099	99	DIRN	SUR	13	80	66	0	0	75.3	32.3	81.9
23456	99	DIRN	SUR	18	67	141	0	0	168.1	29.7	170.7
23460	99	DIRN	SUR	7	88	40	0	0	34.9	66.4	75.0
23492	99	DIRN	SUR	11	72	98	0	0	19.2	-62.5	65.4
3100003	99	DIRN	SUR	-8	-31	217	0	0	8.4	24.1	25.5
3100053	99	DIRN	SUR	-32	-50	297	3	0	23.3	-29.9	38.0
3100231	99	DIRN	SUR	-27	-47	162	2	0	127.2	96.1	159.4
3100262	99	DIRN	SUR	-23	-43	32	0	0	23.6	-30.8	38.8
31003	99	DIRN	SUR	-8	-31	188	0	0	9.3	23.1	24.9
3100374	99	DIRN	SUR	-23	-43	64	0	0	31.9	90.2	95.7
31053	99	DIRN	SUR	-32	-50	300	3	0	25.5	-29.6	39.0
31231	99	DIRN	SUR	-27	-47	160	2	0	128.4	94.2	159.3
31262	99	DIRN	SUR	-23	-43	34	0	0	24.8	-31.2	39.8
31374	99	DIRN	SUR	-23	-43	59	0	0	30.0	90.1	95.0
3200303	99	DIRN	SUR	5	-95	381	0	0	41.2	22.8	47.1
32303	99	DIRN	SUR	5	-95	377	0	0	37.4	24.4	44.7
4100013	99	DIRN	SUR	33	-78	1908	0	0	25.7	24.1	35.2
41013	99	DIRN	SUR	33	-78	1214	0	0	24.9	21.6	32.9
4200012	99	DIRN	SUR	30	-88	39	0	0	45.8	44.9	64.1
4400058	99	DIRN	SUR	38	-76	1703	0	0	23.4	-21.8	32.0
44058	99	DIRN	SUR	38	-76	841	0	0	20.5	-23.3	31.1

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
44139	99	DIRN	SUR	44	-57	646	0	0	11.9	-24.2	26.9
4600092	99	DIRN	SUR	37	-122	285	0	0	27.1	30.5	40.8
4600118	99	DIRN	SUR	49	-123	320	2	0	65.1	-69.9	95.5
4600120	99	DIRN	SUR	48	-122	465	0	0	19.7	128.3	129.8
46083	99	DIRN	SUR	58	-138	632	0	0	30.1	23.1	37.9
46092	99	DIRN	SUR	37	-122	697	0	0	30.1	32.2	44.1
46118	99	DIRN	SUR	49	-123	427	6	0	63.8	-68.6	93.7
46120	99	DIRN	SUR	48	-122	118	0	0	45.1	114.6	123.2
5100020	99	DIRN	SUR	5	-155	604	0	0	29.8	-36.0	46.7
5100022	99	DIRN	SUR	-2	-155	417	0	0	24.5	31.2	39.7
51020	99	DIRN	SUR	5	-155	604	0	0	29.8	-35.8	46.6
51022	99	DIRN	SUR	-2	-155	411	0	0	24.6	31.6	40.0
5200004	99	DIRN	SUR	-5	165	378	0	0	32.9	-30.0	44.5
52004	99	DIRN	SUR	-5	165	368	0	0	31.0	-30.2	43.3
5300040	99	DIRN	SUR	-8	95	454	0	0	157.8	48.8	165.2
5300056	99	DIRN	SUR	-5	95	384	6	0	151.2	46.6	158.2
53040	99	DIRN	SUR	-8	95	457	0	0	152.9	61.3	164.7
53056	99	DIRN	SUR	-5	95	390	7	0	151.3	44.1	157.6
6101003	99	DIRN	SUR	40	25	71	0	0	37.4	39.2	54.1
6200191	99	DIRN	SUR	41	-10	198	0	0	10.9	116.6	117.1
6200200	99	DIRN	SUR	36	-8	439	7	0	163.6	-43.7	169.3
66022	99	DIRN	SUR	54	14	547	1	0	76.6	38.4	85.7

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

```
          LIST OF SUSPECT STATIONS        : RADIOSONDES
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
                    AREA                  : GLOBAL
                    PERIOD                : DEC 2018
                    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	12	Z	1000	57	3	25	0	12.4	75.9	76.9
01400	00	Z	1000	57	3	23	0	5.6	77.8	78.0
23205	12	Z	30	68	53	16	1	168.0	-151.0	225.9
23415	12	Z	50	65	57	29	0	123.3	66.1	139.9
28695	12	Z	250	55	73	10	0	45.6	-91.8	102.5
28695	00	Z	400	55	73	13	0	28.1	-60.8	67.0
32389	12	Z	300	56	161	31	0	44.4	-65.1	78.8
48568	00	Z	925	7	101	14	0	19.4	24.3	31.1
68842	00	Z	1000	-34	26	30	0	25.5	18.8	31.7
VKB4L5	12	Z	1000	23	-61	13	0	5.0	31.1	31.5

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                : DEC 2018
                    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
```

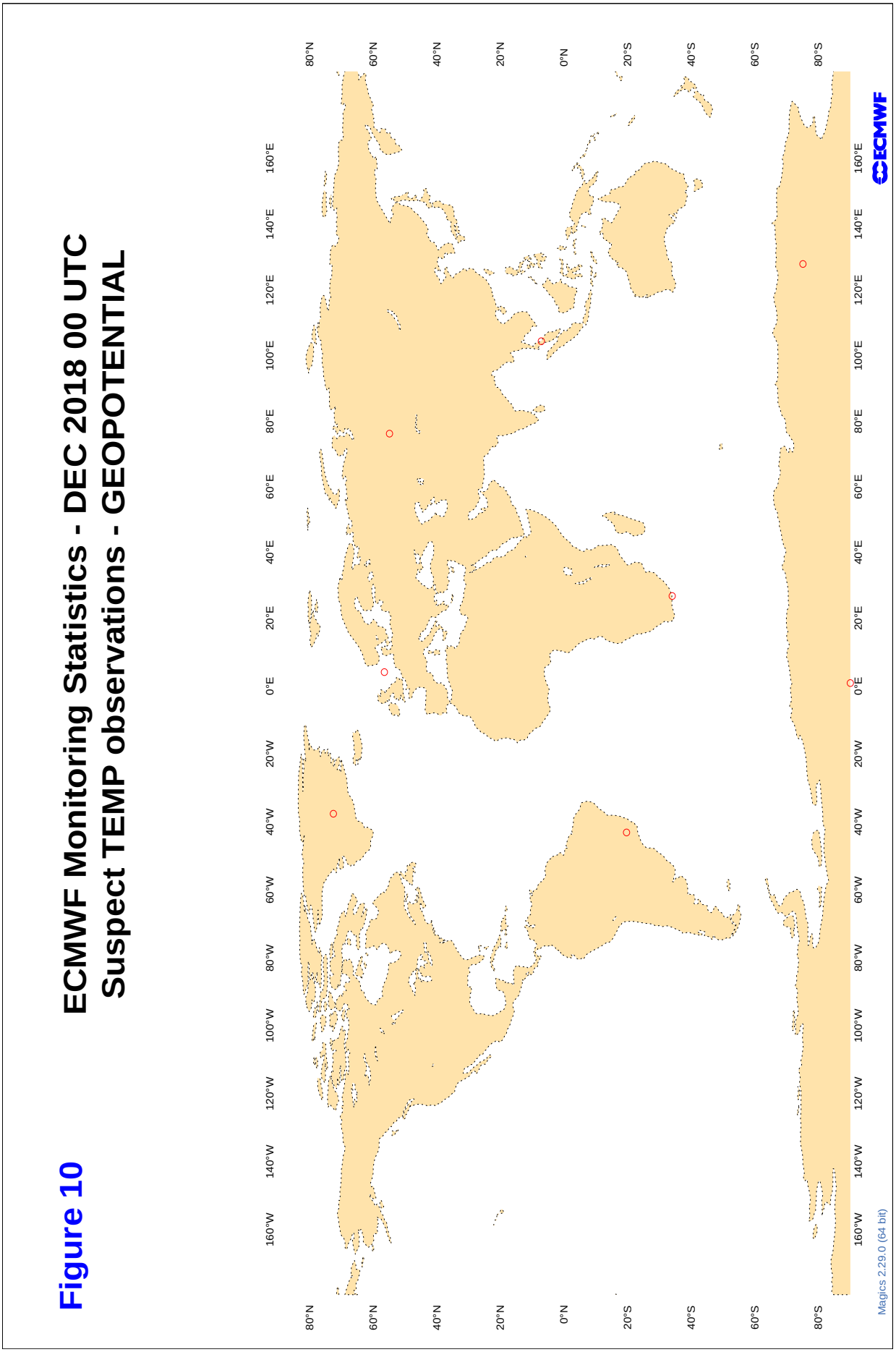
WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	UBIAS	VBIAS	RMS
30635	00	V	100	53	109	26	1	-9.8	12.9	22.4
30635	12	V	100	53	109	31	0	-8.8	13.8	23.1
41923	12	V	150	24	90	10	0	4.2	0.8	15.0

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

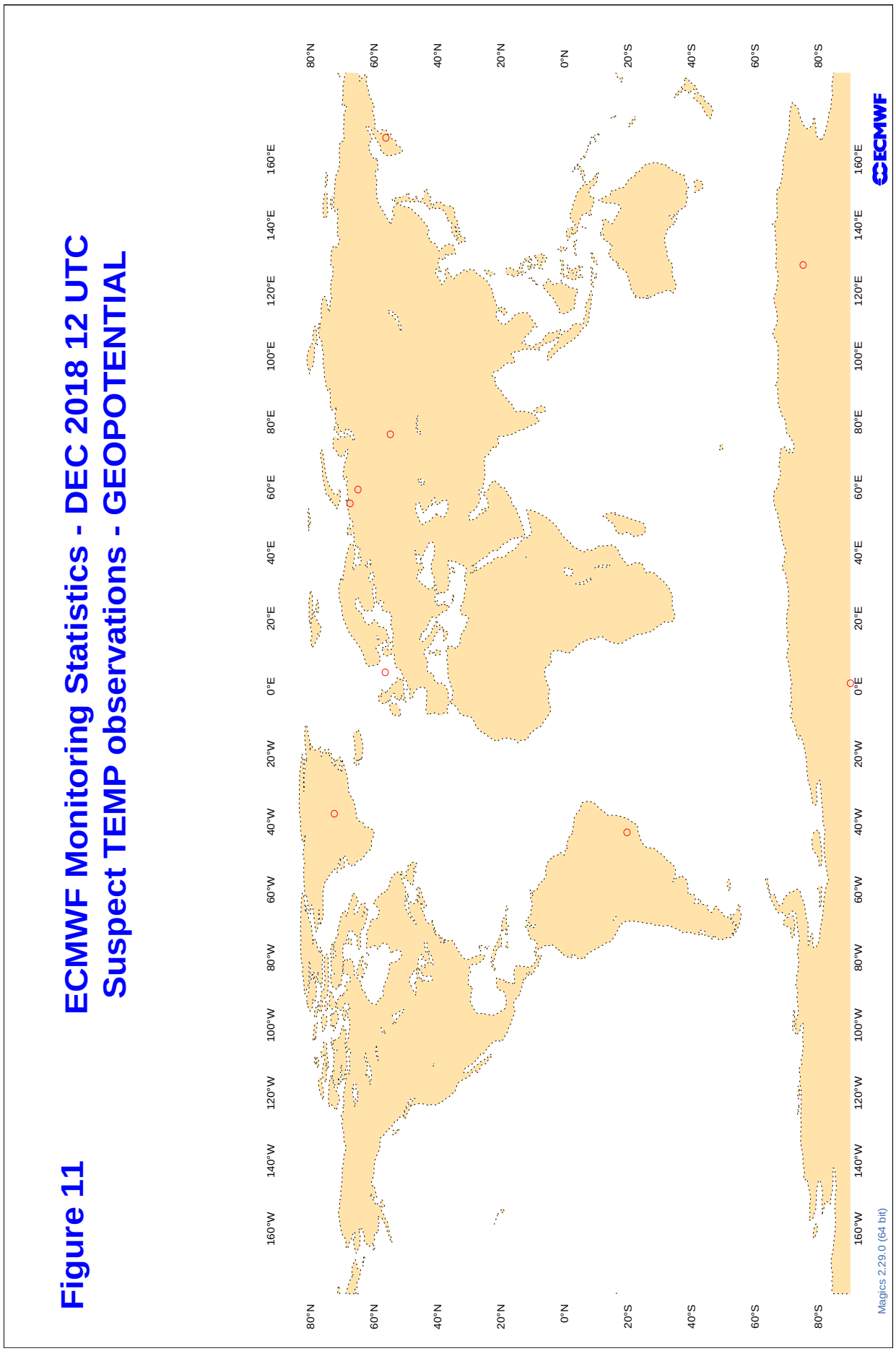
```
          LIST OF SUSPECT STATIONS        : RADIOSONDES
                    MONITORING CENTRE     : ECMWF
                    ELEMENT MONITORED     : WIND DIRECTION (DEGREES)
                    AREA                  : GLOBAL
                    PERIOD                : DEC 2018
                    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
56146	00	DD	32	100	30	10.4	2.4	5.1
56146	12	DD	32	100	30	11.6	5.2	7.6

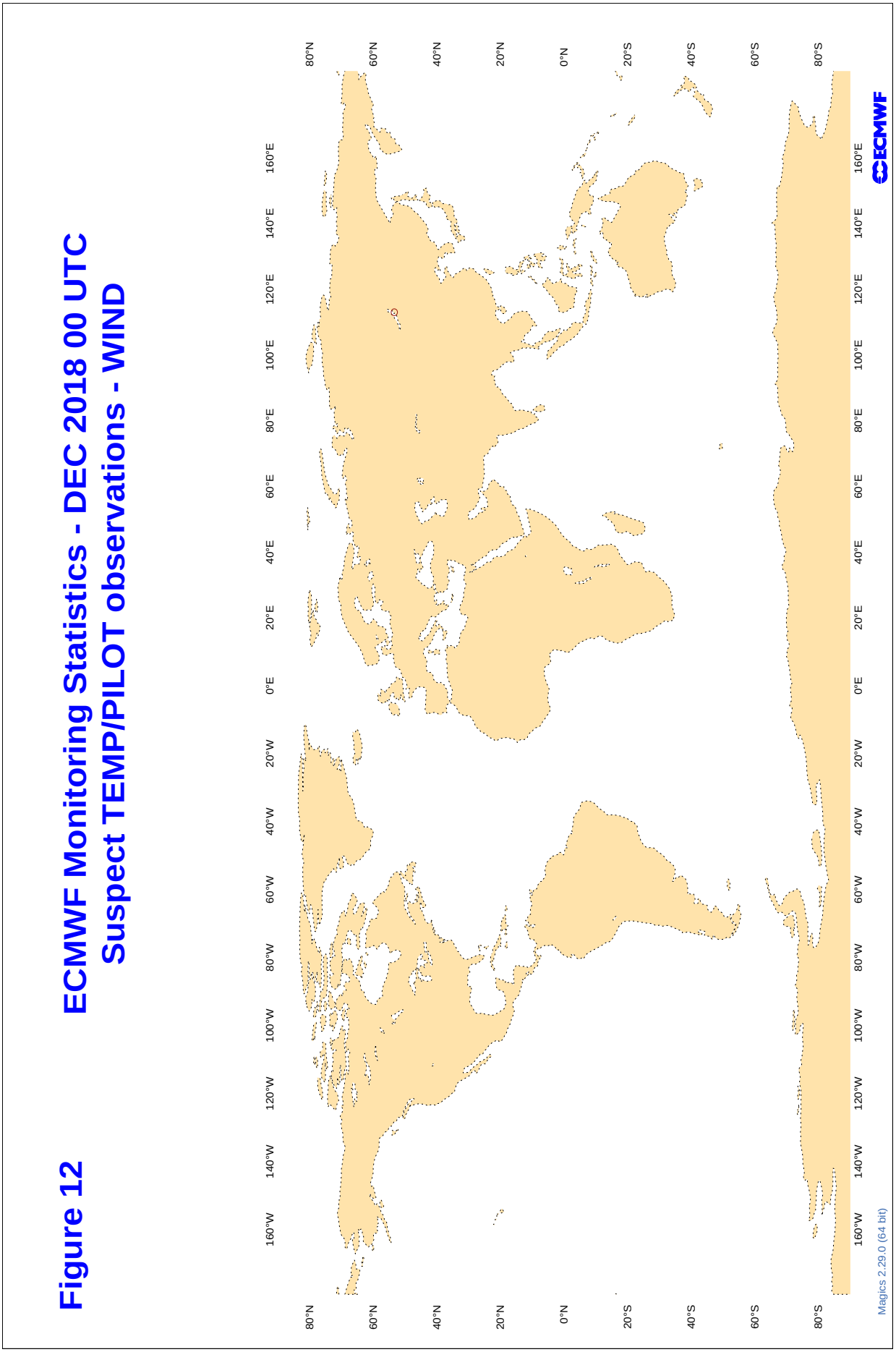
3.2.21 Figure 10 - Suspect TEMP observations - geopotential : 00 UTC



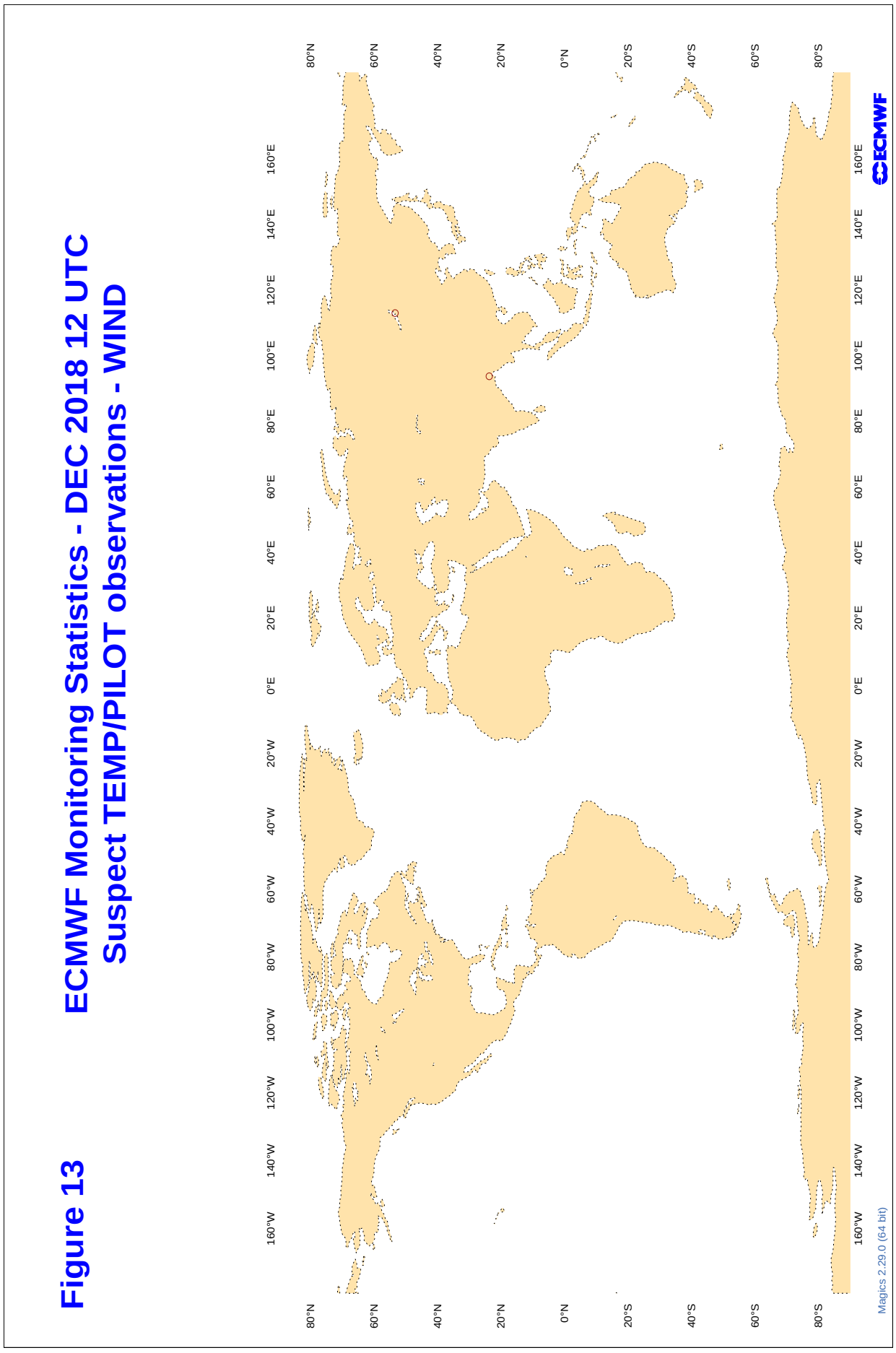
3.2.22 Figure 11 - Suspect TEMP observations - geopotential : 12 UTC



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                : DEC 2018
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
5QPW8X	12	Z	100	7	24.4	24.0
5QPW8X	00	Z	100	10	27.4	26.2
7HCPVT	00	Z	100	4	30.9	30.6
7HCPVT	12	Z	100	6	24.6	23.0
7JUNA4	00	Z	100	8	5.4	-2.2
7JUNA4	12	Z	100	7	15.5	14.0
ASDE09	12	Z	100	1	3.6	-3.6
DBLK	00	Z	100	7	6.2	-4.4
DBLK	12	Z	100	26	11.0	3.4
FHM5UJ	12	Z	100	13	13.5	9.0
FHM5UJ	00	Z	100	10	15.9	10.2
FPUW5G	00	Z	100	1	14.3	14.3
FPUW5G	12	Z	100	9	10.3	8.7
HTXUH4	12	Z	100	11	11.8	8.8
HTXUH4	00	Z	100	5	20.8	17.2
JGQH	12	Z	100	0	0.0	0.0
JGQH	00	Z	100	3	17.1	16.4
JNSR	12	Z	100	2	8.2	7.7
JNSR	00	Z	100	3	6.4	4.4
QCY3TG	00	Z	100	6	24.1	20.7
QCY3TG	12	Z	100	7	27.0	26.0
VKB4L5	12	Z	100	12	56.7	55.9
VKB4L5	00	Z	100	8	53.0	52.5
WDK38H	12	Z	100	13	10.4	9.2
WDK38H	00	Z	100	1	3.6	3.6
WSD	00	Z	100	2	0.0	0.0
XKQLWQ	12	Z	100	20	43.2	41.3
XQFJRG	12	Z	100	1	1.1	-1.1
XQFJRG	00	Z	100	4	13.7	0.7
XWHDEA	12	Z	100	5	11.5	6.5
XWHDEA	00	Z	100	4	9.9	5.5
YLV96W	00	Z	100	2	4.6	4.1
YLV96W	12	Z	100	2	14.0	-8.7
ZVQEQC	12	Z	100	1	10.4	10.4

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                : DEC 2018
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
5QPW8X	12	V	100	7	4.0	-1.4	1.5
5QPW8X	00	V	100	10	2.3	0.7	-0.6
7HCPVT	00	V	100	4	3.6	-2.1	-0.4
7HCPVT	12	V	100	6	2.8	0.4	-0.2
7JUNA4	00	V	100	7	3.5	0.8	0.2
7JUNA4	12	V	100	7	3.6	-1.5	1.2
ASDE09	12	V	100	1	0.8	-0.6	-0.6
DBLK	00	V	100	7	1.7	0.7	0.2
DBLK	12	V	100	26	3.3	0.0	0.7
FHM5UJ	12	V	100	13	3.3	-0.5	0.2
FHM5UJ	00	V	100	10	2.3	0.2	-0.9
FPUW5G	00	V	100	1	4.1	3.4	2.3
FPUW5G	12	V	100	9	4.9	2.5	1.3
HTXUH4	12	V	100	10	5.9	0.9	2.8
HTXUH4	00	V	100	5	3.4	-0.7	-0.8
JGQH	12	V	100	0	0.0	0.0	0.0
JGQH	00	V	100	3	3.4	-2.2	-1.8
JNSR	12	V	100	2	5.8	-1.6	4.1
JNSR	00	V	100	3	1.6	0.1	-0.3
QCY3TG	00	V	100	6	4.3	1.0	1.4
QCY3TG	12	V	100	7	3.2	0.0	1.0
VKB4L5	12	V	100	12	6.4	0.7	1.9
VKB4L5	00	V	100	8	2.7	0.6	-0.6
WDK38H	12	V	100	13	3.9	0.4	-0.3
WDK38H	00	V	100	1	1.8	1.5	-1.0
WSD	00	V	100	2	1.9	0.1	-0.6
XKQLWQ	12	V	100	20	5.5	-0.1	-1.3
XQFJRG	12	V	100	0	0.0	0.0	0.0
XQFJRG	00	V	100	3	3.0	-0.9	1.6
XWHDEA	12	V	100	5	3.5	-1.6	0.3
XWHDEA	00	V	100	4	3.3	1.0	-2.0
YLV96W	00	V	100	2	2.3	0.7	2.2
YLV96W	12	V	100	2	3.8	-1.5	0.1
ZVQEQC	12	V	100	1	2.4	2.3	0.7

3.2.27 Figure 14 - SATOB Winds: 700-1000hPa

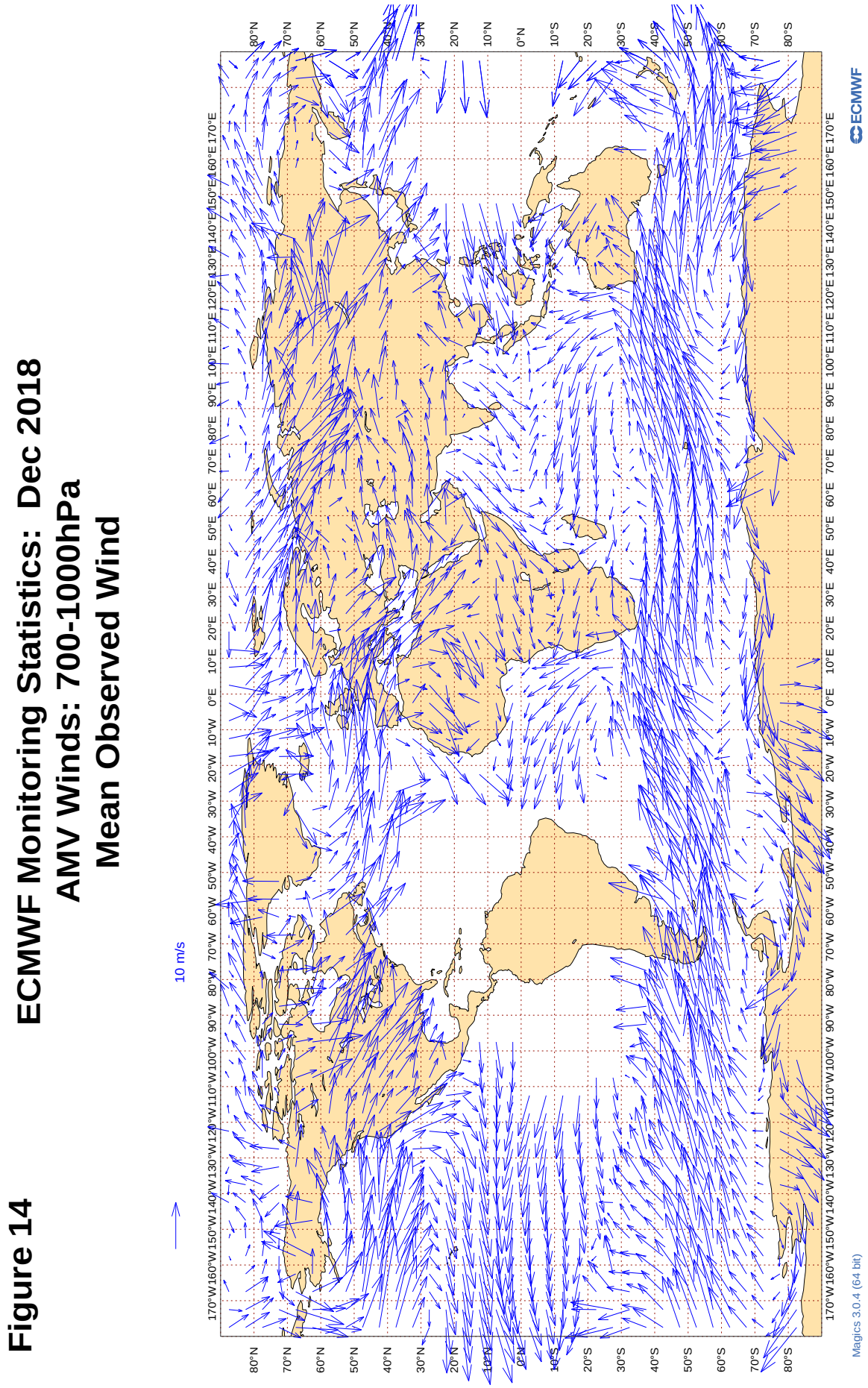


Figure 14

3.2.28 Figure 15 - SATOB Winds: 150- 400hPa

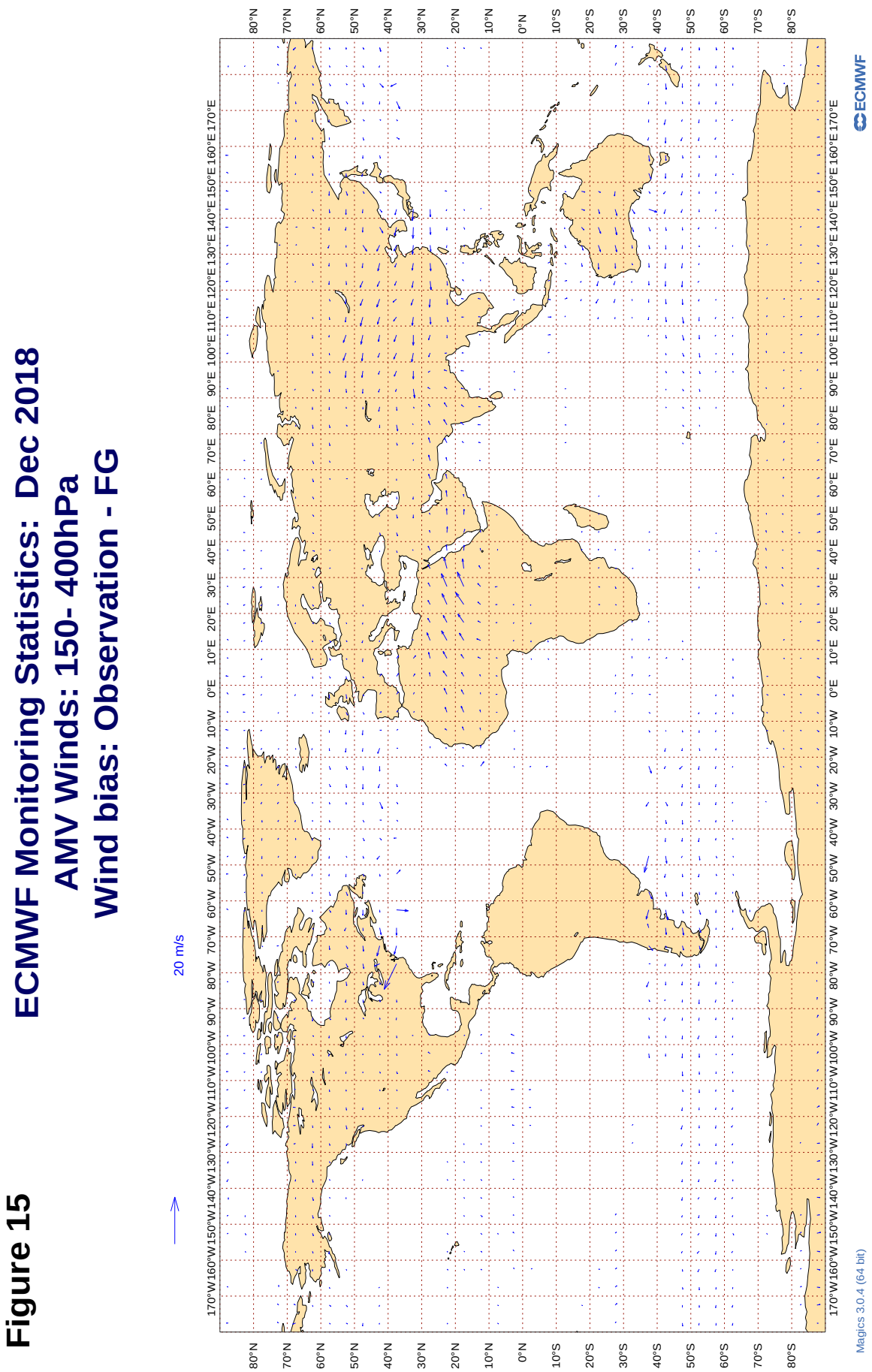


Figure 15

3.2.29 Figure 16 - SATOB Winds: 700-1000hPa

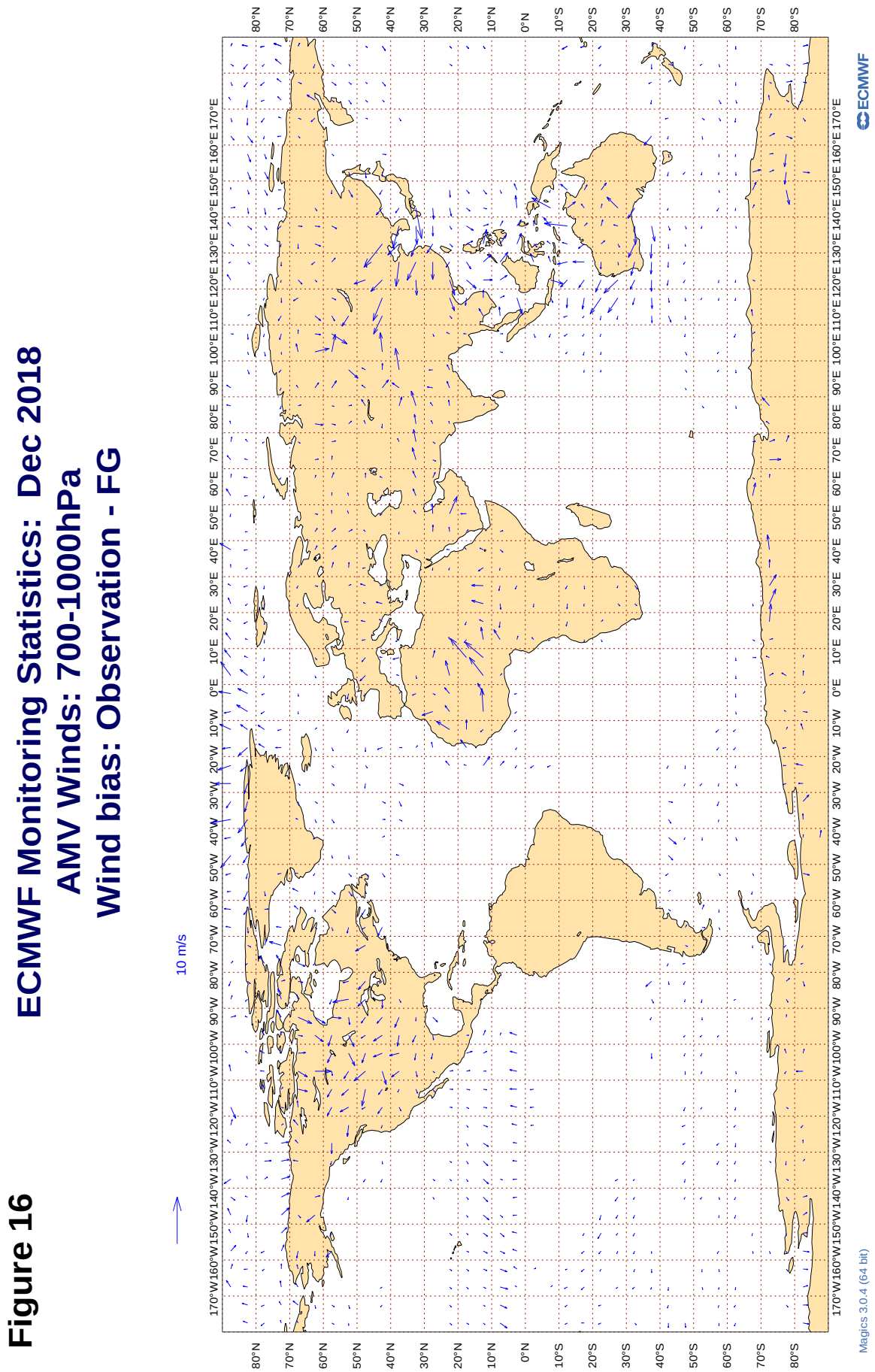


Figure 16

3.2.30 Figure 17 - SATOB Winds: 150- 400hPa

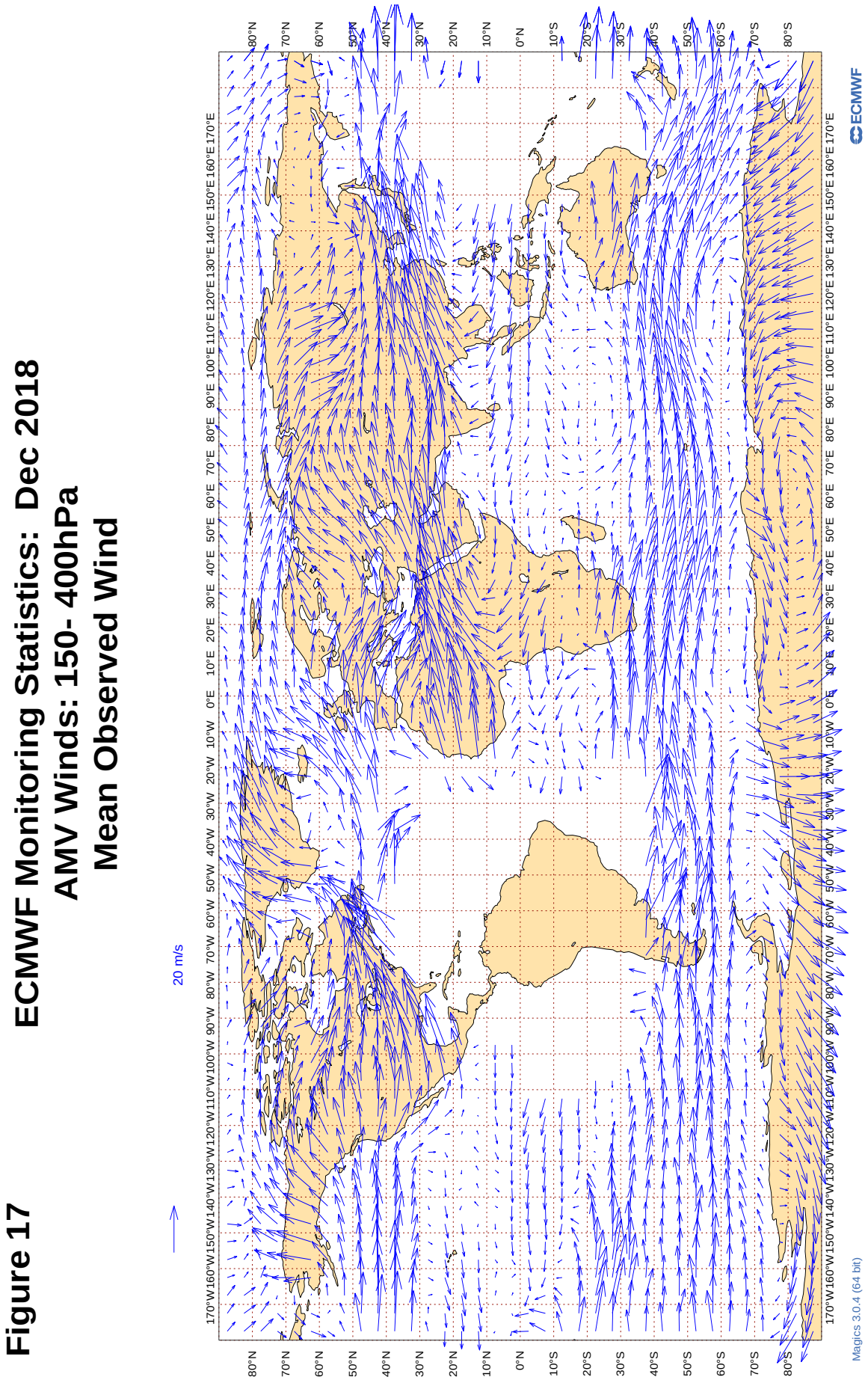


Figure 17

3.2.31 Figure 18 - AIRCRAFT Winds: 150- 300hPa

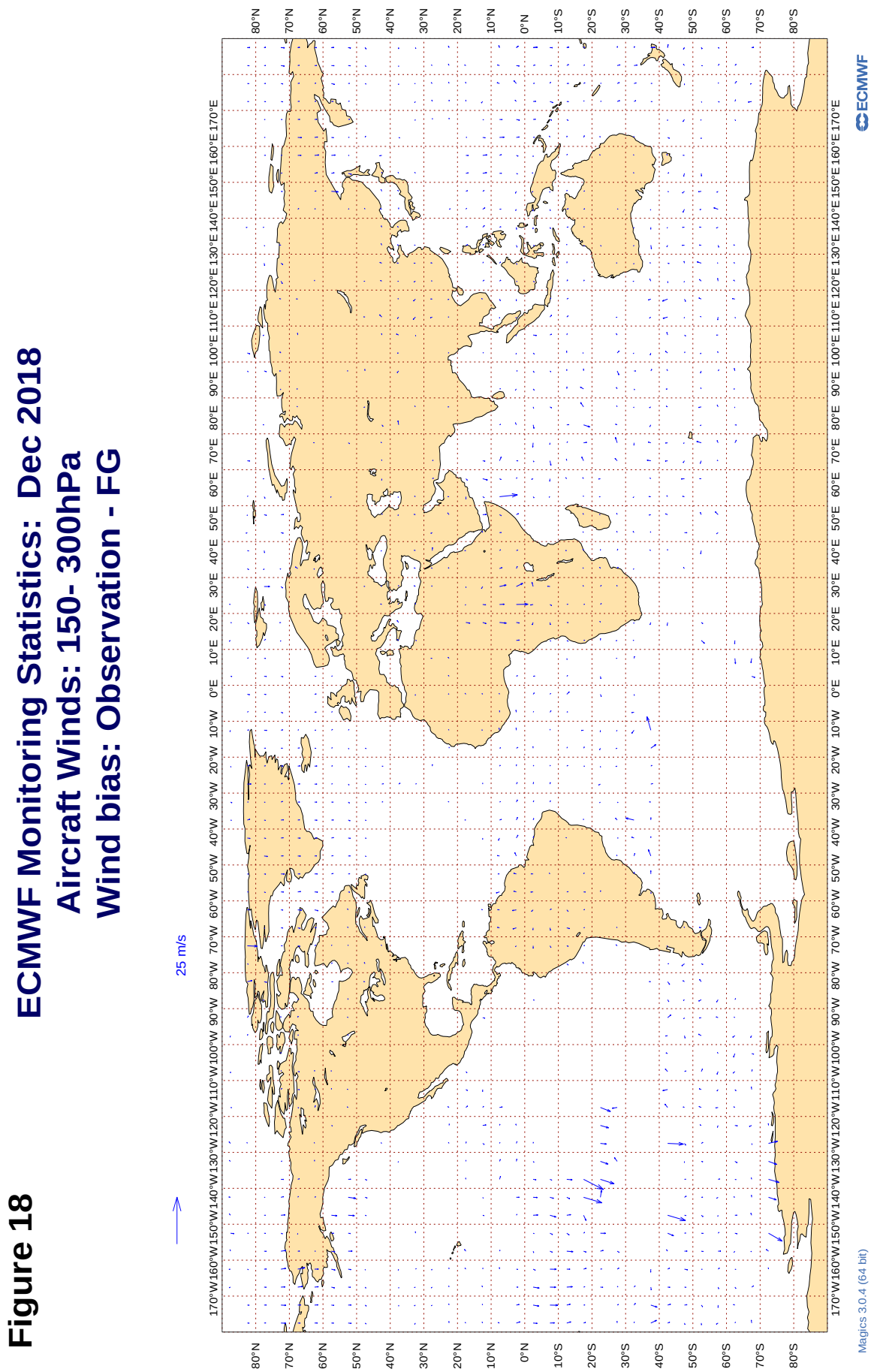


Figure 18

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                : DEC 2018
                   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	105	0	0	4.0	0.3
AAL	99	V	300-150	42650	3	0	7.1	0.3
AAR	99	V	300-150	247	0	0	5.5	-2.2
ABD	99	V	300-150	985	0	0	4.4	-0.4
ABP	99	V	300-150	23	0	0	3.9	-1.0
ABW	99	V	300-150	745	0	0	4.2	-0.4
ACA	99	V	300-150	26352	7	0	9.5	0.2
ACI	99	V	300-150	3147	0	0	4.6	0.4
AEA	99	V	300-150	750	1	1	4.7	-0.4
AFL	99	V	300-150	2078	0	0	3.5	0.5
AFR	99	V	300-150	25149	2	0	5.0	0.2
AHO	99	V	300-150	44	0	0	3.4	0.1
AHY	99	V	300-150	209	11	0	11.4	0.5
AIC	99	V	300-150	1774	1	0	4.7	0.3
AIZ	99	V	300-150	79	0	0	6.0	1.1
ALK	99	V	300-150	954	0	0	3.2	0.6
AMX	99	V	300-150	3161	22	0	13.8	-0.1
ANZ	99	V	300-150	28225	3	0	6.5	0.5
AOJ	99	V	300-150	81	0	0	4.4	-0.1
ASA	99	V	300-150	68	3	1	7.0	-0.2
ASL	99	V	300-150	392	0	0	3.8	0.2
ASV	99	V	300-150	24	0	4	5.0	0.2
ASY	99	V	300-150	263	0	0	5.0	0.8
ATN	99	V	300-150	98	1	1	5.2	-0.1
AUA	99	V	300-150	3766	0	0	4.4	-0.1
AUI	99	V	300-150	503	0	0	3.8	0.3

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
AVA	99	V	300-150	613	19	0	9.7	-0.2
AXB	99	V	300-150	31	0	0	3.5	1.7
AXM	99	V	300-150	152	0	0	6.2	1.1
AZA	99	V	300-150	5568	0	0	4.0	0.1
AZG	99	V	300-150	302	0	0	3.7	0.2
BAH	99	V	300-150	39	0	0	4.3	1.1
BAW	99	V	300-150	48431	4	0	6.7	0.1
BBC	99	V	300-150	235	1	0	4.3	1.0
BEL	99	V	300-150	1184	0	0	3.8	0.1
BLJ	99	V	300-150	44	0	0	4.3	0.5
BLU	99	V	300-150	66	0	0	4.6	0.2
BMW	99	V	300-150	92	0	0	3.4	0.1
BOS	99	V	300-150	1041	0	0	4.1	0.0
BOX	99	V	300-150	1673	0	0	4.2	-0.1
BOX	99	V	300-150	114	0	0	3.5	0.7
BPA	99	V	300-150	72	25	4	11.7	-2.1
CAL	99	V	300-150	410	0	0	4.1	0.4
CAZ	99	V	300-150	97	0	1	3.7	-0.6
CCA	99	V	300-150	1488	6	0	10.0	0.6
CEB	99	V	300-150	61	0	2	3.3	0.2
CES	99	V	300-150	1675	0	0	4.0	0.5
CFC	99	V	300-150	125	0	0	3.9	0.3
CFG	99	V	300-150	4487	0	0	4.5	0.1
CHH	99	V	300-150	310	12	0	11.1	0.7
CJT	99	V	300-150	292	0	0	4.6	0.3
CKS	99	V	300-150	1437	0	0	4.1	-0.3
CLF	99	V	300-150	35	0	0	4.6	-0.7
CLU	99	V	300-150	981	0	0	4.1	-0.1
CLX	99	V	300-150	3700	0	0	4.4	-0.5
CMB	99	V	300-150	547	0	0	4.2	0.0
CNK	99	V	300-150	36	0	0	2.6	0.1
CNV	99	V	300-150	164	0	0	3.7	0.8
CPA	99	V	300-150	1663	0	0	4.0	0.3
CRK	99	V	300-150	670	0	0	4.1	0.6
CRL	99	V	300-150	671	0	0	4.2	0.1
CRV	99	V	300-150	62	0	0	3.7	-0.0
CSC	99	V	300-150	190	0	0	4.7	0.6
CSN	99	V	300-150	1191	11	0	12.5	0.3
CXA	99	V	300-150	27	22	0	20.0	-0.1
DAH	99	V	300-150	589	0	0	3.7	0.0
DAL	99	V	300-150	49114	0	0	4.1	0.1
DCS	99	V	300-150	35	0	0	3.5	-0.1
DGX	99	V	300-150	66	0	0	3.3	-0.4

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
DHK	99	V	300-150	2061	0	0	5.1	-0.6
DJT	99	V	300-150	1481	0	0	4.8	-0.1
DLH	99	V	300-150	25568	0	0	4.0	0.1
DSO	99	V	300-150	48	0	0	2.8	-0.4
DUB	99	V	300-150	45	0	0	4.5	0.1
EAU	99	V	300-150	97	0	0	3.1	0.1
EDC	99	V	300-150	118	10	0	9.2	0.1
EDG	99	V	300-150	54	0	2	3.8	1.1
EDW	99	V	300-150	1306	0	0	4.5	0.3
EIN	99	V	300-150	14631	0	0	4.0	0.2
EJM	99	V	300-150	484	0	0	4.0	-0.1
ELY	99	V	300-150	3027	13	0	10.7	0.0
ETD	99	V	300-150	5944	2	0	5.2	0.3
ETH	99	V	300-150	3464	5	0	7.6	0.2
EWG	99	V	300-150	5432	0	0	4.1	0.3
FBU	99	V	300-150	623	0	0	5.0	0.6
FDX	99	V	300-150	5976	0	0	4.2	0.0
FEX	99	V	300-150	30	0	0	3.9	-0.5
FIN	99	V	300-150	1211	0	0	3.5	0.2
FJI	99	V	300-150	6763	0	0	4.9	0.8
FLA	99	V	300-150	50	0	0	4.9	-0.4
FWI	99	V	300-150	1713	0	1	3.9	0.0
FYG	99	V	300-150	72	0	0	5.2	-0.3
FYL	99	V	300-150	37	0	0	4.7	1.3
GAF	99	V	300-150	37	0	0	3.6	-1.0
GCK	99	V	300-150	22	0	0	3.3	0.0
GCR	99	V	300-150	174	0	0	3.6	0.7
GEC	99	V	300-150	2487	0	0	4.2	0.0
GES	99	V	300-150	201	0	0	3.8	0.0
GFA	99	V	300-150	587	0	0	3.3	0.4
GIA	99	V	300-150	517	0	0	3.2	0.6
GLJ	99	V	300-150	32	0	0	3.7	-0.8
GLO	99	V	300-150	48	2	4	9.5	0.9
GMA	99	V	300-150	35	0	0	3.9	0.3
GTI	99	V	300-150	2204	0	0	4.4	-0.5
HAL	99	V	300-150	5030	0	0	5.0	1.0
HRT	99	V	300-150	58	0	0	3.9	-0.0
HZA	99	V	300-150	22	0	0	6.3	-3.2
HZS	99	V	300-150	40	0	0	5.7	-0.4
HZS	99	V	300-150	61	0	0	4.8	0.9
IAM	99	V	300-150	37	0	0	3.8	0.5
IBE	99	V	300-150	2626	0	1	4.2	0.2
IBK	99	V	300-150	4896	0	0	4.3	0.3

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
ICE	99	V	300-150	1047	0	0	3.7	0.2
ICL	99	V	300-150	1069	0	0	5.0	-0.4
ICV	99	V	300-150	320	0	0	4.5	-0.7
IFA	99	V	300-150	61	75	0	31.6	0.1
ISS	99	V	300-150	1548	0	0	4.1	0.1
JAF	99	V	300-150	1116	17	0	11.9	0.2
JAI	99	V	300-150	1077	0	0	3.7	0.3
JAS	99	V	300-150	102	0	0	4.0	0.4
JEF	99	V	300-150	27	0	0	3.7	0.7
JET	99	V	300-150	97	0	1	5.3	-1.1
JJA	99	V	300-150	44	0	2	5.4	1.4
JLN	99	V	300-150	32	0	0	2.7	-0.1
JME	99	V	300-150	146	0	1	3.4	0.3
JST	99	V	300-150	2126	3	0	9.5	0.5
JTS	99	V	300-150	35	0	0	3.7	0.5
KAC	99	V	300-150	1388	0	0	3.9	0.3
KAI	99	V	300-150	87	0	0	5.1	1.0
KAL	99	V	300-150	2089	0	0	4.7	0.8
KAY	99	V	300-150	92	0	0	4.3	0.9
KFE	99	V	300-150	71	0	0	3.8	-0.3
KLM	99	V	300-150	17292	5	0	7.4	0.0
KQA	99	V	300-150	310	21	1	10.7	0.6
KRH	99	V	300-150	31	0	0	2.9	0.5
KTK	99	V	300-150	273	0	1	4.0	0.0
LAN	99	V	300-150	2217	12	0	10.0	0.3
LEA	99	V	300-150	67	0	0	3.7	-0.5
LNI	99	V	300-150	181	0	1	3.3	0.4
LOT	99	V	300-150	2834	9	0	12.4	-0.2
LXG	99	V	300-150	67	0	0	2.9	0.1
LXJ	99	V	300-150	24	0	0	3.8	0.5
MAS	99	V	300-150	931	0	0	3.4	0.5
MAU	99	V	300-150	125	0	0	4.4	0.3
MED	99	V	300-150	36	0	0	3.6	-0.0
MHV	99	V	300-150	81	0	0	4.0	1.0
MMD	99	V	300-150	471	0	0	3.9	-0.3
MNB	99	V	300-150	197	0	0	3.8	0.7
MPH	99	V	300-150	509	0	0	4.8	-1.0
MSR	99	V	300-150	1441	0	0	4.0	0.2
NAF	99	V	300-150	24	0	0	5.2	-0.5
NAX	99	V	300-150	11019	15	0	12.4	-0.0
NJE	99	V	300-150	324	0	0	3.6	-0.1
NOS	99	V	300-150	614	10	0	10.3	0.3
NRS	99	V	300-150	8104	17	0	11.9	0.2

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
NWS	99	V	300-150	779	0	0	3.8	0.2
OAE	99	V	300-150	960	0	0	4.3	0.2
OMA	99	V	300-150	659	2	0	4.9	0.4
ORF	99	V	300-150	37	0	0	2.9	0.3
OSY	99	V	300-150	24	0	0	5.2	-1.8
PAC	99	V	300-150	295	0	0	4.8	0.3
PAL	99	V	300-150	1109	0	0	3.8	0.5
PAT	99	V	300-150	34	0	0	3.0	-0.4
PEG	99	V	300-150	30	0	7	3.5	-1.3
PIA	99	V	300-150	171	0	1	3.2	-0.2
PJZ	99	V	300-150	25	0	0	2.5	1.2
PLF	99	V	300-150	23	0	0	2.5	-0.3
PVJ	99	V	300-150	44	9	0	3.1	-0.2
QAF	99	V	300-150	95	0	0	3.3	-0.2
QFA	99	V	300-150	21808	0	0	6.6	0.7
QQE	99	V	300-150	59	3	0	6.6	0.5
QTR	99	V	300-150	14578	0	0	4.4	0.2
RAM	99	V	300-150	638	20	0	11.1	0.6
RBA	99	V	300-150	95	4	0	10.0	0.4
RCH	99	V	300-150	3728	0	0	4.8	0.5
RDN	99	V	300-150	104	0	0	4.4	0.0
RJA	99	V	300-150	1290	18	0	14.1	-0.0
ROJ	99	V	300-150	35	0	0	2.7	0.2
ROU	99	V	300-150	691	0	0	5.0	0.8
RRR	99	V	300-150	75	0	0	3.2	0.6
RZO	99	V	300-150	117	0	8	4.3	0.4
SAA	99	V	300-150	20	0	0	4.5	0.3
SAM	99	V	300-150	279	0	0	4.0	0.6
SAS	99	V	300-150	3724	0	0	3.5	0.2
SAZ	99	V	300-150	88	0	0	3.9	-0.5
SCX	99	V	300-150	122	2	1	6.8	0.2
SDM	99	V	300-150	127	0	1	4.8	0.3
SHE	99	V	300-150	51	0	0	3.5	0.3
SIA	99	V	300-150	4549	0	0	4.1	0.0
SIO	99	V	300-150	48	0	0	4.1	1.4
SJT	99	V	300-150	31	0	0	2.9	-0.7
SLM	99	V	300-150	99	0	1	4.1	0.8
SOO	99	V	300-150	704	0	0	4.1	-0.1
SPA	99	V	300-150	48	0	0	2.8	0.4
SUI	99	V	300-150	41	0	0	5.1	1.1
SVA	99	V	300-150	4784	0	0	4.3	0.3
SVW	99	V	300-150	165	0	1	5.1	-0.0
SWR	99	V	300-150	10272	0	1	4.2	0.2

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
SXN	99	V	300-150	60	0	0	3.8	-0.6
TAM	99	V	300-150	36	0	0	4.7	1.0
TAP	99	V	300-150	1398	0	1	4.1	-0.3
TAR	99	V	300-150	287	0	0	3.8	0.2
TAY	99	V	300-150	293	0	0	4.3	0.6
TBJ	99	V	300-150	48	0	0	4.4	1.7
TCX	99	V	300-150	2306	0	0	3.9	0.1
TEU	99	V	300-150	63	0	0	4.4	0.2
TFL	99	V	300-150	1866	16	0	10.2	0.3
TGW	99	V	300-150	68	7	0	8.8	0.8
THA	99	V	300-150	450	7	0	11.4	0.2
THT	99	V	300-150	3116	2	0	8.3	0.6
THY	99	V	300-150	7398	0	0	4.1	0.2
TMN	99	V	300-150	252	0	0	4.5	1.0
TOM	99	V	300-150	4036	19	0	12.4	0.3
TOW	99	V	300-150	61	0	0	3.8	-0.2
TPA	99	V	300-150	218	0	0	4.7	1.0
TSC	99	V	300-150	3407	0	0	4.1	0.1
TVP	99	V	300-150	192	0	0	4.1	0.4
TWY	99	V	300-150	221	0	0	3.6	0.2
UAE	99	V	300-150	16318	0	0	3.8	0.2
UAF	99	V	300-150	36	0	0	3.3	-0.1
UAL	99	V	300-150	70315	2	2	6.7	0.3
ULC	99	V	300-150	92	0	0	3.7	-0.5
UPS	99	V	300-150	4659	0	0	4.7	0.1
UZB	99	V	300-150	109	23	0	17.6	-0.2
VAL	99	V	300-150	20	0	0	3.3	-0.7
VCN	99	V	300-150	33	0	0	3.3	0.3
VIR	99	V	300-150	20142	4	0	6.5	0.0
VJT	99	V	300-150	947	7	0	5.7	0.3
VKG	99	V	300-150	385	0	0	4.6	0.1
VMP	99	V	300-150	24	0	0	2.9	0.6
VOZ	99	V	300-150	6969	0	0	4.5	0.6
VXS	99	V	300-150	20	0	0	4.2	-0.2
WGT	99	V	300-150	88	0	0	3.4	-0.2
WJA	99	V	300-150	3239	1	0	5.9	0.3
WOW	99	V	300-150	4508	0	0	3.4	0.3
WWI	99	V	300-150	25	0	4	4.3	0.1
XAX	99	V	300-150	534	0	0	3.8	0.6
XLF	99	V	300-150	1215	0	0	3.8	0.2
XRO	99	V	300-150	78	0	0	4.9	0.3

4 EUCOS Area Monitoring Statistics

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

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

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

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
         LEVEL                 :  50 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : DEC 2018
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	50	28	16.2	14.1
01001	00	Z	50	28	14.8	13.1
01028	12	Z	50	30	22.3	16.1
01028	00	Z	50	31	11.6	9.5
01400	12	Z	50	22	90.5	89.3
01400	00	Z	50	20	90.8	90.2
01415	00	Z	50	30	19.8	18.0
01415	12	Z	50	30	19.5	17.9
02365	12	Z	50	26	13.4	11.6
02365	00	Z	50	23	14.6	14.0
02591	00	Z	50	27	22.7	21.4
02591	12	Z	50	27	18.8	16.9
02836	12	Z	50	25	12.4	10.7
02836	00	Z	50	26	12.2	9.8
02963	12	Z	50	24	15.6	13.6
02963	00	Z	50	25	14.2	12.9
03005	12	Z	50	30	15.6	13.7
03005	00	Z	50	28	15.0	14.0
03238	00	Z	50	29	17.0	13.6
03238	12	Z	50	3	17.2	11.4
03808	00	Z	50	26	17.4	16.3
03808	12	Z	50	30	17.5	16.0
03918	00	Z	50	30	22.4	19.6
03918	12	Z	50	9	20.7	19.4
03953	00	Z	50	27	27.8	26.1
03953	12	Z	50	32	32.2	29.9
04018	00	Z	50	28	19.8	17.2
04018	12	Z	50	31	12.7	10.6
04220	00	Z	50	31	20.3	15.9
04220	12	Z	50	30	14.6	12.5
04270	00	Z	50	31	15.8	14.0
04270	12	Z	50	31	12.4	10.7
04320	00	Z	50	31	14.0	12.6
04320	12	Z	50	31	15.3	13.7
04339	00	Z	50	26	17.1	13.9
04339	12	Z	50	29	17.8	10.4
04360	12	Z	50	24	12.1	6.0
04360	00	Z	50	26	15.9	9.0
06011	12	Z	50	13	15.4	10.7

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	50	13	15.3	10.7
06260	00	Z	50	31	18.4	16.1
06260	12	Z	50	5	17.7	16.9
06610	12	Z	50	32	24.8	21.5
06610	00	Z	50	27	22.5	19.1
07110	12	Z	50	29	25.1	20.5
07110	00	Z	50	28	51.5	24.7
07510	00	Z	50	28	35.6	34.8
07510	12	Z	50	28	43.7	42.1
07645	12	Z	50	26	20.6	16.4
07645	00	Z	50	30	25.1	18.3
07761	12	Z	50	30	36.9	34.4
07761	00	Z	50	29	35.6	32.6
08001	00	Z	50	31	24.7	22.4
08001	12	Z	50	29	41.3	39.8
08221	00	Z	50	31	25.6	24.9
08221	12	Z	50	31	30.2	28.7
08302	12	Z	50	30	20.4	18.8
08302	00	Z	50	31	19.2	17.7
08508	12	Z	50	23	24.3	21.1
08522	12	Z	50	31	26.6	25.9
08579	12	Z	50	30	35.6	34.0
10035	12	Z	50	31	28.2	21.8
10393	12	Z	50	31	17.3	13.9
10393	00	Z	50	30	18.7	16.9
10410	12	Z	50	31	14.2	12.7
10410	00	Z	50	30	15.5	14.1
10739	00	Z	50	27	21.4	19.3
10739	12	Z	50	31	18.1	15.2
11035	00	Z	50	28	25.7	23.4
11035	12	Z	50	31	39.9	33.4
12982	12	Z	50	14	35.9	35.5
12982	00	Z	50	23	22.7	19.6
16080	00	Z	50	31	16.1	14.2
16080	12	Z	50	31	18.9	15.2
16245	12	Z	50	29	23.0	19.3
16245	00	Z	50	29	18.5	15.9
16320	00	Z	50	29	25.0	22.1
16320	12	Z	50	29	26.1	23.7
16429	00	Z	50	28	19.6	18.7
16429	12	Z	50	31	23.5	19.1
16622	00	Z	50	28	26.5	24.4
16754	00	Z	50	25	26.2	23.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	50	29	21.6	20.1
26435	12	Z	50	14	10.2	8.1
5QPW8X	12	Z	50	6	33.2	32.9
5QPW8X	00	Z	50	8	35.7	34.9
60018	00	Z	50	30	25.3	24.6
60018	12	Z	50	30	19.8	18.7
7HCPVT	00	Z	50	4	49.2	49.1
7HCPVT	12	Z	50	6	39.5	38.4
7JUNA4	00	Z	50	6	8.3	6.1
7JUNA4	12	Z	50	6	34.3	33.7
ASDE09	12	Z	50	0	0.0	0.0
FHM5UJ	12	Z	50	11	24.0	20.6
FHM5UJ	00	Z	50	9	26.7	22.3
FPUW5G	00	Z	50	1	13.4	13.4
FPUW5G	12	Z	50	9	15.9	15.0
HTXUH4	12	Z	50	8	20.6	17.4
HTXUH4	00	Z	50	3	32.1	30.4
QCY3TG	00	Z	50	5	38.6	37.7
QCY3TG	12	Z	50	6	40.5	39.6
VKB4L5	12	Z	50	12	67.0	65.5
VKB4L5	00	Z	50	8	63.2	62.5
WDK38H	12	Z	50	8	16.9	16.5
WDK38H	00	Z	50	1	10.1	10.1
XKQLWQ	12	Z	50	20	55.4	54.0
XQFJRG	12	Z	50	0	0.0	0.0
XQFJRG	00	Z	50	2	8.2	4.5
XWHDEA	12	Z	50	4	30.3	28.8
XWHDEA	00	Z	50	3	28.0	27.9
YLV96W	00	Z	50	2	6.6	6.2
YLV96W	12	Z	50	2	17.6	13.5
ZVQEQC	12	Z	50	0	0.0	0.0

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

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : WIND (M/S)
         LEVEL                 :  50 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : DEC 2018
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	50	26	3.0	0.4	0.2
01001	00	V	50	27	3.0	0.5	-0.9
01028	12	V	50	30	2.7	-0.1	-0.3
01028	00	V	50	30	2.9	-0.4	-0.1
01400	12	V	50	21	3.2	0.1	1.1
01400	00	V	50	19	3.7	1.0	-0.4
01415	00	V	50	29	3.8	0.2	-0.5
01415	12	V	50	30	4.5	-0.8	0.9
02365	12	V	50	23	3.0	0.6	-0.2
02365	00	V	50	22	3.3	-0.5	-0.4
02591	00	V	50	26	3.3	0.4	-0.6
02591	12	V	50	25	3.5	-0.4	-0.2
02836	12	V	50	25	3.5	-0.1	-0.7
02836	00	V	50	22	3.4	0.0	-0.6
02963	12	V	50	23	3.2	0.2	-0.8
02963	00	V	50	24	2.6	0.7	0.2
03005	12	V	50	29	4.2	0.4	0.6
03005	00	V	50	26	3.3	0.9	-1.1
03238	00	V	50	24	3.4	0.2	-0.4
03238	12	V	50	3	4.8	-2.7	1.0
03808	00	V	50	23	2.9	1.3	-0.1
03808	12	V	50	30	4.3	-0.2	0.5
03918	00	V	50	27	3.9	-0.7	0.5
03918	12	V	50	8	2.7	0.8	0.5
03953	00	V	50	24	3.2	0.7	0.0
03953	12	V	50	30	3.2	0.5	-0.2
04018	00	V	50	27	3.8	0.8	-0.3
04018	12	V	50	30	3.4	0.1	0.3
04220	00	V	50	30	3.4	0.5	-0.3
04220	12	V	50	30	3.0	0.6	0.3
04270	00	V	50	29	4.5	0.7	0.0
04270	12	V	50	31	3.4	0.2	1.0
04320	00	V	50	30	3.2	0.2	-0.3
04320	12	V	50	31	3.0	0.3	0.2
04339	00	V	50	23	2.7	-0.3	0.0
04339	12	V	50	27	2.9	0.4	-0.1
04360	12	V	50	24	3.0	0.2	0.6
04360	00	V	50	25	3.7	0.2	-0.7
06011	12	V	50	13	4.3	-0.7	1.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	50	12	3.6	0.3	-0.6
06260	00	V	50	29	3.7	0.7	-1.0
06260	12	V	50	5	2.6	-0.9	-0.2
06610	12	V	50	30	4.7	1.0	-0.8
06610	00	V	50	24	4.3	1.0	-0.4
07110	12	V	50	29	3.0	0.4	-0.5
07110	00	V	50	27	3.5	0.8	0.2
07510	00	V	50	27	3.2	0.7	-0.6
07510	12	V	50	28	3.4	-0.5	0.0
07645	12	V	50	26	4.0	0.4	-0.8
07645	00	V	50	29	4.1	0.1	0.7
07761	12	V	50	30	3.6	0.7	0.6
07761	00	V	50	28	3.4	0.1	-0.1
08001	00	V	50	28	3.0	-0.2	-0.1
08001	12	V	50	26	3.5	0.7	-0.3
08221	00	V	50	28	3.0	0.3	-0.1
08221	12	V	50	31	3.7	-0.2	0.2
08302	12	V	50	30	3.7	0.6	-0.7
08302	00	V	50	29	4.0	1.3	-0.4
08508	12	V	50	22	4.2	-0.1	0.1
08522	12	V	50	31	3.8	0.5	-0.4
08579	12	V	50	29	2.8	-0.1	-0.2
10035	12	V	50	31	3.7	0.4	-0.4
10393	12	V	50	31	3.8	0.2	-0.9
10393	00	V	50	28	3.5	0.3	0.0
10410	12	V	50	31	4.3	0.1	0.0
10410	00	V	50	26	3.9	0.6	0.3
10739	00	V	50	26	4.1	-0.3	0.2
10739	12	V	50	31	4.2	0.6	-0.3
11035	00	V	50	28	5.0	1.0	-1.2
11035	12	V	50	31	4.7	-0.4	-0.6
12982	12	V	50	14	3.0	-0.6	-0.1
12982	00	V	50	22	3.5	0.2	-0.6
16080	00	V	50	30	3.9	0.9	-0.2
16080	12	V	50	31	4.3	0.4	0.1
16245	12	V	50	29	3.3	-0.3	-0.1
16245	00	V	50	28	3.4	0.6	-0.2
16320	00	V	50	27	3.3	0.2	0.2
16320	12	V	50	29	3.5	0.5	0.1
16429	00	V	50	26	3.0	0.0	0.4
16429	12	V	50	31	4.3	0.2	0.1
16622	00	V	50	26	3.6	0.4	-0.6
16754	00	V	50	24	4.1	1.7	1.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	50	4	2.9	1.2	-0.6
26435	12	V	50	13	5.5	0.8	-0.8
5QPW8X	12	V	50	6	4.5	0.3	2.1
5QPW8X	00	V	50	8	2.1	-0.9	-0.2
60018	00	V	50	29	3.5	-1.0	-0.1
60018	12	V	50	30	3.7	0.5	-0.5
7HCPVT	00	V	50	4	3.4	0.0	0.6
7HCPVT	12	V	50	6	3.2	1.2	0.0
7JUNA4	00	V	50	5	2.8	0.7	-0.2
7JUNA4	12	V	50	6	2.5	-0.7	0.8
ASDE09	12	V	50	0	0.0	0.0	0.0
FHM5UJ	12	V	50	8	3.7	0.3	-0.1
FHM5UJ	00	V	50	9	3.2	-0.4	0.9
FPUW5G	00	V	50	1	3.3	2.5	-2.1
FPUW5G	12	V	50	9	3.3	1.6	-0.7
HTXUH4	12	V	50	8	3.1	-0.1	0.3
HTXUH4	00	V	50	3	3.7	-2.6	2.6
QCY3TG	00	V	50	5	2.4	0.3	0.9
QCY3TG	12	V	50	6	2.4	-0.3	1.0
VKB4L5	12	V	50	12	2.4	-0.6	0.0
VKB4L5	00	V	50	8	3.0	-0.7	-0.8
WDK38H	12	V	50	7	5.3	-3.0	1.2
WDK38H	00	V	50	1	1.3	1.2	0.6
XKQLWQ	12	V	50	20	3.2	-0.5	0.2
XQFJRG	12	V	50	0	0.0	0.0	0.0
XQFJRG	00	V	50	2	1.7	0.3	-1.3
XWHDEA	12	V	50	4	3.0	1.7	-0.1
XWHDEA	00	V	50	3	2.8	0.0	-0.1
YLV96W	00	V	50	2	2.3	0.5	1.6
YLV96W	12	V	50	2	2.9	1.1	0.1
ZVQEQC	12	V	50	0	0.0	0.0	0.0

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                : DEC 2018
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	100	29	8.0	5.1
01001	00	Z	100	29	6.7	3.8
01028	12	Z	100	30	16.7	6.0
01028	00	Z	100	31	6.2	0.7
01400	12	Z	100	25	78.2	77.5
01400	00	Z	100	23	79.5	79.3
01415	00	Z	100	30	10.2	4.5
01415	12	Z	100	30	8.9	6.2
02365	12	Z	100	31	6.5	3.3
02365	00	Z	100	30	5.9	4.2
02591	00	Z	100	28	9.8	8.8
02591	12	Z	100	27	8.9	6.3
02836	12	Z	100	27	4.9	1.0
02836	00	Z	100	30	7.3	1.2
02963	12	Z	100	30	6.1	2.9
02963	00	Z	100	31	6.2	3.6
03005	12	Z	100	31	6.1	2.8
03005	00	Z	100	31	5.0	0.9
03238	00	Z	100	30	7.8	2.0
03238	12	Z	100	3	10.4	2.8
03808	00	Z	100	31	7.5	5.1
03808	12	Z	100	31	6.4	3.5
03918	00	Z	100	31	9.5	7.6
03918	12	Z	100	9	8.2	6.8
03953	00	Z	100	31	15.4	13.2
03953	12	Z	100	32	16.4	13.6
04018	00	Z	100	28	7.2	3.2
04018	12	Z	100	31	6.2	0.8
04220	00	Z	100	31	14.3	6.2
04220	12	Z	100	30	5.8	2.4
04270	00	Z	100	31	5.9	2.1
04270	12	Z	100	31	4.9	2.0
04320	00	Z	100	31	5.6	3.2
04320	12	Z	100	31	6.0	3.0
04339	00	Z	100	27	8.2	5.6
04339	12	Z	100	30	13.8	3.9
04360	12	Z	100	28	9.2	-5.3
04360	00	Z	100	26	9.8	-3.4
06011	12	Z	100	27	9.4	1.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	100	30	9.4	4.9
06260	00	Z	100	31	4.6	2.4
06260	12	Z	100	5	6.7	4.7
06610	12	Z	100	33	12.5	9.2
06610	00	Z	100	31	12.6	7.3
07110	12	Z	100	30	15.0	6.3
07110	00	Z	100	30	18.6	5.7
07510	00	Z	100	29	16.0	14.6
07510	12	Z	100	30	24.3	22.8
07645	12	Z	100	30	12.4	6.4
07645	00	Z	100	31	11.4	4.6
07761	12	Z	100	30	22.0	19.6
07761	00	Z	100	29	23.3	17.2
08001	00	Z	100	31	11.2	8.5
08001	12	Z	100	30	20.1	18.8
08221	00	Z	100	31	13.8	13.0
08221	12	Z	100	31	17.9	16.7
08302	12	Z	100	30	8.5	6.6
08302	00	Z	100	31	9.8	7.3
08508	12	Z	100	27	13.2	8.9
08522	12	Z	100	31	14.4	13.1
08579	12	Z	100	30	16.7	15.3
10035	12	Z	100	31	19.1	11.2
10393	12	Z	100	31	8.4	4.1
10393	00	Z	100	31	5.8	2.3
10410	12	Z	100	31	6.8	2.2
10410	00	Z	100	31	5.5	1.1
10739	00	Z	100	31	9.4	6.0
10739	12	Z	100	31	9.4	5.4
11035	00	Z	100	29	13.8	10.5
11035	12	Z	100	31	22.3	18.4
12982	12	Z	100	14	17.8	17.2
12982	00	Z	100	25	9.3	6.5
16080	00	Z	100	31	6.9	2.6
16080	12	Z	100	31	9.7	3.2
16245	12	Z	100	30	9.0	3.9
16245	00	Z	100	31	7.7	2.8
16320	00	Z	100	29	14.2	11.3
16320	12	Z	100	31	14.8	11.3
16429	00	Z	100	31	9.2	4.8
16429	12	Z	100	31	12.7	5.5
16622	00	Z	100	31	15.9	13.7
16754	00	Z	100	31	17.9	11.8

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	100	30	10.8	6.3
26435	12	Z	100	15	4.7	1.5
5QPW8X	12	Z	100	7	24.4	24.0
5QPW8X	00	Z	100	10	27.4	26.2
60018	00	Z	100	30	17.6	17.0
60018	12	Z	100	30	14.9	13.7
7HCPVT	00	Z	100	4	30.9	30.6
7HCPVT	12	Z	100	6	24.6	23.0
7JUNA4	00	Z	100	8	5.4	-2.2
7JUNA4	12	Z	100	7	15.5	14.0
ASDE09	12	Z	100	1	3.6	-3.6
FHM5UJ	12	Z	100	13	13.5	9.0
FHM5UJ	00	Z	100	10	15.9	10.2
FPUW5G	00	Z	100	1	14.3	14.3
FPUW5G	12	Z	100	9	10.3	8.7
HTXUH4	12	Z	100	11	11.8	8.8
HTXUH4	00	Z	100	5	20.8	17.2
QCY3TG	00	Z	100	6	24.1	20.7
QCY3TG	12	Z	100	7	27.0	26.0
VKB4L5	12	Z	100	12	56.7	55.9
VKB4L5	00	Z	100	8	53.0	52.5
WDK38H	12	Z	100	13	10.4	9.2
WDK38H	00	Z	100	1	3.6	3.6
XKQLWQ	12	Z	100	20	43.2	41.3
XQFJRG	12	Z	100	1	1.1	-1.1
XQFJRG	00	Z	100	4	13.7	0.7
XWHDEA	12	Z	100	5	11.5	6.5
XWHDEA	00	Z	100	4	9.9	5.5
YLV96W	00	Z	100	2	4.6	4.1
YLV96W	12	Z	100	2	14.0	-8.7
ZVQEQC	12	Z	100	1	10.4	10.4

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                : DEC 2018
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	100	29	2.6	0.1	-0.3
01001	00	V	100	28	2.9	-0.1	-0.4
01028	12	V	100	30	2.6	-0.1	-0.1
01028	00	V	100	30	2.6	-0.4	-0.2
01400	12	V	100	25	3.6	0.3	-0.8
01400	00	V	100	23	2.9	0.0	-0.7
01415	00	V	100	29	3.4	-0.3	-0.8
01415	12	V	100	30	3.3	-0.3	0.2
02365	12	V	100	31	2.8	0.6	0.4
02365	00	V	100	28	3.2	0.3	-0.8
02591	00	V	100	28	2.8	0.1	-0.4
02591	12	V	100	27	3.0	-0.1	-0.5
02836	12	V	100	26	2.9	-0.2	0.7
02836	00	V	100	25	2.1	-0.5	0.0
02963	12	V	100	30	2.7	0.3	0.2
02963	00	V	100	29	2.9	-0.3	-0.3
03005	12	V	100	31	3.4	-0.2	0.3
03005	00	V	100	28	2.9	-0.3	-0.7
03238	00	V	100	28	3.6	0.2	0.0
03238	12	V	100	3	5.4	1.9	-0.4
03808	00	V	100	28	3.0	0.4	-0.1
03808	12	V	100	31	3.9	-0.4	0.1
03918	00	V	100	30	4.2	0.6	0.7
03918	12	V	100	9	3.8	1.8	-1.0
03953	00	V	100	27	4.0	-0.1	-0.7
03953	12	V	100	30	3.5	0.1	0.7
04018	00	V	100	27	3.1	-0.6	-0.3
04018	12	V	100	31	3.3	0.2	1.2
04220	00	V	100	30	2.5	-0.1	-0.3
04220	12	V	100	30	2.1	0.7	0.2
04270	00	V	100	30	3.5	0.4	-0.6
04270	12	V	100	31	2.8	-0.3	-0.2
04320	00	V	100	30	2.5	-0.3	-0.2
04320	12	V	100	31	2.8	0.9	-0.5
04339	00	V	100	26	3.1	0.4	-0.4
04339	12	V	100	29	2.3	0.0	0.2
04360	12	V	100	28	2.5	-0.7	-0.1
04360	00	V	100	25	2.5	0.0	-0.4
06011	12	V	100	26	3.0	0.0	-0.5

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	100	27	2.9	0.0	0.3
06260	00	V	100	30	3.8	0.5	-0.9
06260	12	V	100	5	2.0	1.1	0.2
06610	12	V	100	31	4.2	-0.3	0.3
06610	00	V	100	28	3.8	0.3	0.4
07110	12	V	100	30	3.9	-0.9	-0.4
07110	00	V	100	29	3.0	0.0	0.1
07510	00	V	100	28	4.3	0.2	-0.3
07510	12	V	100	30	3.5	-0.3	-0.1
07645	12	V	100	30	4.1	0.1	0.3
07645	00	V	100	30	8.7	1.1	-1.3
07761	12	V	100	30	5.6	1.6	-0.2
07761	00	V	100	28	4.9	0.3	-0.2
08001	00	V	100	29	3.1	-0.2	0.6
08001	12	V	100	30	4.2	-0.6	0.5
08221	00	V	100	29	3.2	0.1	0.0
08221	12	V	100	31	2.8	0.0	-0.1
08302	12	V	100	30	3.5	0.5	0.0
08302	00	V	100	30	4.5	-0.3	0.1
08508	12	V	100	27	4.0	-0.5	-1.0
08522	12	V	100	30	3.3	-0.8	-0.3
08579	12	V	100	30	4.2	-0.9	0.7
10035	12	V	100	31	2.9	0.0	0.3
10393	12	V	100	31	3.3	0.9	-0.1
10393	00	V	100	30	3.6	-0.5	0.8
10410	12	V	100	31	3.3	0.5	-0.2
10410	00	V	100	30	3.2	0.8	-0.6
10739	00	V	100	28	3.4	0.3	-0.3
10739	12	V	100	31	3.5	0.0	-0.3
11035	00	V	100	29	4.2	0.2	0.5
11035	12	V	100	31	4.5	-0.9	-0.7
12982	12	V	100	14	2.9	-0.9	0.1
12982	00	V	100	24	4.2	0.3	0.4
16080	00	V	100	30	4.2	-0.2	0.0
16080	12	V	100	31	4.9	0.1	-0.7
16245	12	V	100	30	3.6	0.3	-0.2
16245	00	V	100	29	4.2	0.6	0.2
16320	00	V	100	28	4.0	0.5	-1.1
16320	12	V	100	31	4.6	0.2	-0.2
16429	00	V	100	28	3.8	0.0	0.3
16429	12	V	100	31	3.9	0.2	-0.2
16622	00	V	100	30	4.1	-0.4	-0.4
16754	00	V	100	28	4.3	1.2	0.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	100	5	4.2	1.5	0.3
26435	12	V	100	15	1.9	-0.1	0.8
5QPW8X	12	V	100	7	4.0	-1.4	1.5
5QPW8X	00	V	100	10	2.3	0.7	-0.6
60018	00	V	100	29	4.0	0.7	0.5
60018	12	V	100	30	3.9	-0.5	0.7
7HCPVT	00	V	100	4	3.6	-2.1	-0.4
7HCPVT	12	V	100	6	2.8	0.4	-0.2
7JUNA4	00	V	100	7	3.5	0.8	0.2
7JUNA4	12	V	100	7	3.6	-1.5	1.2
ASDE09	12	V	100	1	0.8	-0.6	-0.6
FHM5UJ	12	V	100	13	3.3	-0.5	0.2
FHM5UJ	00	V	100	10	2.3	0.2	-0.9
FPUW5G	00	V	100	1	4.1	3.4	2.3
FPUW5G	12	V	100	9	4.9	2.5	1.3
HTXUH4	12	V	100	10	5.9	0.9	2.8
HTXUH4	00	V	100	5	3.4	-0.7	-0.8
QCY3TG	00	V	100	6	4.3	1.0	1.4
QCY3TG	12	V	100	7	3.2	0.0	1.0
VKB4L5	12	V	100	12	6.4	0.7	1.9
VKB4L5	00	V	100	8	2.7	0.6	-0.6
WDK38H	12	V	100	13	3.9	0.4	-0.3
WDK38H	00	V	100	1	1.8	1.5	-1.0
XKQLWQ	12	V	100	20	5.5	-0.1	-1.3
XQFJRG	12	V	100	0	0.0	0.0	0.0
XQFJRG	00	V	100	3	3.0	-0.9	1.6
XWHDEA	12	V	100	5	3.5	-1.6	0.3
XWHDEA	00	V	100	4	3.3	1.0	-2.0
YLV96W	00	V	100	2	2.3	0.7	2.2
YLV96W	12	V	100	2	3.8	-1.5	0.1
ZVQEQC	12	V	100	1	2.4	2.3	0.7

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                : DEC 2018
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	500	31	6.3	0.4
01001	00	Z	500	29	7.1	1.2
01028	12	Z	500	30	15.5	2.7
01028	00	Z	500	31	3.6	0.5
01400	12	Z	500	25	76.2	75.4
01400	00	Z	500	23	79.5	79.3
01415	00	Z	500	30	6.9	4.7
01415	12	Z	500	30	6.9	5.2
02365	12	Z	500	31	4.6	2.6
02365	00	Z	500	30	4.3	1.8
02591	00	Z	500	28	6.5	5.9
02591	12	Z	500	27	7.7	6.0
02836	12	Z	500	31	2.4	1.2
02836	00	Z	500	31	3.6	1.4
02963	12	Z	500	30	3.4	2.3
02963	00	Z	500	31	2.7	0.9
03005	12	Z	500	31	3.0	0.0
03005	00	Z	500	32	4.3	-0.3
03238	00	Z	500	31	4.6	3.9
03238	12	Z	500	3	4.7	2.8
03808	00	Z	500	31	5.7	4.4
03808	12	Z	500	31	5.9	5.1
03918	00	Z	500	31	9.0	8.4
03918	12	Z	500	9	9.0	8.4
03953	00	Z	500	31	7.2	4.8
03953	12	Z	500	32	8.2	6.0
04018	00	Z	500	29	3.8	1.4
04018	12	Z	500	31	3.9	0.4
04220	00	Z	500	31	13.9	3.5
04220	12	Z	500	30	4.2	1.2
04270	00	Z	500	31	2.4	0.8
04270	12	Z	500	31	4.4	0.1
04320	00	Z	500	31	4.0	0.3
04320	12	Z	500	31	3.8	-0.1
04339	00	Z	500	28	5.7	3.9
04339	12	Z	500	30	15.7	5.8
04360	12	Z	500	28	9.8	-8.9
04360	00	Z	500	27	10.3	-9.4
06011	12	Z	500	30	7.0	4.6

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	500	31	7.9	5.8
06260	00	Z	500	31	4.3	0.7
06260	12	Z	500	5	4.4	3.3
06610	12	Z	500	32	4.8	2.7
06610	00	Z	500	31	5.2	3.6
07110	12	Z	500	30	19.5	4.5
07110	00	Z	500	31	5.5	-0.4
07510	00	Z	500	30	5.6	3.4
07510	12	Z	500	31	8.0	7.0
07645	12	Z	500	30	4.6	3.4
07645	00	Z	500	30	4.2	-0.8
07761	12	Z	500	31	9.5	8.5
07761	00	Z	500	31	5.8	3.5
08001	00	Z	500	31	6.5	4.5
08001	12	Z	500	31	7.7	6.7
08221	00	Z	500	31	8.5	7.9
08221	12	Z	500	31	8.7	8.0
08302	12	Z	500	30	5.2	3.0
08302	00	Z	500	31	3.9	2.3
08508	12	Z	500	27	9.2	5.3
08522	12	Z	500	31	7.6	6.9
08579	12	Z	500	30	8.0	7.0
10035	12	Z	500	31	17.8	9.3
10393	12	Z	500	31	2.4	0.7
10393	00	Z	500	31	3.7	-0.8
10410	12	Z	500	31	2.6	0.5
10410	00	Z	500	31	3.3	0.5
10739	00	Z	500	31	5.4	3.7
10739	12	Z	500	31	5.6	4.1
11035	00	Z	500	30	8.0	7.0
11035	12	Z	500	31	10.5	8.1
12982	12	Z	500	14	4.6	3.3
12982	00	Z	500	25	4.2	2.4
16080	00	Z	500	31	3.7	-1.6
16080	12	Z	500	31	3.8	-1.6
16245	12	Z	500	31	5.4	-2.1
16245	00	Z	500	31	3.2	-0.9
16320	00	Z	500	30	7.5	5.5
16320	12	Z	500	31	10.0	5.8
16429	00	Z	500	31	4.4	1.6
16429	12	Z	500	31	12.2	1.4
16622	00	Z	500	31	9.4	8.0
16754	00	Z	500	31	11.7	5.5

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	500	30	6.5	5.2
26435	12	Z	500	15	5.7	2.0
5QPW8X	12	Z	500	9	21.7	21.5
5QPW8X	00	Z	500	12	23.6	22.7
60018	00	Z	500	30	7.3	6.6
60018	12	Z	500	30	7.8	7.3
7HCPVT	00	Z	500	6	12.0	9.8
7HCPVT	12	Z	500	8	12.4	12.0
7JUNA4	00	Z	500	8	8.5	3.5
7JUNA4	12	Z	500	8	7.4	0.1
ASDE09	12	Z	500	1	12.7	-12.7
FHM5UJ	12	Z	500	13	15.2	7.9
FHM5UJ	00	Z	500	10	15.3	10.0
FPUW5G	00	Z	500	1	2.0	2.0
FPUW5G	12	Z	500	9	3.4	1.2
HTXUH4	12	Z	500	11	10.2	6.3
HTXUH4	00	Z	500	5	19.1	12.8
QCY3TG	00	Z	500	6	9.5	7.8
QCY3TG	12	Z	500	8	8.9	5.2
VKB4L5	12	Z	500	13	40.5	40.2
VKB4L5	00	Z	500	9	40.9	40.7
WDK38H	12	Z	500	15	3.7	-1.4
WDK38H	00	Z	500	1	3.6	-3.6
XKQLWQ	12	Z	500	22	21.8	19.7
XQFJRG	12	Z	500	3	41.1	19.4
XQFJRG	00	Z	500	7	9.6	-5.2
XWHDEA	12	Z	500	6	7.1	-3.4
XWHDEA	00	Z	500	6	6.1	-4.0
YLV96W	00	Z	500	3	6.5	1.6
YLV96W	12	Z	500	2	15.1	-13.7
ZVQEQC	12	Z	500	1	13.5	13.5

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                : DEC 2018
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	500	31	3.0	0.5	-0.2
01001	00	V	500	28	2.7	0.5	-0.2
01028	12	V	500	30	2.1	0.1	0.2
01028	00	V	500	30	2.5	0.0	0.0
01400	12	V	500	25	3.0	0.5	0.5
01400	00	V	500	23	2.4	0.4	0.0
01415	00	V	500	29	2.4	0.1	0.7
01415	12	V	500	30	3.3	-0.5	0.4
02365	12	V	500	31	2.6	0.1	-0.1
02365	00	V	500	29	2.8	-0.2	0.1
02591	00	V	500	28	2.6	0.4	-0.2
02591	12	V	500	27	2.5	0.1	0.0
02836	12	V	500	31	2.4	-0.6	0.2
02836	00	V	500	30	2.6	0.4	0.2
02963	12	V	500	30	2.3	0.0	-0.2
02963	00	V	500	30	2.0	-0.5	0.4
03005	12	V	500	31	3.5	0.5	-0.2
03005	00	V	500	30	3.4	-0.6	0.1
03238	00	V	500	30	2.5	0.5	0.2
03238	12	V	500	3	4.5	0.6	-3.4
03808	00	V	500	29	3.4	0.7	0.4
03808	12	V	500	31	3.5	0.6	-0.6
03918	00	V	500	30	3.5	0.9	-0.4
03918	12	V	500	9	4.2	0.8	1.1
03953	00	V	500	29	4.2	0.3	0.2
03953	12	V	500	30	3.6	1.0	0.0
04018	00	V	500	28	3.1	0.9	0.4
04018	12	V	500	31	3.0	-0.2	0.1
04220	00	V	500	30	3.0	-0.3	-0.3
04220	12	V	500	30	2.4	0.6	0.4
04270	00	V	500	30	3.9	1.0	0.6
04270	12	V	500	31	3.5	0.5	0.2
04320	00	V	500	30	2.9	0.2	0.2
04320	12	V	500	31	2.3	0.1	0.1
04339	00	V	500	27	3.2	-0.4	1.1
04339	12	V	500	30	2.8	-0.2	0.1
04360	12	V	500	28	3.0	-0.1	0.0
04360	00	V	500	26	2.8	-0.4	0.5
06011	12	V	500	30	2.8	-0.3	0.5

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	500	29	3.1	0.4	-0.2
06260	00	V	500	30	3.0	0.6	-0.6
06260	12	V	500	5	3.1	0.9	-1.4
06610	12	V	500	31	2.8	0.4	0.2
06610	00	V	500	29	2.3	0.1	-0.3
07110	12	V	500	30	3.4	-0.2	-0.4
07110	00	V	500	30	2.7	0.4	-0.5
07510	00	V	500	29	2.3	0.4	-0.1
07510	12	V	500	31	3.2	0.5	-0.3
07645	12	V	500	30	3.0	0.6	0.3
07645	00	V	500	29	3.2	0.1	-0.1
07761	12	V	500	31	3.4	-0.9	-0.1
07761	00	V	500	30	2.7	-0.2	-0.2
08001	00	V	500	30	2.9	-0.1	0.1
08001	12	V	500	31	3.4	0.0	-0.3
08221	00	V	500	30	3.0	-0.1	-0.3
08221	12	V	500	31	2.2	-0.2	-0.2
08302	12	V	500	30	2.5	0.1	-0.6
08302	00	V	500	30	3.5	0.1	-0.8
08508	12	V	500	27	3.7	1.6	0.8
08522	12	V	500	31	2.9	0.9	-0.1
08579	12	V	500	30	2.9	-0.3	-0.7
10035	12	V	500	31	2.4	0.3	0.1
10393	12	V	500	31	3.5	0.1	-0.9
10393	00	V	500	30	2.4	0.4	-0.8
10410	12	V	500	31	2.6	0.0	-0.4
10410	00	V	500	30	3.3	0.6	-0.4
10739	00	V	500	29	3.7	1.3	-0.4
10739	12	V	500	31	2.4	0.5	-0.5
11035	00	V	500	29	2.3	0.2	-0.7
11035	12	V	500	31	3.3	-0.1	-0.7
12982	12	V	500	14	2.5	-0.1	-0.3
12982	00	V	500	24	2.2	0.0	-0.1
16080	00	V	500	30	3.2	0.0	0.5
16080	12	V	500	31	3.4	-0.6	-0.7
16245	12	V	500	31	3.3	0.5	-0.3
16245	00	V	500	30	3.5	-0.2	0.0
16320	00	V	500	29	3.8	0.9	-0.2
16320	12	V	500	31	3.2	1.0	-1.1
16429	00	V	500	30	2.8	0.5	0.1
16429	12	V	500	31	3.2	0.3	0.1
16622	00	V	500	30	3.0	0.2	-0.3
16754	00	V	500	28	2.5	0.2	0.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	500	20	3.3	-0.1	0.4
26435	12	V	500	15	2.7	0.6	0.8
5QPW8X	12	V	500	9	3.1	0.3	-0.1
5QPW8X	00	V	500	12	2.6	0.3	-0.3
60018	00	V	500	29	2.4	0.7	-0.4
60018	12	V	500	30	2.8	1.0	0.0
7HCPVT	00	V	500	6	2.4	1.2	0.2
7HCPVT	12	V	500	8	3.5	0.6	1.3
7JUNA4	00	V	500	8	3.8	-0.6	-1.1
7JUNA4	12	V	500	8	4.2	-0.5	0.3
ASDE09	12	V	500	1	0.8	-0.1	0.8
FHM5UJ	12	V	500	13	3.5	0.8	1.3
FHM5UJ	00	V	500	10	4.9	-0.3	0.8
FPUW5G	00	V	500	1	0.6	-0.6	0.0
FPUW5G	12	V	500	9	2.5	0.0	1.3
HTXUH4	12	V	500	11	3.4	1.0	1.2
HTXUH4	00	V	500	5	2.8	0.9	1.4
QCY3TG	00	V	500	6	3.3	0.3	1.0
QCY3TG	12	V	500	8	2.6	-0.7	-0.7
VKB4L5	12	V	500	13	2.2	0.5	0.4
VKB4L5	00	V	500	9	2.0	0.2	0.4
WDK38H	12	V	500	15	3.0	0.3	-0.2
WDK38H	00	V	500	1	5.2	1.6	4.9
XKQLWQ	12	V	500	22	2.8	-0.3	0.0
XQFJRG	12	V	500	3	1.9	1.3	0.5
XQFJRG	00	V	500	7	3.0	0.4	0.7
XWHDEA	12	V	500	6	2.6	1.2	-0.6
XWHDEA	00	V	500	6	3.3	-0.3	-2.1
YLV96W	00	V	500	3	2.2	-0.2	1.6
YLV96W	12	V	500	2	1.6	-0.3	-0.1
ZVQEQC	12	V	500	1	1.0	-0.1	1.0

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

```
RADIOSONDE MONITORING STATISTICS (EUCOS)
         MONITORING CENTRE     : ECMWF
         ELEMENT MONITORED     : GEOPOTENTIAL HEIGHT (METRES)
         LEVEL                 : 850 HPA
         AREA                  : 0 - 90N, 100W - 40E
         PERIOD                : DEC 2018
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	850	31	3.4	-1.2
01001	00	Z	850	29	3.7	-1.1
01028	12	Z	850	30	16.2	3.0
01028	00	Z	850	31	3.2	-0.4
01400	12	Z	850	25	76.5	75.6
01400	00	Z	850	23	77.6	77.4
01415	00	Z	850	30	4.6	3.8
01415	12	Z	850	30	4.6	3.9
02365	12	Z	850	31	5.1	4.4
02365	00	Z	850	30	4.7	3.9
02591	00	Z	850	28	7.2	6.9
02591	12	Z	850	27	8.2	7.9
02836	12	Z	850	31	2.9	2.2
02836	00	Z	850	31	3.1	2.0
02963	12	Z	850	30	3.4	2.5
02963	00	Z	850	31	2.6	1.7
03005	12	Z	850	31	3.7	0.1
03005	00	Z	850	32	2.9	-0.3
03238	00	Z	850	31	5.0	4.2
03238	12	Z	850	3	5.0	2.1
03808	00	Z	850	31	3.2	2.3
03808	12	Z	850	31	3.8	2.3
03918	00	Z	850	31	7.7	7.3
03918	12	Z	850	9	9.3	8.8
03953	00	Z	850	31	5.5	3.5
03953	12	Z	850	32	5.6	4.0
04018	00	Z	850	29	2.2	0.0
04018	12	Z	850	31	3.2	-0.5
04220	00	Z	850	31	14.4	4.1
04220	12	Z	850	30	3.1	2.4
04270	00	Z	850	31	3.4	-0.2
04270	12	Z	850	31	3.2	0.7
04320	00	Z	850	31	3.6	-1.4
04320	12	Z	850	31	4.0	-0.7
04339	00	Z	850	29	5.2	0.9
04339	12	Z	850	30	15.2	3.7
04360	12	Z	850	28	11.2	-10.0
04360	00	Z	850	27	12.4	-11.4
06011	12	Z	850	30	8.5	6.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	850	31	7.8	5.9
06260	00	Z	850	31	3.4	0.9
06260	12	Z	850	5	1.4	0.9
06610	12	Z	850	31	3.4	2.0
06610	00	Z	850	31	3.6	2.7
07110	12	Z	850	30	12.6	4.5
07110	00	Z	850	31	2.6	0.5
07510	00	Z	850	30	2.8	0.8
07510	12	Z	850	31	4.2	3.1
07645	12	Z	850	30	3.9	-2.1
07645	00	Z	850	30	2.7	-0.4
07761	12	Z	850	31	5.0	4.0
07761	00	Z	850	31	4.7	2.7
08001	00	Z	850	31	4.0	2.8
08001	12	Z	850	31	3.7	2.0
08221	00	Z	850	31	5.8	5.1
08221	12	Z	850	31	4.3	3.1
08302	12	Z	850	30	4.1	-3.1
08302	00	Z	850	31	2.4	-0.7
08508	12	Z	850	28	6.2	3.3
08522	12	Z	850	31	5.0	4.2
08579	12	Z	850	30	3.6	2.6
10035	12	Z	850	31	17.1	8.1
10393	12	Z	850	31	3.0	0.3
10393	00	Z	850	31	3.0	0.4
10410	12	Z	850	31	3.4	-0.7
10410	00	Z	850	31	3.0	-0.2
10739	00	Z	850	31	5.3	4.3
10739	12	Z	850	31	4.3	3.4
11035	00	Z	850	30	8.4	7.3
11035	12	Z	850	31	12.3	11.4
12982	12	Z	850	14	4.0	2.9
12982	00	Z	850	25	3.3	2.1
16080	00	Z	850	31	3.6	-1.8
16080	12	Z	850	31	4.5	-3.6
16245	12	Z	850	31	2.8	-1.6
16245	00	Z	850	31	3.4	-1.9
16320	00	Z	850	30	8.4	5.7
16320	12	Z	850	31	8.6	5.5
16429	00	Z	850	31	3.5	1.3
16429	12	Z	850	31	13.6	0.4
16622	00	Z	850	31	7.0	6.3
16754	00	Z	850	31	10.3	2.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	850	31	3.5	3.0
26435	12	Z	850	15	3.4	2.1
5QPW8X	12	Z	850	9	24.9	24.5
5QPW8X	00	Z	850	12	27.2	26.8
60018	00	Z	850	30	4.4	3.6
60018	12	Z	850	30	3.5	2.6
7HCPVT	00	Z	850	6	10.0	9.9
7HCPVT	12	Z	850	8	7.0	6.2
7JUNA4	00	Z	850	8	5.3	0.6
7JUNA4	12	Z	850	8	5.0	0.1
ASDE09	12	Z	850	1	8.4	-8.4
FHM5UJ	12	Z	850	13	15.1	9.4
FHM5UJ	00	Z	850	10	16.3	10.5
FPUW5G	00	Z	850	1	0.6	-0.6
FPUW5G	12	Z	850	9	2.7	-1.8
HTXUH4	12	Z	850	11	7.9	5.2
HTXUH4	00	Z	850	5	19.9	12.7
QCY3TG	00	Z	850	6	4.7	1.7
QCY3TG	12	Z	850	8	2.6	-0.4
VKB4L5	12	Z	850	13	32.8	32.6
VKB4L5	00	Z	850	9	33.5	33.1
WDK38H	12	Z	850	15	7.1	-6.2
WDK38H	00	Z	850	1	4.9	-4.9
XKQLWQ	12	Z	850	22	15.3	13.3
XQFJRG	12	Z	850	3	11.9	-11.4
XQFJRG	00	Z	850	7	13.1	-12.5
XWHDEA	12	Z	850	6	7.8	-6.9
XWHDEA	00	Z	850	6	9.4	-8.7
YLV96W	00	Z	850	3	4.1	-1.3
YLV96W	12	Z	850	2	17.0	-14.9
ZVQEQC	12	Z	850	1	6.5	6.5

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                : DEC 2018
         STANDARD OF COMPARISON: FIRST-GUESS FIELD
```

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	850	31	3.5	0.1	-0.4
01001	00	V	850	28	4.1	1.2	0.1
01028	12	V	850	30	2.8	0.2	0.3
01028	00	V	850	30	2.9	0.0	0.5
01400	12	V	850	25	2.3	-0.7	0.0
01400	00	V	850	23	2.3	0.6	0.4
01415	00	V	850	29	2.6	-0.3	-0.3
01415	12	V	850	30	2.8	-0.1	0.7
02365	12	V	850	31	3.7	-0.3	0.1
02365	00	V	850	29	2.6	-0.2	0.8
02591	00	V	850	28	3.0	-0.4	-0.5
02591	12	V	850	27	2.7	0.2	-0.8
02836	12	V	850	31	2.4	0.0	0.5
02836	00	V	850	30	2.4	0.2	0.4
02963	12	V	850	30	2.5	-0.2	0.4
02963	00	V	850	30	2.3	-0.4	0.4
03005	12	V	850	31	3.1	0.2	-0.1
03005	00	V	850	30	3.1	-0.5	0.2
03238	00	V	850	30	3.0	0.5	0.0
03238	12	V	850	3	2.9	-0.5	-1.4
03808	00	V	850	29	2.8	-0.1	0.1
03808	12	V	850	31	2.9	0.3	-0.1
03918	00	V	850	30	2.7	0.2	0.1
03918	12	V	850	9	3.2	-0.2	-0.1
03953	00	V	850	29	3.7	-0.1	0.3
03953	12	V	850	30	3.2	0.6	0.1
04018	00	V	850	28	3.1	0.0	0.2
04018	12	V	850	31	2.8	0.4	0.1
04220	00	V	850	30	3.5	0.4	0.2
04220	12	V	850	30	2.6	0.5	0.1
04270	00	V	850	30	4.0	-0.3	-0.1
04270	12	V	850	31	3.1	0.7	-0.1
04320	00	V	850	30	3.7	-0.4	-0.5
04320	12	V	850	31	3.6	0.6	1.1
04339	00	V	850	27	3.7	0.0	0.5
04339	12	V	850	30	4.0	1.4	0.3
04360	12	V	850	28	5.4	2.8	1.0
04360	00	V	850	26	6.2	2.2	1.5
06011	12	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	00	V	850	29	3.7	-0.9	-0.7
06260	00	V	850	30	2.1	0.2	-0.4
06260	12	V	850	5	1.9	0.5	-0.5
06610	12	V	850	31	3.3	0.2	-0.2
06610	00	V	850	29	3.1	0.2	-0.9
07110	12	V	850	30	3.3	0.3	-1.0
07110	00	V	850	30	2.5	0.1	-0.3
07510	00	V	850	29	2.6	0.0	-0.1
07510	12	V	850	31	2.9	-0.7	-0.2
07645	12	V	850	30	2.7	0.1	-0.3
07645	00	V	850	29	4.4	-0.8	0.6
07761	12	V	850	31	3.3	-0.4	-0.2
07761	00	V	850	30	2.8	0.0	0.4
08001	00	V	850	30	3.0	0.4	0.4
08001	12	V	850	31	3.1	0.3	0.9
08221	00	V	850	30	3.1	0.1	1.0
08221	12	V	850	31	3.3	1.0	0.1
08302	12	V	850	30	3.6	-0.1	0.5
08302	00	V	850	30	2.8	-0.6	0.1
08508	12	V	850	28	3.2	0.0	-0.8
08522	12	V	850	31	2.8	0.4	-0.1
08579	12	V	850	30	2.8	0.9	0.4
10035	12	V	850	31	2.5	0.3	-0.2
10393	12	V	850	31	2.6	0.1	0.0
10393	00	V	850	30	2.3	0.0	-0.1
10410	12	V	850	31	2.4	0.0	-0.3
10410	00	V	850	30	2.6	-0.1	0.3
10739	00	V	850	29	2.8	-0.3	-0.3
10739	12	V	850	31	3.1	0.1	-1.0
11035	00	V	850	29	3.5	0.8	0.6
11035	12	V	850	31	2.5	-0.1	-0.5
12982	12	V	850	14	3.7	-0.5	-1.1
12982	00	V	850	24	3.4	0.8	-0.4
16080	00	V	850	30	3.5	0.8	-0.6
16080	12	V	850	31	3.7	0.4	0.3
16245	12	V	850	31	3.0	0.9	0.0
16245	00	V	850	30	2.8	0.4	0.4
16320	00	V	850	29	3.8	-0.2	-0.8
16320	12	V	850	31	3.4	0.2	-0.6
16429	00	V	850	30	2.8	0.3	-0.5
16429	12	V	850	31	2.9	0.6	0.5
16622	00	V	850	30	3.6	0.5	-0.2
16754	00	V	850	28	4.0	0.6	-0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	850	26	3.1	-0.1	-0.1
26435	12	V	850	15	2.8	-0.1	-0.4
5QPW8X	12	V	850	9	2.5	0.3	-0.6
5QPW8X	00	V	850	12	2.9	0.8	0.7
60018	00	V	850	29	2.6	1.1	-0.1
60018	12	V	850	30	3.2	1.5	-0.4
7HCPVT	00	V	850	6	2.8	-0.5	1.6
7HCPVT	12	V	850	8	3.3	1.3	-0.9
7JUNA4	00	V	850	8	2.6	0.2	1.0
7JUNA4	12	V	850	8	3.4	1.1	0.9
ASDE09	12	V	850	1	2.3	-0.8	2.2
FHM5UJ	12	V	850	13	3.2	-1.4	-0.5
FHM5UJ	00	V	850	10	3.9	-0.8	-1.2
FPUW5G	00	V	850	1	0.6	0.4	0.5
FPUW5G	12	V	850	9	2.4	-0.6	-0.6
HTXUH4	12	V	850	11	2.7	0.0	0.9
HTXUH4	00	V	850	5	1.7	0.1	-0.5
QCY3TG	00	V	850	6	2.4	-1.4	0.6
QCY3TG	12	V	850	8	2.5	-0.1	-1.1
VKB4L5	12	V	850	13	1.8	-0.1	0.6
VKB4L5	00	V	850	9	2.2	0.6	0.0
WDK38H	12	V	850	15	2.7	-0.4	-0.9
WDK38H	00	V	850	1	2.5	-2.1	1.4
XKQLWQ	12	V	850	22	2.8	0.1	-0.1
XQFJRG	12	V	850	3	2.9	2.1	-1.0
XQFJRG	00	V	850	7	3.0	-0.5	-0.5
XWHDEA	12	V	850	6	2.9	1.3	0.8
XWHDEA	00	V	850	6	2.9	0.1	-1.2
YLV96W	00	V	850	3	3.2	-2.7	-0.1
YLV96W	12	V	850	2	3.5	-1.1	3.2
ZVQEQC	12	V	850	1	2.1	1.2	-1.7

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                 : DEC 2018
         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
03380	99	P	SUR	54	0	754	0	0.3	-0.2	0.4
1300001	99	P	SUR	11	-23	556	0	0.3	-0.1	0.3
1300008	99	P	SUR	15	-38	534	0	0.2	-0.2	0.3
1300130	99	P	SUR	28	-16	744	0	0.3	0.2	0.4
1300131	99	P	SUR	28	-17	744	0	0.3	0.1	0.3
1300872	99	P	SUR	38	-31	693	13	1.7	-0.1	1.7
1301603	99	P	SUR	25	-54	744	0	0.3	0.0	0.3
1301605	99	P	SUR	26	-50	744	0	0.2	0.1	0.3
1301607	99	P	SUR	22	-40	744	0	0.2	0.4	0.4
1301608	99	P	SUR	28	-42	744	0	0.2	0.5	0.5
1301609	99	P	SUR	20	-45	744	0	0.2	0.3	0.4
1301610	99	P	SUR	23	-38	744	0	0.3	0.2	0.3
1301611	99	P	SUR	31	-37	744	0	0.3	0.2	0.3
1301612	99	P	SUR	26	-30	744	0	0.3	-0.0	0.3
1301618	99	P	SUR	12	-21	744	0	0.3	0.2	0.4
13872	99	P	SUR	38	-31	693	13	1.7	-0.1	1.7
1501529	99	P	SUR	26	-31	743	0	0.3	0.1	0.3
1501531	99	P	SUR	18	-54	743	0	0.2	-0.2	0.3
1501534	99	P	SUR	25	-60	743	0	0.2	-1.0	1.0
1501581	99	P	SUR	13	-38	743	0	0.3	0.5	0.6
2601620	99	P	SUR	82	-2	742	0	0.5	-0.7	0.9
2601621	99	P	SUR	86	-3	742	0	0.7	-0.3	0.8
3100735	99	P	SUR	33	-64	648	3	3.1	-0.2	3.1
31735	99	P	SUR	33	-64	648	3	3.1	-0.2	3.1
4100040	99	P	SUR	15	-53	434	0	0.3	-0.6	0.7
4100041	99	P	SUR	14	-46	2436	0	0.3	0.2	0.3
4100043	99	P	SUR	21	-65	2321	0	0.3	0.0	0.3
4100044	99	P	SUR	22	-59	2311	0	0.3	0.2	0.3
4100046	99	P	SUR	24	-68	2437	0	0.3	0.4	0.5
4100049	99	P	SUR	27	-63	2361	0	0.3	-0.0	0.3
4100052	99	P	SUR	18	-65	1746	0	0.3	-1.3	1.3
4100053	99	P	SUR	18	-66	2939	0	0.3	-0.8	0.8
4100056	99	P	SUR	18	-65	2926	0	0.3	-0.9	1.0
4100139	99	P	SUR	20	-38	556	0	0.2	-0.4	0.5
4100300	99	P	SUR	16	-57	744	0	0.3	-0.1	0.3
4100597	99	P	SUR	31	-44	744	0	0.4	0.1	0.4

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4100729	99	P	SUR	33	-42	739	0	1.1	-0.1	1.1
4100730	99	P	SUR	36	-32	448	17	2.8	-0.5	2.9
4101528	99	P	SUR	33	-34	705	0	0.4	0.7	0.8
4101530	99	P	SUR	35	-32	660	0	0.4	0.5	0.6
4101531	99	P	SUR	41	-24	400	0	0.4	0.7	0.8
4101532	99	P	SUR	37	-44	653	0	0.5	-0.0	0.5
4101533	99	P	SUR	50	-42	650	0	0.8	0.5	0.9
4101534	99	P	SUR	50	-26	613	0	0.6	0.2	0.6
4101535	99	P	SUR	40	-62	699	0	0.6	0.1	0.6
4101536	99	P	SUR	47	-28	700	0	0.7	0.0	0.7
4101537	99	P	SUR	41	-24	697	0	0.4	0.5	0.7
4101538	99	P	SUR	27	-67	481	0	0.3	0.3	0.5
4101539	99	P	SUR	34	-68	744	0	0.5	0.0	0.5
4101554	99	P	SUR	27	-59	739	0	0.3	0.3	0.5
4101556	99	P	SUR	38	-34	743	0	0.5	0.4	0.6
4101557	99	P	SUR	35	-33	744	0	0.3	0.2	0.4
4101558	99	P	SUR	26	-23	743	0	0.3	0.5	0.6
4101560	99	P	SUR	35	-45	730	0	0.5	0.6	0.8
4101562	99	P	SUR	33	-53	691	0	0.4	0.3	0.5
4101564	99	P	SUR	33	-46	721	0	0.4	-0.2	0.4
4101565	99	P	SUR	33	-39	674	0	0.4	0.3	0.5
4101566	99	P	SUR	28	-54	667	0	0.3	0.1	0.3
4101567	99	P	SUR	35	-55	683	0	0.5	0.3	0.6
4101568	99	P	SUR	38	-47	665	0	0.6	0.1	0.6
4101570	99	P	SUR	30	-53	744	0	0.3	0.2	0.4
4101572	99	P	SUR	46	-31	679	0	0.6	0.2	0.6
4101573	99	P	SUR	37	-62	743	0	0.7	-0.0	0.7
4101575	99	P	SUR	38	-61	581	0	0.5	-0.0	0.5
4101576	99	P	SUR	22	-67	744	0	0.3	0.3	0.4
4101579	99	P	SUR	23	-59	742	0	2.5	-1.8	3.1
4101594	99	P	SUR	16	-55	742	0	0.3	-0.8	0.8
4101595	99	P	SUR	17	-57	744	0	0.8	0.4	0.8
4101596	99	P	SUR	56	-19	744	0	0.6	0.6	0.8
4101598	99	P	SUR	19	-50	744	0	0.3	0.3	0.4
4101599	99	P	SUR	51	-11	744	0	0.5	0.1	0.5
4101600	99	P	SUR	10	-49	741	0	0.3	0.4	0.5
4101601	99	P	SUR	15	-51	742	0	0.3	0.3	0.4
4101604	99	P	SUR	10	-46	743	0	0.3	0.4	0.5
4101605	99	P	SUR	69	-21	280	33	0.7	0.2	0.7
4101606	99	P	SUR	45	-11	744	0	0.3	0.4	0.5
4101607	99	P	SUR	42	-14	744	0	0.3	0.3	0.4
4101608	99	P	SUR	69	-13	744	0	0.5	0.4	0.6
4101609	99	P	SUR	40	-18	744	0	0.4	0.2	0.4

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4101610	99	P	SUR	69	-13	744	0	0.5	0.4	0.6
4101611	99	P	SUR	47	-7	744	0	0.4	0.4	0.6
4101612	99	P	SUR	46	-7	744	0	0.4	0.6	0.7
4101619	99	P	SUR	50	-19	744	0	0.5	-0.0	0.5
4101620	99	P	SUR	51	-13	744	0	0.5	0.2	0.5
4101622	99	P	SUR	71	-7	744	0	0.5	0.2	0.5
4101623	99	P	SUR	61	-56	744	0	0.7	0.1	0.7
4101624	99	P	SUR	62	-35	744	0	0.6	0.4	0.7
4101625	99	P	SUR	64	-32	744	0	0.6	0.3	0.7
4101626	99	P	SUR	57	-35	744	0	0.6	0.1	0.6
4101627	99	P	SUR	56	-33	744	0	0.7	-0.0	0.7
4101629	99	P	SUR	65	-40	648	0	1.0	-0.2	1.0
4101700	99	P	SUR	27	-51	744	0	0.2	0.1	0.3
4101702	99	P	SUR	34	-61	744	9	3.4	-1.0	3.5
4101705	99	P	SUR	30	-35	743	0	0.3	-0.0	0.3
4101706	99	P	SUR	33	-30	744	0	0.3	-0.6	0.7
4101707	99	P	SUR	34	-34	744	0	0.4	-0.2	0.4
4101708	99	P	SUR	27	-36	743	0	0.3	-0.5	0.5
4101709	99	P	SUR	18	-52	744	0	0.2	0.9	0.9
4101712	99	P	SUR	35	-32	729	0	0.4	0.1	0.4
4101713	99	P	SUR	32	-68	744	0	0.5	-0.2	0.5
4101714	99	P	SUR	33	-34	744	0	0.3	-0.1	0.3
4101715	99	P	SUR	29	-54	742	0	0.4	0.4	0.6
4101716	99	P	SUR	26	-49	744	0	0.3	-1.0	1.1
4101717	99	P	SUR	24	-61	744	0	0.3	-0.1	0.3
4101718	99	P	SUR	34	-41	343	0	0.5	-0.0	0.5
4101719	99	P	SUR	34	-51	344	0	0.4	-0.1	0.5
4101742	99	P	SUR	35	-67	313	4	3.8	-0.9	3.9
4101743	99	P	SUR	27	-57	744	0	0.3	0.5	0.6
41041	99	P	SUR	14	-46	1352	0	0.4	0.7	0.8
41043	99	P	SUR	21	-65	1443	0	0.3	0.4	0.5
41044	99	P	SUR	22	-59	1486	0	0.4	0.6	0.7
41046	99	P	SUR	24	-68	1291	0	0.4	0.8	0.9
41049	99	P	SUR	28	-63	1349	0	0.3	0.4	0.5
41052	99	P	SUR	18	-65	743	0	0.4	-1.3	1.3
41053	99	P	SUR	19	-66	2011	0	0.3	-0.8	0.8
41056	99	P	SUR	18	-66	1966	0	0.4	-0.9	1.0
41300	99	P	SUR	16	-57	744	0	0.3	-0.1	0.3
41597	99	P	SUR	31	-44	744	0	0.4	0.1	0.4
41729	99	P	SUR	33	-42	739	0	1.1	-0.1	1.1
41730	99	P	SUR	37	-32	448	17	2.8	-0.5	2.9
4200060	99	P	SUR	16	-63	2367	0	0.3	-0.3	0.5
4200085	99	P	SUR	18	-67	577	0	0.3	-0.9	0.9

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
42060	99	P	SUR	16	-63	1469	0	0.4	0.1	0.4
42085	99	P	SUR	18	-67	825	0	0.3	-0.9	1.0
4400032	99	P	SUR	44	-69	428	0	0.5	-1.2	1.3
4400033	99	P	SUR	44	-69	487	0	0.6	-0.9	1.1
4400034	99	P	SUR	44	-68	487	0	0.5	-0.7	0.8
4400037	99	P	SUR	43	-68	482	0	0.5	-1.1	1.2
44005	99	P	SUR	43	-69	404	0	0.7	-0.4	0.8
4400513	99	P	SUR	54	-10	491	0	0.5	-0.5	0.7
4400517	99	P	SUR	23	-68	744	0	0.3	0.1	0.3
4400521	99	P	SUR	35	-31	697	0	0.4	-1.0	1.0
4400746	99	P	SUR	34	-50	744	0	0.4	0.0	0.4
4400777	99	P	SUR	30	-46	744	0	0.3	0.2	0.3
4400778	99	P	SUR	24	-47	742	0	0.2	0.2	0.3
4400857	99	P	SUR	31	-52	744	0	0.4	0.1	0.4
4400874	99	P	SUR	35	-35	744	4	1.7	0.6	1.8
4400887	99	P	SUR	40	-32	729	0	0.6	-0.3	0.7
4401503	99	P	SUR	38	-60	743	0	0.7	-0.2	0.8
4401531	99	P	SUR	38	-58	742	0	0.6	-0.0	0.6
4401536	99	P	SUR	38	-17	739	0	0.3	0.6	0.7
4401537	99	P	SUR	34	-43	684	0	0.5	-0.4	0.7
4401539	99	P	SUR	37	-32	744	0	0.5	-0.6	0.8
4401540	99	P	SUR	38	-60	744	0	0.7	-0.0	0.7
4401541	99	P	SUR	34	-24	743	0	0.3	-0.0	0.3
4401542	99	P	SUR	29	-69	744	0	0.3	0.2	0.4
4401544	99	P	SUR	36	-58	744	0	0.5	-1.1	1.2
4401549	99	P	SUR	60	-11	699	0	0.5	0.0	0.5
4401551	99	P	SUR	38	-31	743	0	0.4	0.2	0.4
4401552	99	P	SUR	17	-37	709	0	0.2	0.1	0.3
4401553	99	P	SUR	68	3	744	0	0.8	0.4	0.9
4401556	99	P	SUR	34	-30	743	0	0.4	0.1	0.4
4401557	99	P	SUR	34	-30	743	0	0.4	0.2	0.4
4401558	99	P	SUR	63	3	744	0	0.4	0.3	0.5
4401559	99	P	SUR	45	-13	744	0	0.8	0.6	1.0
4401560	99	P	SUR	41	-17	744	0	0.5	0.0	0.5
4401561	99	P	SUR	27	-37	744	0	0.3	-0.2	0.3
4401562	99	P	SUR	34	-19	656	0	0.3	-0.1	0.3
4401563	99	P	SUR	26	-43	744	0	0.3	-0.5	0.6
4401564	99	P	SUR	38	-36	744	0	0.5	-0.2	0.6
4401565	99	P	SUR	61	-16	744	0	0.5	0.2	0.5
4401566	99	P	SUR	49	-10	744	0	0.9	0.7	1.1
4401567	99	P	SUR	54	-48	742	0	0.5	0.4	0.6
4401568	99	P	SUR	50	-48	744	0	0.6	0.2	0.6
4401569	99	P	SUR	54	-49	744	0	0.5	0.1	0.5

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4401570	99	P	SUR	48	-26	743	0	0.6	-0.0	0.6
4401571	99	P	SUR	50	-22	732	0	0.5	0.0	0.5
4401572	99	P	SUR	49	-51	744	0	0.6	0.4	0.7
4401573	99	P	SUR	50	-49	744	0	0.5	0.3	0.6
4401601	99	P	SUR	59	-10	718	0	0.5	0.0	0.5
4401605	99	P	SUR	62	-3	720	0	0.4	0.1	0.4
4401611	99	P	SUR	45	-58	720	0	0.4	0.5	0.6
4401613	99	P	SUR	41	-10	720	0	0.3	0.5	0.7
4401616	99	P	SUR	37	-42	720	0	0.6	-0.4	0.7
4401633	99	P	SUR	37	-15	720	0	0.3	0.5	0.5
4401750	99	P	SUR	61	-8	702	0	0.5	-1.2	1.3
4401751	99	P	SUR	63	-11	711	0	0.5	0.5	0.7
4401753	99	P	SUR	63	-15	667	0	0.6	0.6	0.8
4401755	99	P	SUR	72	28	620	0	0.4	0.3	0.5
4401799	99	P	SUR	19	-42	697	0	0.3	0.2	0.4
4401802	99	P	SUR	39	-22	720	0	1.5	0.5	1.6
4401803	99	P	SUR	50	-18	744	0	0.6	0.2	0.6
4401807	99	P	SUR	62	-4	717	2	2.8	3.1	4.2
44027	99	P	SUR	44	-67	762	0	0.7	-0.7	1.0
44032	99	P	SUR	44	-69	654	0	0.5	-1.2	1.3
44033	99	P	SUR	44	-69	744	0	0.5	-0.9	1.1
44034	99	P	SUR	44	-68	743	0	0.5	-0.7	0.8
44037	99	P	SUR	44	-68	737	0	0.5	-1.2	1.3
44137	99	P	SUR	42	-62	732	0	0.5	-0.3	0.6
44139	99	P	SUR	44	-57	681	1	0.5	-0.1	0.5
44150	99	P	SUR	43	-64	714	0	0.6	-0.0	0.6
44258	99	P	SUR	45	-63	735	0	0.5	-0.2	0.6
44513	99	P	SUR	54	-10	491	0	0.5	-0.5	0.7
44517	99	P	SUR	23	-68	744	0	0.3	0.1	0.3
44521	99	P	SUR	35	-31	695	0	0.4	-1.0	1.0
44746	99	P	SUR	34	-50	744	0	0.4	0.0	0.4
44777	99	P	SUR	30	-46	744	0	0.3	0.2	0.3
44778	99	P	SUR	24	-47	742	0	0.2	0.2	0.3
44857	99	P	SUR	31	-52	744	0	0.4	0.1	0.4
44874	99	P	SUR	35	-35	744	4	1.7	0.6	1.8
44887	99	P	SUR	39	-32	729	0	0.6	-0.3	0.7
45138	99	P	SUR	50	-66	709	0	0.5	0.0	0.5
4700546	99	P	SUR	29	-48	722	1	1.1	0.1	1.1
4701669	99	P	SUR	41	-47	720	0	0.7	0.2	0.7
47546	99	P	SUR	29	-48	742	1	1.1	0.1	1.1
4800770	99	P	SUR	71	-22	215	205	2.0	13.0	13.2
4802004	99	P	SUR	66	-15	719	41	3.4	-1.0	3.6
48770	99	P	SUR	71	-22	224	214	2.1	13.0	13.2

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
6100001	99	P	SUR	43	8	743	0	0.5	0.0	0.5
6100002	99	P	SUR	42	5	744	0	0.4	0.2	0.4
61001	99	P	SUR	43	8	743	0	0.5	0.0	0.5
6100196	99	P	SUR	42	4	631	0	0.5	-0.1	0.6
6100197	99	P	SUR	40	4	730	0	0.4	0.1	0.4
6100198	99	P	SUR	37	-2	742	0	0.3	0.2	0.4
61002	99	P	SUR	42	5	744	0	0.4	0.2	0.4
6100280	99	P	SUR	41	1	721	0	0.4	0.0	0.4
6100281	99	P	SUR	40	0	733	0	0.4	0.0	0.4
6100417	99	P	SUR	38	0	723	0	0.4	0.3	0.5
6100430	99	P	SUR	40	2	736	0	0.3	-0.1	0.4
6101003	99	P	SUR	40	25	96	0	0.5	0.3	0.6
6101007	99	P	SUR	36	25	219	0	0.6	-0.6	0.8
6102501	99	P	SUR	34	20	744	0	0.4	0.2	0.5
6102623	99	P	SUR	36	11	536	0	0.4	0.5	0.6
6200024	99	P	SUR	44	-3	306	0	0.5	-0.4	0.6
6200025	99	P	SUR	44	-6	744	0	0.5	-0.3	0.6
6200082	99	P	SUR	44	-8	653	0	0.5	-0.0	0.5
6200083	99	P	SUR	43	-9	738	253	5.2	-6.0	7.9
6200084	99	P	SUR	42	-9	744	0	0.5	-0.2	0.5
6200085	99	P	SUR	36	-7	743	0	0.3	0.2	0.4
6200091	99	P	SUR	53	-5	744	0	0.6	-0.2	0.6
6200092	99	P	SUR	51	-11	744	0	2.3	-0.6	2.4
6200094	99	P	SUR	52	-7	744	1	0.6	-0.1	0.6
62001	99	P	SUR	45	-5	736	0	0.5	-0.1	0.6
6200192	99	P	SUR	40	-10	472	0	0.3	0.2	0.4
6200199	99	P	SUR	40	-9	592	0	0.3	-0.0	0.3
6200200	99	P	SUR	36	-8	589	0	0.3	0.0	0.3
6200940	99	P	SUR	35	-41	711	0	0.5	-0.3	0.5
6201030	99	P	SUR	44	-4	633	0	0.5	0.9	1.0
62029	99	P	SUR	49	-12	1466	0	0.5	-0.2	0.5
62030	99	P	SUR	50	-4	1328	0	0.4	-0.1	0.4
6203503	99	P	SUR	42	-26	744	0	0.5	-0.3	0.6
6203523	99	P	SUR	68	-4	710	0	0.5	-0.3	0.5
6203525	99	P	SUR	68	-4	697	0	0.5	-0.5	0.7
6203526	99	P	SUR	80	4	688	0	0.5	0.1	0.5
6203527	99	P	SUR	61	-13	696	0	0.5	-2.3	2.4
6203528	99	P	SUR	29	-23	713	0	0.4	0.0	0.4
6203529	99	P	SUR	24	-68	743	0	0.3	-0.3	0.5
6203600	99	P	SUR	45	-12	744	0	0.5	0.5	0.6
6203601	99	P	SUR	46	-11	744	0	0.4	0.5	0.7
6203602	99	P	SUR	66	-58	126	0	2.4	1.0	2.6
6203603	99	P	SUR	61	-25	744	0	0.6	0.1	0.6

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
6203607	99	P	SUR	35	-31	743	0	0.4	0.3	0.5
6203608	99	P	SUR	51	-13	743	0	0.6	0.2	0.6
6203609	99	P	SUR	48	-16	744	0	0.6	-0.2	0.6
6203610	99	P	SUR	50	-12	705	0	0.5	0.1	0.5
62050	99	P	SUR	50	-4	748	0	0.4	0.1	0.5
62081	99	P	SUR	51	-13	758	0	0.5	-0.3	0.6
62087	99	P	SUR	54	9	679	0	0.4	-1.8	1.8
62091	99	P	SUR	53	-5	744	0	0.6	-0.2	0.6
62092	99	P	SUR	51	-11	744	0	2.3	-0.6	2.4
62094	99	P	SUR	52	-7	744	1	0.6	-0.1	0.6
62095	99	P	SUR	53	-16	556	0	0.7	-0.2	0.7
62102	99	P	SUR	58	2	754	0	0.8	0.5	1.0
62103	99	P	SUR	50	-3	754	0	0.5	0.4	0.6
62104	99	P	SUR	57	1	754	0	0.3	-0.0	0.3
62107	99	P	SUR	50	-6	1467	0	0.5	0.3	0.6
62112	99	P	SUR	58	0	753	0	0.4	0.4	0.5
62113	99	P	SUR	58	0	753	0	0.5	-0.0	0.5
62114	99	P	SUR	58	0	1467	0	0.5	0.3	0.6
62115	99	P	SUR	58	-3	300	0	0.4	0.1	0.4
62116	99	P	SUR	58	1	752	0	0.6	0.3	0.7
62118	99	P	SUR	58	1	754	0	0.4	0.5	0.6
62119	99	P	SUR	57	2	754	0	0.5	0.2	0.5
62120	99	P	SUR	56	2	754	0	0.5	-0.0	0.5
62121	99	P	SUR	54	3	754	0	0.5	0.5	0.7
62122	99	P	SUR	57	2	1467	0	0.4	0.2	0.5
62124	99	P	SUR	54	-4	439	0	0.4	0.1	0.4
62127	99	P	SUR	54	1	754	0	0.4	0.6	0.7
62129	99	P	SUR	58	0	649	0	0.5	0.2	0.5
62130	99	P	SUR	59	1	754	0	0.4	-0.1	0.4
62131	99	P	SUR	54	1	603	0	0.5	0.6	0.8
62132	99	P	SUR	56	2	697	0	0.6	0.6	0.9
62133	99	P	SUR	57	1	754	0	0.7	0.4	0.8
62134	99	P	SUR	58	1	754	0	0.4	0.8	0.8
62135	99	P	SUR	54	2	753	0	0.3	0.4	0.5
62136	99	P	SUR	54	3	754	0	0.6	0.8	1.0
62138	99	P	SUR	54	0	1464	0	0.5	1.0	1.1
62139	99	P	SUR	53	2	1461	0	0.4	0.4	0.5
62140	99	P	SUR	57	1	1465	0	0.4	0.2	0.4
62141	99	P	SUR	58	-4	744	0	0.4	-2.3	2.3
62143	99	P	SUR	58	2	750	0	0.4	0.8	0.9
62144	99	P	SUR	53	2	726	0	0.5	0.4	0.6
62145	99	P	SUR	53	3	1467	0	0.4	0.5	0.6
62146	99	P	SUR	57	2	753	0	0.5	0.1	0.5

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62148	99	P	SUR	54	2	726	0	0.5	0.9	1.0
62149	99	P	SUR	54	1	752	0	0.4	0.7	0.8
62150	99	P	SUR	54	1	524	0	0.4	1.3	1.4
62151	99	P	SUR	57	2	1464	0	0.4	0.6	0.7
62152	99	P	SUR	57	2	754	0	0.4	0.5	0.7
62153	99	P	SUR	57	2	1467	0	0.3	0.3	0.5
62154	99	P	SUR	56	2	754	0	0.4	0.1	0.4
62155	99	P	SUR	58	1	748	0	0.4	0.5	0.7
62157	99	P	SUR	58	0	751	0	0.4	-0.0	0.4
62160	99	P	SUR	57	2	1464	0	0.4	0.4	0.5
62161	99	P	SUR	58	1	754	0	0.5	0.0	0.5
62162	99	P	SUR	57	1	484	0	0.4	0.1	0.4
62163	99	P	SUR	48	-8	710	0	0.6	0.1	0.6
62164	99	P	SUR	57	1	231	0	0.3	0.3	0.4
62165	99	P	SUR	54	1	753	0	0.4	0.6	0.7
62168	99	P	SUR	58	1	754	0	0.4	0.1	0.4
62170	99	P	SUR	51	2	754	0	0.4	0.3	0.5
62296	99	P	SUR	53	2	754	0	0.4	0.2	0.4
62297	99	P	SUR	59	2	1461	0	0.4	0.0	0.4
62302	99	P	SUR	61	-2	754	0	0.5	-0.0	0.5
62304	99	P	SUR	51	2	749	0	0.4	0.3	0.5
62305	99	P	SUR	50	0	745	0	0.4	0.3	0.5
62442	99	P	SUR	49	-16	729	0	0.5	-0.2	0.6
62940	99	P	SUR	35	-41	711	0	0.5	-0.3	0.5
6301555	99	P	SUR	74	19	268	0	0.4	-0.3	0.5
6301558	99	P	SUR	86	0	743	0	0.6	1.0	1.1
6301560	99	P	SUR	76	1	422	0	3.0	-0.1	3.0
6301562	99	P	SUR	81	-2	744	0	0.5	-0.0	0.5
6301563	99	P	SUR	86	11	741	0	0.7	0.8	1.1
6301564	99	P	SUR	79	1	136	0	5.8	-0.9	5.9
6301592	99	P	SUR	87	8	723	0	0.5	-0.0	0.5
6301596	99	P	SUR	87	5	997	0	0.5	0.4	0.6
6301598	99	P	SUR	87	4	723	0	0.5	0.3	0.6
6301600	99	P	SUR	87	-2	723	0	0.5	0.2	0.5
63055	99	P	SUR	61	2	754	0	0.7	-0.1	0.7
63056	99	P	SUR	60	2	733	0	0.5	0.5	0.7
63057	99	P	SUR	59	2	754	0	0.4	0.0	0.4
63058	99	P	SUR	53	2	1172	0	0.4	0.3	0.5
63059	99	P	SUR	58	-1	754	0	0.4	0.4	0.6
63101	99	P	SUR	61	1	754	0	0.6	0.4	0.8
63102	99	P	SUR	61	1	754	0	0.6	0.1	0.6
63103	99	P	SUR	61	1	754	0	0.5	0.2	0.6
63104	99	P	SUR	61	2	754	0	0.5	-0.1	0.5

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
63105	99	P	SUR	61	2	754	0	0.4	-0.2	0.5
63108	99	P	SUR	61	2	754	0	0.5	-0.0	0.5
63109	99	P	SUR	60	2	754	0	0.5	-0.4	0.6
63110	99	P	SUR	60	2	754	0	0.6	0.2	0.6
63111	99	P	SUR	61	2	1463	0	0.5	-0.4	0.6
63112	99	P	SUR	61	1	754	0	0.4	-0.3	0.5
63115	99	P	SUR	62	1	754	0	0.6	0.1	0.6
63117	99	P	SUR	61	1	1465	0	0.8	0.9	1.2
63118	99	P	SUR	58	1	751	0	0.4	-0.1	0.4
63120	99	P	SUR	54	2	754	0	0.4	0.6	0.7
6400562	99	P	SUR	73	13	744	0	0.5	-0.0	0.5
6401502	99	P	SUR	63	4	714	0	0.4	0.6	0.7
6401503	99	P	SUR	59	2	694	0	0.4	0.6	0.8
6401504	99	P	SUR	61	-8	359	0	0.4	0.3	0.5
6401505	99	P	SUR	63	-25	683	0	0.5	0.2	0.6
6401506	99	P	SUR	62	-14	722	0	0.6	0.3	0.7
6401531	99	P	SUR	57	-45	742	0	0.6	0.2	0.6
6401536	99	P	SUR	65	-40	611	2	0.8	0.3	0.8
6401537	99	P	SUR	63	-42	261	0	0.5	-0.3	0.6
6401539	99	P	SUR	62	-53	743	0	0.5	0.5	0.7
6401544	99	P	SUR	60	-45	743	1	1.0	0.5	1.1
6401550	99	P	SUR	68	12	744	0	0.4	-0.0	0.4
6401555	99	P	SUR	74	17	744	0	0.4	0.3	0.5
6401556	99	P	SUR	73	13	744	0	0.5	0.3	0.6
6401561	99	P	SUR	64	-13	744	0	0.5	0.3	0.6
6401562	99	P	SUR	71	2	743	0	1.0	0.0	1.0
6401563	99	P	SUR	58	-35	744	0	1.1	0.3	1.1
6401565	99	P	SUR	71	30	722	0	0.5	-0.4	0.6
6401566	99	P	SUR	63	8	743	0	0.5	0.2	0.6
6401568	99	P	SUR	61	-9	743	0	0.5	0.6	0.7
6401569	99	P	SUR	61	-17	743	0	0.5	0.3	0.6
6401570	99	P	SUR	67	-3	744	0	0.5	0.4	0.7
6401571	99	P	SUR	63	-3	744	0	0.4	0.6	0.7
6401572	99	P	SUR	62	-25	743	0	1.3	0.1	1.3
6401654	99	P	SUR	86	0	723	0	0.6	-0.2	0.6
64041	99	P	SUR	61	-3	754	0	0.6	-0.1	0.6
64045	99	P	SUR	59	-12	740	0	0.6	-0.2	0.6
64046	99	P	SUR	61	-4	743	0	0.5	-0.1	0.5
64562	99	P	SUR	73	13	744	0	0.5	-0.0	0.5
6500596	99	P	SUR	68	-18	744	0	0.5	0.3	0.5
6501555	99	P	SUR	65	-52	744	0	0.5	-0.5	0.7
6501556	99	P	SUR	66	-1	744	0	0.4	0.5	0.7
65596	99	P	SUR	68	-18	744	0	0.5	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
66023	99	P	SUR	55	11	751	0	0.4	0.1	0.4

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

```
          DRIFTER MONITORING STATISTICS (EUCOS)
                   MONITORING CENTRE     : ECMWF
                   ELEMENT MONITORED     : WIND SPEED (M/S)
                   AREA                  : 10N - 90N, 70W - 40E
                   PERIOD                : DEC 2018
                   STANDARD OF COMPARISON: FIRST-GUESS FIELD


TIME = 99 => AVERAGE OF ALL OBSERVATIONS


GROSS ERROR LIMIT FOR VECTOR WIND = 25 M/S
```

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
1300001	99	SPEED	SUR	11	-23	556	0	0	0.7	0.6	0.9
1300002	99	SPEED	SUR	20	-23	540	0	0	0.8	0.6	1.0
1300008	99	SPEED	SUR	15	-38	534	0	0	0.7	0.3	0.8
1300130	99	SPEED	SUR	28	-16	111	0	0	1.6	0.6	1.7
1300131	99	SPEED	SUR	28	-17	737	0	0	1.7	1.1	2.0
4100026	99	SPEED	SUR	12	-38	269	0	0	0.6	-0.1	0.6
4100041	99	SPEED	SUR	14	-46	2435	0	0	0.8	-0.1	0.8
4100043	99	SPEED	SUR	21	-65	2321	0	0	0.9	-0.2	0.9
4100044	99	SPEED	SUR	22	-59	2311	0	0	0.9	0.0	0.9
4100046	99	SPEED	SUR	24	-68	2436	0	0	1.1	0.0	1.1
4100049	99	SPEED	SUR	27	-63	2361	0	0	1.3	-0.2	1.3
4100052	99	SPEED	SUR	18	-65	1746	0	0	1.0	-0.7	1.2
4100053	99	SPEED	SUR	18	-66	2937	0	0	1.5	1.0	1.8
4100056	99	SPEED	SUR	18	-65	2926	0	0	1.2	-1.2	1.7
4100139	99	SPEED	SUR	20	-38	556	0	0	0.9	0.2	0.9
4100300	99	SPEED	SUR	16	-57	744	0	0	0.9	-0.5	1.1
41026	99	SPEED	SUR	12	-38	248	0	0	0.7	-0.0	0.7
41041	99	SPEED	SUR	14	-46	1351	0	0	0.9	-0.3	0.9
41043	99	SPEED	SUR	21	-65	1472	0	0	0.9	-0.2	0.9
41044	99	SPEED	SUR	22	-59	1484	0	0	1.0	-0.3	1.1
41046	99	SPEED	SUR	24	-68	1290	0	0	1.2	-0.1	1.2
41049	99	SPEED	SUR	28	-63	1348	0	0	1.2	-0.3	1.3
41052	99	SPEED	SUR	18	-65	743	0	0	1.0	-0.6	1.2
41053	99	SPEED	SUR	19	-66	2011	0	0	1.4	0.2	1.4
41056	99	SPEED	SUR	18	-66	1966	0	0	1.1	-1.0	1.5
41300	99	SPEED	SUR	16	-57	744	0	0	1.0	-0.5	1.1
4200060	99	SPEED	SUR	16	-63	2364	0	0	1.0	-0.0	1.0
4200085	99	SPEED	SUR	18	-67	554	0	0	1.1	-1.1	1.6
42060	99	SPEED	SUR	16	-63	1494	0	0	1.0	-0.3	1.1
42085	99	SPEED	SUR	18	-67	811	0	0	1.0	-0.5	1.2
4400032	99	SPEED	SUR	44	-69	428	0	0	1.5	0.1	1.5
4400033	99	SPEED	SUR	44	-69	487	0	0	1.7	0.1	1.7
4400034	99	SPEED	SUR	44	-68	487	0	0	1.5	0.2	1.5
4400037	99	SPEED	SUR	43	-68	482	0	0	1.3	0.0	1.3

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
44027	99	SPEED	SUR	44	-67	762	0	0	1.3	0.5	1.4
44032	99	SPEED	SUR	44	-69	654	0	0	1.5	0.1	1.5
44033	99	SPEED	SUR	44	-69	744	0	0	1.6	0.4	1.6
44034	99	SPEED	SUR	44	-68	743	0	0	1.5	0.2	1.5
44037	99	SPEED	SUR	44	-68	737	0	0	1.3	0.2	1.3
44137	99	SPEED	SUR	42	-62	735	0	0	1.3	0.0	1.3
44139	99	SPEED	SUR	44	-57	688	0	0	1.2	-0.0	1.2
44150	99	SPEED	SUR	43	-64	719	0	0	1.4	-0.2	1.4
44258	99	SPEED	SUR	45	-63	735	0	0	1.5	0.3	1.5
45138	99	SPEED	SUR	50	-66	711	0	0	1.8	0.5	1.8
6100001	99	SPEED	SUR	43	8	743	0	0	1.7	-0.0	1.7
6100002	99	SPEED	SUR	42	5	744	0	0	1.4	0.3	1.4
61001	99	SPEED	SUR	43	8	743	0	0	1.8	-0.6	2.0
6100196	99	SPEED	SUR	42	4	626	0	0	2.0	-1.0	2.2
6100197	99	SPEED	SUR	40	4	514	0	0	1.5	-0.5	1.6
6100198	99	SPEED	SUR	37	-2	724	0	0	1.5	-0.7	1.6
61002	99	SPEED	SUR	42	5	744	0	0	1.5	-0.3	1.5
6100280	99	SPEED	SUR	41	1	715	0	0	1.7	-0.7	1.8
6100281	99	SPEED	SUR	40	0	718	0	0	1.9	0.9	2.1
6100417	99	SPEED	SUR	38	0	712	0	0	1.2	-0.1	1.2
6100430	99	SPEED	SUR	40	2	682	0	0	1.5	-0.7	1.7
6101003	99	SPEED	SUR	40	25	96	0	0	1.3	-0.9	1.5
6101007	99	SPEED	SUR	36	25	219	0	0	1.9	-0.6	2.0
6101008	99	SPEED	SUR	37	22	55	0	0	3.0	-5.4	6.2
6200024	99	SPEED	SUR	44	-3	303	0	0	1.6	0.1	1.6
6200082	99	SPEED	SUR	44	-8	653	0	0	1.3	-0.7	1.5
6200083	99	SPEED	SUR	43	-9	737	0	0	1.3	-0.3	1.3
6200084	99	SPEED	SUR	42	-9	738	0	0	1.3	-0.6	1.4
6200085	99	SPEED	SUR	36	-7	740	0	0	1.1	-0.2	1.1
6200091	99	SPEED	SUR	53	-5	744	0	0	1.2	0.4	1.3
6200092	99	SPEED	SUR	51	-11	744	0	0	1.2	-0.6	1.4
6200094	99	SPEED	SUR	52	-7	744	0	0	1.3	-0.0	1.3
62001	99	SPEED	SUR	45	-5	736	0	0	1.1	0.5	1.3
6200191	99	SPEED	SUR	41	-10	223	0	0	1.1	0.2	1.1
6200192	99	SPEED	SUR	40	-10	472	0	0	1.1	0.3	1.2
6200199	99	SPEED	SUR	40	-9	592	0	0	1.4	0.2	1.5
6200200	99	SPEED	SUR	36	-8	589	7	0	1.0	-0.1	1.0
6201030	99	SPEED	SUR	44	-4	632	0	0	1.4	-0.3	1.5
62029	99	SPEED	SUR	49	-12	1466	0	0	1.3	0.2	1.3
62050	99	SPEED	SUR	50	-4	748	0	0	1.5	0.4	1.5
62081	99	SPEED	SUR	51	-13	758	0	0	1.5	-0.2	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
62087	99	SPEED	SUR	54	9	679	0	0	1.8	-0.3	1.9
62091	99	SPEED	SUR	53	-5	744	0	0	1.3	0.4	1.3
62092	99	SPEED	SUR	51	-11	744	0	0	1.3	-0.5	1.4
62094	99	SPEED	SUR	52	-7	744	0	0	1.3	0.0	1.3
62095	99	SPEED	SUR	53	-16	556	0	0	1.6	0.2	1.6
62102	99	SPEED	SUR	58	2	754	0	0	1.4	0.1	1.4
62103	99	SPEED	SUR	50	-3	750	0	0	1.6	1.5	2.2
62104	99	SPEED	SUR	57	1	754	0	0	1.3	-0.6	1.5
62107	99	SPEED	SUR	50	-6	1467	0	0	1.6	1.0	1.9
62112	99	SPEED	SUR	58	0	753	0	0	1.7	-1.0	2.0
62113	99	SPEED	SUR	58	0	753	0	0	1.5	0.2	1.5
62114	99	SPEED	SUR	58	0	1467	0	0	1.6	0.5	1.6
62118	99	SPEED	SUR	58	1	754	0	0	1.6	0.4	1.6
62119	99	SPEED	SUR	57	2	754	0	0	1.6	-0.5	1.7
62120	99	SPEED	SUR	56	2	754	0	0	1.4	0.3	1.4
62121	99	SPEED	SUR	54	3	754	0	0	1.3	-0.2	1.4
62122	99	SPEED	SUR	57	2	1467	0	0	1.3	-0.2	1.3
62129	99	SPEED	SUR	58	0	649	0	0	1.3	-0.1	1.3
62131	99	SPEED	SUR	54	1	603	0	0	1.4	-0.2	1.4
62132	99	SPEED	SUR	56	2	688	0	0	2.7	-2.2	3.5
62133	99	SPEED	SUR	57	1	754	0	0	1.4	-0.1	1.4
62134	99	SPEED	SUR	58	1	754	0	0	1.5	-0.0	1.5
62140	99	SPEED	SUR	57	1	1465	0	0	1.3	-0.3	1.4
62143	99	SPEED	SUR	58	2	751	0	0	1.8	-0.5	1.8
62144	99	SPEED	SUR	53	2	726	0	0	2.3	-0.7	2.4
62145	99	SPEED	SUR	53	3	1467	0	0	1.4	0.3	1.4
62146	99	SPEED	SUR	57	2	750	0	0	1.6	-0.1	1.6
62148	99	SPEED	SUR	54	2	304	0	0	1.7	-0.7	1.9
62149	99	SPEED	SUR	54	1	752	0	0	2.7	-0.8	2.8
62150	99	SPEED	SUR	54	1	524	0	0	1.9	-0.9	2.1
62152	99	SPEED	SUR	57	2	754	0	0	1.7	-1.1	2.0
62153	99	SPEED	SUR	57	2	1467	0	0	2.4	-1.6	2.9
62154	99	SPEED	SUR	56	2	744	0	0	1.3	-0.2	1.3
62155	99	SPEED	SUR	58	1	178	0	0	2.1	-0.1	2.1
62163	99	SPEED	SUR	48	-8	710	0	0	1.2	-0.2	1.2
62164	99	SPEED	SUR	57	1	231	0	0	1.7	-1.2	2.1
62165	99	SPEED	SUR	54	1	753	0	0	1.8	-0.8	2.0
62170	99	SPEED	SUR	51	2	753	0	0	1.9	1.1	2.2
62304	99	SPEED	SUR	51	2	652	0	0	1.8	1.9	2.6
62305	99	SPEED	SUR	50	0	745	0	0	1.7	1.3	2.2
62442	99	SPEED	SUR	49	-16	729	0	0	1.4	-0.2	1.4

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
63055	99	SPEED	SUR	61	2	754	0	0	1.3	-0.8	1.5
63056	99	SPEED	SUR	60	2	733	0	0	1.5	-0.2	1.5
63057	99	SPEED	SUR	59	2	754	0	0	1.8	-0.2	1.8
63058	99	SPEED	SUR	53	2	983	0	0	1.3	0.1	1.3
63101	99	SPEED	SUR	61	1	754	0	0	1.4	-0.4	1.5
63103	99	SPEED	SUR	61	1	754	0	0	1.7	-0.3	1.7
63104	99	SPEED	SUR	61	2	754	0	0	1.5	-0.5	1.5
63105	99	SPEED	SUR	61	2	754	0	0	1.6	-0.7	1.8
63106	99	SPEED	SUR	61	2	754	0	0	1.5	-0.3	1.5
63108	99	SPEED	SUR	61	2	754	0	0	1.5	-0.2	1.5
63109	99	SPEED	SUR	60	2	745	0	0	1.6	-0.1	1.6
63110	99	SPEED	SUR	60	2	754	0	0	1.6	-0.3	1.6
63112	99	SPEED	SUR	61	1	754	0	0	1.3	-1.0	1.6
63113	99	SPEED	SUR	61	2	754	0	0	1.3	-0.9	1.6
63115	99	SPEED	SUR	62	1	754	0	0	1.4	-0.8	1.6
63117	99	SPEED	SUR	61	1	1465	0	0	1.7	-0.5	1.7
64041	99	SPEED	SUR	61	-3	754	0	0	1.4	-0.2	1.5
64045	99	SPEED	SUR	59	-12	739	0	0	1.3	0.3	1.4
64046	99	SPEED	SUR	61	-4	743	0	0	1.4	0.6	1.5
66021	99	SPEED	SUR	55	14	744	0	0	1.4	0.7	1.6
66022	99	SPEED	SUR	54	14	609	1	0	1.8	-0.2	1.8
66024	99	SPEED	SUR	55	13	393	0	0	1.4	1.1	1.8

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

```
          DRIFTER MONITORING STATISTICS (EUCOS)
                   MONITORING CENTRE     : ECMWF
                   ELEMENT MONITORED     : WIND DIRECTION (DEGREES)
                   AREA                  : 10N - 90N, 70W - 40E
                   PERIOD                : DEC 2018
                   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	546	0	0	8.3	0.1	8.3
1300002	99	DIRN	SUR	20	-23	484	0	0	10.0	-1.0	10.0
1300008	99	DIRN	SUR	15	-38	534	0	0	8.3	2.7	8.7
1300130	99	DIRN	SUR	28	-16	73	0	0	13.0	56.7	58.1
1300131	99	DIRN	SUR	28	-17	509	0	0	16.7	-2.5	16.9
4100004	99	DIRN	SUR	33	-79	1930	0	0	26.2	8.7	27.6
4100009	99	DIRN	SUR	29	-80	1975	0	0	14.8	9.0	17.3
4100010	99	DIRN	SUR	29	-78	2293	0	0	15.5	11.0	19.0
4100013	99	DIRN	SUR	33	-78	1908	0	0	25.7	24.1	35.2
4100024	99	DIRN	SUR	34	-78	348	0	0	19.3	-0.8	19.3
4100025	99	DIRN	SUR	35	-76	241	0	0	17.0	7.2	18.5
4100026	99	DIRN	SUR	12	-38	269	0	0	7.9	-0.7	7.9
4100029	99	DIRN	SUR	33	-80	367	0	0	20.2	0.8	20.2
4100033	99	DIRN	SUR	32	-80	340	0	0	26.9	3.2	27.1
4100037	99	DIRN	SUR	34	-77	405	0	0	20.1	-6.9	21.2
4100038	99	DIRN	SUR	34	-78	361	0	0	24.8	-8.9	26.4
4100041	99	DIRN	SUR	14	-46	2434	0	0	10.3	-10.2	14.5
4100043	99	DIRN	SUR	21	-65	2132	0	0	10.6	-8.4	13.5
4100044	99	DIRN	SUR	22	-59	2148	0	0	11.0	5.2	12.2
4100046	99	DIRN	SUR	24	-68	2259	0	0	17.0	1.4	17.1
4100047	99	DIRN	SUR	28	-72	1932	0	0	10.5	-1.2	10.6
4100049	99	DIRN	SUR	27	-63	1930	0	0	14.0	5.9	15.2
4100052	99	DIRN	SUR	18	-65	1743	0	0	9.6	2.9	10.0
4100053	99	DIRN	SUR	18	-66	1919	0	0	16.9	0.2	16.9
4100056	99	DIRN	SUR	18	-65	2772	0	0	11.4	3.5	11.9
4100064	99	DIRN	SUR	34	-77	399	0	0	19.7	-17.5	26.3
4100139	99	DIRN	SUR	20	-38	537	0	0	11.5	3.4	12.0
4100300	99	DIRN	SUR	16	-57	744	0	0	11.8	5.2	12.9
41004	99	DIRN	SUR	33	-79	1191	0	0	23.5	6.8	24.5
41008	99	DIRN	SUR	31	-81	573	0	0	27.1	10.5	29.1
41009	99	DIRN	SUR	29	-80	1150	0	0	16.2	6.2	17.3
41010	99	DIRN	SUR	29	-79	1216	0	0	14.2	9.7	17.2

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
41013	99	DIRN	SUR	33	-78	1214	0	0	24.9	21.6	32.9
41024	99	DIRN	SUR	34	-79	529	0	0	19.0	-2.1	19.1
41025	99	DIRN	SUR	35	-75	506	0	0	17.2	9.9	19.9
41026	99	DIRN	SUR	12	-38	248	0	0	8.4	-1.3	8.5
41029	99	DIRN	SUR	33	-80	909	0	0	24.9	0.9	24.9
41033	99	DIRN	SUR	32	-80	495	0	0	26.2	1.7	26.3
41037	99	DIRN	SUR	34	-77	612	0	0	19.0	-9.1	21.1
41038	99	DIRN	SUR	34	-78	548	0	0	23.1	-9.1	24.8
41041	99	DIRN	SUR	14	-46	1348	0	0	9.8	-10.3	14.2
41043	99	DIRN	SUR	21	-65	1373	0	0	10.8	-9.8	14.6
41044	99	DIRN	SUR	22	-59	1349	0	0	13.1	5.7	14.3
41046	99	DIRN	SUR	24	-68	1159	0	0	16.6	-0.6	16.7
41047	99	DIRN	SUR	28	-72	1140	0	0	12.2	-3.2	12.6
41049	99	DIRN	SUR	28	-63	1147	0	0	13.8	5.1	14.7
41052	99	DIRN	SUR	18	-65	741	0	0	10.5	2.7	10.8
41053	99	DIRN	SUR	19	-66	1509	0	0	17.3	-2.5	17.4
41056	99	DIRN	SUR	18	-66	1871	0	0	11.5	3.8	12.1
41064	99	DIRN	SUR	34	-77	622	0	0	21.9	-17.3	27.9
41300	99	DIRN	SUR	16	-57	744	0	0	11.8	5.2	12.9
4200013	99	DIRN	SUR	27	-83	678	1	0	23.4	5.3	24.0
4200022	99	DIRN	SUR	28	-84	834	0	0	20.9	2.9	21.1
4200023	99	DIRN	SUR	26	-83	851	0	0	16.2	4.9	16.9
4200057	99	DIRN	SUR	17	-81	2429	0	0	13.0	1.8	13.1
4200060	99	DIRN	SUR	16	-63	2351	0	0	9.9	3.5	10.5
4200085	99	DIRN	SUR	18	-67	533	0	0	20.1	19.1	27.7
42013	99	DIRN	SUR	27	-83	1026	0	0	21.8	3.0	22.0
42022	99	DIRN	SUR	28	-84	1258	0	0	19.4	3.5	19.7
42023	99	DIRN	SUR	26	-83	1114	0	0	16.2	4.4	16.8
42057	99	DIRN	SUR	17	-81	1482	0	0	12.3	2.0	12.4
42060	99	DIRN	SUR	16	-63	1453	0	0	10.4	-1.5	10.5
42085	99	DIRN	SUR	18	-67	784	0	0	15.8	15.1	21.9
4400007	99	DIRN	SUR	44	-70	4	0	0	13.6	-4.7	14.4
4400020	99	DIRN	SUR	41	-70	1931	0	0	13.8	3.8	14.3
4400022	99	DIRN	SUR	41	-74	727	0	0	17.1	8.8	19.2
4400029	99	DIRN	SUR	43	-71	435	0	0	14.0	-3.8	14.5
4400030	99	DIRN	SUR	43	-70	407	0	0	19.8	-1.6	19.8
4400032	99	DIRN	SUR	44	-69	359	0	0	13.9	10.1	17.1
4400033	99	DIRN	SUR	44	-69	389	0	0	17.7	-1.7	17.8
4400034	99	DIRN	SUR	44	-68	436	0	0	13.5	2.8	13.8
4400037	99	DIRN	SUR	43	-68	431	0	0	16.1	4.0	16.6
4400039	99	DIRN	SUR	41	-73	1242	0	0	17.4	1.8	17.5

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
4400040	99	DIRN	SUR	41	-74	615	0	0	19.1	0.2	19.1
4400042	99	DIRN	SUR	38	-76	685	0	0	25.9	-7.3	27.0
4400058	99	DIRN	SUR	38	-76	1703	0	0	23.4	-21.8	32.0
4400064	99	DIRN	SUR	37	-76	1934	0	0	22.3	-12.9	25.7
4400065	99	DIRN	SUR	40	-74	1996	0	0	15.8	6.5	17.1
4400072	99	DIRN	SUR	37	-76	266	0	0	35.0	10.7	36.6
44007	99	DIRN	SUR	44	-70	554	0	0	17.5	0.8	17.5
44013	99	DIRN	SUR	42	-71	631	0	0	18.2	8.4	20.0
44014	99	DIRN	SUR	37	-75	641	0	0	17.3	5.0	18.0
44017	99	DIRN	SUR	41	-72	656	0	0	12.6	11.2	16.9
44018	99	DIRN	SUR	42	-70	663	0	0	14.1	8.0	16.2
44020	99	DIRN	SUR	42	-70	1210	0	0	13.4	4.5	14.2
44022	99	DIRN	SUR	41	-74	350	0	0	21.5	9.8	23.6
44025	99	DIRN	SUR	40	-73	661	0	0	12.8	1.9	12.9
44027	99	DIRN	SUR	44	-67	677	0	0	13.4	7.8	15.5
44029	99	DIRN	SUR	43	-71	1013	0	0	14.1	-4.7	14.9
44030	99	DIRN	SUR	43	-70	605	0	0	18.7	-1.5	18.7
44032	99	DIRN	SUR	44	-69	535	0	0	14.3	9.2	17.0
44033	99	DIRN	SUR	44	-69	581	0	0	15.5	-2.8	15.8
44034	99	DIRN	SUR	44	-68	657	0	0	13.6	2.0	13.7
44037	99	DIRN	SUR	44	-68	648	0	0	14.6	2.5	14.8
44039	99	DIRN	SUR	41	-73	631	0	0	18.5	0.6	18.5
44040	99	DIRN	SUR	41	-74	459	0	0	19.9	-0.5	19.9
44042	99	DIRN	SUR	38	-76	693	0	0	23.7	-6.4	24.5
44058	99	DIRN	SUR	38	-76	841	0	0	20.5	-23.3	31.1
44064	99	DIRN	SUR	37	-76	930	0	0	20.4	-16.7	26.3
44065	99	DIRN	SUR	40	-74	1217	0	0	14.7	4.0	15.2
44066	99	DIRN	SUR	40	-73	388	3	0	31.9	3.8	32.2
44069	99	DIRN	SUR	41	-73	176	0	0	15.6	4.2	16.1
44072	99	DIRN	SUR	37	-76	384	0	0	23.4	-2.2	23.5
44137	99	DIRN	SUR	42	-62	688	0	0	11.0	2.0	11.2
44139	99	DIRN	SUR	44	-57	646	0	0	11.9	-24.2	26.9
44150	99	DIRN	SUR	43	-64	662	0	0	12.5	6.0	13.8
44258	99	DIRN	SUR	45	-63	633	0	0	21.9	6.7	22.9
45132	99	DIRN	SUR	43	-81	84	0	0	23.6	3.3	23.9
45138	99	DIRN	SUR	50	-66	636	0	0	14.7	-1.1	14.7
45142	99	DIRN	SUR	43	-79	74	0	0	15.1	-2.1	15.3
45149	99	DIRN	SUR	44	-82	7	0	0	20.8	22.8	30.8
45154	99	DIRN	SUR	46	-83	15	0	0	31.1	22.6	38.5
6100198	99	DIRN	SUR	37	-2	382	0	0	19.5	5.0	20.1
6100281	99	DIRN	SUR	40	0	288	0	0	32.0	-4.5	32.3

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
6100417	99	DIRN	SUR	38	0	425	0	0	18.4	6.7	19.6
6200024	99	DIRN	SUR	44	-3	239	0	0	17.5	12.2	21.3
6200082	99	DIRN	SUR	44	-8	537	0	0	10.1	4.2	10.9
6200083	99	DIRN	SUR	43	-9	634	0	0	10.5	8.3	13.3
6200084	99	DIRN	SUR	42	-9	553	0	0	13.1	9.7	16.3
6200085	99	DIRN	SUR	36	-7	582	0	0	15.9	3.4	16.3
6200091	99	DIRN	SUR	53	-5	697	0	0	11.8	0.4	11.8
6200092	99	DIRN	SUR	51	-11	711	0	0	14.3	6.7	15.7
6200094	99	DIRN	SUR	52	-7	706	0	0	12.6	-0.2	12.6
62001	99	DIRN	SUR	45	-5	645	0	0	11.2	6.4	12.9
6200191	99	DIRN	SUR	41	-10	198	0	0	10.9	116.6	117.1
6200192	99	DIRN	SUR	40	-10	412	0	0	12.3	-0.7	12.3
6200199	99	DIRN	SUR	40	-9	422	0	0	15.3	2.5	15.5
6200200	99	DIRN	SUR	36	-8	439	7	0	163.6	-43.7	169.3
6201030	99	DIRN	SUR	44	-4	435	0	0	19.3	1.7	19.3
62029	99	DIRN	SUR	49	-12	1418	0	0	9.9	10.6	14.5
62050	99	DIRN	SUR	50	-4	638	0	0	11.6	2.8	12.0
62081	99	DIRN	SUR	51	-13	727	0	0	13.3	11.8	17.8
62091	99	DIRN	SUR	53	-5	689	0	0	11.9	-0.0	11.9
62092	99	DIRN	SUR	51	-11	703	0	0	14.6	5.9	15.7
62094	99	DIRN	SUR	52	-7	700	0	0	13.0	-0.7	13.0
62095	99	DIRN	SUR	53	-16	541	0	0	18.9	9.4	21.1
62103	99	DIRN	SUR	50	-3	701	0	0	13.6	1.9	13.7
62107	99	DIRN	SUR	50	-6	1349	0	0	16.0	2.3	16.1
62112	99	DIRN	SUR	58	0	667	0	0	13.2	4.5	13.9
62114	99	DIRN	SUR	58	0	1374	0	0	12.5	0.8	12.6
62163	99	DIRN	SUR	48	-8	637	0	0	10.3	0.2	10.3
62305	99	DIRN	SUR	50	0	693	0	0	14.7	3.0	15.0
62442	99	DIRN	SUR	49	-16	718	0	0	12.5	-5.0	13.5
64041	99	DIRN	SUR	61	-3	703	0	0	10.6	9.2	14.0
64045	99	DIRN	SUR	59	-12	648	0	0	17.8	6.2	18.9
64046	99	DIRN	SUR	61	-4	686	0	0	11.4	-2.6	11.7

4.12 Table 24 - List of Assimilated BUFR Encoded Radiosonde Stations

ASDE09	DBLK	FHM5UJH	FPUW5GN	HTXUH4H	QCY3TGN	VKB4L5Q	WDK38HS	XKQLWQB
XQFJRGX	XWHDEAD	YLV96WM	ZVQEQCM	5QPW8XG	7HCPVTB	7JUNA4N	01001	01004
01010	01028	01241	01400	01415	02185	02365	02527	02591
02836	02963	03005	03238	03354	03502	03743	03808	03882
03918	03953	04018	04089	04220	04270	04320	04339	04360
04417	06011	06260	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	17281	17607	22008	26038	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	61901	61904	61980	61998	67083	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	76458	76612
76679	76743	78897	78954	81405	85442	85469	85586	85799
85934	87155	87244	87344	87418	87576	87623	87715	87860
88889	89002	89022	89062	89564	89571	89611	89625	89642
89662	89859	91212	91285	91592	91643	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

ASDE09	DBLK	FHM5UJH	FPUW5GN	HTXUH4H	QCY3TGN	VKB4L5Q	WDK38HS	XKQLWQB
XQFJRGX	XWHDEAD	YLV96WM	ZVQEQCM	5QPW8XG	7HCPVTB	7JUNA4N	01001	01004
01010	01028	01241	01400	01415	02185	02365	02527	02591
02836	02963	03005	03238	03354	03502	03808	03882	03918
04018	04089	04220	04270	04320	04339	04360	04417	06260
06610	07110	07145	07510	07645	07761	08001	08023	08190
08221	08302	08383	08430	08508	08522	08579	10035	10113
10184	10238	10393	10410	10548	10618	10739	10771	10962
11010	11120	11240	11520	11747	11952	12120	12374	12425
12843	13275	16045	16080	16113	16144	16245	16429	16546
16622	16716	16754	17607	22008	33008	40179	40186	45004
47155	47186	47401	47412	47418	47582	47600	47646	47678
47741	47778	47807	47827	47909	47918	47945	47971	47991
48698	60018	61901	61904	61980	61998	68816	70026	70133
70200	70231	70326	71043	71082	71600	71823	71845	71867
71906	71907	71908	71913	71926	71934	71945	71964	72206
72208	72210	72214	72215	72233	72235	72240	72248	72249
72250	72251	72265	72274	72293	72317	72327	72340	72363
72364	72365	72376	72388	72426	72440	72451	72476	72489
72493	72518	72520	72528	72558	72562	72572	72597	72632
72634	72645	72649	72659	72681	72694	72747	72764	72786
73033	74389	74560	76612	76743	78897	78954	81405	85442
85586	85934	87244	87344	87623	87860	88889	89002	89062
89564	89571	89611	89642	89859	91212	91285	91765	91925
91938	91948	91958	93417	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						

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.