



# ECMWF Global Data Monitoring Report

September 2019

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

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### 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 percentage 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	Aug	Sep	Ident	Time	Aug	Sep
01415	(00)	30	12	41169	(00)	0	29
01415	(12)	31	14	72208	(00)	3	30
02365	(00)	26	8	76405	(12)	9	23
02365	(12)	28	13	76595	(12)	13	27
17030	(00)	26	9	78397	(12)	4	28
23472	(00)	12	0	82400	(00)	11	25
23884	(12)	31	17	82400	(12)	12	26
26477	(00)	30	17	91643	(00)	3	16
26477	(12)	30	16	-	-	-	-
33791	(12)	29	9	-	-	-	-
34731	(00)	29	3	-	-	-	-
34731	(12)	29	2	-	-	-	-
42874	(12)	31	13	-	-	-	-
43369	(00)	28	10	-	-	-	-
43371	(12)	25	0	-	-	-	-
65503	(12)	13	0	-	-	-	-
71600	(00)	21	0	-	-	-	-
71600	(12)	20	0	-	-	-	-
74646	(00)	11	24	-	-	-	-
74646	(12)	10	23	-	-	-	-
74794	(12)	62	48	-	-	-	-
78954	(12)	15	0	-	-	-	-
85442	(12)	31	2	-	-	-	-
91765	(00)	26	5	-	-	-	-
94302	(00)	30	10	-	-	-	-
98646	(00)	24	0	-	-	-	-
98646	(12)	23	0	-	-	-	-

## 2.2 Drifting Buoys

Surface pressure observations from **1836** drifting buoys were received during the month.

## 3 Global monitoring statistics

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

### 3.1 Data Availability

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

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

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

### 3.2 Data Quality

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

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

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

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

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

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

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

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

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

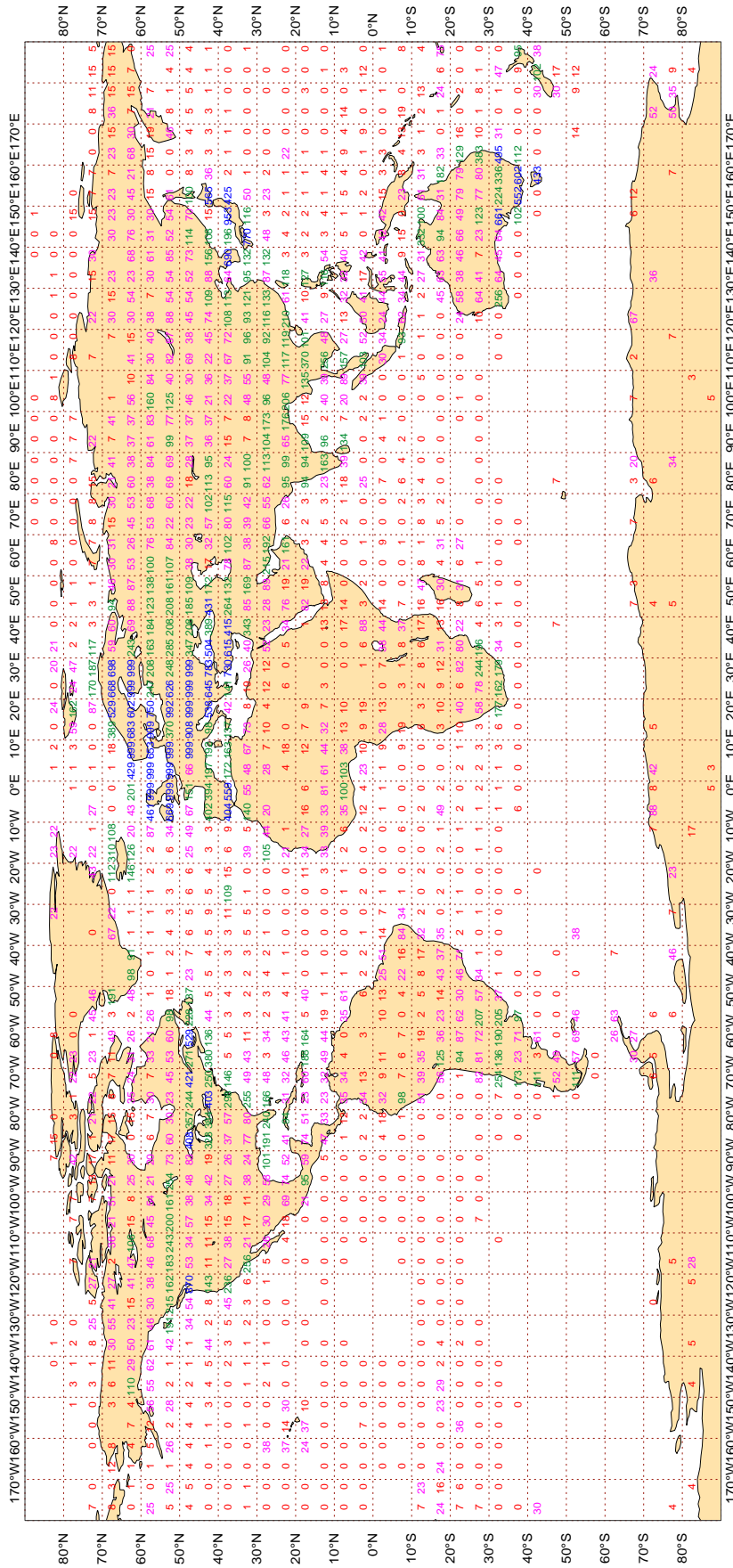
Table 12 provides quality statistics of aircraft wind observations stratified by airline carrier.



3.2.1 Figure 1 - Availability - SYNOP PRESSURE

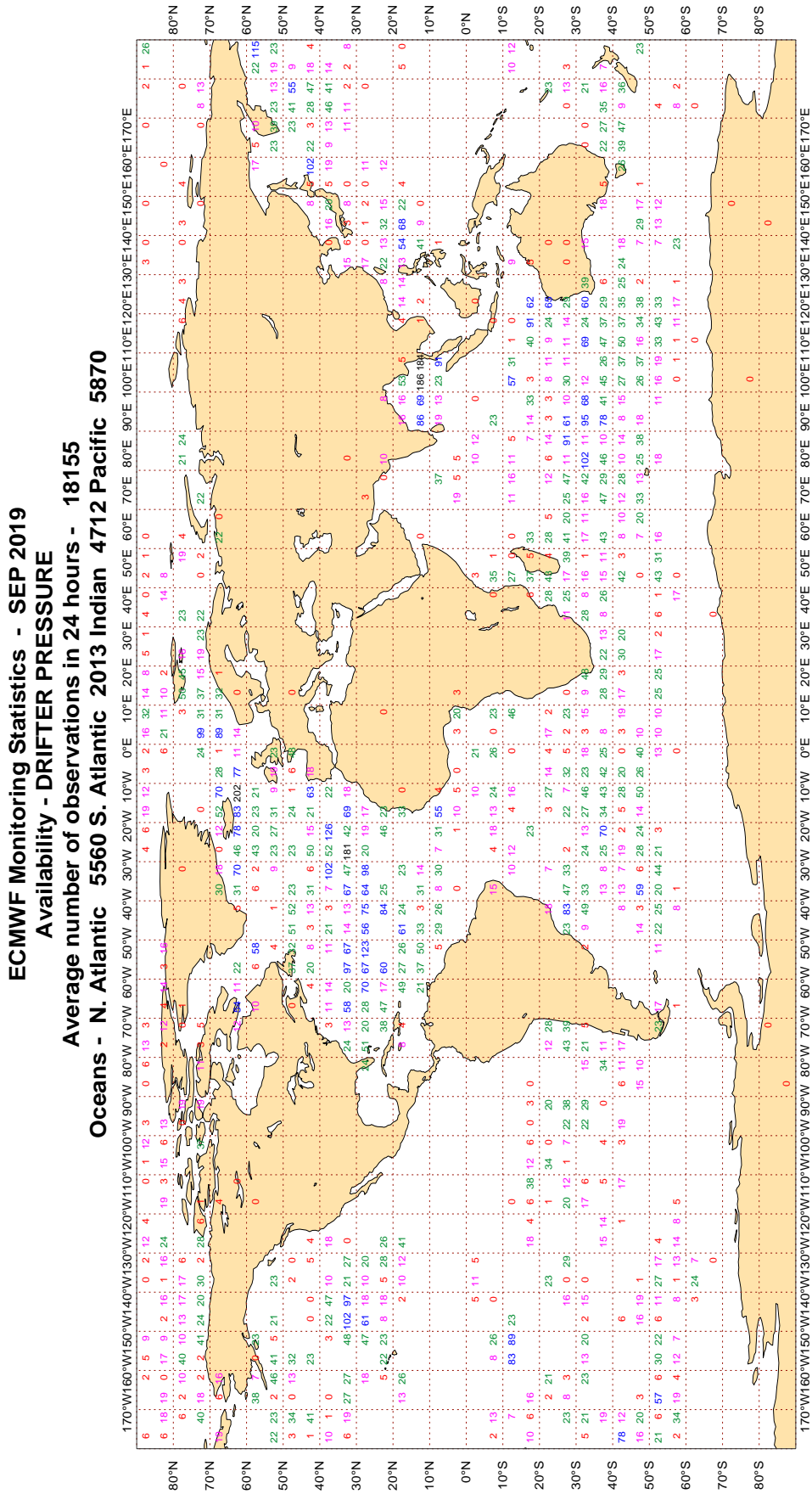
Figure 1

ECMWF Monitoring Statistics - SEP 2019  
 Availability - SYNOP/SHIP (manual, auto) pressure  
 Average number of observations in 24 hours - 97608  
 LAND - WMO Region I: 4080 II:18263 III: 3985 IV: 7090  
 Region V: 8685 VI:39364 Antarctic: 908  
 Oceans - N. Atlantic 8740 S. Atlantic 202 Indian 517 Pacific 5771



3.2.2 Figure 2 - Availability - DRIFTER PRESSURE

Figure 2



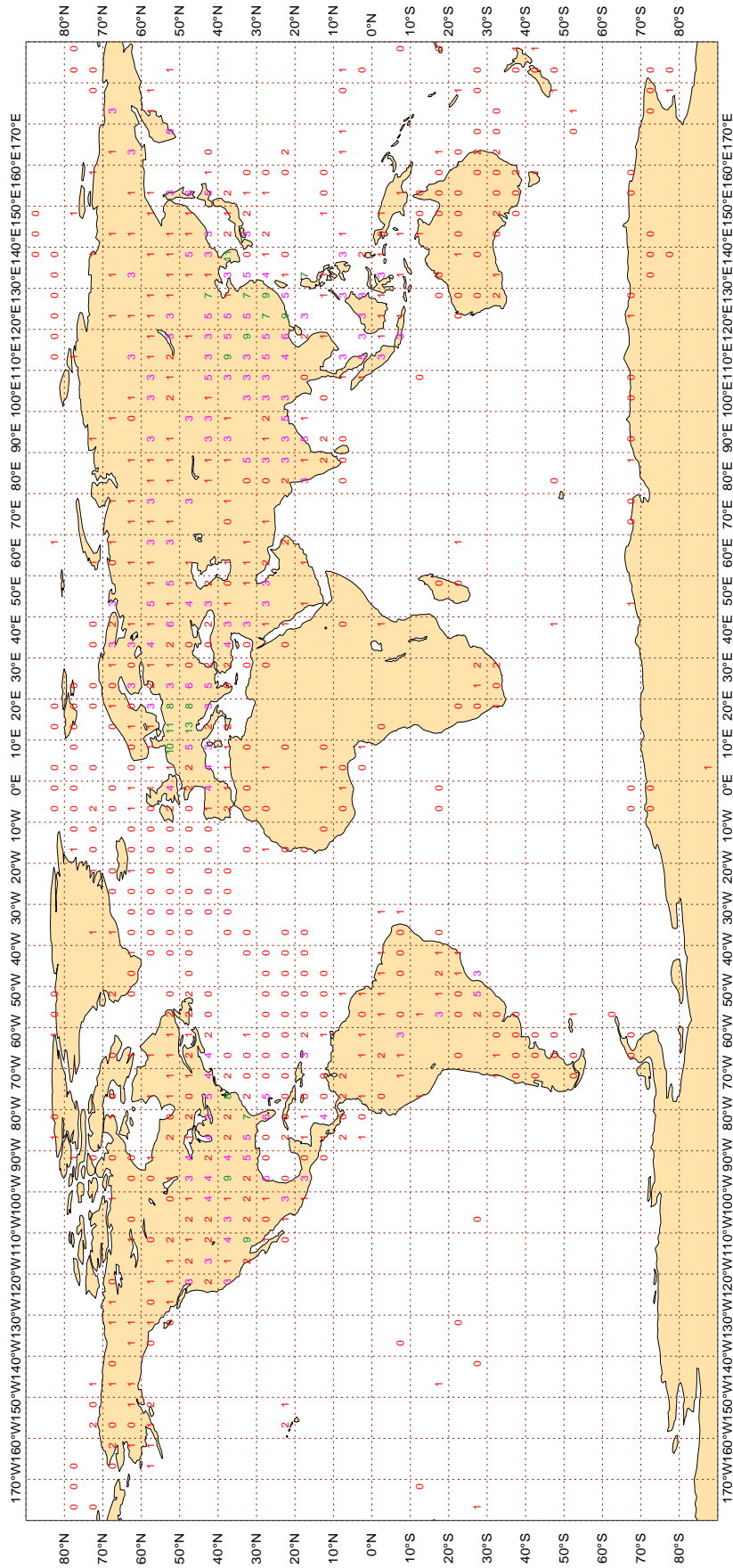
Magicis 3.0.4 (64 bit)



3.2.3 Figure 3 - Availability - TEMP 500 hPa geopotential

Figure 3

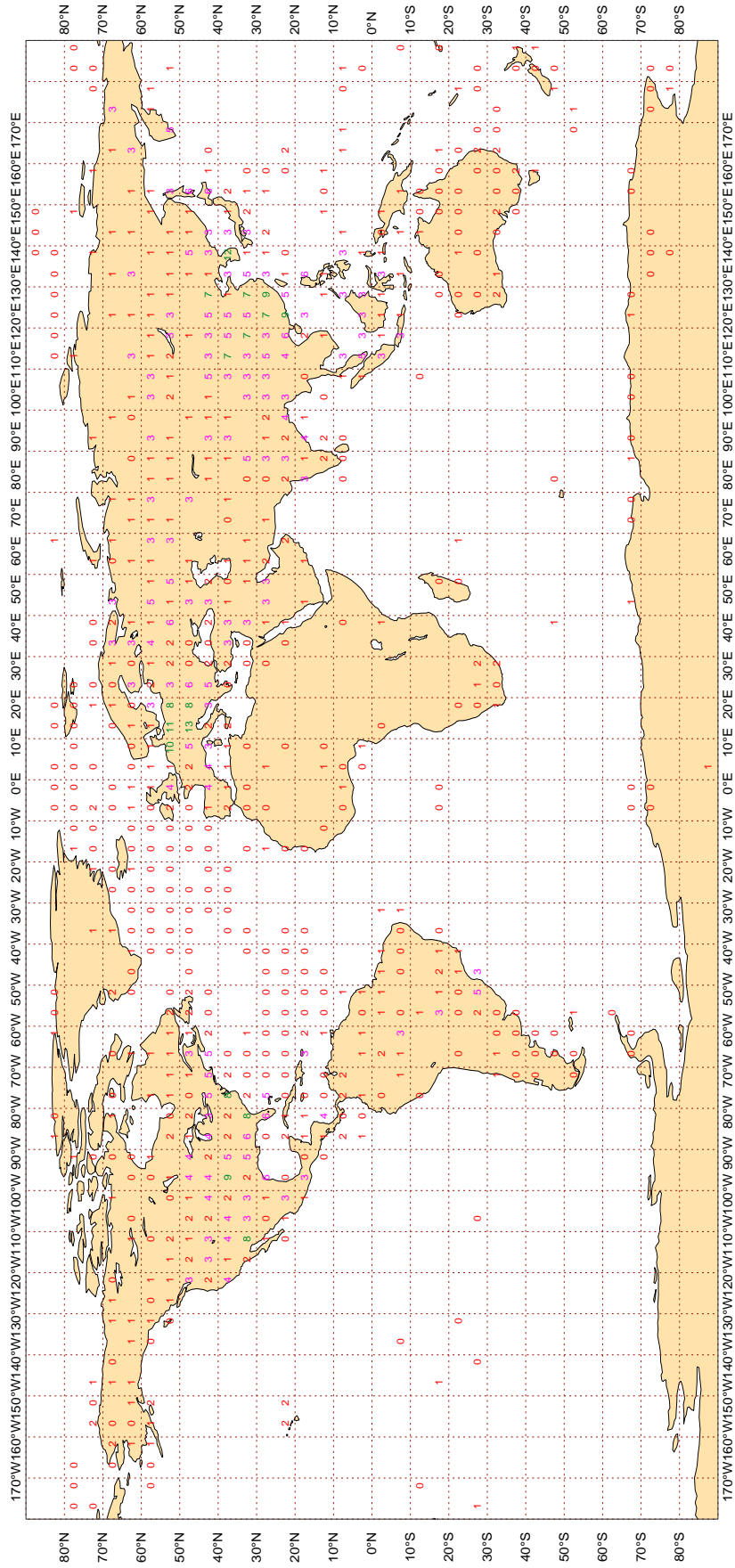
ECMWF Monitoring Statistics - SEP 2019  
 Availability - TEMP 500 hPa Geopotential  
 Average number of observations in 24 hours - 1344  
 LAND - WMO Region I: 31 II: 525 III: 80 IV: 290  
 Region V: 139 VI: 252 Antarctic: 15  
 Oceans - N. Atlantic 9 S. Atlantic 0 Indian 0 Pacific 3



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

Figure 4

ECMWF Monitoring Statistics - SEP 2019  
 Availability - TEMP/PILOT 300 hPa wind  
 Average number of observations in 24 hours - 1336  
 LAND - WMO Region I: 31 II: 511 III: 79 IV: 300  
 Region V: 137 VI: 250 Antarctic: 15  
 Oceans - N. Atlantic 9 S. Atlantic 0 Indian 0 Pacific 3



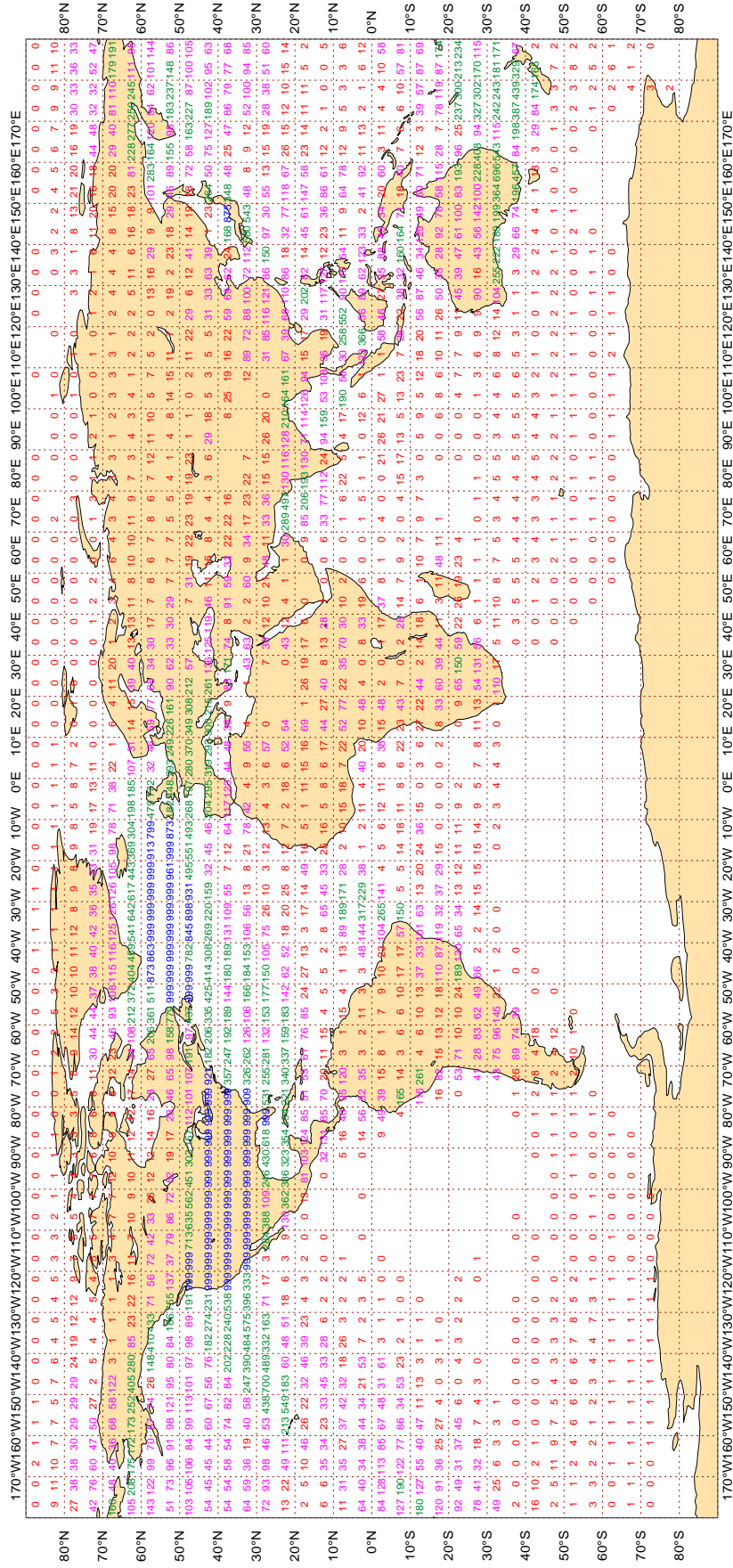
Magics 3.0.4 (64 bit)



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

Figure 5

ECMWF Monitoring Statistics - SEP 2019  
Availability - Aircraft winds 300-150 hPa  
Average number of observations in 24 hours - 223998

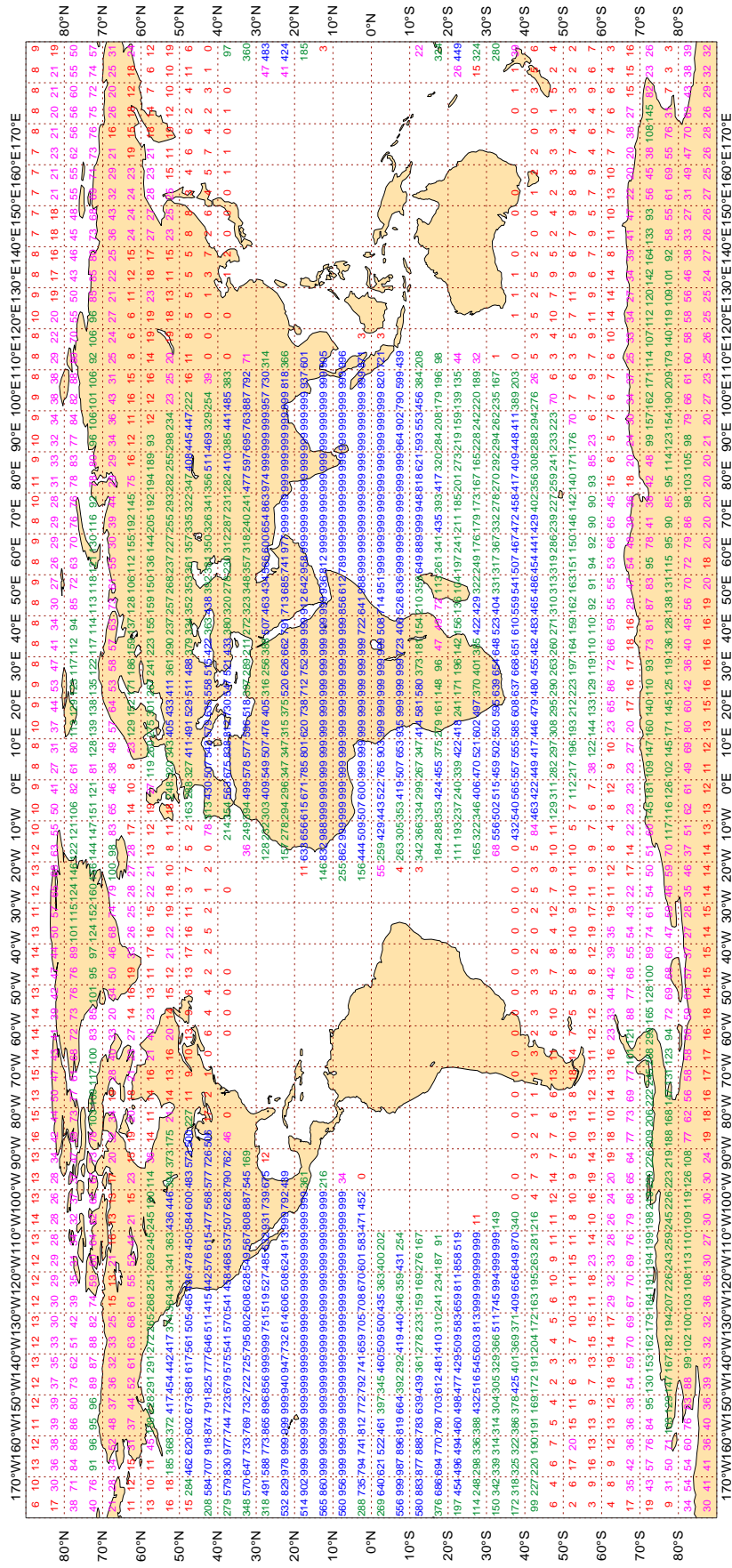




3.2.6 Figure 6 - Availability - SATOB winds 400-150 hPa

Figure 6

ECMWF Monitoring Statistics - SEP 2019  
Availability - AMV winds 400-150 hPa  
Average number of observations in 24 hours - 619220



Magics 3.0.4 (64 bit)



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

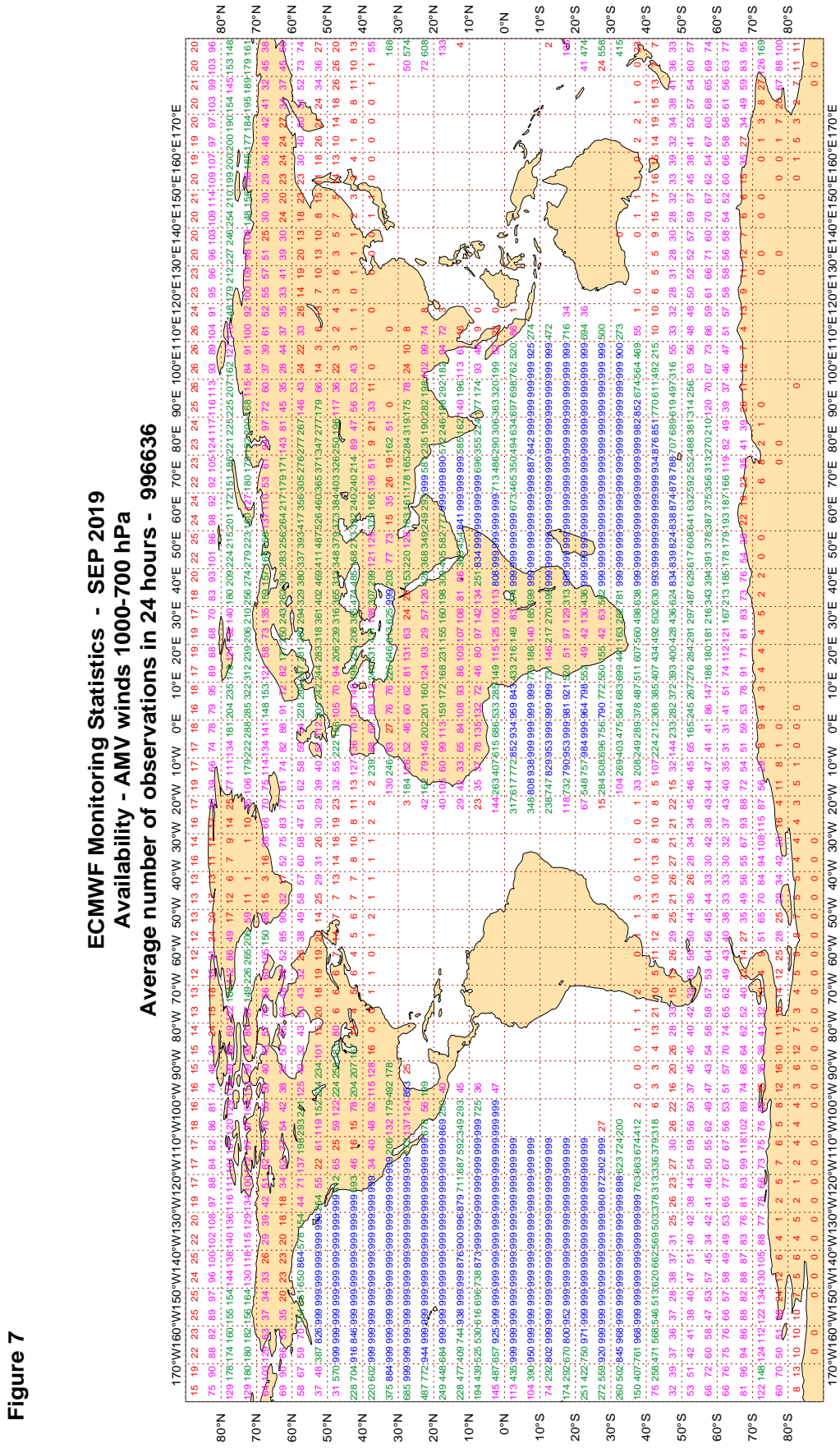


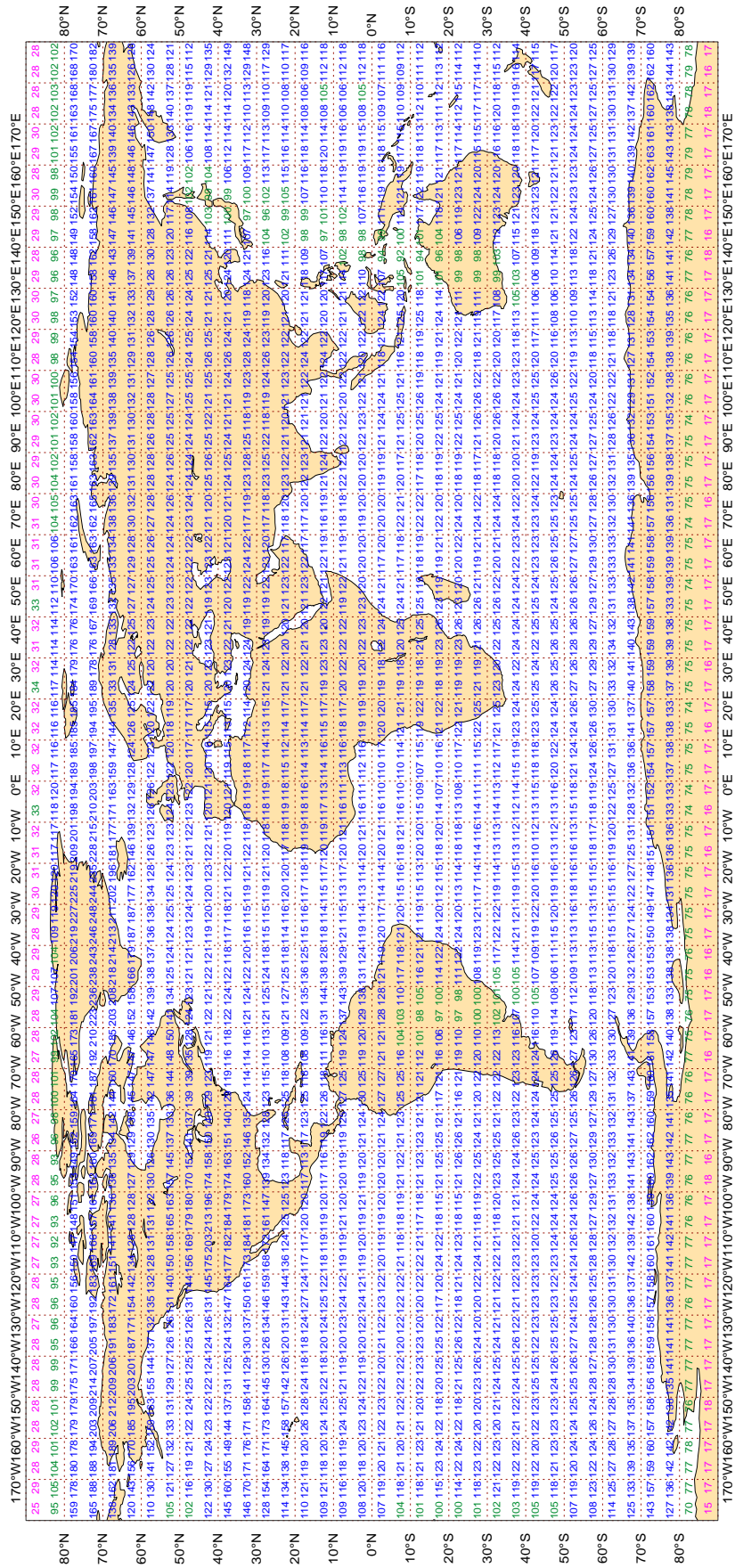
Figure 7



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

Figure 8

ECMWF Monitoring Statistics - SEP 2019  
Availability - NOAA15 ATOVS : AMSU-A  
Average number of observations in 24 hours - 316128



Magics 3.0.4 (64 bit)

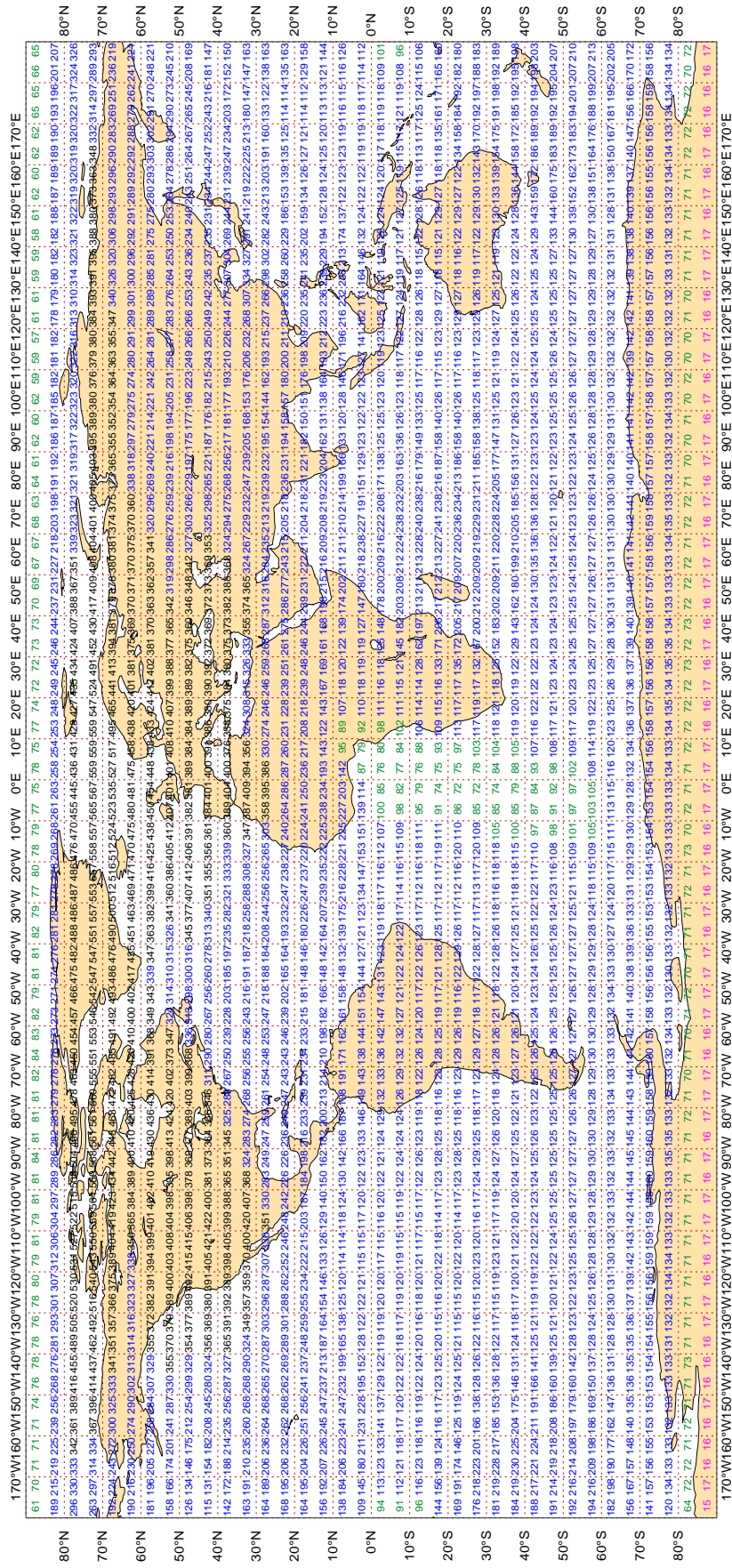




3.2.9 Figure 9.1 - Availability - NOAA18 ATOVS : AMSU-A

Figure 9.1

ECMWF Monitoring Statistics - SEP 2019  
 Availability - NOAA18 ATOVS : AMSU-A  
 Average number of observations in 24 hours - 520115



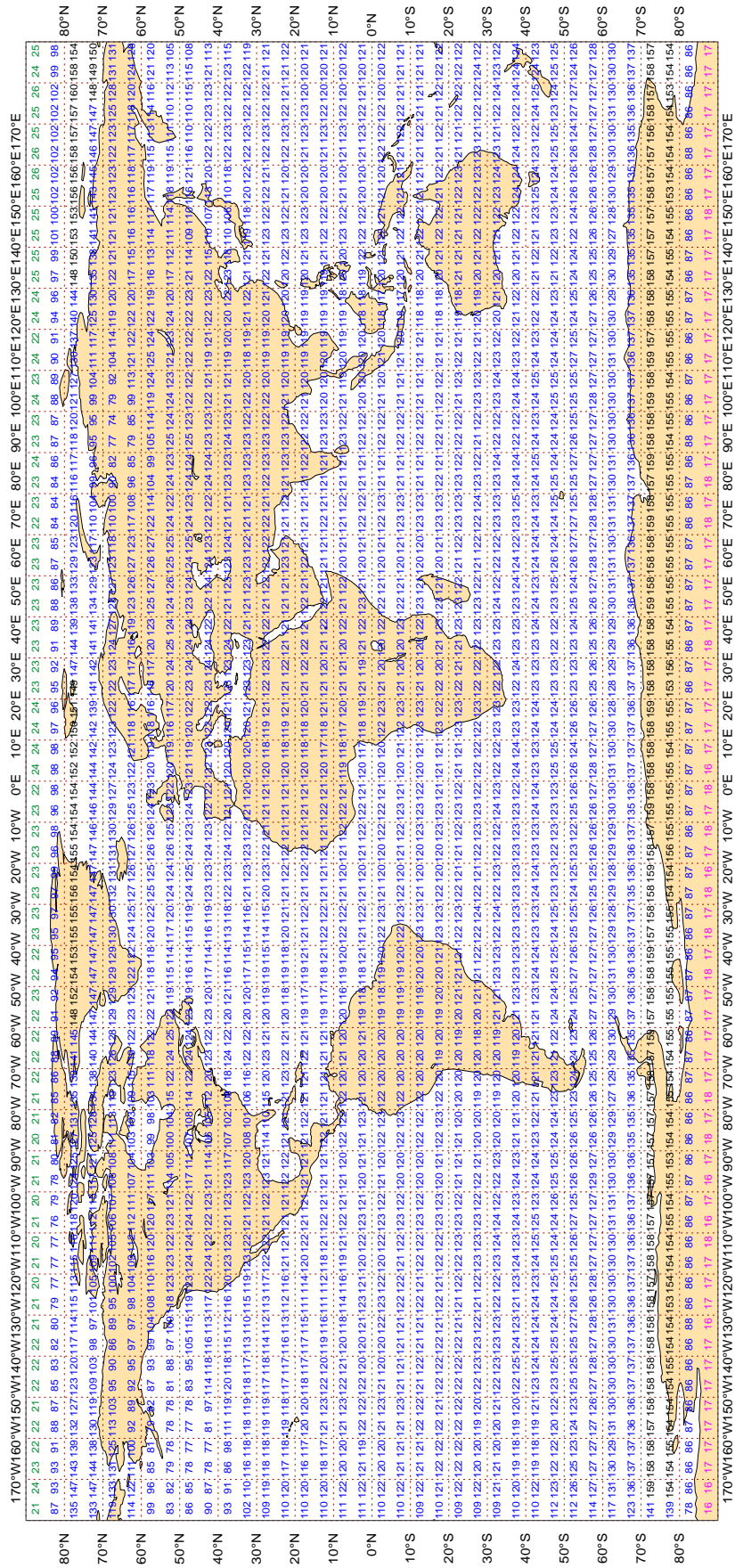
Magics 3.0.4 (64 bit)



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

Figure 9.2

ECMWF Monitoring Statistics - SEP 2019  
Availability - AQUA ATOVS : AMSU-A  
Average number of observations in 24 hours - 302566



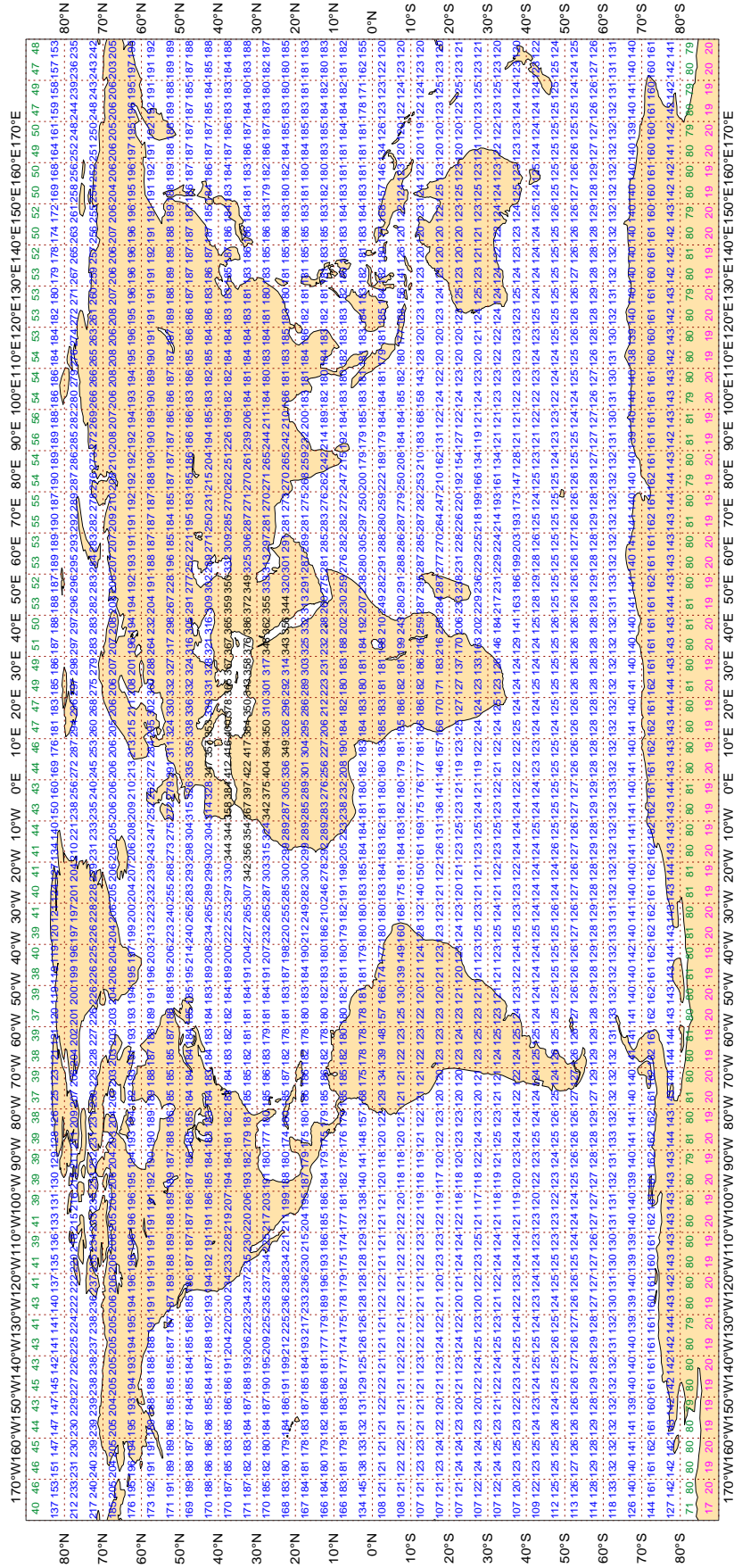
Magics 3.0.4 (64 bit)



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

Figure 9.3

ECMWF Monitoring Statistics - SEP 2019  
Availability - METOP ATOVS : AMSU-A  
Average number of observations in 24 hours - 435164



**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 : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

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

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	SD	BIAS	RMS
3FFA5	99	P	SUR	15	5	4.1	11.5	12.2
44058	99	P	SUR	151	0	0.5	3.6	3.6
4XFC	99	P	SUR	23	0	1.1	4.8	4.9
7KCR	99	P	SUR	24	0	1.6	6.7	6.8
9HA4330	99	P	SUR	29	0	1.7	-5.5	5.8
9HA4883	99	P	SUR	31	0	0.6	-3.1	3.1
9HJB9	99	P	SUR	21	0	1.7	3.5	3.9
9V2779	99	P	SUR	56	0	5.4	5.8	7.9
9V9498	99	P	SUR	36	0	1.2	4.2	4.4
9V9793	99	P	SUR	41	0	1.8	5.1	5.4
9VDD2	99	P	SUR	32	0	1.6	-3.6	3.9
ATVK	99	P	SUR	74	49	7.0	5.0	8.6
AUCE	99	P	SUR	120	39	4.3	-0.4	4.3
AUFH	99	P	SUR	40	0	1.9	-5.4	5.8
C6CX3	99	P	SUR	16	0	2.5	3.9	4.6
C6FU4	99	P	SUR	17	0	0.6	6.0	6.0
C6FV8	99	P	SUR	27	0	1.9	-5.4	5.7
C6WW4	99	P	SUR	37	0	2.2	4.3	4.8
CQAI7	99	P	SUR	74	0	1.2	5.3	5.4
CQHW	99	P	SUR	22	0	0.9	-4.1	4.2
D5HF2	99	P	SUR	16	0	2.1	-5.9	6.2
D5KR2	99	P	SUR	28	0	2.8	4.0	4.9
D5LW3	99	P	SUR	24	0	1.0	7.1	7.1
J8QB8	99	P	SUR	38	0	1.0	3.5	3.7
LAHR7	99	P	SUR	19	2	5.8	6.1	8.4
LAQL7	99	P	SUR	49	0	0.8	3.5	3.6
OWWS2	99	P	SUR	36	0	2.1	4.2	4.7
OZ2049	99	P	SUR	37	0	0.8	-6.3	6.3
OZBY2	99	P	SUR	25	2	2.4	3.8	4.5
UBNY	99	P	SUR	18	0	0.7	3.1	3.2
UFJN	99	P	SUR	101	0	0.9	-3.7	3.8
V7DQ4	99	P	SUR	40	0	7.0	0.6	7.0

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
V7FA7	99	P	SUR	21	0	0.6	4.0	4.0
V7GR8	99	P	SUR	50	0	1.5	3.0	3.4
V7QJ5	99	P	SUR	21	0	1.5	3.4	3.7
VRBI2	99	P	SUR	16	0	2.4	9.2	9.5
VRBJ9	99	P	SUR	15	0	1.5	3.5	3.8
VRCU7	99	P	SUR	17	0	0.5	-4.8	4.8
VRFX2	99	P	SUR	70	0	0.8	-3.6	3.7
VRGW3	99	P	SUR	26	0	1.5	-3.3	3.7
VRIB3	99	P	SUR	51	0	2.4	-7.4	7.8
VRMD3	99	P	SUR	19	0	1.0	3.5	3.6
VRMX7	99	P	SUR	16	0	1.5	3.4	3.7
VRPN6	99	P	SUR	22	0	1.3	3.5	3.7
VRWN4	99	P	SUR	18	0	1.0	-5.0	5.1
VTSG	99	P	SUR	19	0	0.5	11.9	12.0
VTWS	99	P	SUR	22	20	0.7	-8.1	8.1
WADN	99	P	SUR	23	0	0.5	3.3	3.4
WBP3210	99	P	SUR	65	0	1.0	-12.8	12.8
WDG2803	99	P	SUR	16	1	0.8	-4.2	4.2
WDI3177	99	P	SUR	37	0	0.5	3.6	3.7
WPTC	99	P	SUR	41	0	1.8	4.4	4.7
WTOI	99	P	SUR	57	0	2.2	3.0	3.8
YJUP4	99	P	SUR	48	2	2.4	3.3	4.1
ZDNC7	99	P	SUR	16	0	3.1	7.3	7.9

**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 : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

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

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
45147	99	SPEED	SUR	46	0	0	2.1	-4.1	4.6



### 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 : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

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

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
42013	99	DIRN	SUR	120	0	0	114.7	-24.3	117.3
44072	99	DIRN	SUR	165	0	0	21.0	-78.8	81.5
45141	99	DIRN	SUR	86	0	0	22.5	32.9	39.9
45150	99	DIRN	SUR	91	0	0	16.6	89.7	91.3
45166	99	DIRN	SUR	116	0	0	12.5	-36.7	38.8
45175	99	DIRN	SUR	148	0	0	73.8	-16.4	75.6
45176	99	DIRN	SUR	97	0	0	111.0	-29.1	114.7
66022	99	DIRN	SUR	138	0	0	53.9	30.3	61.8

**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 : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

TIME = 99 => AVERAGE OF ALL OBSERVATIONS

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
1501628	99	P	SUR	-10	-3	33	0	1.1	6.1	6.2
1601579	99	P	SUR	-49	91	429	6	3.0	6.9	7.5
1601651	99	P	SUR	-51	70	422	422	0.0	0.0	0.0
1701514	99	P	SUR	-12	44	138	0	0.0	-6.4	6.4
2301719	99	P	SUR	22	89	215	71	8.8	-3.2	9.4
4101661	99	P	SUR	62	-12	168	10	1.0	13.3	13.3
4500001	99	P	SUR	48	-88	4301	4301	0.0	0.0	0.0
4500002	99	P	SUR	45	-86	4211	4211	0.0	0.0	0.0
4500003	99	P	SUR	45	-83	717	716	0.0	-0.2	0.2
4500004	99	P	SUR	48	-87	3934	3934	0.0	0.0	0.0
4500005	99	P	SUR	42	-82	4309	4309	0.0	0.0	0.0
4500006	99	P	SUR	47	-90	717	715	0.0	0.5	0.5
4500007	99	P	SUR	43	-87	4295	4295	0.0	0.0	0.0
4500008	99	P	SUR	44	-82	4305	4305	0.0	0.0	0.0
4500012	99	P	SUR	44	-77	4297	0	0.4	-9.3	9.3
4500026	99	P	SUR	42	-87	4212	4212	0.0	0.0	0.0
4500029	99	P	SUR	43	-86	4260	4260	0.0	0.0	0.0
4500168	99	P	SUR	42	-86	4114	4114	0.0	0.0	0.0
4701658	99	P	SUR	72	-95	601	540	3.7	5.7	6.8
4701660	99	P	SUR	70	-102	572	230	6.7	-2.6	7.2
4800770	99	P	SUR	58	-40	599	599	0.0	0.0	0.0
4801612	99	P	SUR	80	-160	689	483	4.4	-2.5	5.1
4801625	99	P	SUR	85	178	481	7	4.9	-4.1	6.4
4802008	99	P	SUR	81	-95	593	30	6.4	0.1	6.5
6203584	99	P	SUR	65	-30	307	219	2.7	11.2	11.5
7401530	99	P	SUR	-37	-12	555	0	0.7	-5.9	5.9



**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 : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

TIME = 99 => AVERAGE OF ALL OBSERVATIONS

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
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**3.2.17 Table 6 - Suspect drifters: Wind direction (degrees)**

LIST OF SUSPECT STATIONS : DRIFTER  
 MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND DIRECTION (DEGREES)  
 PERIOD : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

TIME = 99 => AVERAGE OF ALL OBSERVATIONS

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
0062087	99	DIRN	SUR	55	7	345	0	0	11.6	-59.2	60.3
0066022	99	DIRN	SUR	54	14	205	0	0	56.5	31.9	64.9
1500001	99	DIRN	SUR	-10	-10	692	0	0	102.4	-4.1	102.5
1500002	99	DIRN	SUR	0	-10	238	0	0	107.4	-105.3	150.4
15002	99	DIRN	SUR	0	-10	178	0	0	111.2	-106.4	153.9
2301795	99	DIRN	SUR	17	90	25	0	0	25.3	21.4	33.1
23093	99	DIRN	SUR	16	88	128	0	0	15.9	-29.9	33.9
23094	99	DIRN	SUR	14	84	288	0	0	19.4	-27.0	33.2
23451	99	DIRN	SUR	15	69	65	0	0	31.3	-53.6	62.1
23456	99	DIRN	SUR	18	67	161	0	0	152.6	74.0	169.7
23459	99	DIRN	SUR	14	87	136	0	0	20.2	-35.0	40.4
23492	99	DIRN	SUR	11	72	144	0	0	39.1	-63.9	74.9
3100003	99	DIRN	SUR	-8	-31	247	0	0	11.3	29.8	31.9
3100053	99	DIRN	SUR	-23	-43	147	2	0	25.9	-23.2	34.8
3100231	99	DIRN	SUR	-27	-47	89	0	0	60.4	-82.8	102.5
31003	99	DIRN	SUR	-8	-31	186	0	0	12.2	29.3	31.8
31053	99	DIRN	SUR	-23	-43	35	2	0	28.9	-21.4	36.0
31231	99	DIRN	SUR	-27	-47	90	0	0	63.0	-79.7	101.6
4200013	99	DIRN	SUR	27	-83	790	0	0	116.9	-25.8	119.7
4200085	99	DIRN	SUR	18	-67	3005	0	0	29.1	21.7	36.2
42013	99	DIRN	SUR	27	-83	762	0	0	115.1	-27.8	118.4
4400063	99	DIRN	SUR	39	-76	3445	0	0	25.4	-23.4	34.5
4400072	99	DIRN	SUR	37	-76	2897	0	0	16.2	-76.5	78.2
44063	99	DIRN	SUR	39	-76	782	0	0	25.5	-24.0	35.0
44072	99	DIRN	SUR	37	-76	801	1	0	16.8	-78.4	80.2
44139	99	DIRN	SUR	44	-57	627	0	0	11.4	-25.1	27.6
4500024	99	DIRN	SUR	44	-87	3179	0	0	19.0	22.9	29.8
4500025	99	DIRN	SUR	47	-88	2279	0	0	66.9	0.7	66.9
4500166	99	DIRN	SUR	45	-73	1528	0	0	17.2	-39.5	43.1
4500168	99	DIRN	SUR	42	-86	2742	0	0	35.4	27.8	45.1
4500173	99	DIRN	SUR	47	-87	2025	0	0	20.7	-21.5	29.8

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
4500175	99	DIRN	SUR	46	-85	2691	0	0	70.4	-21.0	73.5
4500176	99	DIRN	SUR	42	-82	1342	0	0	114.1	-12.7	114.8
4500186	99	DIRN	SUR	42	-88	868	0	0	23.7	25.4	34.8
45024	99	DIRN	SUR	44	-87	864	0	0	20.7	23.0	31.0
45025	99	DIRN	SUR	47	-88	530	0	0	65.5	3.4	65.6
45141	99	DIRN	SUR	61	-115	538	0	0	19.9	34.0	39.4
45149	99	DIRN	SUR	44	-82	498	0	0	23.3	22.9	32.7
45150	99	DIRN	SUR	62	-114	542	0	0	16.4	89.7	91.2
45166	99	DIRN	SUR	45	-73	519	0	0	16.9	-40.5	43.9
45168	99	DIRN	SUR	42	-86	610	0	0	34.8	24.9	42.8
45173	99	DIRN	SUR	47	-87	596	0	0	22.5	-24.5	33.3
45175	99	DIRN	SUR	46	-85	617	0	0	73.8	-17.8	75.9
45176	99	DIRN	SUR	42	-82	551	0	0	112.6	-23.2	114.9
45186	99	DIRN	SUR	42	-88	328	0	0	22.1	24.4	32.9
4600060	99	DIRN	SUR	61	-147	445	0	0	37.2	22.6	43.6
46060	99	DIRN	SUR	61	-147	455	0	0	34.4	21.8	40.7
46120	99	DIRN	SUR	48	-122	140	0	0	24.0	-20.2	31.3
5300040	99	DIRN	SUR	-8	95	684	0	0	158.9	69.7	173.5
5300056	99	DIRN	SUR	-5	95	656	0	0	135.4	105.1	171.4
53040	99	DIRN	SUR	-8	95	684	0	0	157.3	71.5	172.8
53056	99	DIRN	SUR	-5	95	658	0	0	140.1	97.8	170.9
6101001	99	DIRN	SUR	38	24	72	0	0	98.1	-33.4	103.7
6101003	99	DIRN	SUR	40	25	23	0	0	50.8	41.5	65.6
6200191	99	DIRN	SUR	41	-10	191	0	0	16.4	27.8	32.3
62146	99	DIRN	SUR	57	2	337	0	0	25.3	-24.1	34.9
66022	99	DIRN	SUR	54	14	822	0	0	56.3	33.1	65.3

**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 : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

ONLY THE WORST LEVEL IS SHOWN (WITH UNWEIGHTED RMS)

WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
01400	12	Z	1000	57	3	26	0	5.6	78.6	78.8
01400	00	Z	1000	57	3	25	0	4.0	80.5	80.6
24343	00	Z	250	67	123	30	0	75.8	70.3	103.4
24343	12	Z	250	67	123	29	0	73.1	55.8	92.0
24726	00	Z	30	63	114	29	0	63.7	193.9	204.1
27707	00	Z	30	54	35	27	0	64.8	-170.6	182.5
30758	00	Z	30	52	113	19	0	154.8	160.7	223.1
31510	00	Z	30	50	127	26	0	135.4	136.8	192.5
37011	12	Z	50	44	39	26	0	125.8	145.8	192.6
42634	00	Z	850	23	70	29	0	13.4	46.1	48.0
61687	12	Z	1000	14	-14	20	0	4.9	-39.7	40.0
76394	00	Z	200	26	-100	26	0	99.0	160.2	188.3
JNKN7J	00	Z	1000	51	-11	11	0	3.1	47.2	47.3
JNKN7J	12	Z	1000	51	-17	11	0	4.3	47.0	47.2

**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 : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

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

WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	UBIAS	VBIAS	RMS
44373	12	V	150	44	104	28	0	-15.2	0.8	19.8
44373	00	V	150	44	104	30	0	-14.0	1.2	18.7

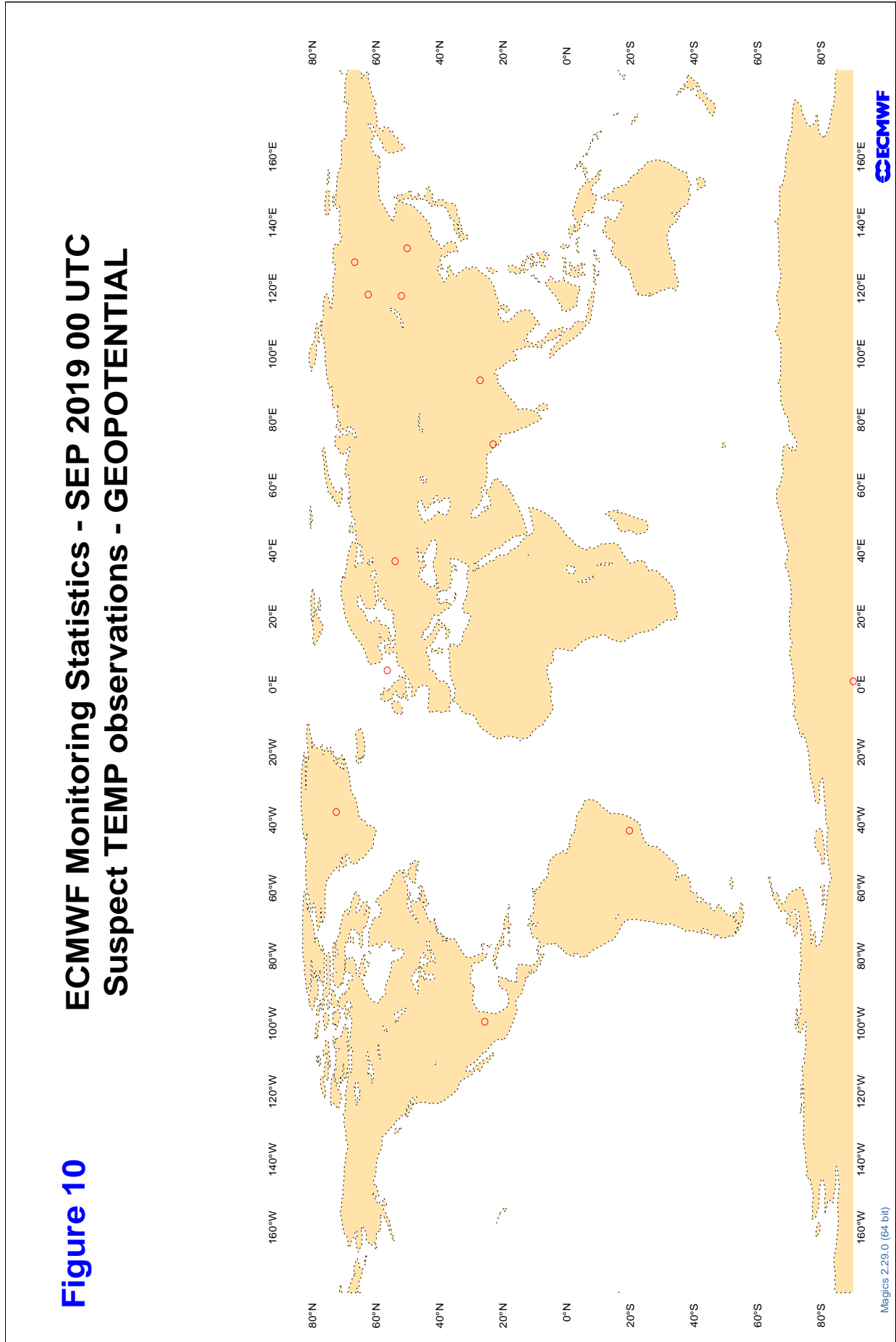
**3.2.20 Table 9 - Suspect radiosondes: Wind direction (degrees)**

LIST OF SUSPECT STATIONS : RADIOSONDES  
 MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND DIRECTION (DEGREES)  
 AREA : GLOBAL  
 PERIOD : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

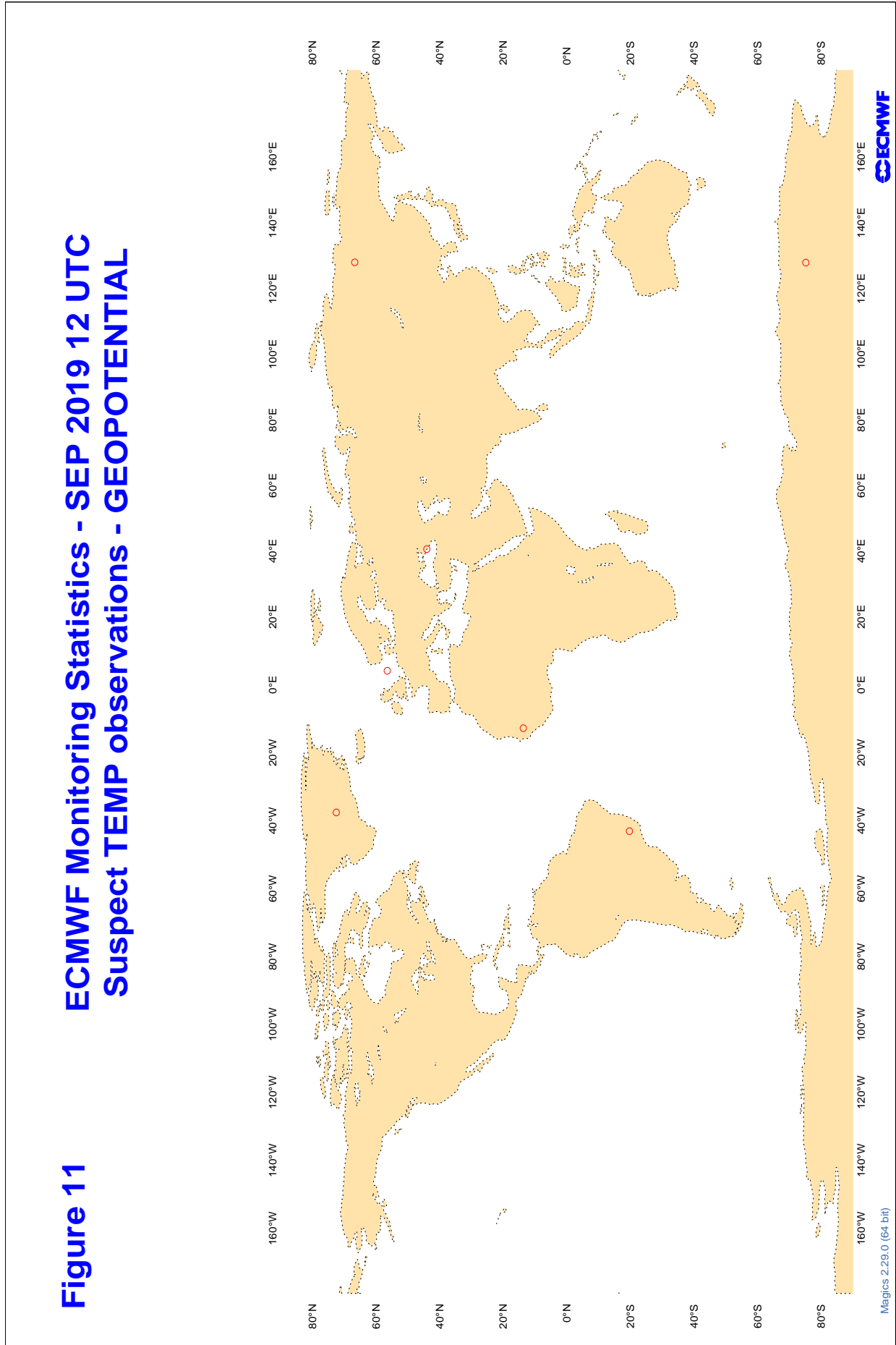
SELECTION CRITERIA: OBSERVED/FORECAST WIND SPEEDS  $\geq$  5 M/S  
 NO. OF OBSERVATIONS  $\geq$  5, AND,  
 ABSOLUTE BIAS  $\geq$  10 DEGREES, WITH  
 STANDARD DEVIATION  $<$  30 DEGREES, AND,  
 VERTICAL SPREAD  $<$  10 DEGREES  
 (AVERAGE BETWEEN 500 AND 150 HPA)

WMO IDENT	OBS TIME	ELM	LAT	LONG	NUM OBS	BIAS	MAX SPREAD	SD
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3.2.21 Figure 10 - Suspect TEMP observations - geopotential : 00 UTC

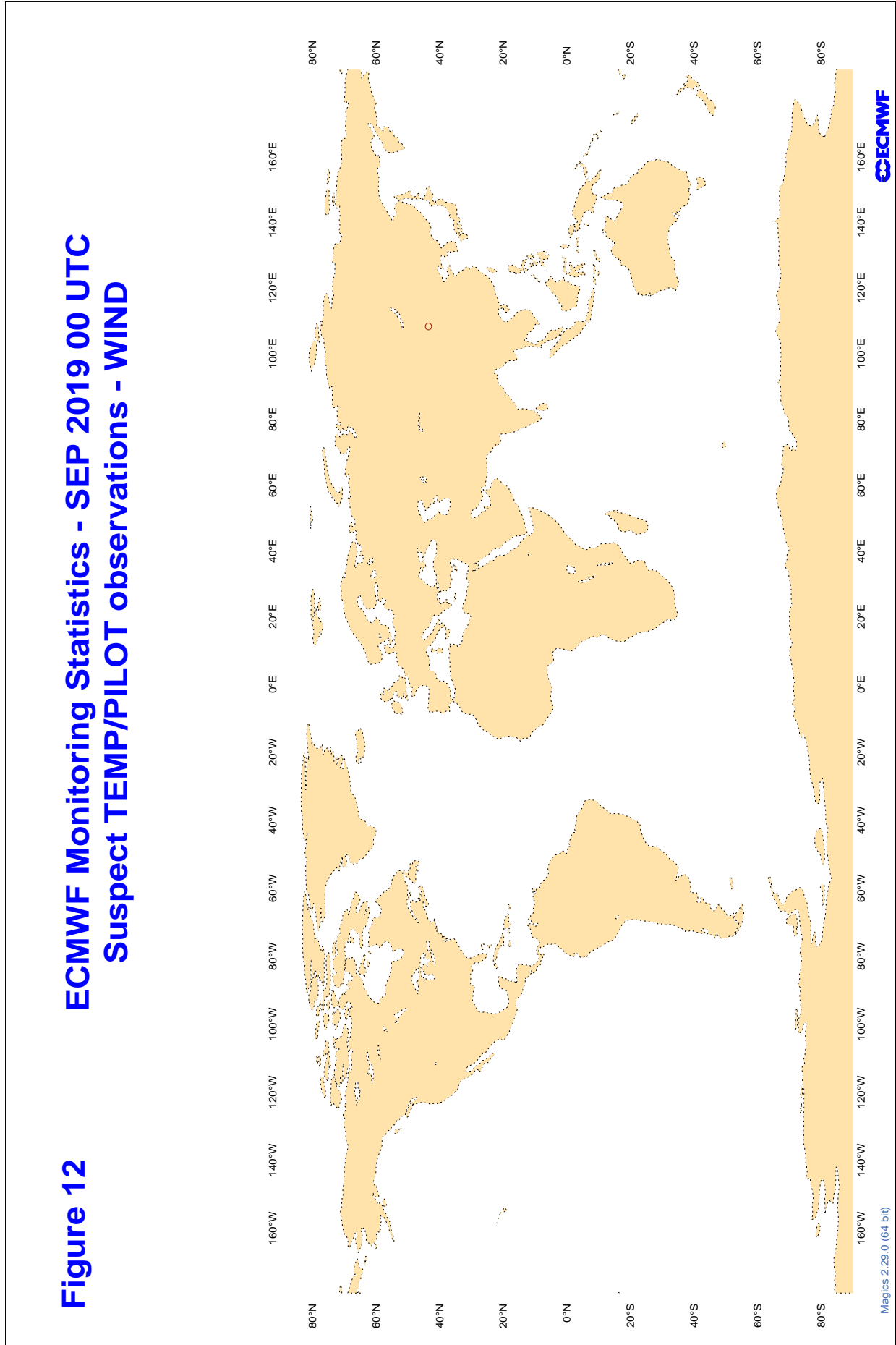


3.2.22 Figure 11 - Suspect TEMP observations - geopotential : 12 UTC

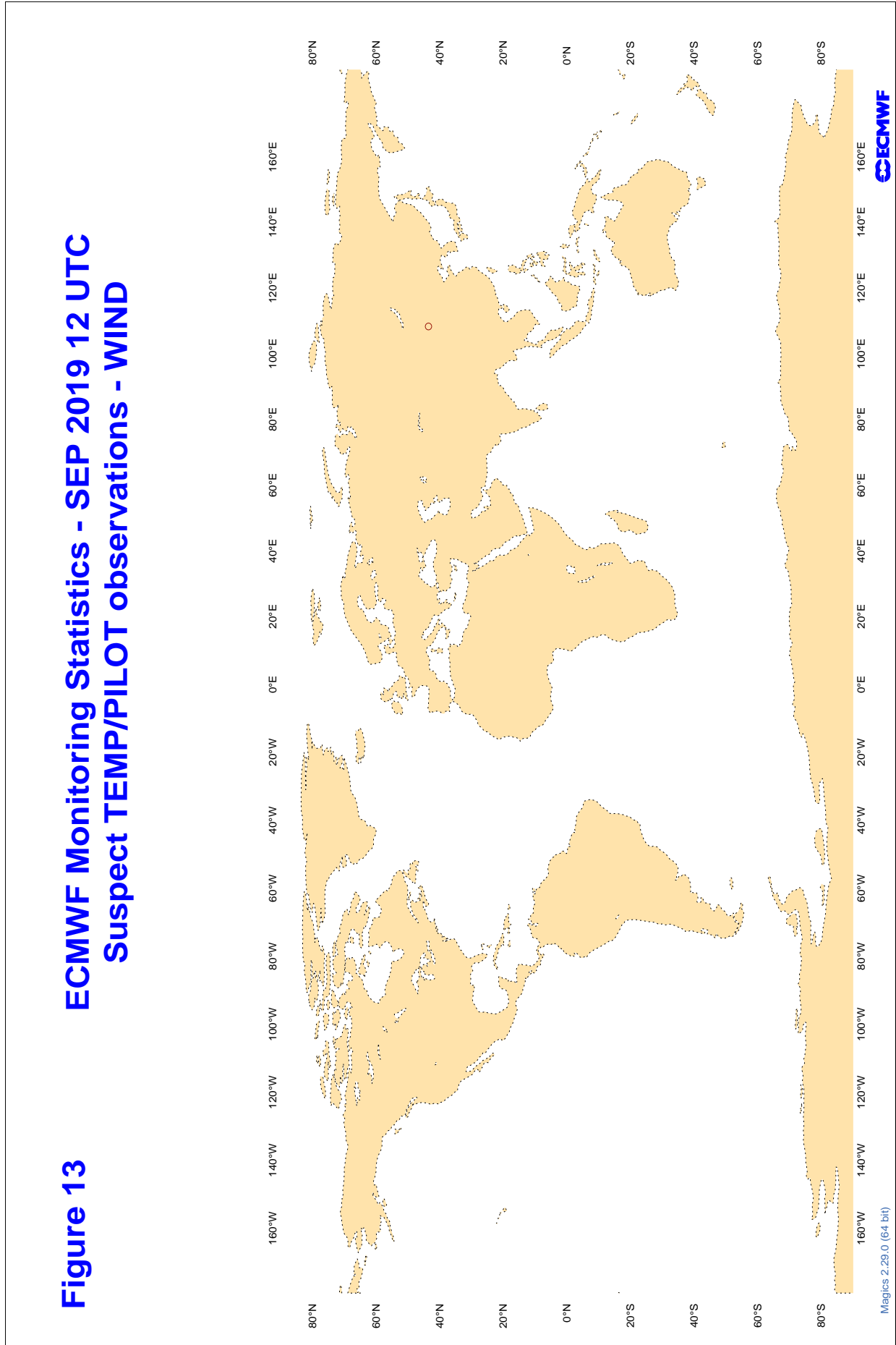




3.2.23 Figure 12 - Suspect TEMP/PILOT observations - wind : 00 UTC



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 : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
5QPW8X	12	Z	100	9	18.6	16.2
5QPW8X	00	Z	100	9	18.6	10.3
7JUNA4	12	Z	100	10	34.2	30.5
7JUNA4	00	Z	100	4	11.8	8.4
ASDE09	12	Z	100	4	39.8	38.7
BPMWB2	00	Z	100	6	17.7	16.8
BPMWB2	12	Z	100	6	23.0	17.7
DBLK	12	Z	100	7	5.3	-2.2
DBLK	00	Z	100	5	2.6	-0.7
DSQL7	00	Z	100	17	7.6	-5.6
DSQL7	12	Z	100	16	7.8	-7.0
EDWDPA	12	Z	100	1	46.5	46.5
ERTOUN	12	Z	100	1	26.1	-26.1
ERTOUN	00	Z	100	3	7.0	-2.6
FHM5UJ	12	Z	100	10	6.7	4.2
FHM5UJ	00	Z	100	6	8.0	5.8
FPUW5G	12	Z	100	10	8.5	7.4
HTXUH4	12	Z	100	10	13.4	4.0
HTXUH4	00	Z	100	8	6.3	1.2
JGQH	00	Z	100	1	15.9	15.9
JGQH	12	Z	100	0	0.0	0.0
JNKN7J	12	Z	100	7	60.4	58.7
JNKN7J	00	Z	100	10	34.1	32.0
JNSR	12	Z	100	1	5.4	5.4
KJJF9X	00	Z	100	8	21.8	20.8
KJJF9X	12	Z	100	9	25.9	23.0
KMPLHP	12	Z	100	6	25.9	24.4
KMPLHP	00	Z	100	6	14.9	6.8
STCZC	00	Z	100	0	0.0	0.0
WDK38H	12	Z	100	21	8.3	-6.3
XKQLWQ	12	Z	100	20	35.6	33.9
XQFJRG	12	Z	100	3	5.4	4.4
XQFJRG	00	Z	100	3	14.9	-8.5
YLV96W	00	Z	100	3	25.4	14.0
YLV96W	12	Z	100	4	36.1	35.1
ZCTSER	12	Z	100	2	17.0	16.9
ZCTSER	00	Z	100	2	10.3	9.9
ZVQEQC	12	Z	100	1	17.6	17.6

**3.2.26 Table 11 - Radiosonde monitoring statistics (SHIPs): Wind (m/s)**

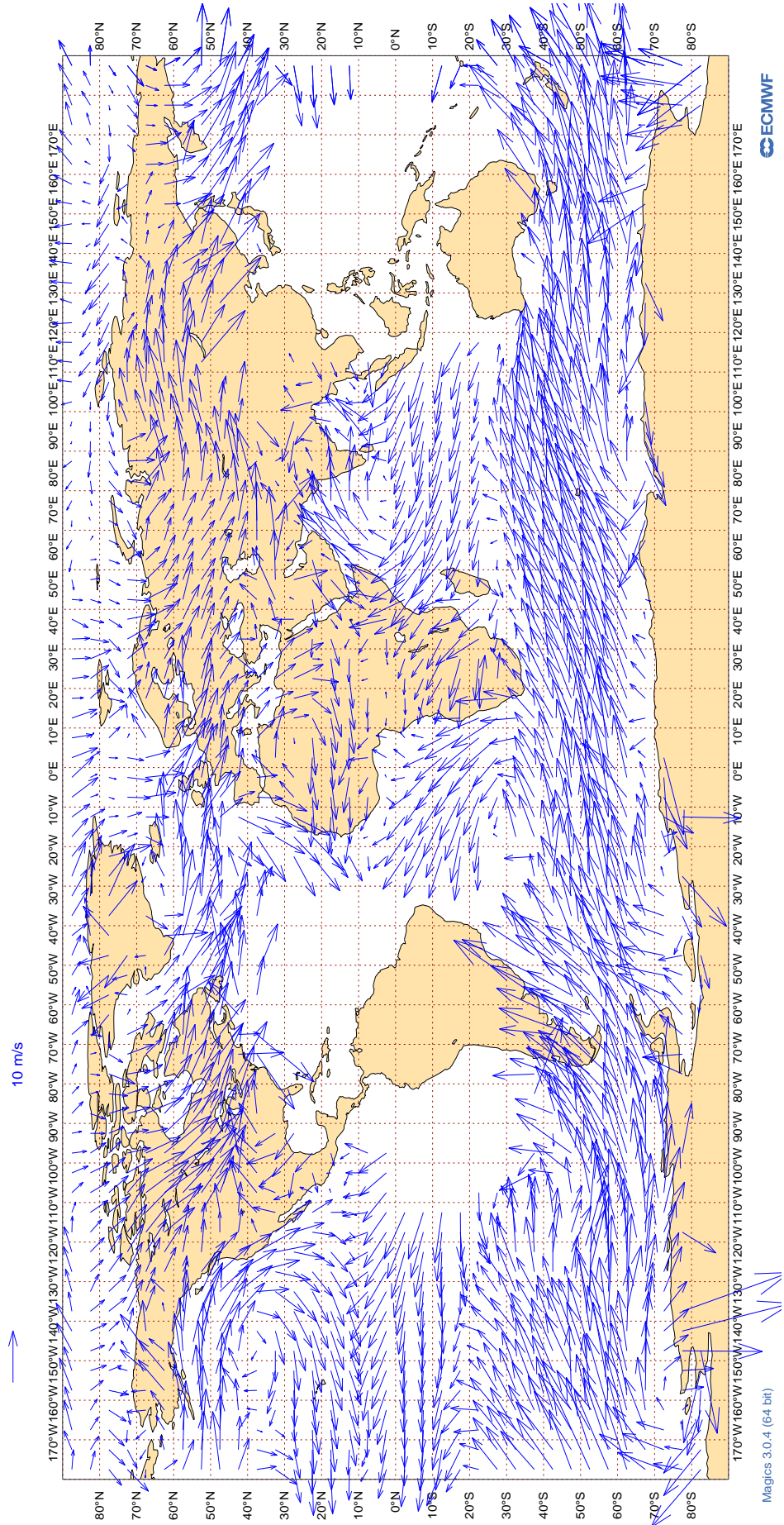
## RADIOSONDE MONITORING STATISTICS (SHIPS)

MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND (M/S)  
 LEVEL : 100 HPA  
 AREA : GLOBAL  
 PERIOD : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
5QPW8X	12	V	100	9	2.6	0.3	0.1
5QPW8X	00	V	100	9	2.5	0.6	0.6
7JUNA4	12	V	100	10	3.8	-1.0	-0.8
7JUNA4	00	V	100	4	3.1	0.6	-0.9
ASDE09	12	V	100	4	2.8	0.4	0.7
BPMWB2	00	V	100	6	2.4	-0.8	0.9
BPMWB2	12	V	100	6	3.5	-1.1	0.7
DBLK	12	V	100	7	1.9	-0.1	-0.6
DBLK	00	V	100	5	1.3	0.3	-0.4
DSQL7	00	V	100	17	2.3	0.2	-0.5
DSQL7	12	V	100	16	2.4	0.0	-0.2
EDWDPA	12	V	100	1	2.1	-2.1	0.4
ERTOUN	12	V	100	1	0.2	0.1	-0.2
ERTOUN	00	V	100	3	5.6	1.0	-1.9
FHM5UJ	12	V	100	10	2.6	0.5	-0.5
FHM5UJ	00	V	100	6	1.7	0.3	-0.3
FPUW5G	12	V	100	10	3.4	0.3	-1.4
HTXUH4	12	V	100	10	2.1	-0.5	-0.6
HTXUH4	00	V	100	8	2.6	0.4	1.5
JGQH	00	V	100	1	3.0	0.7	2.9
JGQH	12	V	100	0	0.0	0.0	0.0
JNKN7J	12	V	100	7	3.5	1.8	0.5
JNKN7J	00	V	100	10	3.0	-0.7	1.4
JNSR	12	V	100	1	0.5	0.5	0.0
KJJF9X	00	V	100	8	4.2	-1.1	1.4
KJJF9X	12	V	100	9	2.9	0.2	0.1
KMPLHP	12	V	100	6	2.8	0.6	1.1
KMPLHP	00	V	100	6	2.8	0.2	-0.3
STCZC	00	V	100	0	0.0	0.0	0.0
WDK38H	12	V	100	20	2.4	-0.4	0.1
XKQLWQ	12	V	100	20	3.2	-0.1	-0.3
XQFJRG	12	V	100	3	3.0	-0.3	-1.2
XQFJRG	00	V	100	3	2.8	1.7	-0.8
YL96W	00	V	100	3	1.7	-0.4	-0.1
YL96W	12	V	100	4	3.1	-0.6	0.6
ZCTSER	12	V	100	2	4.2	-0.5	0.3
ZCTSER	00	V	100	1	5.2	-3.1	-4.2
ZVQEQC	12	V	100	1	2.9	-0.1	-2.9

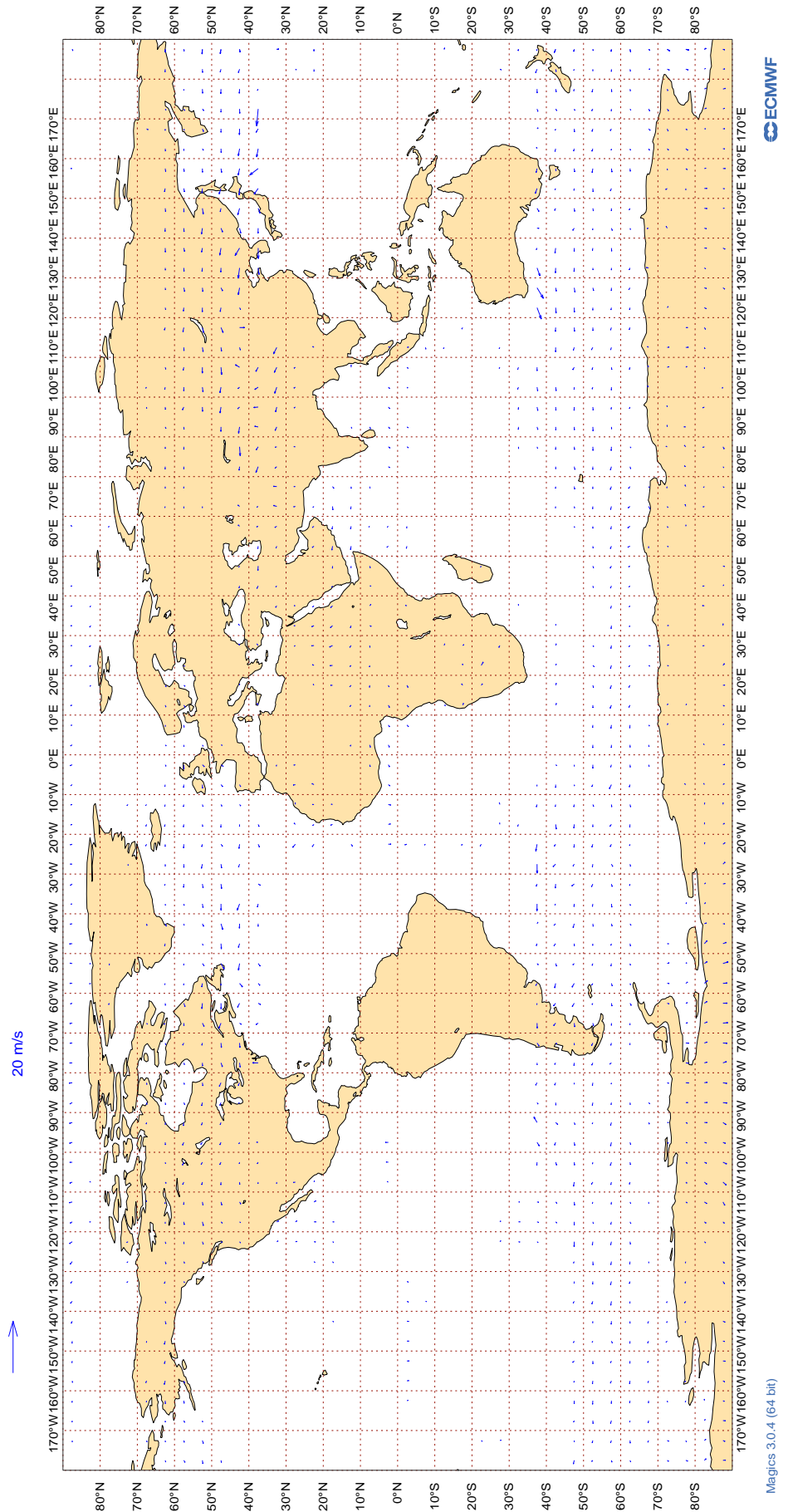
3.2.27 Figure 14 - SATOB Winds: 700-1000hPa

**Figure 14**  
**ECMWF Monitoring Statistics: Sep 2019**  
**AMV Winds: 700-1000hPa**  
**Mean Observed Wind**



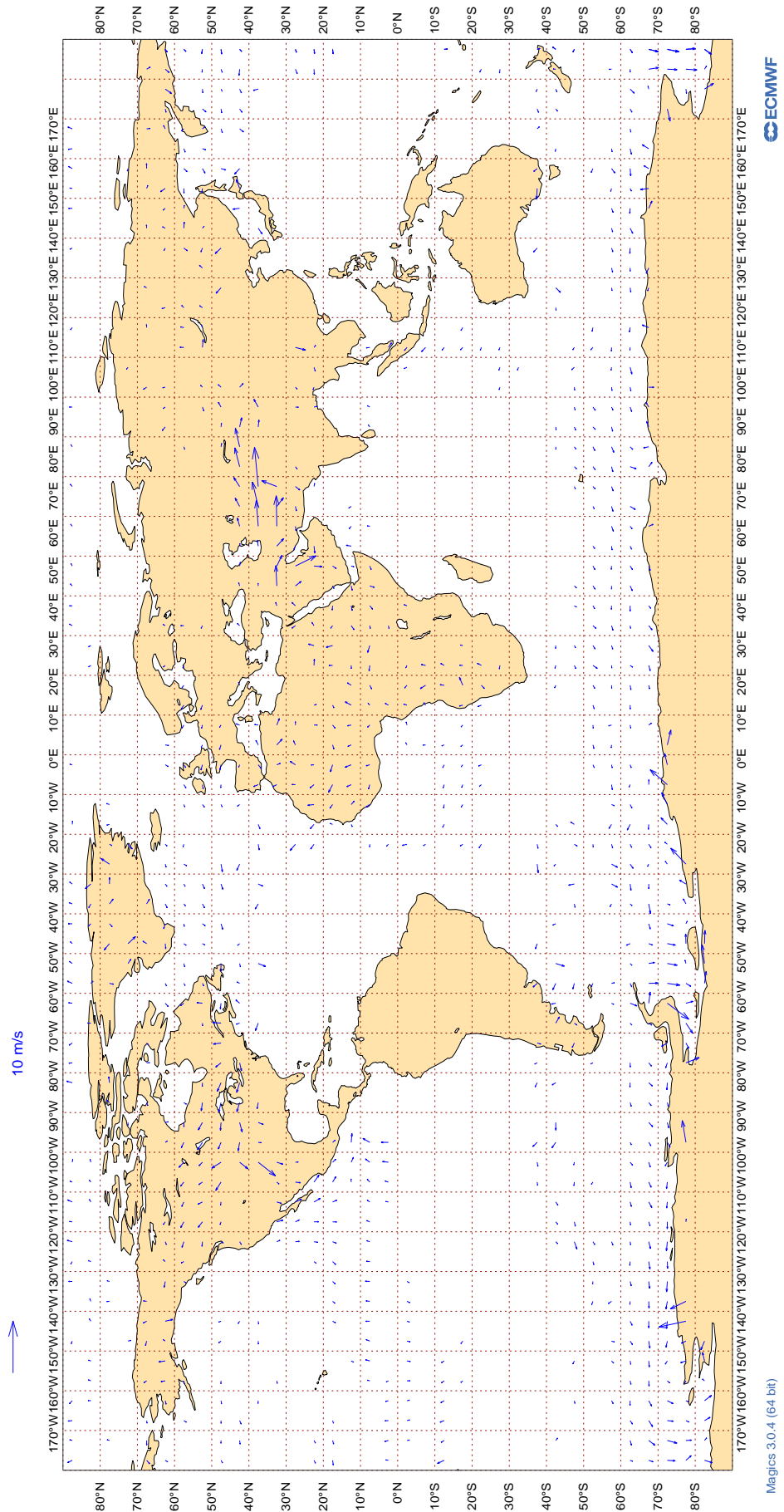
3.2.28 Figure 15 - SATOB Winds: 150- 400hPa

**Figure 15**  
**ECMWF Monitoring Statistics: Sep 2019**  
**AMV Winds: 150- 400hPa**  
**Wind bias: Observation - FG**



3.2.29 Figure 16 - SATOB Winds: 700-1000hPa

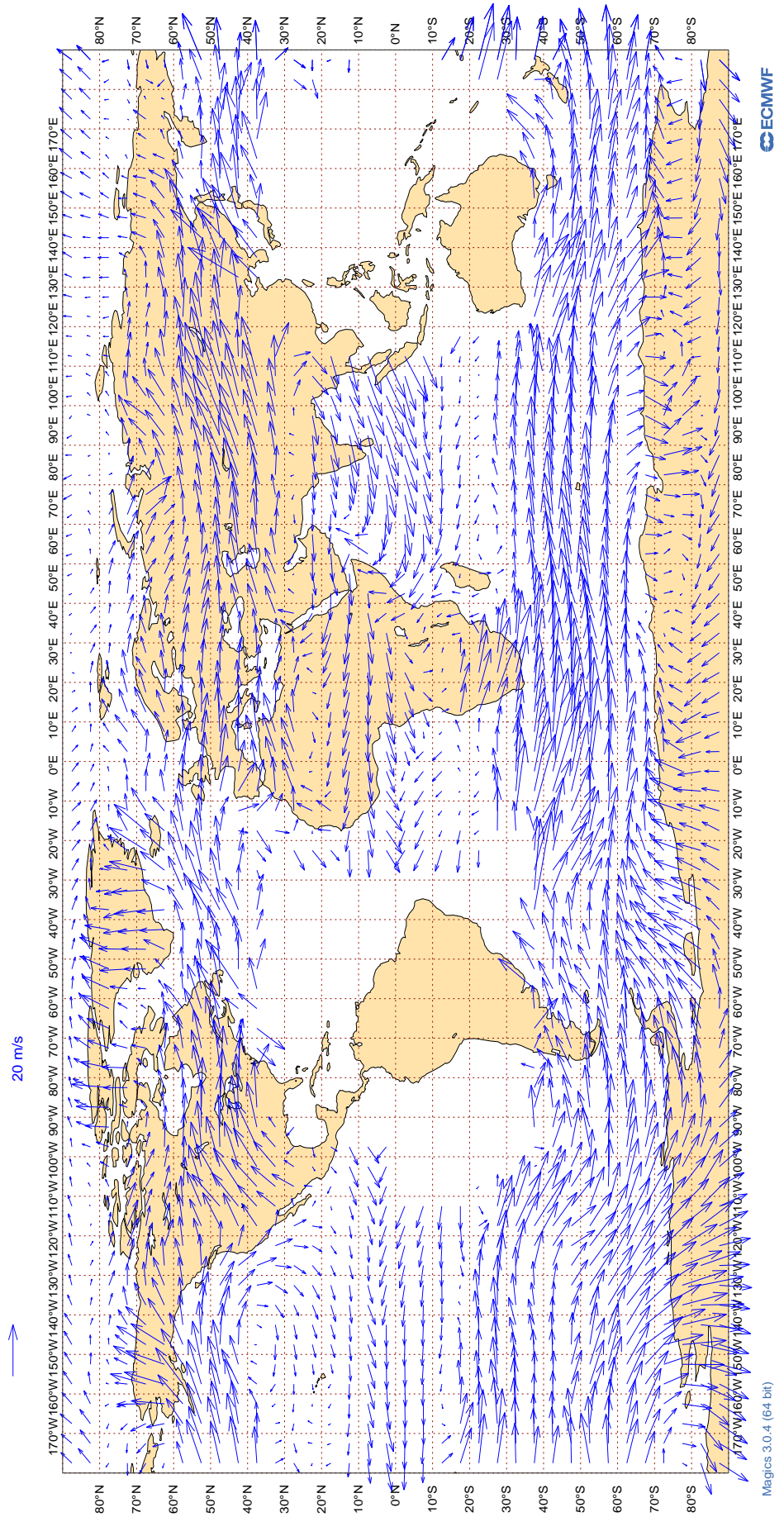
**Figure 16**  
**ECMWF Monitoring Statistics: Sep 2019**  
**AMV Winds: 700-1000hPa**  
**Wind bias: Observation - FG**





3.2.30 Figure 17 - SATOB Winds: 150- 400hPa

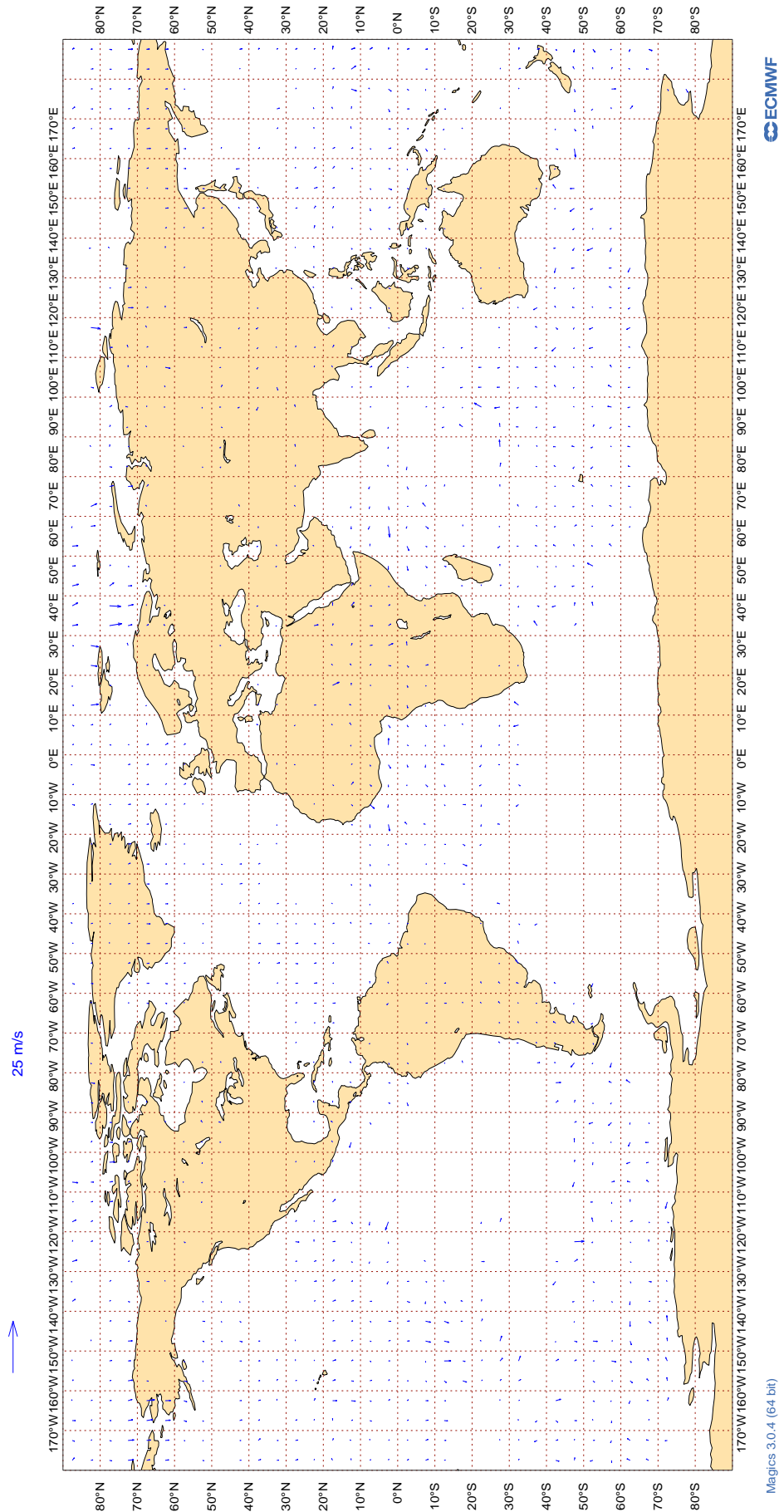
**Figure 17**  
**ECMWF Monitoring Statistics: Sep 2019**  
**AMV Winds: 150- 400hPa**  
**Mean Observed Wind**





3.2.31 Figure 18 - AIRCRAFT Winds: 150- 300hPa

**Figure 18**  
**ECMWF Monitoring Statistics: Sep 2019**  
**Aircraft Winds: 150- 300hPa**  
**Wind bias: Observation - FG**



**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 : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

SELECTION CRITERIA: NO. OF OBS. &gt;= 20

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

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
AAL	99	V	300-150	63895	3	0	5.7	0.2
AAR	99	V	300-150	260	0	0	4.3	-1.4
ABD	99	V	300-150	663	0	0	4.2	-0.2
ABG	99	V	300-150	151	0	0	3.6	0.0
ABL	99	V	300-150	23	0	0	5.9	1.6
ABW	99	V	300-150	774	0	0	3.4	-0.5
ACA	99	V	300-150	33835	4	0	6.1	0.2
ACI	99	V	300-150	2720	0	0	3.3	0.2
AEA	99	V	300-150	1131	4	1	5.4	-0.2
AFL	99	V	300-150	2143	0	0	3.4	0.5
AFR	99	V	300-150	28965	1	0	4.3	0.1
AHO	99	V	300-150	83	0	0	3.6	-0.4
AHY	99	V	300-150	189	7	0	12.1	-0.4
AIC	99	V	300-150	1790	0	0	4.1	0.3
AIZ	99	V	300-150	48	0	0	5.4	1.2
AKK	99	V	300-150	43	0	0	4.1	0.2
ALK	99	V	300-150	1073	0	0	4.0	0.8
AMX	99	V	300-150	4019	15	0	9.8	-0.2
ANG	99	V	300-150	45	0	0	4.8	0.8
ANZ	99	V	300-150	28235	1	0	4.3	0.4
AOJ	99	V	300-150	157	0	0	3.8	0.4
ASA	99	V	300-150	53	0	0	5.5	0.6
ASL	99	V	300-150	532	0	0	3.7	0.2
ASY	99	V	300-150	505	0	0	4.0	0.7
ATC	99	V	300-150	45	0	0	5.3	0.2
ATN	99	V	300-150	143	0	1	6.0	0.9

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS  
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
AUA	99	V	300-150	5519	0	0	4.1	-0.1
AUH	99	V	300-150	62	13	0	10.7	0.2
AUI	99	V	300-150	530	0	0	3.4	0.4
AVA	99	V	300-150	611	6	1	7.6	0.2
AXM	99	V	300-150	210	0	0	5.3	0.5
AXY	99	V	300-150	38	0	0	3.7	-0.0
AZA	99	V	300-150	9108	0	0	3.5	0.3
AZG	99	V	300-150	193	0	0	3.7	-0.1
BAF	99	V	300-150	33	0	0	4.5	0.8
BAH	99	V	300-150	20	0	0	4.0	1.2
BAW	99	V	300-150	48715	2	0	5.1	0.0
BBC	99	V	300-150	109	0	0	4.3	0.6
BCS	99	V	300-150	281	0	0	3.2	0.0
BEL	99	V	300-150	2604	0	0	3.6	0.3
BFY	99	V	300-150	48	0	0	4.5	-0.5
BLU	99	V	300-150	22	0	0	5.2	-0.5
BMW	99	V	300-150	66	0	0	3.0	-0.0
BOS	99	V	300-150	1576	0	0	3.7	0.3
BOX	99	V	300-150	2501	0	0	3.7	-0.1
BRK	99	V	300-150	22	0	0	10.5	1.4
BVR	99	V	300-150	79	0	0	2.7	0.3
CAL	99	V	300-150	384	0	0	4.0	0.7
CAZ	99	V	300-150	186	0	0	3.5	-0.7
CCA	99	V	300-150	787	5	0	5.1	0.6
CEB	99	V	300-150	68	0	0	4.5	1.7
CEF	99	V	300-150	37	0	0	3.2	-0.9
CES	99	V	300-150	2177	3	0	4.5	0.7
CFC	99	V	300-150	306	0	0	4.3	0.5
CFG	99	V	300-150	5358	0	0	3.9	-0.2
CHH	99	V	300-150	237	2	0	7.8	0.3
CJT	99	V	300-150	217	0	0	4.6	-0.1
CKS	99	V	300-150	1383	0	0	3.8	-0.1
CLU	99	V	300-150	363	0	0	3.7	-0.6
CLX	99	V	300-150	3089	0	0	3.8	-0.5
CMB	99	V	300-150	658	0	0	4.1	0.0
CNV	99	V	300-150	194	0	0	2.9	-0.0
CPA	99	V	300-150	933	0	0	3.6	0.5
CRL	99	V	300-150	1461	0	0	3.5	0.2
CSC	99	V	300-150	245	0	0	3.8	0.9
CSN	99	V	300-150	723	2	0	5.5	0.7
CTM	99	V	300-150	104	0	1	3.7	-0.0
CWG	99	V	300-150	40	0	0	6.7	1.3
DAH	99	V	300-150	836	0	0	3.4	0.3

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS  
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
DAL	99	V	300-150	77661	0	0	3.7	0.1
DCW	99	V	300-150	80	0	0	3.5	-0.2
DGX	99	V	300-150	60	0	0	3.5	0.0
DHK	99	V	300-150	964	0	0	6.4	-1.0
DJT	99	V	300-150	2371	0	0	3.9	0.2
DLH	99	V	300-150	32679	0	0	3.6	0.1
DSO	99	V	300-150	33	0	0	2.8	-0.4
DUB	99	V	300-150	120	0	0	3.9	0.2
EAU	99	V	300-150	20	0	0	2.8	-0.2
EDC	99	V	300-150	35	0	0	3.5	-0.3
EDG	99	V	300-150	251	13	0	10.8	0.1
EDW	99	V	300-150	1340	0	0	3.8	0.2
EIN	99	V	300-150	16621	0	0	3.6	0.2
EJM	99	V	300-150	1142	3	0	5.2	-0.1
ELY	99	V	300-150	3998	11	0	9.1	0.1
ETD	99	V	300-150	5563	2	0	5.2	0.4
ETH	99	V	300-150	3485	3	0	6.0	0.4
EVE	99	V	300-150	121	0	0	3.3	-0.2
EWG	99	V	300-150	4111	0	0	3.7	0.2
EXS	99	V	300-150	242	0	1	3.2	-0.3
FBU	99	V	300-150	653	0	0	4.4	0.4
FDX	99	V	300-150	6646	0	0	3.5	0.0
FEX	99	V	300-150	49	0	0	3.5	0.4
FIN	99	V	300-150	855	0	0	3.0	0.2
FJI	99	V	300-150	7531	0	0	4.0	0.4
FRE	99	V	300-150	31	0	0	4.9	0.7
FRH	99	V	300-150	262	0	0	4.5	-0.6
FWI	99	V	300-150	901	0	0	2.8	0.2
FYG	99	V	300-150	114	0	0	3.3	0.2
GAF	99	V	300-150	128	0	0	3.2	0.1
GAJ	99	V	300-150	21	0	0	3.7	0.9
GCK	99	V	300-150	25	0	0	3.1	-0.9
GEC	99	V	300-150	2142	0	0	3.8	0.1
GES	99	V	300-150	134	0	0	4.1	-0.1
GFA	99	V	300-150	487	0	1	4.2	0.6
GIA	99	V	300-150	697	0	0	4.3	0.4
GLJ	99	V	300-150	22	0	0	3.0	-1.2
GLO	99	V	300-150	21	5	5	10.4	-1.2
GTH	99	V	300-150	90	0	0	3.5	-0.4
GTI	99	V	300-150	2882	0	0	4.1	-0.2
HAL	99	V	300-150	4333	0	0	4.2	0.7
HFM	99	V	300-150	31	0	0	2.8	-0.1
HFY	99	V	300-150	44	0	0	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
HRT	99	V	300-150	112	0	0	3.8	-0.4
HUA	99	V	300-150	35	0	0	5.6	0.8
IAE	99	V	300-150	45	0	0	3.4	0.1
IAM	99	V	300-150	59	0	0	4.4	1.2
IBE	99	V	300-150	6383	0	0	3.5	0.2
IBK	99	V	300-150	505	0	0	3.5	0.3
ICE	99	V	300-150	297	0	2	5.2	0.6
ICL	99	V	300-150	505	0	0	5.0	-0.7
ICV	99	V	300-150	229	0	0	3.9	-0.3
IJM	99	V	300-150	74	0	0	4.7	0.3
ISS	99	V	300-150	3048	0	0	3.6	0.3
IXR	99	V	300-150	38	0	0	2.7	-0.2
JAF	99	V	300-150	766	11	0	10.2	-0.1
JAS	99	V	300-150	285	0	0	3.6	-0.2
JCO	99	V	300-150	101	0	0	4.2	1.4
JCT	99	V	300-150	38	0	0	3.6	1.4
JET	99	V	300-150	34	0	0	2.7	0.9
JJA	99	V	300-150	50	0	0	8.1	1.4
JME	99	V	300-150	73	0	0	3.2	-0.2
JST	99	V	300-150	3362	2	0	7.1	0.5
KAC	99	V	300-150	1246	0	0	3.7	0.5
KAI	99	V	300-150	88	0	0	4.0	0.8
KAL	99	V	300-150	1478	3	0	4.7	0.6
KAY	99	V	300-150	71	0	0	4.6	-0.4
KCE	99	V	300-150	46	0	2	4.1	0.8
KFE	99	V	300-150	49	0	0	3.2	0.9
KIW	99	V	300-150	131	0	0	4.1	1.1
KLM	99	V	300-150	18076	2	0	5.1	0.0
KNE	99	V	300-150	61	0	0	5.4	0.6
KQA	99	V	300-150	222	7	0	5.1	0.6
KRF	99	V	300-150	33	0	0	3.3	0.7
KTK	99	V	300-150	334	0	0	3.4	0.6
KUG	99	V	300-150	92	0	1	3.1	0.2
LAN	99	V	300-150	2140	7	0	7.1	0.2
LCO	99	V	300-150	97	0	2	4.7	-1.1
LEA	99	V	300-150	46	0	0	3.5	0.2
LHO	99	V	300-150	45	0	0	4.2	-0.7
LNI	99	V	300-150	112	0	0	3.6	0.2
LOT	99	V	300-150	5275	9	0	8.9	-0.0
LUC	99	V	300-150	48	0	0	3.1	-0.7
LWG	99	V	300-150	37	0	0	3.9	-0.3
LXA	99	V	300-150	36	0	0	3.6	-0.8
LXG	99	V	300-150	35	0	0	2.8	-0.5

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS  
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
LXJ	99	V	300-150	156	0	1	3.7	0.3
MAS	99	V	300-150	634	0	0	3.7	0.4
MAU	99	V	300-150	284	0	0	5.1	1.4
MED	99	V	300-150	81	0	0	4.8	-0.3
MHV	99	V	300-150	54	0	0	3.3	-0.7
MLM	99	V	300-150	65	0	0	3.5	0.8
MMD	99	V	300-150	382	0	0	3.7	0.3
MMZ	99	V	300-150	41	0	0	4.6	1.7
MPH	99	V	300-150	624	0	0	4.1	-0.9
MSR	99	V	300-150	1728	3	0	5.5	0.4
NAF	99	V	300-150	28	0	0	4.7	-0.6
NAS	99	V	300-150	24	0	0	2.6	-0.7
NAX	99	V	300-150	12527	11	0	9.4	-0.1
NCA	99	V	300-150	205	0	0	3.9	-0.7
NJE	99	V	300-150	337	0	0	4.0	0.5
NOS	99	V	300-150	220	5	0	7.2	-1.5
NRS	99	V	300-150	8481	9	0	8.2	0.1
NWS	99	V	300-150	323	0	0	3.0	0.2
OAE	99	V	300-150	1433	0	0	4.2	0.2
OMA	99	V	300-150	628	0	0	4.8	0.6
OSY	99	V	300-150	30	0	0	4.8	-0.5
PAC	99	V	300-150	191	0	0	3.8	0.2
PAL	99	V	300-150	525	0	0	3.9	0.9
PAO	99	V	300-150	65	2	14	9.8	1.0
PAT	99	V	300-150	34	0	0	2.8	0.5
PEG	99	V	300-150	91	0	0	4.1	0.9
PIA	99	V	300-150	131	0	0	2.9	0.3
PJZ	99	V	300-150	24	0	0	3.4	0.5
PLF	99	V	300-150	45	0	0	3.3	0.9
PLM	99	V	300-150	287	0	0	4.9	0.4
PNC	99	V	300-150	21	0	0	4.6	4.0
PRD	99	V	300-150	40	0	0	4.0	-1.0
QAF	99	V	300-150	55	0	0	2.7	0.2
QFA	99	V	300-150	19988	0	0	4.8	0.1
QQE	99	V	300-150	134	0	0	3.2	0.6
QTR	99	V	300-150	14574	0	0	3.9	0.2
RAM	99	V	300-150	671	13	0	9.4	0.2
RBA	99	V	300-150	91	0	0	4.3	0.5
RCH	99	V	300-150	4265	0	0	4.5	0.4
RDN	99	V	300-150	97	0	0	3.8	-0.1
RJA	99	V	300-150	1726	11	0	9.7	-0.0
RJE	99	V	300-150	30	0	0	6.3	0.9
ROM	99	V	300-150	81	0	0	5.6	0.1

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS  
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
ROU	99	V	300-150	11049	0	0	4.3	-0.3
RRR	99	V	300-150	183	0	0	4.2	0.8
RWD	99	V	300-150	44	0	0	4.5	0.8
RZO	99	V	300-150	291	0	1	5.1	0.6
SAM	99	V	300-150	453	0	0	3.8	0.2
SAS	99	V	300-150	4943	0	0	3.3	0.2
SCX	99	V	300-150	194	0	0	3.8	0.4
SEY	99	V	300-150	111	0	0	4.2	0.6
SHE	99	V	300-150	116	0	0	3.2	0.5
SIA	99	V	300-150	3501	0	0	3.7	0.1
SIO	99	V	300-150	83	0	0	3.9	0.4
SIS	99	V	300-150	83	0	0	3.7	0.6
SLM	99	V	300-150	94	0	0	3.4	0.8
SOO	99	V	300-150	505	0	0	3.5	0.2
SPA	99	V	300-150	105	0	0	3.9	0.6
SSG	99	V	300-150	36	0	0	4.0	0.1
SVA	99	V	300-150	4225	0	0	3.8	0.4
SVW	99	V	300-150	85	0	0	3.9	1.0
SWA	99	V	300-150	55	0	0	4.4	0.5
SWR	99	V	300-150	10757	0	0	3.6	0.3
SYB	99	V	300-150	174	0	0	4.3	-0.0
TAM	99	V	300-150	33	0	0	6.5	0.1
TAP	99	V	300-150	2529	0	0	4.0	0.2
TAR	99	V	300-150	394	0	0	3.6	0.4
TAY	99	V	300-150	343	0	0	4.2	-0.6
TBJ	99	V	300-150	39	0	0	3.2	-0.4
TCX	99	V	300-150	4543	0	0	3.6	0.4
TEU	99	V	300-150	36	0	0	3.5	1.1
TFF	99	V	300-150	38	0	0	3.8	-0.0
TFL	99	V	300-150	1478	9	0	9.0	-0.1
TGW	99	V	300-150	56	0	0	4.7	0.7
THA	99	V	300-150	390	4	0	6.6	0.3
THT	99	V	300-150	3451	2	0	7.3	0.5
THY	99	V	300-150	9600	2	0	5.3	0.2
TMN	99	V	300-150	221	1	0	4.0	0.6
TOG	99	V	300-150	40	0	0	4.0	0.2
TOM	99	V	300-150	5773	11	0	9.8	0.0
TOR	99	V	300-150	29	0	0	3.9	1.0
TOW	99	V	300-150	74	0	0	2.9	-0.6
TPA	99	V	300-150	220	0	0	3.5	0.0
TRK	99	V	300-150	53	0	0	5.5	1.1
TSC	99	V	300-150	19441	0	0	3.7	0.2
TWB	99	V	300-150	22	0	0	7.7	0.9

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS  
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
TWY	99	V	300-150	483	0	0	3.6	0.1
UAE	99	V	300-150	15500	0	0	3.9	0.2
UAL	99	V	300-150	82048	2	1	5.6	0.1
ULC	99	V	300-150	120	0	0	3.3	-0.1
UPS	99	V	300-150	4128	0	0	3.9	-0.0
UZB	99	V	300-150	156	13	0	9.4	-0.0
VAL	99	V	300-150	47	0	0	4.4	0.8
VCG	99	V	300-150	36	0	3	2.7	0.6
VIR	99	V	300-150	22047	3	0	5.2	0.1
VJT	99	V	300-150	1520	0	0	3.6	0.2
VMP	99	V	300-150	83	0	0	4.9	0.6
VOZ	99	V	300-150	5877	0	0	3.8	0.3
WGT	99	V	300-150	47	0	0	3.4	-0.3
WJA	99	V	300-150	5865	2	0	5.5	0.1
WWI	99	V	300-150	32	0	0	2.9	-0.9
XLF	99	V	300-150	1488	0	0	3.4	0.3
XRO	99	V	300-150	52	0	0	4.1	-1.0



## 4 EUCOS Area Monitoring Statistics

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

Tables 13, 14 (50 hPa level), 15, 16 (100 hPa level) 17, 18 (500 hPa level) 19 and 20 (850 hPa level) provide quality statistics for all TEMPSHIPS and PILOTSHIPS received during the month in the area 10°N - 90°N, 70°W - 40°E and for TEMPS and PILOTS from selected land stations within the same area. The statistics are in the same form as tables 10 and 11.

Tables 21-23 provides quality statistics of pressure and wind for all DRIFTER reports received in the area 10°N - 90°N, 70°W - 40°E. The statistics are in the same form as tables 4-6.

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

##### RADIOSONDE MONITORING STATISTICS (EUCOS)

MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : GEOPOTENTIAL HEIGHT (METRES)  
 LEVEL : 50 HPA  
 AREA : 0 - 90N, 100W - 40E  
 PERIOD : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	00	Z	50	29	13.0	10.5
01001	12	Z	50	29	11.6	6.8
01028	12	Z	50	30	8.2	5.3
01028	00	Z	50	30	11.0	9.7
01400	00	Z	50	22	95.7	95.3
01400	12	Z	50	25	84.9	84.6
014007	12	Z	50	0	0.0	0.0
014008	12	Z	50	0	0.0	0.0
014009	12	Z	50	0	0.0	0.0
01415	12	Z	50	12	13.3	11.4
01415	00	Z	50	12	19.5	18.8
02365	00	Z	50	5	12.3	8.5
02365	12	Z	50	12	8.6	7.5
02591	12	Z	50	24	12.5	10.5
02591	00	Z	50	28	21.9	21.3
02836	12	Z	50	30	6.8	4.0
02836	00	Z	50	29	13.8	12.6
02963	12	Z	50	29	11.8	7.6
02963	00	Z	50	31	14.3	13.7
03005	00	Z	50	27	12.4	10.7
03005	12	Z	50	29	9.9	6.3
03238	00	Z	50	30	16.7	13.1
03238	12	Z	50	1	14.4	14.4
03808	12	Z	50	28	11.5	9.8
03808	00	Z	50	29	18.1	16.7
03918	00	Z	50	28	21.7	20.8
03918	12	Z	50	3	14.6	14.6
03953	00	Z	50	24	24.9	22.7
03953	12	Z	50	24	31.1	25.3
04018	12	Z	50	30	7.1	2.0
04018	00	Z	50	30	11.7	9.2
04220	12	Z	50	29	11.9	5.4
04220	00	Z	50	30	9.7	8.9
04270	00	Z	50	30	12.8	9.8
04270	12	Z	50	30	9.1	6.7
04320	00	Z	50	30	12.2	4.4
04320	12	Z	50	29	12.6	5.7
04339	00	Z	50	30	16.7	10.2
04339	12	Z	50	30	8.9	5.2

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
04360	00	Z	50	25	16.6	-2.9
04360	12	Z	50	23	8.4	0.5
06011	00	Z	50	28	15.3	10.6
06011	12	Z	50	29	14.0	11.1
06260	00	Z	50	29	14.8	13.4
06260	12	Z	50	5	9.0	6.7
06610	12	Z	50	30	11.4	9.7
06610	00	Z	50	30	16.5	15.0
07110	00	Z	50	28	16.5	13.3
07110	12	Z	50	30	18.4	15.2
07510	00	Z	50	28	31.2	29.5
07510	12	Z	50	30	28.1	26.8
07645	12	Z	50	30	25.6	20.9
07645	00	Z	50	30	22.8	20.5
07761	12	Z	50	30	26.8	25.5
07761	00	Z	50	25	35.3	34.4
08001	00	Z	50	30	21.6	20.4
08001	12	Z	50	27	14.4	13.4
08221	00	Z	50	28	23.9	23.2
08221	12	Z	50	28	19.2	18.2
08302	12	Z	50	30	7.6	5.5
08302	00	Z	50	30	13.6	12.4
08508	12	Z	50	28	13.2	12.1
08522	12	Z	50	30	16.2	15.4
085227	00	Z	50	0	0.0	0.0
08579	12	Z	50	30	17.6	16.9
10035	12	Z	50	29	11.8	9.7
10393	12	Z	50	30	11.2	9.0
10393	00	Z	50	30	15.6	14.8
10410	00	Z	50	29	14.1	13.0
10410	12	Z	50	30	8.0	5.7
10739	00	Z	50	29	19.1	18.0
10739	12	Z	50	30	15.0	13.6
11035	12	Z	50	30	33.3	30.7
11035	00	Z	50	29	23.6	23.3
12982	00	Z	50	27	23.9	21.5
12982	12	Z	50	29	30.4	29.1
16080	00	Z	50	29	16.4	14.5
16080	12	Z	50	30	8.5	5.3
16245	00	Z	50	29	15.8	14.9
16245	12	Z	50	29	8.1	6.9
16320	12	Z	50	29	18.9	16.4
16320	00	Z	50	30	25.6	24.6

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	50	30	14.0	12.6
16429	00	Z	50	30	23.5	22.3
16622	00	Z	50	30	33.3	33.0
16754	00	Z	50	27	28.1	26.8
17607	12	Z	50	29	12.9	10.5
26435	12	Z	50	14	6.7	4.4
5QPW8X	12	Z	50	9	22.6	20.4
5QPW8X	00	Z	50	9	26.2	21.1
60018	00	Z	50	29	20.1	19.4
60018	12	Z	50	29	12.2	10.6
7JUNA4	12	Z	50	7	49.3	47.1
7JUNA4	00	Z	50	3	17.0	14.3
ASDE09	12	Z	50	2	61.2	61.2
BPMWB2	00	Z	50	6	33.4	32.3
BPMWB2	12	Z	50	6	37.3	32.4
DBLK	12	Z	50	6	10.3	6.7
EDWDPA	12	Z	50	1	0.0	0.0
ERTOUN	12	Z	50	1	0.4	-0.4
ERTOUN	00	Z	50	3	8.1	5.8
FHM5UJ	12	Z	50	10	15.2	14.0
FHM5UJ	00	Z	50	4	20.8	19.4
FPUW5G	12	Z	50	7	16.2	15.8
HTXUH4	12	Z	50	9	11.4	7.2
HTXUH4	00	Z	50	6	12.7	11.7
JNKN7J	12	Z	50	5	69.7	68.9
JNKN7J	00	Z	50	8	43.7	41.9
KJFF9X	00	Z	50	8	43.7	41.8
KJFF9X	12	Z	50	9	36.3	34.5
KMPLHP	12	Z	50	4	42.0	39.4
KMPLHP	00	Z	50	4	9.2	5.4
STCZC	00	Z	50	0	0.0	0.0
WDK38H	12	Z	50	17	10.1	4.8
XKQLWQ	12	Z	50	19	50.4	48.5
XQFJRG	12	Z	50	3	26.0	24.3
XQFJRG	00	Z	50	3	8.4	-2.3
YLV96W	00	Z	50	2	9.7	9.3
YLV96W	12	Z	50	3	73.4	71.5
ZCTSER	12	Z	50	0	0.0	0.0
ZCTSER	00	Z	50	0	0.0	0.0
ZVQEQC	12	Z	50	1	30.7	30.7

**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 : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	00	V	50	24	3.2	0.4	0.5
01001	12	V	50	29	2.4	-0.3	0.1
01028	12	V	50	30	2.5	0.3	-0.3
01028	00	V	50	25	2.1	0.2	-0.5
01400	00	V	50	17	2.6	0.4	0.0
01400	12	V	50	25	2.7	0.4	0.5
014007	12	V	50	0	0.0	0.0	0.0
014008	12	V	50	0	0.0	0.0	0.0
014009	12	V	50	0	0.0	0.0	0.0
01415	12	V	50	12	2.5	0.4	-0.3
01415	00	V	50	10	2.5	-0.5	-1.6
02365	00	V	50	3	2.3	0.6	0.0
02365	12	V	50	12	2.8	0.6	0.7
02591	12	V	50	23	3.0	0.2	0.3
02591	00	V	50	24	3.2	0.5	0.3
02836	12	V	50	30	2.7	-0.8	-0.5
02836	00	V	50	27	2.9	0.2	-0.1
02963	12	V	50	28	3.3	-0.1	-0.3
02963	00	V	50	23	2.9	0.0	0.7
03005	00	V	50	22	3.1	1.0	-0.2
03005	12	V	50	29	2.9	0.4	-0.2
03238	00	V	50	25	3.3	1.5	-0.7
03238	12	V	50	1	3.2	-1.2	3.0
03808	12	V	50	28	3.0	0.7	-0.6
03808	00	V	50	24	2.6	-0.1	0.2
03918	00	V	50	23	2.9	0.4	0.1
03918	12	V	50	3	2.4	-1.0	1.2
03953	00	V	50	21	2.7	-0.1	-0.4
03953	12	V	50	24	3.2	0.9	-0.6
04018	12	V	50	30	3.3	-0.3	-0.6
04018	00	V	50	23	3.0	0.5	0.0
04220	12	V	50	29	2.8	-0.3	0.3
04220	00	V	50	24	3.1	-0.6	-0.1
04270	00	V	50	26	3.6	0.4	-1.0
04270	12	V	50	30	3.8	1.2	-0.1
04320	00	V	50	24	2.8	0.2	0.0
04320	12	V	50	29	3.3	-0.3	-0.5
04339	00	V	50	24	2.2	-0.3	0.0
04339	12	V	50	30	2.9	-0.2	-0.6

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
04360	00	V	50	21	2.8	0.1	0.3
04360	12	V	50	23	2.8	-0.1	0.1
06011	00	V	50	23	2.7	0.4	0.2
06011	12	V	50	29	3.4	-0.2	0.4
06260	00	V	50	23	3.3	-0.2	-0.5
06260	12	V	50	5	2.5	0.9	-1.5
06610	12	V	50	30	3.3	0.1	-0.2
06610	00	V	50	25	3.6	0.2	0.6
07110	00	V	50	22	3.2	0.1	0.9
07110	12	V	50	30	3.4	0.4	0.1
07510	00	V	50	24	3.4	0.4	-0.2
07510	12	V	50	30	2.9	-0.1	0.1
07645	12	V	50	30	3.7	0.6	-0.2
07645	00	V	50	26	3.5	0.3	-0.3
07761	12	V	50	30	3.0	0.6	0.5
07761	00	V	50	21	4.1	1.2	0.6
08001	00	V	50	24	2.8	-0.3	0.4
08001	12	V	50	26	3.7	0.3	0.3
08221	00	V	50	21	3.8	-0.2	0.7
08221	12	V	50	27	3.3	1.1	-0.2
08302	12	V	50	30	4.1	0.6	0.2
08302	00	V	50	26	3.8	1.0	0.6
08508	12	V	50	28	2.8	-0.1	0.4
08522	12	V	50	30	2.9	0.0	0.4
085227	00	V	50	0	0.0	0.0	0.0
08579	12	V	50	30	3.3	0.3	0.0
10035	12	V	50	29	2.7	-0.1	-0.1
10393	12	V	50	30	3.0	0.5	-0.3
10393	00	V	50	24	2.7	0.4	-0.3
10410	00	V	50	28	3.1	-0.2	-0.3
10410	12	V	50	30	3.0	0.3	-0.2
10739	00	V	50	29	3.6	0.8	0.4
10739	12	V	50	30	3.4	1.0	0.1
11035	12	V	50	30	3.3	0.2	0.2
11035	00	V	50	22	3.2	0.1	0.5
12982	00	V	50	24	3.0	-0.1	0.0
12982	12	V	50	29	3.5	0.3	-0.4
16080	00	V	50	26	4.3	0.8	0.7
16080	12	V	50	30	4.1	0.1	-0.2
16245	00	V	50	22	4.3	-0.1	0.7
16245	12	V	50	29	3.4	0.1	-0.2
16320	12	V	50	29	4.1	0.6	0.5
16320	00	V	50	26	4.2	0.2	-0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	50	30	3.6	0.0	0.1
16429	00	V	50	27	3.3	0.1	0.5
16622	00	V	50	24	3.6	0.8	0.5
16754	00	V	50	21	3.3	0.4	0.5
17607	12	V	50	1	2.5	1.0	2.3
26435	12	V	50	14	2.6	0.2	-1.0
5QPW8X	12	V	50	9	5.9	1.8	-1.8
5QPW8X	00	V	50	9	2.8	0.4	0.1
60018	00	V	50	23	3.6	-0.7	0.9
60018	12	V	50	29	3.3	-0.1	0.0
7JUNA4	12	V	50	7	2.1	-0.3	0.3
7JUNA4	00	V	50	3	6.6	5.0	-0.1
ASDE09	12	V	50	2	3.4	3.1	-1.1
BPMWB2	00	V	50	6	3.2	-0.5	-0.2
BPMWB2	12	V	50	6	4.1	-1.2	0.7
DBLK	12	V	50	6	2.8	1.0	1.3
EDWDPA	12	V	50	1	0.2	-0.1	-0.2
ERTOUN	12	V	50	1	4.4	-2.1	-3.9
ERTOUN	00	V	50	3	2.7	0.8	0.2
FHM5UJ	12	V	50	10	2.4	0.7	-0.5
FHM5UJ	00	V	50	4	2.9	1.9	-0.2
FPUW5G	12	V	50	6	2.0	0.1	-0.5
HTXUH4	12	V	50	7	3.6	-0.2	0.7
HTXUH4	00	V	50	6	3.4	-0.5	-2.1
JNKN7J	12	V	50	5	3.0	0.8	-0.6
JNKN7J	00	V	50	8	2.8	-0.3	0.9
KJJF9X	00	V	50	8	3.5	0.0	-0.2
KJJF9X	12	V	50	9	3.0	0.7	0.0
KMPLHP	12	V	50	4	1.9	0.3	-0.5
KMPLHP	00	V	50	4	2.7	-1.0	0.1
STCZC	00	V	50	0	0.0	0.0	0.0
WDK38H	12	V	50	13	2.8	-0.2	0.7
XKQLWQ	12	V	50	19	4.0	0.0	0.2
XQFJRG	12	V	50	3	4.0	-1.9	1.8
XQFJRG	00	V	50	3	3.5	0.0	0.7
YLV96W	00	V	50	2	4.5	-0.1	0.1
YLV96W	12	V	50	3	3.7	-2.6	-0.9
ZCTSER	12	V	50	0	0.0	0.0	0.0
ZCTSER	00	V	50	0	0.0	0.0	0.0
ZVQEQC	12	V	50	1	0.6	0.5	-0.4

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

RADIOSONDE MONITORING STATISTICS (EUCOS)

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	00	Z	100	29	6.8	0.8
01001	12	Z	100	30	7.1	-2.2
01028	12	Z	100	30	5.6	-2.6
01028	00	Z	100	30	4.4	-0.7
01400	00	Z	100	24	85.4	85.1
01400	12	Z	100	26	79.5	78.9
014007	12	Z	100	0	0.0	0.0
014008	12	Z	100	0	0.0	0.0
014009	12	Z	100	0	0.0	0.0
01415	12	Z	100	13	5.6	3.4
01415	00	Z	100	12	7.1	6.2
02365	00	Z	100	8	8.0	-0.4
02365	12	Z	100	13	4.1	-1.0
02591	12	Z	100	24	7.1	4.4
02591	00	Z	100	30	12.9	11.6
02836	12	Z	100	30	4.7	-2.1
02836	00	Z	100	30	5.1	1.8
02963	12	Z	100	29	6.7	-0.1
02963	00	Z	100	31	5.2	3.3
03005	00	Z	100	30	5.0	1.5
03005	12	Z	100	30	6.1	-1.8
03238	00	Z	100	30	8.6	2.2
03238	12	Z	100	1	4.1	4.1
03808	12	Z	100	30	6.1	3.0
03808	00	Z	100	30	9.3	6.9
03918	00	Z	100	30	11.6	9.0
03918	12	Z	100	3	5.1	4.3
03953	00	Z	100	25	11.0	6.6
03953	12	Z	100	24	16.9	10.5
04018	12	Z	100	30	7.1	-4.8
04018	00	Z	100	30	6.4	-0.2
04220	12	Z	100	29	7.2	-0.7
04220	00	Z	100	30	4.2	1.5
04270	00	Z	100	30	7.1	0.1
04270	12	Z	100	30	5.7	-0.3
04320	00	Z	100	30	9.8	-2.7
04320	12	Z	100	29	8.6	-1.3
04339	00	Z	100	30	13.4	1.7
04339	12	Z	100	30	7.3	-0.3



RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
04360	00	Z	100	25	14.1	-10.5
04360	12	Z	100	24	9.4	-6.5
06011	00	Z	100	29	8.7	2.8
06011	12	Z	100	29	8.0	3.6
06260	00	Z	100	29	5.9	2.7
06260	12	Z	100	6	6.1	1.1
06610	12	Z	100	30	5.7	2.2
06610	00	Z	100	31	7.2	4.7
07110	00	Z	100	29	8.1	0.7
07110	12	Z	100	30	34.5	9.4
07510	00	Z	100	28	15.7	14.3
07510	12	Z	100	30	15.4	14.1
07645	12	Z	100	30	13.0	8.4
07645	00	Z	100	30	11.2	8.5
07761	12	Z	100	30	14.3	12.4
07761	00	Z	100	27	19.6	18.3
08001	00	Z	100	30	11.4	9.9
08001	12	Z	100	30	7.8	5.1
08221	00	Z	100	30	13.9	13.1
08221	12	Z	100	31	11.1	9.8
08302	12	Z	100	30	6.0	-0.8
08302	00	Z	100	30	5.4	1.9
08508	12	Z	100	29	9.2	8.0
08522	12	Z	100	30	8.9	8.2
085227	00	Z	100	0	0.0	0.0
08579	12	Z	100	30	10.4	9.4
10035	12	Z	100	30	6.3	3.2
10393	12	Z	100	30	5.1	1.3
10393	00	Z	100	30	7.2	5.6
10410	00	Z	100	30	5.2	1.8
10410	12	Z	100	30	5.6	-2.1
10739	00	Z	100	30	9.8	8.7
10739	12	Z	100	30	7.0	5.0
11035	12	Z	100	30	21.5	18.3
11035	00	Z	100	30	14.7	13.9
12982	00	Z	100	28	15.1	12.2
12982	12	Z	100	29	15.0	13.7
16080	00	Z	100	30	6.0	2.6
16080	12	Z	100	30	4.9	-2.2
16245	00	Z	100	30	8.2	6.2
16245	12	Z	100	29	4.1	-1.5
16320	12	Z	100	29	11.3	8.3
16320	00	Z	100	30	16.0	14.4

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	100	30	6.4	3.5
16429	00	Z	100	30	13.0	10.6
16622	00	Z	100	30	23.0	22.8
16754	00	Z	100	28	18.2	16.4
17607	12	Z	100	30	8.7	1.0
26435	12	Z	100	14	4.3	-2.3
5QPW8X	12	Z	100	9	18.6	16.2
5QPW8X	00	Z	100	9	18.6	10.3
60018	00	Z	100	29	13.7	13.0
60018	12	Z	100	29	7.3	6.1
7JUNA4	12	Z	100	10	34.2	30.5
7JUNA4	00	Z	100	4	11.8	8.4
ASDE09	12	Z	100	4	39.8	38.7
BPMWB2	00	Z	100	6	17.7	16.8
BPMWB2	12	Z	100	6	23.0	17.7
DBLK	12	Z	100	7	5.3	-2.2
EDWDPA	12	Z	100	1	46.5	46.5
ERTOUN	12	Z	100	1	26.1	-26.1
ERTOUN	00	Z	100	3	7.0	-2.6
FHM5UJ	12	Z	100	10	6.7	4.2
FHM5UJ	00	Z	100	6	8.0	5.8
FPUW5G	12	Z	100	10	8.5	7.4
HTXUH4	12	Z	100	10	13.4	4.0
HTXUH4	00	Z	100	8	6.3	1.2
JNKN7J	12	Z	100	7	60.4	58.7
JNKN7J	00	Z	100	10	34.1	32.0
KJFF9X	00	Z	100	8	21.8	20.8
KJFF9X	12	Z	100	9	25.9	23.0
KMPLHP	12	Z	100	6	25.9	24.4
KMPLHP	00	Z	100	6	14.9	6.8
STCZC	00	Z	100	0	0.0	0.0
WDK38H	12	Z	100	21	8.3	-6.3
XKQLWQ	12	Z	100	20	35.6	33.9
XQFJRG	12	Z	100	3	5.4	4.4
XQFJRG	00	Z	100	3	14.9	-8.5
YLV96W	00	Z	100	3	25.4	14.0
YLV96W	12	Z	100	4	36.1	35.1
ZCTSER	12	Z	100	2	17.0	16.9
ZCTSER	00	Z	100	2	10.3	9.9
ZVQEQC	12	Z	100	1	17.6	17.6

**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 : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	00	V	100	24	2.1	0.4	-0.3
01001	12	V	100	30	3.0	-0.1	0.4
01028	12	V	100	30	2.7	-0.6	-0.4
01028	00	V	100	25	2.4	0.2	0.2
01400	00	V	100	18	3.2	-0.3	-0.3
01400	12	V	100	26	4.2	0.5	-0.4
014007	12	V	100	0	0.0	0.0	0.0
014008	12	V	100	0	0.0	0.0	0.0
014009	12	V	100	0	0.0	0.0	0.0
01415	12	V	100	12	2.9	-0.2	-0.9
01415	00	V	100	10	3.0	0.3	-0.5
02365	00	V	100	7	1.7	0.8	-0.5
02365	12	V	100	13	3.7	0.1	0.5
02591	12	V	100	24	3.7	-0.6	0.4
02591	00	V	100	27	2.4	-0.4	0.3
02836	12	V	100	30	2.7	-0.4	0.2
02836	00	V	100	27	2.4	0.6	-0.5
02963	12	V	100	29	2.9	-0.2	-0.2
02963	00	V	100	24	2.4	0.7	0.0
03005	00	V	100	24	2.9	0.2	-0.3
03005	12	V	100	30	3.3	0.3	0.0
03238	00	V	100	25	3.1	0.8	0.0
03238	12	V	100	1	1.0	0.4	-0.9
03808	12	V	100	30	3.1	-0.2	0.2
03808	00	V	100	25	3.3	0.6	0.7
03918	00	V	100	27	3.5	0.0	0.3
03918	12	V	100	3	3.3	2.2	-1.1
03953	00	V	100	22	2.9	0.3	0.7
03953	12	V	100	24	2.9	-0.2	0.0
04018	12	V	100	30	3.0	0.0	-0.2
04018	00	V	100	29	3.2	-0.5	-0.5
04220	12	V	100	29	2.6	-0.4	0.7
04220	00	V	100	26	2.6	0.2	-0.1
04270	00	V	100	29	3.1	-0.4	0.2
04270	12	V	100	30	3.6	-0.2	0.8
04320	00	V	100	25	2.1	0.2	-0.2
04320	12	V	100	29	2.6	0.5	-0.2
04339	00	V	100	30	2.5	-0.1	-0.2
04339	12	V	100	30	2.3	0.1	0.4

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
04360	00	V	100	22	2.6	0.4	0.5
04360	12	V	100	24	2.3	-0.4	-0.2
06011	00	V	100	28	3.1	0.1	-0.7
06011	12	V	100	29	2.7	0.6	0.0
06260	00	V	100	23	2.5	-0.1	-0.3
06260	12	V	100	6	3.1	-1.0	-0.2
06610	12	V	100	30	3.1	0.1	0.2
06610	00	V	100	28	3.2	1.0	-1.0
07110	00	V	100	23	3.0	-0.4	0.5
07110	12	V	100	30	4.3	-0.5	-0.1
07510	00	V	100	24	3.5	0.1	0.8
07510	12	V	100	30	3.5	-0.3	-0.4
07645	12	V	100	30	3.5	-0.6	0.3
07645	00	V	100	26	3.3	0.5	0.6
07761	12	V	100	30	4.0	1.3	0.5
07761	00	V	100	23	4.1	0.8	-0.1
08001	00	V	100	25	3.5	-0.2	0.6
08001	12	V	100	29	3.4	-0.5	1.0
08221	00	V	100	23	3.5	0.6	-0.7
08221	12	V	100	29	2.8	-0.1	0.1
08302	12	V	100	30	3.0	0.2	-0.5
08302	00	V	100	26	3.7	0.5	-0.2
08508	12	V	100	29	4.7	0.1	-0.6
08522	12	V	100	30	3.0	-0.2	0.0
085227	00	V	100	0	0.0	0.0	0.0
08579	12	V	100	30	2.4	0.2	0.1
10035	12	V	100	30	3.2	0.5	-0.2
10393	12	V	100	30	2.9	-0.4	0.2
10393	00	V	100	30	2.8	0.0	-0.1
10410	00	V	100	30	2.7	0.7	0.2
10410	12	V	100	30	2.8	0.4	-0.4
10739	00	V	100	30	2.9	0.6	-0.5
10739	12	V	100	30	3.6	1.1	-0.5
11035	12	V	100	30	3.0	0.4	-0.7
11035	00	V	100	23	3.4	-0.2	-0.5
12982	00	V	100	26	2.9	0.2	-0.3
12982	12	V	100	29	3.3	-0.2	0.7
16080	00	V	100	28	3.4	-0.2	-0.6
16080	12	V	100	30	2.9	0.1	0.0
16245	00	V	100	26	3.3	0.0	-0.5
16245	12	V	100	29	3.3	0.6	-0.3
16320	12	V	100	29	3.2	0.3	-0.1
16320	00	V	100	29	4.0	1.0	0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	100	30	3.9	0.7	0.9
16429	00	V	100	27	3.6	-0.1	-0.5
16622	00	V	100	25	3.5	0.9	0.2
16754	00	V	100	22	4.4	0.8	0.5
17607	12	V	100	1	3.5	-2.3	2.6
26435	12	V	100	14	3.8	-0.4	-0.5
5QPW8X	12	V	100	9	2.6	0.3	0.1
5QPW8X	00	V	100	9	2.5	0.6	0.6
60018	00	V	100	24	3.3	0.1	0.1
60018	12	V	100	29	4.2	-0.1	0.3
7JUNA4	12	V	100	10	3.8	-1.0	-0.8
7JUNA4	00	V	100	4	3.1	0.6	-0.9
ASDE09	12	V	100	4	2.8	0.4	0.7
BPMWB2	00	V	100	6	2.4	-0.8	0.9
BPMWB2	12	V	100	6	3.5	-1.1	0.7
DBLK	12	V	100	7	1.9	-0.1	-0.6
EDWDPA	12	V	100	1	2.1	-2.1	0.4
ERTOUN	12	V	100	1	0.2	0.1	-0.2
ERTOUN	00	V	100	3	5.6	1.0	-1.9
FHM5UJ	12	V	100	10	2.6	0.5	-0.5
FHM5UJ	00	V	100	6	1.7	0.3	-0.3
FPUW5G	12	V	100	10	3.4	0.3	-1.4
HTXUH4	12	V	100	10	2.1	-0.5	-0.6
HTXUH4	00	V	100	8	2.6	0.4	1.5
JNKN7J	12	V	100	7	3.5	1.8	0.5
JNKN7J	00	V	100	10	3.0	-0.7	1.4
KJJF9X	00	V	100	8	4.2	-1.1	1.4
KJJF9X	12	V	100	9	2.9	0.2	0.1
KMPLHP	12	V	100	6	2.8	0.6	1.1
KMPLHP	00	V	100	6	2.8	0.2	-0.3
STCZC	00	V	100	0	0.0	0.0	0.0
WDK38H	12	V	100	20	2.4	-0.4	0.1
XKQLWQ	12	V	100	20	3.2	-0.1	-0.3
XQFJRG	12	V	100	3	3.0	-0.3	-1.2
XQFJRG	00	V	100	3	2.8	1.7	-0.8
YLV96W	00	V	100	3	1.7	-0.4	-0.1
YLV96W	12	V	100	4	3.1	-0.6	0.6
ZCTSER	12	V	100	2	4.2	-0.5	0.3
ZCTSER	00	V	100	1	5.2	-3.1	-4.2
ZVQEQC	12	V	100	1	2.9	-0.1	-2.9

#### 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 : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	00	Z	500	30	5.2	-1.1
01001	12	Z	500	30	5.9	-3.4
01028	12	Z	500	30	3.8	-1.4
01028	00	Z	500	30	4.0	-0.2
01400	00	Z	500	25	80.5	80.3
01400	12	Z	500	26	78.8	78.3
014007	12	Z	500	3	8.8	7.0
014008	12	Z	500	5	9.2	7.7
014009	12	Z	500	1	4.2	4.2
01415	12	Z	500	14	5.1	2.8
01415	00	Z	500	12	4.2	0.6
02365	00	Z	500	8	3.8	2.7
02365	12	Z	500	13	3.8	2.2
02591	12	Z	500	25	8.3	7.8
02591	00	Z	500	30	9.5	8.9
02836	12	Z	500	30	2.9	0.2
02836	00	Z	500	30	2.8	0.9
02963	12	Z	500	29	3.4	2.1
02963	00	Z	500	31	3.7	2.4
03005	00	Z	500	30	4.9	-2.4
03005	12	Z	500	31	4.6	-2.3
03238	00	Z	500	32	3.8	2.3
03238	12	Z	500	1	4.7	4.7
03808	12	Z	500	30	4.5	3.4
03808	00	Z	500	30	4.2	3.3
03918	00	Z	500	30	7.3	7.0
03918	12	Z	500	4	5.4	5.3
03953	00	Z	500	32	7.5	0.0
03953	12	Z	500	30	8.9	4.2
04018	12	Z	500	30	3.3	-1.7
04018	00	Z	500	30	3.7	-0.8
04220	12	Z	500	29	3.7	1.2
04220	00	Z	500	30	2.8	0.9
04270	00	Z	500	30	2.9	-0.9
04270	12	Z	500	30	4.0	-2.2
04320	00	Z	500	30	3.6	0.4
04320	12	Z	500	30	3.5	0.2
04339	00	Z	500	30	14.0	1.2
04339	12	Z	500	30	10.9	-0.8

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
04360	00	Z	500	27	11.7	-10.9
04360	12	Z	500	25	11.5	-10.5
06011	00	Z	500	30	5.4	1.9
06011	12	Z	500	29	5.5	1.4
06260	00	Z	500	29	3.2	0.9
06260	12	Z	500	6	3.4	1.9
06610	12	Z	500	30	3.4	2.2
06610	00	Z	500	31	4.6	3.1
07110	00	Z	500	29	7.1	-4.7
07110	12	Z	500	31	5.1	-0.4
07510	00	Z	500	29	12.4	7.1
07510	12	Z	500	30	8.7	6.8
07645	12	Z	500	30	4.7	1.5
07645	00	Z	500	30	3.9	-0.5
07761	12	Z	500	30	5.6	5.0
07761	00	Z	500	27	4.3	3.0
08001	00	Z	500	30	3.8	2.8
08001	12	Z	500	30	4.5	3.6
08221	00	Z	500	30	8.4	7.2
08221	12	Z	500	34	6.7	5.9
08302	12	Z	500	30	4.6	-3.7
08302	00	Z	500	30	3.5	-2.0
08508	12	Z	500	29	5.7	4.5
08522	12	Z	500	30	7.3	6.9
085227	00	Z	500	0	0.0	0.0
08579	12	Z	500	30	9.2	8.3
10035	12	Z	500	30	5.4	4.7
10393	12	Z	500	30	2.7	1.3
10393	00	Z	500	30	3.0	1.8
10410	00	Z	500	30	2.0	0.2
10410	12	Z	500	30	2.2	-0.1
10739	00	Z	500	30	6.3	5.7
10739	12	Z	500	30	5.5	4.4
11035	12	Z	500	30	17.7	14.1
11035	00	Z	500	30	10.6	9.9
12982	00	Z	500	28	10.5	7.7
12982	12	Z	500	29	6.8	4.4
16080	00	Z	500	30	3.0	-0.2
16080	12	Z	500	30	3.7	-2.3
16245	00	Z	500	30	3.6	-1.2
16245	12	Z	500	29	3.5	-2.7
16320	12	Z	500	30	10.3	6.6
16320	00	Z	500	30	10.1	7.0

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	500	30	5.9	2.5
16429	00	Z	500	30	6.5	4.1
16622	00	Z	500	30	13.4	13.1
16754	00	Z	500	29	9.6	6.0
17607	12	Z	500	30	3.6	1.7
26435	12	Z	500	15	3.2	1.0
5QPW8X	12	Z	500	11	23.4	22.4
5QPW8X	00	Z	500	12	22.4	16.2
60018	00	Z	500	29	4.4	3.8
60018	12	Z	500	30	5.4	4.7
7JUNA4	12	Z	500	10	9.1	1.8
7JUNA4	00	Z	500	4	7.6	0.6
ASDE09	12	Z	500	4	27.8	27.4
BPMWB2	00	Z	500	5	6.9	5.1
BPMWB2	12	Z	500	6	9.7	7.1
DBLK	12	Z	500	7	5.5	-2.2
EDWDPA	12	Z	500	1	34.4	34.4
ERTOUN	12	Z	500	1	15.1	-15.1
ERTOUN	00	Z	500	3	5.5	-5.0
FHM5UJ	12	Z	500	10	7.7	3.8
FHM5UJ	00	Z	500	6	4.3	3.0
FPUW5G	12	Z	500	11	6.7	6.0
HTXUH4	12	Z	500	13	7.1	2.0
HTXUH4	00	Z	500	12	10.7	-1.8
JNKN7J	12	Z	500	10	43.6	43.2
JNKN7J	00	Z	500	11	41.8	41.3
KJFF9X	00	Z	500	10	9.6	4.6
KJFF9X	12	Z	500	9	13.7	11.9
KMPLHP	12	Z	500	7	8.8	8.3
KMPLHP	00	Z	500	5	8.7	7.3
STCZC	00	Z	500	1	12.1	12.1
WDK38H	12	Z	500	21	9.6	-8.4
XKQLWQ	12	Z	500	20	17.8	17.1
XQFJRG	12	Z	500	4	10.2	-9.7
XQFJRG	00	Z	500	5	14.9	-12.3
YLV96W	00	Z	500	6	4.4	-3.2
YLV96W	12	Z	500	6	4.8	4.1
ZCTSER	12	Z	500	2	11.7	11.6
ZCTSER	00	Z	500	3	12.0	11.1
ZVQEQC	12	Z	500	1	14.6	14.6



**4.6 Table 18 - Radiosonde Monitoring Statistics (EUCOS): 500 hPa Wind (m/s)**

## RADIOSONDE MONITORING STATISTICS (EUCOS)

MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND (M/S)  
 LEVEL : 500 HPA  
 AREA : 0 - 90N, 100W - 40E  
 PERIOD : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	00	V	500	30	3.3	0.3	-0.2
01001	12	V	500	30	2.3	0.5	-0.3
01028	12	V	500	30	2.3	-0.2	-0.1
01028	00	V	500	30	2.3	0.1	-0.2
01400	00	V	500	23	3.4	0.7	0.4
01400	12	V	500	26	2.7	0.2	-0.8
014007	12	V	500	3	2.8	0.0	-1.5
014008	12	V	500	5	2.5	-0.7	-0.2
014009	12	V	500	1	1.1	-0.2	1.1
01415	12	V	500	14	2.7	0.2	-0.9
01415	00	V	500	12	3.4	0.2	0.5
02365	00	V	500	8	3.0	-0.3	0.4
02365	12	V	500	13	2.8	-0.3	1.0
02591	12	V	500	25	2.7	0.3	-0.4
02591	00	V	500	30	2.9	0.2	0.4
02836	12	V	500	30	2.1	-0.3	-0.1
02836	00	V	500	30	2.8	0.5	0.4
02963	12	V	500	29	3.0	-0.6	0.2
02963	00	V	500	30	2.6	1.0	0.4
03005	00	V	500	30	2.6	0.4	0.5
03005	12	V	500	30	2.6	0.2	-0.6
03238	00	V	500	30	2.8	0.1	0.4
03238	12	V	500	1	2.7	2.7	0.5
03808	12	V	500	30	3.0	0.8	0.9
03808	00	V	500	29	2.8	-0.8	0.1
03918	00	V	500	30	2.6	0.6	-0.2
03918	12	V	500	4	1.8	0.9	0.5
03953	00	V	500	29	2.7	-0.3	0.8
03953	12	V	500	30	2.7	0.1	0.5
04018	12	V	500	30	2.6	-0.2	-0.2
04018	00	V	500	30	3.1	0.6	0.6
04220	12	V	500	29	2.8	0.4	-0.5
04220	00	V	500	30	2.4	-0.2	0.1
04270	00	V	500	30	3.1	0.3	0.9
04270	12	V	500	30	3.3	-0.4	0.7
04320	00	V	500	30	2.1	0.3	-0.1
04320	12	V	500	30	2.3	-0.4	0.1
04339	00	V	500	30	2.3	0.2	-0.2
04339	12	V	500	30	2.4	-0.1	0.0

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
04360	00	V	500	27	3.0	0.0	0.3
04360	12	V	500	25	2.9	0.5	0.7
06011	00	V	500	30	2.8	0.2	-0.1
06011	12	V	500	29	2.8	-0.1	0.0
06260	00	V	500	28	2.4	-0.1	-0.3
06260	12	V	500	6	2.3	0.2	0.2
06610	12	V	500	30	3.1	0.2	-1.1
06610	00	V	500	30	2.9	0.2	0.1
07110	00	V	500	29	2.6	0.0	0.1
07110	12	V	500	30	2.1	-0.2	-0.1
07510	00	V	500	29	2.3	0.5	0.2
07510	12	V	500	30	2.1	0.1	-0.4
07645	12	V	500	30	3.8	-0.1	-1.1
07645	00	V	500	30	2.9	0.3	0.4
07761	12	V	500	30	2.8	0.1	0.0
07761	00	V	500	26	2.1	-0.1	0.0
08001	00	V	500	30	2.3	-0.1	0.0
08001	12	V	500	30	2.5	0.1	-0.7
08221	00	V	500	30	2.3	0.4	-0.5
08221	12	V	500	30	2.2	-0.4	-0.1
08302	12	V	500	30	2.3	-0.2	-0.3
08302	00	V	500	30	2.4	0.0	-0.2
08508	12	V	500	29	2.3	0.5	0.1
08522	12	V	500	30	1.9	0.4	0.0
085227	00	V	500	0	0.0	0.0	0.0
08579	12	V	500	30	2.7	0.1	0.2
10035	12	V	500	30	2.4	-0.3	-0.1
10393	12	V	500	30	2.5	-0.7	-0.1
10393	00	V	500	30	2.5	0.1	-0.2
10410	00	V	500	30	2.5	0.7	0.3
10410	12	V	500	30	2.1	0.2	-0.2
10739	00	V	500	30	2.4	0.4	0.2
10739	12	V	500	30	3.0	-0.7	-0.3
11035	12	V	500	30	2.6	0.4	-0.2
11035	00	V	500	29	2.8	0.2	-0.2
12982	00	V	500	27	2.4	0.3	-0.1
12982	12	V	500	29	2.3	0.0	-0.4
16080	00	V	500	30	3.1	0.6	-0.2
16080	12	V	500	30	2.7	0.0	-0.1
16245	00	V	500	30	2.7	0.3	0.4
16245	12	V	500	29	2.1	0.6	0.4
16320	12	V	500	30	2.1	-0.2	0.3
16320	00	V	500	30	2.2	0.1	-0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	500	30	2.3	0.1	-0.6
16429	00	V	500	30	2.5	-0.1	-0.1
16622	00	V	500	30	2.3	0.5	-0.3
16754	00	V	500	25	1.8	-0.1	0.0
17607	12	V	500	6	2.3	1.4	0.7
26435	12	V	500	15	2.7	-0.1	-0.7
5QPW8X	12	V	500	11	2.2	-0.3	0.2
5QPW8X	00	V	500	12	2.3	-1.1	0.1
60018	00	V	500	29	2.6	0.7	-0.3
60018	12	V	500	30	2.5	0.6	0.1
7JUNA4	12	V	500	10	2.3	0.1	0.1
7JUNA4	00	V	500	4	2.4	1.1	0.5
ASDE09	12	V	500	4	3.7	-1.8	-0.5
BPMWB2	00	V	500	5	2.4	-1.0	-0.3
BPMWB2	12	V	500	6	1.7	-0.2	1.2
DBLK	12	V	500	7	1.6	-0.2	-0.4
EDWDPA	12	V	500	1	2.0	0.8	1.8
ERTOUN	12	V	500	1	6.1	3.8	4.8
ERTOUN	00	V	500	3	3.4	2.4	-1.4
FHM5UJ	12	V	500	10	2.9	0.0	0.9
FHM5UJ	00	V	500	6	3.1	0.3	0.0
FPUW5G	12	V	500	11	3.0	0.5	-1.1
HTXUH4	12	V	500	13	2.8	0.1	-0.3
HTXUH4	00	V	500	12	2.4	0.9	0.1
JNKN7J	12	V	500	10	3.1	-0.5	-1.1
JNKN7J	00	V	500	11	2.8	-0.2	-0.5
KJJF9X	00	V	500	10	2.6	-0.5	-0.9
KJJF9X	12	V	500	9	3.0	0.0	0.7
KMPLHP	12	V	500	7	2.6	-0.8	0.8
KMPLHP	00	V	500	5	2.1	-0.3	0.5
STCZC	00	V	500	1	7.5	6.0	4.5
WDK38H	12	V	500	21	2.8	0.5	-0.2
XKQLWQ	12	V	500	20	1.9	0.1	0.0
XQFJRG	12	V	500	4	3.0	1.7	1.2
XQFJRG	00	V	500	5	3.4	0.9	-1.3
YLV96W	00	V	500	6	2.3	0.1	0.3
YLV96W	12	V	500	6	2.3	-0.6	0.1
ZCTSER	12	V	500	2	1.3	0.2	0.5
ZCTSER	00	V	500	2	1.3	1.1	0.0
ZVQEQC	12	V	500	1	3.4	-1.0	-3.2

#### 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 : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	00	Z	850	30	4.6	-0.6
01001	12	Z	850	30	5.2	-2.7
01028	12	Z	850	30	2.6	-0.2
01028	00	Z	850	30	3.4	0.8
01400	00	Z	850	25	81.0	80.8
01400	12	Z	850	26	78.2	78.0
014007	12	Z	850	3	4.8	-0.8
014008	12	Z	850	5	4.1	-0.3
014009	12	Z	850	1	8.3	-8.3
01415	12	Z	850	14	4.6	3.0
01415	00	Z	850	12	3.7	3.4
02365	00	Z	850	8	4.1	3.4
02365	12	Z	850	13	3.7	3.2
02591	12	Z	850	25	9.4	9.2
02591	00	Z	850	30	10.0	9.6
02836	12	Z	850	30	3.3	2.7
02836	00	Z	850	30	3.2	2.6
02963	12	Z	850	29	4.5	3.9
02963	00	Z	850	31	3.5	3.2
03005	00	Z	850	30	4.1	-2.0
03005	12	Z	850	31	3.1	-0.9
03238	00	Z	850	32	3.5	2.6
03238	12	Z	850	1	4.2	4.2
03808	12	Z	850	30	4.1	3.3
03808	00	Z	850	30	4.0	3.3
03918	00	Z	850	30	6.6	6.2
03918	12	Z	850	4	8.9	8.8
03953	00	Z	850	32	4.0	2.8
03953	12	Z	850	30	6.2	5.1
04018	12	Z	850	30	2.6	-1.2
04018	00	Z	850	30	2.1	-0.4
04220	12	Z	850	29	2.6	1.7
04220	00	Z	850	30	2.8	1.9
04270	00	Z	850	30	2.7	0.2
04270	12	Z	850	30	2.6	0.1
04320	00	Z	850	30	4.0	1.6
04320	12	Z	850	30	3.1	0.6
04339	00	Z	850	30	13.9	2.2
04339	12	Z	850	30	12.6	1.4

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
04360	00	Z	850	27	9.1	-8.5
04360	12	Z	850	25	10.0	-8.8
06011	00	Z	850	30	4.9	3.7
06011	12	Z	850	29	4.3	2.3
06260	00	Z	850	29	3.2	1.4
06260	12	Z	850	6	3.2	1.6
06610	12	Z	850	30	3.2	2.1
06610	00	Z	850	31	3.7	2.8
07110	00	Z	850	29	2.9	-1.9
07110	12	Z	850	31	3.7	-1.7
07510	00	Z	850	29	4.3	3.9
07510	12	Z	850	30	5.4	4.6
07645	12	Z	850	30	1.7	0.3
07645	00	Z	850	31	2.7	-0.3
07761	12	Z	850	30	2.5	1.7
07761	00	Z	850	27	2.6	1.2
08001	00	Z	850	30	3.1	1.1
08001	12	Z	850	30	3.2	2.0
08221	00	Z	850	30	4.2	3.6
08221	12	Z	850	35	4.9	3.6
08302	12	Z	850	30	6.1	-5.4
08302	00	Z	850	30	4.6	-3.8
08508	12	Z	850	29	3.7	3.0
08522	12	Z	850	30	4.0	3.5
085227	00	Z	850	1	10.6	-10.6
08579	12	Z	850	30	7.2	6.6
10035	12	Z	850	30	6.3	5.7
10393	12	Z	850	30	2.1	0.8
10393	00	Z	850	30	2.4	0.5
10410	00	Z	850	30	2.0	-0.9
10410	12	Z	850	30	2.4	-0.4
10739	00	Z	850	30	4.6	4.2
10739	12	Z	850	30	5.2	4.8
11035	12	Z	850	30	18.9	16.1
11035	00	Z	850	30	9.3	8.8
12982	00	Z	850	28	9.3	6.1
12982	12	Z	850	29	6.1	5.7
16080	00	Z	850	30	3.5	0.2
16080	12	Z	850	30	3.4	-1.9
16245	00	Z	850	30	2.9	-1.4
16245	12	Z	850	29	3.0	-1.7
16320	12	Z	850	30	10.6	7.1
16320	00	Z	850	30	10.3	6.9

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16429	12	Z	850	30	6.9	3.6
16429	00	Z	850	30	5.7	3.7
16622	00	Z	850	30	12.7	12.5
16754	00	Z	850	29	8.9	4.3
17607	12	Z	850	30	3.0	2.3
26435	12	Z	850	15	3.3	2.4
5QPW8X	12	Z	850	14	27.7	26.9
5QPW8X	00	Z	850	12	25.1	20.7
60018	00	Z	850	29	2.9	-0.1
60018	12	Z	850	30	2.5	0.7
7JUNA4	12	Z	850	10	6.5	1.9
7JUNA4	00	Z	850	4	8.6	5.2
ASDE09	12	Z	850	4	31.8	31.6
BPMWB2	00	Z	850	4	3.3	0.6
BPMWB2	12	Z	850	6	4.4	0.9
DBLK	12	Z	850	7	4.6	-2.8
EDWDPA	12	Z	850	1	29.4	29.4
ERTOUN	12	Z	850	1	17.1	-17.1
ERTOUN	00	Z	850	3	13.2	-13.1
FHM5UJ	12	Z	850	10	8.1	4.5
FHM5UJ	00	Z	850	6	4.1	3.8
FPUW5G	12	Z	850	11	5.5	5.0
HTXUH4	12	Z	850	14	7.6	2.8
HTXUH4	00	Z	850	12	11.9	-1.4
JNKN7J	12	Z	850	10	47.2	47.0
JNKN7J	00	Z	850	10	46.7	46.4
KJFF9X	00	Z	850	10	4.6	1.4
KJFF9X	12	Z	850	9	5.5	4.4
KMPLHP	12	Z	850	7	6.4	5.5
KMPLHP	00	Z	850	6	6.3	5.1
STCZC	00	Z	850	1	3.5	3.5
WDK38H	12	Z	850	21	8.9	-8.1
XKQLWQ	12	Z	850	20	11.7	11.0
XQFJRG	12	Z	850	5	11.9	-11.1
XQFJRG	00	Z	850	7	10.7	-9.0
YLV96W	00	Z	850	6	3.1	-0.8
YLV96W	12	Z	850	6	4.5	-2.0
ZCTSER	12	Z	850	2	11.2	11.0
ZCTSER	00	Z	850	3	9.3	7.4
ZVQEQC	12	Z	850	1	2.1	2.1

**4.8 Table 20 - Radiosonde Monitoring Statistics (EUCOS): 850 hPa Wind (m/s)**

## RADIOSONDE MONITORING STATISTICS (EUCOS)

MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND (M/S)  
 LEVEL : 850 HPA  
 AREA : 0 - 90N, 100W - 40E  
 PERIOD : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	00	V	850	30	3.0	-0.2	-0.7
01001	12	V	850	30	3.2	0.4	-0.4
01028	12	V	850	30	2.9	-0.1	-0.3
01028	00	V	850	30	2.8	-0.3	-0.4
01400	00	V	850	23	1.8	-0.1	0.0
01400	12	V	850	26	2.1	0.0	0.2
014007	12	V	850	3	3.7	-2.0	-1.2
014008	12	V	850	5	2.1	-0.8	-0.9
014009	12	V	850	1	2.6	-1.0	-2.4
01415	12	V	850	14	3.8	-0.5	0.3
01415	00	V	850	12	2.2	0.0	0.7
02365	00	V	850	8	2.1	0.7	0.1
02365	12	V	850	13	2.5	0.1	0.1
02591	12	V	850	25	2.5	0.1	0.5
02591	00	V	850	30	2.5	0.2	-0.4
02836	12	V	850	30	2.1	0.1	-0.2
02836	00	V	850	30	2.6	0.0	0.0
02963	12	V	850	29	2.5	-0.2	0.2
02963	00	V	850	30	2.4	0.3	-0.2
03005	00	V	850	30	2.7	0.1	0.2
03005	12	V	850	30	2.5	0.0	0.0
03238	00	V	850	30	2.0	0.0	-0.1
03238	12	V	850	1	1.6	-1.6	0.2
03808	12	V	850	30	3.4	0.1	0.1
03808	00	V	850	29	3.2	0.0	0.0
03918	00	V	850	30	2.6	0.2	-0.3
03918	12	V	850	4	2.0	-1.0	-0.8
03953	00	V	850	29	2.0	0.8	0.3
03953	12	V	850	30	2.4	0.5	-0.5
04018	12	V	850	30	2.6	-0.1	0.3
04018	00	V	850	30	3.4	-0.2	0.0
04220	12	V	850	29	2.5	0.0	-0.2
04220	00	V	850	30	2.5	0.1	0.6
04270	00	V	850	30	3.1	0.0	0.2
04270	12	V	850	30	4.1	0.3	-0.3
04320	00	V	850	30	3.0	-0.3	-0.2
04320	12	V	850	30	4.4	0.1	0.6
04339	00	V	850	30	4.2	-0.1	0.2
04339	12	V	850	30	3.5	-0.3	0.4

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
04360	00	V	850	27	4.7	2.2	1.3
04360	12	V	850	25	4.0	-0.3	0.3
06011	00	V	850	30	2.5	-0.2	-0.2
06011	12	V	850	29	2.3	-0.3	0.2
06260	00	V	850	29	2.2	-0.2	-0.3
06260	12	V	850	6	2.6	1.1	0.0
06610	12	V	850	30	2.4	0.7	0.2
06610	00	V	850	30	2.5	0.6	0.0
07110	00	V	850	29	2.7	-0.6	-0.4
07110	12	V	850	30	3.0	-0.1	-0.2
07510	00	V	850	29	3.2	0.3	1.0
07510	12	V	850	30	3.1	0.5	1.1
07645	12	V	850	30	2.9	0.1	0.1
07645	00	V	850	30	3.3	-0.2	-0.4
07761	12	V	850	30	2.7	0.2	-0.3
07761	00	V	850	26	2.6	0.8	0.2
08001	00	V	850	30	3.0	0.5	-0.7
08001	12	V	850	30	3.3	0.9	-0.6
08221	00	V	850	30	3.3	0.8	0.6
08221	12	V	850	30	2.7	0.7	0.9
08302	12	V	850	30	2.3	0.3	-0.2
08302	00	V	850	30	2.3	-0.2	0.1
08508	12	V	850	29	3.1	0.3	0.7
08522	12	V	850	30	2.5	-0.1	-0.4
085227	00	V	850	1	5.0	3.4	3.6
08579	12	V	850	30	2.2	0.3	0.6
10035	12	V	850	30	2.1	0.0	-0.5
10393	12	V	850	30	2.6	0.1	0.3
10393	00	V	850	30	2.3	-0.1	0.6
10410	00	V	850	30	2.3	0.3	-0.4
10410	12	V	850	30	2.4	-0.4	0.1
10739	00	V	850	30	2.2	0.4	-0.2
10739	12	V	850	30	2.5	0.3	0.5
11035	12	V	850	30	2.7	0.3	-0.1
11035	00	V	850	29	3.1	0.7	-0.1
12982	00	V	850	27	2.6	0.7	0.4
12982	12	V	850	29	3.1	-0.2	0.2
16080	00	V	850	30	3.6	0.4	0.2
16080	12	V	850	30	2.7	0.3	-1.2
16245	00	V	850	30	3.2	-0.1	0.2
16245	12	V	850	29	2.4	-0.2	-0.2
16320	12	V	850	30	2.5	0.4	-0.7
16320	00	V	850	30	2.6	0.2	-0.6



RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16429	12	V	850	30	2.0	0.1	-0.2
16429	00	V	850	30	2.7	0.0	0.3
16622	00	V	850	30	2.8	0.3	-0.7
16754	00	V	850	25	3.0	0.5	-0.1
17607	12	V	850	30	2.8	0.9	0.6
26435	12	V	850	15	2.9	0.3	-0.3
5QPW8X	12	V	850	14	2.7	1.1	0.3
5QPW8X	00	V	850	12	2.2	0.5	0.7
60018	00	V	850	29	3.9	0.9	1.2
60018	12	V	850	30	4.2	-0.6	1.6
7JUNA4	12	V	850	10	3.0	-0.3	0.1
7JUNA4	00	V	850	4	3.0	1.3	-0.8
ASDE09	12	V	850	4	3.3	-1.4	-0.3
BPMWB2	00	V	850	4	1.4	0.0	0.8
BPMWB2	12	V	850	6	2.2	0.0	-0.4
DBLK	12	V	850	7	3.3	0.5	-1.0
EDWDPA	12	V	850	1	3.7	0.8	-3.6
ERTOUN	12	V	850	1	7.7	-7.3	2.4
ERTOUN	00	V	850	3	2.5	0.0	-0.1
FHM5UJ	12	V	850	10	3.2	-0.3	0.8
FHM5UJ	00	V	850	6	4.6	-1.5	-1.4
FPUW5G	12	V	850	11	3.5	-1.7	-0.3
HTXUH4	12	V	850	14	2.2	0.3	0.1
HTXUH4	00	V	850	12	3.0	0.2	0.1
JNKN7J	12	V	850	10	2.8	-0.2	-0.5
JNKN7J	00	V	850	10	2.3	0.0	-0.6
KJJF9X	00	V	850	10	2.0	1.0	-0.2
KJJF9X	12	V	850	9	2.3	-0.6	0.6
KMPLHP	12	V	850	7	2.3	0.2	-0.3
KMPLHP	00	V	850	6	2.5	0.5	-0.1
STCZC	00	V	850	1	5.4	4.0	-3.6
WDK38H	12	V	850	21	2.8	0.0	0.6
XKQLWQ	12	V	850	20	2.9	0.1	0.3
XQFJRG	12	V	850	5	3.0	1.1	-0.5
XQFJRG	00	V	850	7	2.1	-0.4	1.1
YLV96W	00	V	850	6	2.5	-1.2	-0.5
YLV96W	12	V	850	6	2.4	-0.8	0.0
ZCTSER	12	V	850	2	3.1	1.3	-0.6
ZCTSER	00	V	850	2	2.1	1.1	0.2
ZVQEQC	12	V	850	1	4.3	0.4	-4.3

**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 : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
0062087	99	P	SUR	55	7	370	0	0.4	-0.2	0.4
0066022	99	P	SUR	54	14	230	0	0.4	-0.1	0.4
0066023	99	P	SUR	55	11	371	0	0.3	0.1	0.3
0066024	99	P	SUR	55	13	70	0	0.4	0.2	0.5
03380	99	P	SUR	54	0	764	0	0.3	-0.1	0.3
0640046	99	P	SUR	60	-4	716	0	0.4	-0.2	0.4
1300001	99	P	SUR	11	-23	692	0	0.4	-0.2	0.5
1300008	99	P	SUR	15	-38	704	0	0.5	-0.3	0.6
1300130	99	P	SUR	28	-16	713	4	0.4	0.1	0.4
1300131	99	P	SUR	28	-17	715	0	0.4	0.0	0.4
1301569	99	P	SUR	24	-38	719	0	0.4	-0.0	0.4
1301603	99	P	SUR	32	-57	709	0	0.4	-0.0	0.4
1301605	99	P	SUR	25	-62	715	0	0.4	-0.1	0.4
1301607	99	P	SUR	22	-59	707	0	0.6	-0.1	0.6
1301608	99	P	SUR	29	-45	718	3	1.1	1.1	1.6
1301609	99	P	SUR	22	-68	706	0	0.4	0.3	0.5
1301610	99	P	SUR	20	-56	717	0	0.4	0.1	0.4
1301612	99	P	SUR	26	-45	717	0	0.4	0.0	0.5
1301618	99	P	SUR	17	-33	719	0	0.4	0.2	0.4
1301619	99	P	SUR	30	-23	698	0	0.2	0.4	0.5
1301620	99	P	SUR	12	-37	714	0	0.4	-0.0	0.4
1402554	99	P	SUR	22	-68	718	0	0.5	0.2	0.5
1402559	99	P	SUR	28	-51	718	0	0.4	0.2	0.5
1501531	99	P	SUR	29	-56	719	0	0.3	-0.3	0.4
1501534	99	P	SUR	24	-68	719	0	0.4	-1.3	1.3
2501641	99	P	SUR	87	17	595	0	1.6	-0.1	1.6
2501643	99	P	SUR	88	2	607	0	0.5	-0.2	0.5
2501644	99	P	SUR	88	31	607	0	0.5	-0.3	0.6
2501645	99	P	SUR	89	10	606	0	0.5	-0.1	0.5
2501647	99	P	SUR	89	2	606	0	0.4	-0.0	0.4
2501653	99	P	SUR	88	21	607	0	0.5	-0.1	0.5
2501661	99	P	SUR	84	13	720	0	0.5	-0.2	0.5
2601623	99	P	SUR	76	30	720	0	0.3	-0.1	0.4
2601624	99	P	SUR	80	5	195	0	0.4	-0.0	0.4
2601625	99	P	SUR	77	21	720	1	2.6	3.6	4.5
3100735	99	P	SUR	34	-68	703	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
31735	99	P	SUR	34	-68	526	0	0.4	0.1	0.4
3732621	99	P	SUR	35	25	19	0	0.3	-0.8	0.9
4100040	99	P	SUR	15	-53	4190	0	0.3	-0.8	0.9
4100043	99	P	SUR	21	-65	4188	0	0.4	0.0	0.4
4100044	99	P	SUR	22	-59	4230	0	0.3	0.2	0.4
4100046	99	P	SUR	24	-68	4086	0	0.4	-0.4	0.6
4100048	99	P	SUR	32	-70	4256	0	0.8	-0.7	1.1
4100049	99	P	SUR	27	-63	4263	0	0.6	-0.0	0.6
4100053	99	P	SUR	18	-66	4256	0	0.4	-0.7	0.8
4100056	99	P	SUR	18	-65	4297	0	0.4	-0.9	1.0
4100139	99	P	SUR	20	-38	700	0	0.3	-0.2	0.4
4100300	99	P	SUR	16	-57	683	0	0.4	0.0	0.4
4100597	99	P	SUR	34	-30	702	0	0.3	0.2	0.3
4100729	99	P	SUR	32	-27	701	0	0.3	0.0	0.3
4100730	99	P	SUR	32	-28	701	0	0.3	0.3	0.4
4101529	99	P	SUR	31	-60	719	0	0.4	-1.1	1.2
4101530	99	P	SUR	31	-27	698	0	0.3	0.5	0.6
4101531	99	P	SUR	38	-21	717	0	0.3	0.6	0.7
4101533	99	P	SUR	55	-23	216	0	0.7	0.8	1.0
4101536	99	P	SUR	41	-27	718	0	0.4	0.3	0.5
4101537	99	P	SUR	36	-13	707	0	0.3	0.2	0.4
4101539	99	P	SUR	40	-29	719	0	0.4	0.2	0.4
4101554	99	P	SUR	27	-60	705	0	0.4	0.3	0.5
4101557	99	P	SUR	35	-29	719	0	0.3	0.2	0.4
4101558	99	P	SUR	24	-58	719	0	0.3	0.4	0.5
4101560	99	P	SUR	38	-32	719	0	0.3	0.5	0.6
4101562	99	P	SUR	29	-51	692	0	0.3	0.6	0.7
4101564	99	P	SUR	28	-42	707	0	0.6	0.0	0.6
4101565	99	P	SUR	25	-30	565	0	0.3	0.5	0.6
4101567	99	P	SUR	35	-47	719	0	0.4	0.4	0.6
4101568	99	P	SUR	36	-50	237	0	0.4	0.4	0.6
4101570	99	P	SUR	29	-59	718	0	0.4	0.2	0.5
4101572	99	P	SUR	50	-15	265	0	0.4	0.5	0.7
4101573	99	P	SUR	30	-38	719	0	0.4	0.1	0.4
4101598	99	P	SUR	15	-61	719	0	0.4	-0.5	0.7
4101603	99	P	SUR	15	-61	404	0	0.4	-0.2	0.5
4101604	99	P	SUR	10	-62	667	0	0.5	-0.2	0.6
4101606	99	P	SUR	43	-9	548	0	0.6	0.5	0.8
4101607	99	P	SUR	41	-14	719	0	0.3	0.4	0.5
4101609	99	P	SUR	38	-23	719	0	0.3	0.2	0.4
4101610	99	P	SUR	66	-10	719	0	0.3	0.4	0.5
4101613	99	P	SUR	34	-18	719	0	0.3	0.6	0.7
4101614	99	P	SUR	36	-23	719	0	0.3	0.0	0.3

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4101615	99	P	SUR	15	-47	719	0	0.4	0.2	0.4
4101616	99	P	SUR	37	-24	719	0	0.3	0.1	0.3
4101617	99	P	SUR	33	-26	719	0	0.3	0.4	0.4
4101618	99	P	SUR	35	-23	719	0	0.3	0.3	0.4
4101620	99	P	SUR	51	-5	719	0	0.4	0.5	0.6
4101621	99	P	SUR	39	-34	719	0	0.3	0.2	0.4
4101622	99	P	SUR	69	-18	719	0	0.3	0.1	0.4
4101623	99	P	SUR	57	-54	719	0	0.4	-0.1	0.4
4101627	99	P	SUR	63	-31	719	0	0.5	0.1	0.5
4101630	99	P	SUR	11	-50	719	0	0.3	-0.0	0.3
4101660	99	P	SUR	63	-15	684	0	0.3	-0.0	0.3
4101661	99	P	SUR	62	-12	168	10	1.0	13.3	13.3
4101662	99	P	SUR	64	-13	719	0	0.3	0.1	0.3
4101663	99	P	SUR	64	-24	719	0	0.4	-0.1	0.4
4101664	99	P	SUR	62	-28	719	0	0.3	0.0	0.3
4101666	99	P	SUR	62	-11	719	0	0.3	-0.1	0.3
4101690	99	P	SUR	50	-51	717	0	0.5	0.3	0.6
4101700	99	P	SUR	31	-55	705	0	0.4	-1.0	1.1
4101702	99	P	SUR	37	-65	512	19	2.1	-0.6	2.1
4101705	99	P	SUR	30	-32	703	0	0.3	0.0	0.3
4101706	99	P	SUR	36	-25	705	0	0.3	-0.8	0.9
4101707	99	P	SUR	36	-34	715	0	0.3	-0.3	0.5
4101708	99	P	SUR	29	-54	707	0	0.3	-0.5	0.6
4101712	99	P	SUR	37	-33	708	0	0.3	-0.1	0.3
4101713	99	P	SUR	36	-65	702	0	0.5	-0.2	0.6
4101714	99	P	SUR	29	-31	713	0	0.3	-0.1	0.3
4101715	99	P	SUR	29	-52	713	0	0.4	-0.6	0.7
4101716	99	P	SUR	27	-54	707	0	0.3	-0.8	0.8
4101717	99	P	SUR	28	-60	719	0	0.3	-0.1	0.3
4101718	99	P	SUR	31	-26	717	0	0.3	0.1	0.3
4101719	99	P	SUR	32	-60	715	0	0.5	-0.1	0.5
4101720	99	P	SUR	45	-55	716	0	0.5	0.6	0.8
4101721	99	P	SUR	37	-46	714	0	0.4	0.5	0.6
4101742	99	P	SUR	30	-39	702	0	0.4	-0.2	0.4
4101743	99	P	SUR	29	-64	708	0	0.5	0.6	0.8
4101752	99	P	SUR	13	-53	706	0	0.3	0.0	0.3
4101753	99	P	SUR	21	-22	719	0	0.4	0.4	0.5
4101754	99	P	SUR	15	-45	717	0	0.4	0.0	0.4
4101755	99	P	SUR	21	-22	718	0	0.4	0.4	0.5
4101760	99	P	SUR	30	-51	719	0	0.5	0.2	0.5
4101762	99	P	SUR	29	-68	718	0	0.5	0.2	0.5
4101765	99	P	SUR	60	-11	717	0	0.4	0.1	0.4
4101767	99	P	SUR	13	-34	718	0	0.5	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
4101771	99	P	SUR	73	5	154	0	0.4	0.2	0.4
4101772	99	P	SUR	77	14	154	0	0.4	-0.1	0.4
41040	99	P	SUR	15	-53	1232	0	0.4	-0.4	0.6
41043	99	P	SUR	21	-65	1231	0	0.5	0.4	0.6
41044	99	P	SUR	22	-59	1186	0	0.4	0.5	0.7
41046	99	P	SUR	24	-68	1199	0	0.4	0.2	0.5
41048	99	P	SUR	32	-70	1172	0	1.2	-0.2	1.2
41049	99	P	SUR	28	-63	1012	0	0.4	0.5	0.7
41053	99	P	SUR	19	-66	1562	0	0.4	-0.7	0.8
41056	99	P	SUR	18	-66	1537	0	0.4	-0.9	1.0
41300	99	P	SUR	16	-58	523	0	0.4	0.0	0.4
41597	99	P	SUR	34	-30	526	0	0.3	0.1	0.3
41729	99	P	SUR	32	-27	528	0	0.3	0.0	0.3
41730	99	P	SUR	32	-28	526	0	0.3	0.3	0.4
4200059	99	P	SUR	15	-67	4040	0	0.4	-0.0	0.4
4200085	99	P	SUR	18	-67	4132	0	0.4	-0.7	0.8
42059	99	P	SUR	15	-68	1245	0	0.5	0.3	0.6
42085	99	P	SUR	18	-67	1598	0	0.4	-0.8	0.9
4400005	99	P	SUR	43	-69	716	0	0.4	0.4	0.5
4400008	99	P	SUR	41	-69	4305	0	0.4	0.1	0.5
4400011	99	P	SUR	41	-67	4296	0	0.8	-0.1	0.8
4400027	99	P	SUR	44	-67	718	0	0.5	-0.2	0.5
4400032	99	P	SUR	44	-69	718	0	0.5	-1.1	1.2
4400033	99	P	SUR	44	-69	718	0	0.5	-0.5	0.7
4400034	99	P	SUR	44	-68	716	0	0.5	-0.0	0.5
4400037	99	P	SUR	43	-68	707	0	0.4	-0.2	0.4
44005	99	P	SUR	43	-69	776	0	0.4	0.3	0.5
4400513	99	P	SUR	54	-10	613	0	0.3	-0.4	0.5
4400517	99	P	SUR	30	-69	718	0	0.5	0.1	0.5
4400521	99	P	SUR	27	-39	652	0	0.5	-1.0	1.1
4400746	99	P	SUR	35	-27	232	1	0.3	-0.4	0.5
4400777	99	P	SUR	29	-53	707	0	0.3	0.2	0.4
44008	99	P	SUR	41	-69	1558	0	0.5	0.6	0.8
4400857	99	P	SUR	29	-32	700	0	0.3	0.3	0.4
4400874	99	P	SUR	34	-27	703	0	0.3	-0.6	0.7
44011	99	P	SUR	41	-67	1457	0	1.0	0.3	1.0
4401531	99	P	SUR	37	-30	718	0	0.3	0.3	0.4
4401536	99	P	SUR	33	-22	716	0	0.3	0.8	0.8
4401537	99	P	SUR	27	-48	717	0	0.5	-1.0	1.1
4401539	99	P	SUR	34	-16	719	0	0.3	-0.4	0.5
4401540	99	P	SUR	31	-38	719	0	0.3	0.1	0.3
4401541	99	P	SUR	27	-36	719	0	0.4	-0.2	0.5
4401551	99	P	SUR	31	-26	692	0	0.3	0.2	0.3

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4401556	99	P	SUR	23	-40	699	1	0.9	0.0	0.9
4401557	99	P	SUR	28	-40	702	0	0.5	0.2	0.6
4401558	99	P	SUR	66	12	697	0	0.4	-0.1	0.4
4401559	99	P	SUR	47	-3	700	0	0.5	0.5	0.7
4401561	99	P	SUR	28	-45	706	0	0.5	-0.0	0.5
4401562	99	P	SUR	26	-31	706	0	0.3	-0.4	0.5
4401563	99	P	SUR	32	-54	704	0	0.4	-0.5	0.6
4401564	99	P	SUR	37	-23	700	0	0.4	0.5	0.7
4401565	99	P	SUR	62	-23	699	0	0.3	-0.0	0.3
4401567	99	P	SUR	53	-21	718	0	0.5	0.5	0.7
4401568	99	P	SUR	52	-23	718	0	0.5	0.3	0.6
4401569	99	P	SUR	53	-32	717	0	0.4	0.1	0.4
4401570	99	P	SUR	45	-16	709	0	0.4	0.2	0.4
4401572	99	P	SUR	46	-37	717	0	0.5	0.2	0.5
4401573	99	P	SUR	52	-20	718	0	0.6	0.2	0.6
4401574	99	P	SUR	60	-34	715	0	0.6	-0.1	0.6
4401575	99	P	SUR	49	-46	278	15	3.3	-0.6	3.4
4401576	99	P	SUR	42	-28	717	0	0.5	0.4	0.6
4401577	99	P	SUR	41	-41	715	0	0.4	0.1	0.4
4401578	99	P	SUR	46	-29	718	0	0.6	0.0	0.6
4401579	99	P	SUR	42	-36	716	0	0.4	0.0	0.4
4401580	99	P	SUR	48	-45	712	0	0.5	0.2	0.5
4401581	99	P	SUR	40	-57	716	0	0.5	-0.0	0.5
4401582	99	P	SUR	45	-42	718	0	0.6	0.1	0.6
4401583	99	P	SUR	42	-53	100	0	0.5	0.2	0.6
4401611	99	P	SUR	45	-42	602	0	0.4	0.2	0.5
4401613	99	P	SUR	30	-18	602	0	0.3	0.7	0.7
4401750	99	P	SUR	66	4	696	0	0.4	-1.4	1.5
4401751	99	P	SUR	64	-3	694	0	0.4	0.2	0.4
4401753	99	P	SUR	65	1	549	0	0.4	0.6	0.7
4401799	99	P	SUR	22	-57	689	0	0.4	0.2	0.4
4401802	99	P	SUR	34	-18	602	0	0.2	0.1	0.3
4401821	99	P	SUR	62	-65	705	0	0.5	-0.0	0.5
4401822	99	P	SUR	62	-69	712	0	0.5	0.4	0.7
4401823	99	P	SUR	60	-69	643	0	0.5	0.2	0.5
4401824	99	P	SUR	61	-67	697	0	0.5	0.2	0.5
4401825	99	P	SUR	46	-57	644	0	0.6	1.0	1.2
4401827	99	P	SUR	45	-58	502	0	0.4	0.4	0.6
4401853	99	P	SUR	13	-59	699	0	0.4	0.0	0.4
4401856	99	P	SUR	13	-59	719	0	0.4	0.0	0.4
4401870	99	P	SUR	16	-18	442	0	0.7	0.6	0.9
4401872	99	P	SUR	22	-18	442	0	0.5	0.4	0.6
4401873	99	P	SUR	17	-18	442	0	0.7	0.7	1.0

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4401893	99	P	SUR	48	-51	708	0	0.4	0.4	0.6
4401894	99	P	SUR	49	-51	708	0	0.4	0.5	0.7
44027	99	P	SUR	44	-67	778	0	0.5	-0.2	0.5
44032	99	P	SUR	44	-69	729	0	0.5	-1.1	1.2
44033	99	P	SUR	44	-69	729	0	0.5	-0.5	0.7
44034	99	P	SUR	44	-68	727	0	0.5	-0.0	0.5
44037	99	P	SUR	44	-68	716	0	0.4	-0.2	0.4
44137	99	P	SUR	42	-62	705	0	0.6	-0.0	0.6
44139	99	P	SUR	44	-57	712	0	0.5	0.1	0.5
44150	99	P	SUR	43	-64	710	0	0.7	0.2	0.7
44258	99	P	SUR	45	-63	712	0	0.4	-0.0	0.4
44513	99	P	SUR	54	-10	466	0	0.3	-0.4	0.5
44517	99	P	SUR	30	-69	538	0	0.4	0.1	0.4
44521	99	P	SUR	27	-39	652	0	0.5	-1.0	1.1
44746	99	P	SUR	35	-27	232	1	0.3	-0.3	0.5
44777	99	P	SUR	29	-53	529	0	0.3	0.2	0.4
44857	99	P	SUR	29	-32	523	0	0.3	0.3	0.4
44874	99	P	SUR	34	-27	528	0	0.3	-0.7	0.7
45138	99	P	SUR	50	-66	713	0	0.5	-0.1	0.5
4602501	99	P	SUR	70	0	714	0	0.4	0.0	0.4
4602502	99	P	SUR	70	1	718	0	0.4	0.2	0.5
4602504	99	P	SUR	70	3	719	0	0.4	0.2	0.5
4700546	99	P	SUR	32	-59	557	0	0.4	0.0	0.4
4701669	99	P	SUR	45	-15	604	0	0.5	0.0	0.5
4800770	99	P	SUR	58	-40	599	599	0.0	0.0	0.0
4802505	99	P	SUR	83	-55	604	0	0.4	0.1	0.5
5301764	99	P	SUR	62	-21	640	43	5.2	0.6	5.3
5301765	99	P	SUR	62	-12	716	0	0.6	0.6	0.8
6100001	99	P	SUR	43	8	677	0	0.5	0.3	0.6
6100002	99	P	SUR	42	5	659	0	0.5	-0.1	0.5
61001	99	P	SUR	43	8	518	0	0.4	0.2	0.5
6100196	99	P	SUR	42	4	714	0	1.8	-0.2	1.8
6100197	99	P	SUR	40	4	686	0	0.5	0.2	0.6
6100198	99	P	SUR	37	-2	713	0	0.4	0.2	0.5
61002	99	P	SUR	42	5	500	0	0.5	-0.1	0.5
6100280	99	P	SUR	41	1	713	0	0.5	0.1	0.5
6100281	99	P	SUR	40	0	716	0	0.5	0.0	0.5
6100417	99	P	SUR	38	0	713	0	0.4	0.4	0.6
6100430	99	P	SUR	40	2	715	0	0.5	-0.0	0.5
6101001	99	P	SUR	38	24	177	0	4.3	3.0	5.2
6101003	99	P	SUR	40	25	229	1	0.4	0.8	0.8
6101005	99	P	SUR	38	26	236	0	0.4	0.7	0.8
6101007	99	P	SUR	36	25	2	0	0.1	-0.4	0.4

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
6101008	99	P	SUR	37	22	59	0	0.4	0.5	0.7
6101009	99	P	SUR	35	25	217	0	0.4	-0.7	0.8
6200024	99	P	SUR	44	-3	714	0	0.4	0.2	0.4
6200025	99	P	SUR	44	-6	607	0	0.4	0.0	0.4
6200082	99	P	SUR	44	-8	707	0	0.4	-0.1	0.4
6200083	99	P	SUR	43	-9	715	0	0.4	0.1	0.4
6200084	99	P	SUR	42	-9	715	0	0.4	0.4	0.5
6200085	99	P	SUR	36	-7	715	0	0.3	0.2	0.4
6200091	99	P	SUR	53	-5	719	0	0.4	-0.1	0.4
6200092	99	P	SUR	51	-11	719	0	0.4	-0.2	0.4
6200093	99	P	SUR	55	-10	719	0	0.4	-0.2	0.4
6200094	99	P	SUR	52	-7	719	0	0.4	0.1	0.4
6200095	99	P	SUR	53	-16	719	0	0.4	-0.4	0.6
62001	99	P	SUR	45	-5	763	0	0.3	0.2	0.4
6200191	99	P	SUR	41	-10	350	0	0.3	-0.4	0.5
6200192	99	P	SUR	40	-10	614	0	0.3	-0.3	0.5
6200200	99	P	SUR	36	-8	451	0	0.3	-0.3	0.5
6201030	99	P	SUR	44	-4	705	0	0.4	0.0	0.4
62023	99	P	SUR	51	-8	669	0	0.3	0.0	0.3
6202613	99	P	SUR	19	-18	442	0	0.6	0.7	0.9
6202638	99	P	SUR	18	-44	719	0	0.3	0.0	0.3
6202639	99	P	SUR	22	-41	719	0	0.9	0.5	1.0
6202640	99	P	SUR	21	-43	719	0	0.9	0.2	0.9
6202641	99	P	SUR	16	-55	719	0	0.4	0.3	0.5
6202642	99	P	SUR	19	-52	719	0	0.3	0.0	0.3
6202643	99	P	SUR	18	-49	719	0	0.3	-0.0	0.3
6202644	99	P	SUR	23	-43	719	0	0.7	0.3	0.7
6202647	99	P	SUR	13	-47	719	0	0.3	-0.1	0.4
6202670	99	P	SUR	58	-20	115	12	2.5	1.5	2.9
6202671	99	P	SUR	57	-17	115	0	0.4	0.5	0.7
6202672	99	P	SUR	60	-16	115	0	0.3	0.7	0.7
6202673	99	P	SUR	61	-22	116	0	1.5	1.1	1.9
6202674	99	P	SUR	59	-21	114	0	3.4	2.4	4.2
6202675	99	P	SUR	58	-22	696	0	0.3	0.1	0.3
6202676	99	P	SUR	62	-17	696	0	0.3	0.2	0.4
6202677	99	P	SUR	59	-19	700	0	0.3	0.1	0.3
6202678	99	P	SUR	58	-29	684	0	0.4	0.1	0.4
6202679	99	P	SUR	63	-32	642	0	0.5	0.3	0.6
6202680	99	P	SUR	60	-18	687	0	0.4	0.2	0.4
6202681	99	P	SUR	61	-15	696	0	0.3	0.2	0.4
6202682	99	P	SUR	61	-13	702	0	0.4	0.1	0.4
6202683	99	P	SUR	59	-15	685	0	0.4	0.3	0.5
6202684	99	P	SUR	62	-18	698	0	0.3	0.4	0.5



DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62029	99	P	SUR	49	-12	1325	0	0.4	0.0	0.4
6203503	99	P	SUR	44	-10	708	0	0.3	-0.0	0.3
6203523	99	P	SUR	70	1	680	0	0.4	-0.9	1.0
6203525	99	P	SUR	72	20	17	0	0.6	-0.2	0.6
6203528	99	P	SUR	27	-25	670	0	0.3	-0.3	0.5
6203574	99	P	SUR	66	-32	717	0	0.4	0.5	0.6
6203576	99	P	SUR	64	-58	712	0	0.4	0.5	0.6
6203577	99	P	SUR	66	-17	210	0	0.6	0.1	0.6
6203579	99	P	SUR	65	-40	717	0	3.9	2.4	4.6
6203580	99	P	SUR	68	-13	706	0	0.3	0.3	0.5
6203581	99	P	SUR	63	-10	644	0	0.3	-0.0	0.3
6203582	99	P	SUR	60	-28	707	0	0.4	0.2	0.5
6203583	99	P	SUR	59	-30	671	0	0.4	-0.0	0.4
6203584	99	P	SUR	65	-30	307	219	2.7	11.2	11.5
6203585	99	P	SUR	68	-18	712	0	0.3	0.4	0.5
6203586	99	P	SUR	68	-13	712	0	0.3	0.5	0.6
6203587	99	P	SUR	63	-13	654	0	0.3	-0.2	0.4
6203588	99	P	SUR	62	-21	707	0	0.3	0.6	0.7
6203601	99	P	SUR	34	-15	702	0	0.3	0.7	0.7
6203607	99	P	SUR	33	-30	716	0	0.3	0.1	0.3
6203608	99	P	SUR	48	-6	718	0	0.4	0.3	0.5
6203609	99	P	SUR	42	-15	717	0	0.3	0.0	0.3
6203610	99	P	SUR	49	-5	274	0	0.3	0.5	0.6
6203706	99	P	SUR	28	-63	720	0	0.5	0.1	0.5
6203707	99	P	SUR	30	-31	718	0	0.4	0.2	0.4
6203708	99	P	SUR	27	-38	718	0	0.5	0.2	0.6
6203710	99	P	SUR	63	-14	719	0	0.4	0.1	0.4
6203711	99	P	SUR	64	-22	171	1	3.9	-1.0	4.0
6203715	99	P	SUR	73	25	718	0	0.4	0.3	0.5
6203719	99	P	SUR	74	9	154	0	0.4	0.2	0.4
62050	99	P	SUR	50	-4	762	0	0.3	0.3	0.5
62081	99	P	SUR	51	-13	766	0	0.4	-0.1	0.4
62091	99	P	SUR	53	-5	719	0	0.4	-0.1	0.4
62092	99	P	SUR	51	-11	719	0	0.4	-0.2	0.4
62093	99	P	SUR	55	-10	719	0	0.4	-0.2	0.4
62094	99	P	SUR	52	-7	719	0	0.4	0.1	0.4
62095	99	P	SUR	53	-16	719	0	0.4	-0.4	0.6
62102	99	P	SUR	58	2	764	0	0.6	0.4	0.8
62103	99	P	SUR	50	-3	762	0	0.4	0.6	0.7
62104	99	P	SUR	57	1	764	0	0.4	0.2	0.5
62105	99	P	SUR	55	-13	1349	0	0.3	-0.2	0.4
62107	99	P	SUR	50	-6	1337	0	0.6	0.5	0.8
62112	99	P	SUR	58	0	713	0	0.4	0.4	0.6

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62113	99	P	SUR	58	0	763	0	0.5	0.2	0.5
62114	99	P	SUR	58	0	1333	0	0.5	0.3	0.6
62115	99	P	SUR	58	-3	753	0	0.3	0.1	0.4
62116	99	P	SUR	58	1	763	0	0.4	0.2	0.5
62118	99	P	SUR	58	1	764	0	0.3	0.6	0.7
62119	99	P	SUR	57	2	764	0	0.3	0.3	0.4
62120	99	P	SUR	56	2	764	0	0.4	0.1	0.4
62121	99	P	SUR	54	3	764	0	0.4	0.5	0.6
62122	99	P	SUR	57	2	1335	0	0.4	0.3	0.5
62124	99	P	SUR	54	-4	764	0	0.3	0.2	0.3
62127	99	P	SUR	54	1	764	0	0.3	0.8	0.8
62129	99	P	SUR	58	0	763	0	0.4	0.2	0.5
62130	99	P	SUR	59	1	747	0	0.5	0.0	0.5
62131	99	P	SUR	54	1	764	0	0.3	0.6	0.7
62132	99	P	SUR	56	2	547	0	0.4	0.6	0.7
62133	99	P	SUR	57	1	762	0	0.5	0.3	0.6
62134	99	P	SUR	58	1	764	0	0.3	0.8	0.8
62135	99	P	SUR	54	2	646	0	0.3	0.5	0.6
62136	99	P	SUR	54	3	632	0	0.3	0.7	0.8
62138	99	P	SUR	54	0	1307	0	0.4	1.0	1.1
62140	99	P	SUR	57	1	798	0	0.5	0.3	0.6
62141	99	P	SUR	58	-4	762	0	0.5	-2.1	2.2
62143	99	P	SUR	58	2	764	0	0.4	1.1	1.1
62144	99	P	SUR	53	2	764	0	0.3	0.5	0.6
62145	99	P	SUR	53	3	1335	0	0.3	0.6	0.7
62146	99	P	SUR	57	2	764	0	0.4	0.3	0.5
62148	99	P	SUR	54	2	764	0	0.4	0.7	0.8
62149	99	P	SUR	54	1	764	0	0.3	0.9	0.9
62150	99	P	SUR	54	1	764	0	0.4	1.5	1.6
62151	99	P	SUR	57	2	1333	0	0.4	0.4	0.5
62152	99	P	SUR	57	2	748	0	0.3	0.6	0.7
62153	99	P	SUR	57	2	1334	0	0.4	0.5	0.6
62154	99	P	SUR	56	2	764	0	0.3	0.2	0.4
62155	99	P	SUR	58	1	764	0	0.3	0.6	0.7
62157	99	P	SUR	58	0	746	0	0.4	0.1	0.4
62160	99	P	SUR	57	2	1334	0	0.4	0.5	0.6
62161	99	P	SUR	58	1	730	0	0.5	0.1	0.5
62162	99	P	SUR	57	1	764	0	0.4	0.2	0.4
62163	99	P	SUR	48	-8	725	0	0.4	0.4	0.5
62165	99	P	SUR	54	1	764	0	0.4	0.8	0.8
62168	99	P	SUR	58	1	764	0	0.3	0.2	0.4
62296	99	P	SUR	53	2	747	0	0.3	0.3	0.4
62297	99	P	SUR	59	2	1304	0	0.4	0.2	0.5

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62302	99	P	SUR	61	-2	743	0	0.5	-0.0	0.5
62304	99	P	SUR	51	2	614	0	0.4	0.2	0.5
62305	99	P	SUR	50	0	761	0	0.4	0.4	0.5
62442	99	P	SUR	49	-16	634	0	0.3	0.2	0.4
6301504	99	P	SUR	81	39	699	1	0.9	0.1	0.9
6301505	99	P	SUR	82	3	719	0	0.4	-0.0	0.4
6301538	99	P	SUR	76	14	107	0	0.4	-0.2	0.4
6301539	99	P	SUR	76	14	105	0	0.4	-0.3	0.5
6301540	99	P	SUR	77	14	125	0	0.4	-0.1	0.4
6301541	99	P	SUR	76	14	79	0	0.4	-0.0	0.4
6301542	99	P	SUR	76	14	106	0	0.4	-0.3	0.5
6301543	99	P	SUR	74	22	14	0	0.3	-0.4	0.5
6301544	99	P	SUR	74	22	12	0	0.2	-0.4	0.5
6301545	99	P	SUR	74	22	12	0	0.3	-0.5	0.5
6301547	99	P	SUR	74	22	15	0	0.3	-0.3	0.4
6301548	99	P	SUR	77	15	53	0	0.5	-0.3	0.6
6301549	99	P	SUR	76	14	109	0	0.4	-0.4	0.5
6301558	99	P	SUR	66	-15	708	0	0.5	0.4	0.6
6301562	99	P	SUR	58	-55	703	0	0.4	0.0	0.4
6301563	99	P	SUR	57	-57	703	0	0.5	0.7	0.9
6301564	99	P	SUR	63	-16	710	0	0.3	0.4	0.5
6301681	99	P	SUR	73	5	717	0	0.4	0.0	0.4
6301682	99	P	SUR	71	-4	720	0	0.8	0.6	1.0
6301683	99	P	SUR	77	15	57	0	0.5	-0.7	0.9
6301684	99	P	SUR	77	15	51	0	0.5	-0.7	0.8
6301685	99	P	SUR	77	15	55	0	0.5	-0.6	0.8
6301686	99	P	SUR	77	15	44	0	0.6	-0.6	0.8
6301687	99	P	SUR	77	15	51	0	0.5	-0.4	0.7
6301688	99	P	SUR	74	22	14	0	0.3	-0.5	0.5
6301689	99	P	SUR	77	15	58	0	0.6	-0.9	1.0
6301690	99	P	SUR	77	15	59	0	0.5	-0.5	0.8
63055	99	P	SUR	61	2	748	0	0.5	0.2	0.5
63056	99	P	SUR	60	2	764	0	0.5	0.4	0.7
63057	99	P	SUR	59	2	762	0	0.4	0.1	0.5
63058	99	P	SUR	53	2	2132	0	0.3	0.5	0.6
63059	99	P	SUR	58	-1	748	0	0.4	0.5	0.6
63101	99	P	SUR	61	1	764	0	0.5	0.2	0.6
63102	99	P	SUR	61	1	748	0	0.5	0.3	0.6
63103	99	P	SUR	61	1	763	0	0.4	0.4	0.5
63104	99	P	SUR	61	2	764	0	0.5	0.0	0.5
63108	99	P	SUR	61	2	748	0	0.5	0.2	0.5
63109	99	P	SUR	60	2	764	0	0.4	-0.2	0.5
63110	99	P	SUR	60	2	764	0	0.6	0.0	0.6

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
63111	99	P	SUR	61	2	1305	0	0.5	-0.2	0.5
63112	99	P	SUR	61	1	764	0	0.4	-0.2	0.5
63115	99	P	SUR	62	1	764	0	0.5	0.3	0.5
63117	99	P	SUR	61	1	1335	0	0.5	0.5	0.7
63118	99	P	SUR	57	2	1322	0	0.4	0.1	0.4
63120	99	P	SUR	54	2	725	0	0.3	0.7	0.8
6401502	99	P	SUR	73	12	688	0	0.4	0.2	0.5
6401503	99	P	SUR	66	4	474	0	0.4	0.5	0.6
6401506	99	P	SUR	69	0	648	0	0.4	0.2	0.4
6401531	99	P	SUR	59	-39	718	0	0.5	0.1	0.5
6401556	99	P	SUR	72	17	704	0	0.3	0.1	0.4
6401561	99	P	SUR	66	0	589	9	1.7	-0.4	1.8
6401565	99	P	SUR	71	30	705	0	0.5	0.1	0.5
6401568	99	P	SUR	62	-6	717	0	0.3	0.3	0.4
6401569	99	P	SUR	65	1	718	0	0.4	0.3	0.5
6401570	99	P	SUR	69	11	704	0	0.3	0.0	0.3
6401784	99	P	SUR	77	14	505	0	0.3	-0.0	0.3
6401785	99	P	SUR	77	14	127	0	0.4	0.1	0.4
6401786	99	P	SUR	77	14	125	0	0.4	0.1	0.4
6401787	99	P	SUR	77	14	128	0	0.4	0.1	0.4
6401788	99	P	SUR	77	14	127	0	0.4	0.0	0.4
6401789	99	P	SUR	74	22	13	0	0.3	-0.7	0.7
6401795	99	P	SUR	74	22	13	0	0.2	-0.4	0.5
6401796	99	P	SUR	74	22	13	0	0.3	-0.5	0.6
6401797	99	P	SUR	74	22	13	0	0.4	-0.4	0.6
6401798	99	P	SUR	74	22	11	0	0.2	-0.3	0.4
6401799	99	P	SUR	76	14	107	0	0.4	-0.3	0.5
6401800	99	P	SUR	77	14	124	0	0.4	-0.1	0.4
6401801	99	P	SUR	76	14	104	0	0.4	-0.2	0.5
6401802	99	P	SUR	76	14	102	0	0.4	-0.3	0.5
6401803	99	P	SUR	77	14	127	0	0.4	0.3	0.5
6401804	99	P	SUR	74	22	14	0	0.3	-0.5	0.6
6401805	99	P	SUR	74	22	15	0	0.3	-0.6	0.7
6401806	99	P	SUR	74	22	12	0	0.3	-0.6	0.7
6401807	99	P	SUR	74	22	13	0	0.3	-0.6	0.7
6401808	99	P	SUR	74	22	12	0	0.3	-0.6	0.7
64041	99	P	SUR	61	-3	764	0	0.5	0.0	0.5
64045	99	P	SUR	59	-12	1037	0	0.4	-0.2	0.5
64046	99	P	SUR	61	-4	762	0	0.4	-0.1	0.4
6501556	99	P	SUR	73	10	711	0	0.4	0.1	0.4
66023	99	P	SUR	55	11	745	0	0.3	0.1	0.3

#### 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 : SEP 2019  
 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
0062087	99	SPEED	SUR	55	7	365	0	0	1.4	1.5	2.0
0066022	99	SPEED	SUR	54	14	230	0	0	1.3	0.3	1.3
0066023	99	SPEED	SUR	55	11	371	0	0	1.6	2.3	2.8
0066024	99	SPEED	SUR	55	13	70	0	0	1.1	0.8	1.4
0640046	99	SPEED	SUR	60	-4	716	0	0	1.1	-0.9	1.5
1300001	99	SPEED	SUR	11	-23	692	0	0	1.3	0.2	1.3
1300002	99	SPEED	SUR	20	-23	647	0	0	0.8	0.2	0.8
1300008	99	SPEED	SUR	15	-38	704	0	0	1.3	0.5	1.4
1300131	99	SPEED	SUR	28	-17	713	0	0	1.9	2.1	2.8
3732621	99	SPEED	SUR	35	25	19	0	0	1.2	1.4	1.9
4100026	99	SPEED	SUR	12	-38	257	0	0	1.6	0.3	1.7
4100040	99	SPEED	SUR	15	-53	4186	0	0	1.2	0.1	1.2
4100043	99	SPEED	SUR	21	-65	4188	0	0	1.3	-0.1	1.3
4100044	99	SPEED	SUR	22	-59	4230	0	0	1.0	0.2	1.1
4100046	99	SPEED	SUR	24	-68	4085	0	0	1.4	0.2	1.4
4100048	99	SPEED	SUR	32	-70	4255	0	0	1.2	0.2	1.2
4100049	99	SPEED	SUR	27	-63	4263	0	0	1.5	0.0	1.5
4100053	99	SPEED	SUR	18	-66	4256	0	0	1.4	1.1	1.8
4100056	99	SPEED	SUR	18	-65	4297	0	0	1.4	-0.7	1.5
4100139	99	SPEED	SUR	20	-38	700	0	0	0.8	-0.1	0.8
4100300	99	SPEED	SUR	16	-57	683	0	0	1.1	-0.3	1.1
41026	99	SPEED	SUR	12	-38	192	0	0	1.6	0.3	1.6
41040	99	SPEED	SUR	15	-53	1230	0	0	1.2	-0.2	1.3
41043	99	SPEED	SUR	21	-65	1239	0	0	1.4	-0.1	1.4
41044	99	SPEED	SUR	22	-59	1190	0	0	1.1	-0.0	1.1
41046	99	SPEED	SUR	24	-68	1199	0	0	1.4	0.2	1.5
41048	99	SPEED	SUR	32	-70	1181	1	0	1.4	0.0	1.4
41049	99	SPEED	SUR	28	-63	1343	0	0	1.6	-0.0	1.6
41053	99	SPEED	SUR	19	-66	1562	0	0	1.5	0.6	1.6
41056	99	SPEED	SUR	18	-66	1537	0	0	1.4	-0.5	1.5
41300	99	SPEED	SUR	16	-58	523	0	0	1.1	-0.2	1.2
4200059	99	SPEED	SUR	15	-67	4037	0	0	1.1	0.6	1.3
4200085	99	SPEED	SUR	18	-67	4141	0	0	1.4	-0.2	1.4
42059	99	SPEED	SUR	15	-68	1252	0	0	1.2	0.5	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
42085	99	SPEED	SUR	18	-67	1599	0	0	1.4	0.0	1.4
4400005	99	SPEED	SUR	43	-69	716	0	0	1.2	-0.3	1.2
4400008	99	SPEED	SUR	41	-69	4304	0	0	1.5	0.3	1.5
4400011	99	SPEED	SUR	41	-67	1722	0	0	1.5	-0.1	1.5
4400027	99	SPEED	SUR	44	-67	718	0	0	1.2	-0.4	1.2
4400032	99	SPEED	SUR	44	-69	718	0	0	1.3	-0.5	1.4
4400033	99	SPEED	SUR	44	-69	718	0	0	1.5	-0.3	1.5
4400034	99	SPEED	SUR	44	-68	716	0	0	1.5	-1.0	1.8
4400037	99	SPEED	SUR	43	-68	708	0	0	1.0	-0.1	1.0
44005	99	SPEED	SUR	43	-69	776	0	0	1.2	-0.2	1.2
44008	99	SPEED	SUR	41	-69	1568	0	0	1.4	-0.2	1.4
44011	99	SPEED	SUR	41	-67	534	1	0	1.6	-0.5	1.6
44027	99	SPEED	SUR	44	-67	778	0	0	1.2	-0.4	1.2
44032	99	SPEED	SUR	44	-69	729	0	0	1.3	-0.4	1.4
44033	99	SPEED	SUR	44	-69	729	0	0	1.5	-0.0	1.5
44034	99	SPEED	SUR	44	-68	727	0	0	1.5	-1.0	1.8
44037	99	SPEED	SUR	44	-68	717	0	0	1.1	-0.0	1.1
44139	99	SPEED	SUR	44	-57	712	0	0	1.2	-0.1	1.2
44150	99	SPEED	SUR	43	-64	706	0	0	1.3	0.2	1.3
44258	99	SPEED	SUR	45	-63	712	0	0	1.6	0.2	1.6
45138	99	SPEED	SUR	50	-66	712	0	0	1.5	-0.0	1.5
6100001	99	SPEED	SUR	43	8	677	0	0	1.8	-0.2	1.9
6100002	99	SPEED	SUR	42	5	561	0	0	1.5	0.1	1.5
61001	99	SPEED	SUR	43	8	518	0	0	2.0	-0.6	2.1
6100196	99	SPEED	SUR	42	4	690	0	0	1.6	-0.5	1.7
6100197	99	SPEED	SUR	40	4	665	0	0	1.4	-0.2	1.4
6100198	99	SPEED	SUR	37	-2	698	0	0	1.8	-0.5	1.8
61002	99	SPEED	SUR	42	5	479	0	0	1.7	-0.4	1.8
6100280	99	SPEED	SUR	41	1	697	0	0	1.6	-0.5	1.7
6100281	99	SPEED	SUR	40	0	708	0	0	2.0	0.3	2.0
6100417	99	SPEED	SUR	38	0	698	0	0	1.4	-0.2	1.4
6100430	99	SPEED	SUR	40	2	705	0	0	1.9	0.2	2.0
6101001	99	SPEED	SUR	38	24	177	0	0	3.8	-1.4	4.1
6101003	99	SPEED	SUR	40	25	229	0	0	3.6	-4.7	5.9
6101005	99	SPEED	SUR	38	26	236	0	0	1.3	-0.4	1.4
6101007	99	SPEED	SUR	36	25	3	0	0	0.9	0.2	0.9
6101008	99	SPEED	SUR	37	22	59	0	0	1.6	-0.2	1.6
6101009	99	SPEED	SUR	35	25	217	0	0	1.1	1.3	1.7
6200024	99	SPEED	SUR	44	-3	712	0	0	1.4	-0.1	1.4
6200025	99	SPEED	SUR	44	-6	603	0	0	1.3	-0.4	1.4
6200082	99	SPEED	SUR	44	-8	715	0	0	0.9	-0.4	1.0

## DRIFTER MONITORING STATISTICS (EUCOS)

MONITORING CENTRE : ECMWF

ELEMENT MONITORED : WIND SPEED (M/S)

(CONTINU

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
6200083	99	SPEED	SUR	43	-9	715	0	0	1.1	-1.0	1.4
6200084	99	SPEED	SUR	42	-9	712	0	0	1.2	-0.4	1.3
6200085	99	SPEED	SUR	36	-7	703	0	0	1.5	-0.3	1.5
6200091	99	SPEED	SUR	53	-5	719	0	0	1.2	0.0	1.2
6200092	99	SPEED	SUR	51	-11	719	0	0	0.9	-0.2	0.9
6200093	99	SPEED	SUR	55	-10	719	0	0	1.1	-0.2	1.1
6200094	99	SPEED	SUR	52	-7	719	0	0	1.0	0.2	1.0
6200095	99	SPEED	SUR	53	-16	719	0	0	1.1	-0.3	1.1
62001	99	SPEED	SUR	45	-5	763	0	0	1.0	0.8	1.3
6200191	99	SPEED	SUR	41	-10	351	0	0	1.0	0.0	1.0
6200192	99	SPEED	SUR	40	-10	612	0	0	1.1	-0.2	1.1
6200200	99	SPEED	SUR	36	-8	494	0	0	1.4	0.2	1.4
6201030	99	SPEED	SUR	44	-4	701	0	0	1.3	-0.1	1.3
62023	99	SPEED	SUR	51	-8	668	0	0	1.5	0.5	1.5
6202670	99	SPEED	SUR	58	-20	115	0	0	1.2	2.9	3.1
6202671	99	SPEED	SUR	57	-17	115	0	0	1.0	3.2	3.3
6202672	99	SPEED	SUR	60	-16	115	0	0	1.4	2.9	3.2
6202673	99	SPEED	SUR	61	-22	116	0	0	1.0	3.5	3.7
6202674	99	SPEED	SUR	59	-21	114	0	0	1.3	3.6	3.8
62029	99	SPEED	SUR	49	-12	1325	0	0	0.9	0.3	1.0
62050	99	SPEED	SUR	50	-4	762	0	0	1.2	0.4	1.2
62081	99	SPEED	SUR	51	-13	766	0	0	1.1	0.4	1.2
62091	99	SPEED	SUR	53	-5	719	0	0	1.2	0.1	1.2
62092	99	SPEED	SUR	51	-11	719	0	0	1.0	-0.1	1.0
62093	99	SPEED	SUR	55	-10	719	0	0	1.1	-0.2	1.1
62094	99	SPEED	SUR	52	-7	719	0	0	1.0	0.2	1.0
62095	99	SPEED	SUR	53	-16	719	0	0	1.2	-0.4	1.2
62102	99	SPEED	SUR	58	2	764	0	0	2.1	-1.0	2.3
62103	99	SPEED	SUR	50	-3	746	0	0	1.3	1.2	1.8
62104	99	SPEED	SUR	57	1	764	0	0	1.3	-0.2	1.3
62105	99	SPEED	SUR	55	-13	1349	0	0	0.9	0.1	0.9
62107	99	SPEED	SUR	50	-6	1337	0	0	1.4	0.8	1.6
62112	99	SPEED	SUR	58	0	713	0	0	1.7	-0.5	1.8
62113	99	SPEED	SUR	58	0	763	0	0	1.7	0.3	1.7
62114	99	SPEED	SUR	58	0	1333	0	0	1.7	1.0	2.0
62118	99	SPEED	SUR	58	1	764	0	0	1.5	0.7	1.7
62119	99	SPEED	SUR	57	2	764	0	0	1.4	-0.5	1.5
62120	99	SPEED	SUR	56	2	764	0	0	1.3	-0.4	1.4
62121	99	SPEED	SUR	54	3	3	0	0	1.3	1.2	1.8
62122	99	SPEED	SUR	57	2	1335	0	0	1.2	-0.1	1.2
62129	99	SPEED	SUR	58	0	763	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
62131	99	SPEED	SUR	54	1	764	0	0	1.4	-0.0	1.4
62132	99	SPEED	SUR	56	2	546	0	0	2.2	-1.5	2.7
62133	99	SPEED	SUR	57	1	762	0	0	1.5	0.2	1.6
62134	99	SPEED	SUR	58	1	764	0	0	1.4	-0.1	1.5
62140	99	SPEED	SUR	57	1	1313	0	0	1.3	0.0	1.3
62143	99	SPEED	SUR	58	2	764	0	0	2.2	-1.0	2.4
62144	99	SPEED	SUR	53	2	764	0	0	1.7	-0.6	1.8
62145	99	SPEED	SUR	53	3	1335	0	0	1.2	0.1	1.2
62146	99	SPEED	SUR	57	2	370	0	0	1.5	-0.1	1.5
62148	99	SPEED	SUR	54	2	764	0	0	1.5	-0.5	1.6
62149	99	SPEED	SUR	54	1	764	0	0	2.1	-0.7	2.2
62150	99	SPEED	SUR	54	1	764	0	0	2.5	-0.9	2.7
62152	99	SPEED	SUR	57	2	748	0	0	1.5	-1.1	1.9
62153	99	SPEED	SUR	57	2	1334	0	0	2.7	-1.5	3.1
62154	99	SPEED	SUR	56	2	755	0	0	1.3	-0.5	1.4
62155	99	SPEED	SUR	58	1	735	0	0	1.5	-0.0	1.5
62163	99	SPEED	SUR	48	-8	725	0	0	0.9	0.1	0.9
62165	99	SPEED	SUR	54	1	764	0	0	1.4	-0.4	1.5
62304	99	SPEED	SUR	51	2	614	0	0	1.6	1.7	2.3
62305	99	SPEED	SUR	50	0	758	0	0	2.0	0.9	2.2
62442	99	SPEED	SUR	49	-16	634	0	0	1.1	0.2	1.1
63055	99	SPEED	SUR	61	2	748	0	0	1.4	-1.1	1.8
63056	99	SPEED	SUR	60	2	764	0	0	1.2	-0.3	1.2
63057	99	SPEED	SUR	59	2	762	0	0	1.9	0.0	1.9
63058	99	SPEED	SUR	53	2	1428	0	0	1.1	-0.1	1.1
63101	99	SPEED	SUR	61	1	764	0	0	1.3	-0.4	1.4
63103	99	SPEED	SUR	61	1	763	0	0	1.4	-0.2	1.4
63104	99	SPEED	SUR	61	2	764	0	0	1.3	-0.2	1.3
63108	99	SPEED	SUR	61	2	748	0	0	1.5	-0.1	1.5
63109	99	SPEED	SUR	60	2	758	0	0	1.2	-0.0	1.2
63110	99	SPEED	SUR	60	2	764	0	0	1.6	-0.3	1.6
63112	99	SPEED	SUR	61	1	764	0	0	1.3	-0.5	1.4
63113	99	SPEED	SUR	61	2	764	0	0	1.4	-0.5	1.5
63115	99	SPEED	SUR	62	1	764	0	0	1.3	-0.2	1.3
63117	99	SPEED	SUR	61	1	1335	0	0	1.4	-0.4	1.4
64041	99	SPEED	SUR	61	-3	764	0	0	1.4	-0.1	1.4
64045	99	SPEED	SUR	59	-12	1037	0	0	1.2	0.2	1.3
64046	99	SPEED	SUR	61	-4	762	0	0	1.0	0.4	1.1
66022	99	SPEED	SUR	54	14	925	0	0	1.3	0.2	1.3
66023	99	SPEED	SUR	55	11	745	0	0	1.5	1.6	2.2
66024	99	SPEED	SUR	55	13	719	0	0	1.4	0.9	1.6



### 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 : SEP 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
0640046	99	DIRN	SUR	60	-4	658	0	0	11.1	1.0	11.1
1300001	99	DIRN	SUR	11	-23	372	0	0	23.4	1.8	23.5
1300002	99	DIRN	SUR	20	-23	647	0	0	8.9	1.6	9.1
1300008	99	DIRN	SUR	15	-38	630	0	0	14.4	8.3	16.6
1300131	99	DIRN	SUR	28	-17	452	0	0	19.1	1.9	19.2
4100001	99	DIRN	SUR	35	-73	2864	0	0	18.3	6.6	19.4
4100002	99	DIRN	SUR	32	-75	3906	0	0	11.5	5.4	12.7
4100004	99	DIRN	SUR	33	-79	3535	3	0	12.9	6.5	14.5
4100008	99	DIRN	SUR	31	-81	646	0	0	13.6	-5.0	14.5
4100009	99	DIRN	SUR	29	-80	3766	0	0	11.3	7.1	13.4
4100010	99	DIRN	SUR	29	-78	3591	0	0	9.4	10.7	14.2
4100013	99	DIRN	SUR	33	-78	3192	0	0	12.9	6.5	14.5
4100024	99	DIRN	SUR	34	-78	1024	0	0	19.5	-6.8	20.7
4100025	99	DIRN	SUR	35	-75	2773	0	0	20.1	7.6	21.5
4100026	99	DIRN	SUR	12	-38	186	0	0	24.7	9.0	26.3
4100029	99	DIRN	SUR	33	-80	1060	14	0	14.8	-16.9	22.5
4100033	99	DIRN	SUR	32	-80	635	0	0	15.5	-14.8	21.5
4100037	99	DIRN	SUR	34	-77	551	0	0	16.4	-13.2	21.0
4100038	99	DIRN	SUR	34	-78	1041	0	0	16.4	-1.1	16.5
4100040	99	DIRN	SUR	15	-53	3085	0	0	15.3	5.6	16.3
4100043	99	DIRN	SUR	21	-65	3469	0	0	20.6	-13.0	24.3
4100044	99	DIRN	SUR	22	-59	3686	0	0	14.9	4.1	15.5
4100046	99	DIRN	SUR	24	-68	3259	0	0	26.2	8.0	27.4
4100047	99	DIRN	SUR	28	-71	3872	0	0	13.5	-7.4	15.4
4100048	99	DIRN	SUR	32	-70	3801	0	0	14.2	7.5	16.1
4100049	99	DIRN	SUR	27	-63	3151	0	0	25.0	4.6	25.4
4100053	99	DIRN	SUR	18	-66	1657	0	0	23.6	3.9	23.9
4100056	99	DIRN	SUR	18	-65	3300	0	0	22.9	2.2	23.0
4100064	99	DIRN	SUR	34	-77	539	0	0	14.1	-19.2	23.8
41001	99	DIRN	SUR	35	-73	769	0	0	18.2	6.3	19.3
4100139	99	DIRN	SUR	20	-38	677	0	0	9.4	5.4	10.8
41002	99	DIRN	SUR	32	-75	1015	0	0	12.3	7.1	14.2

## 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
4100300	99	DIRN	SUR	16	-57	527	0	0	20.7	1.2	20.7
41004	99	DIRN	SUR	33	-79	947	3	0	13.7	6.1	15.0
41008	99	DIRN	SUR	31	-81	686	0	0	13.5	-5.9	14.7
41009	99	DIRN	SUR	29	-80	1053	0	0	12.1	6.4	13.7
41010	99	DIRN	SUR	29	-79	1042	0	0	9.9	11.2	14.9
41013	99	DIRN	SUR	33	-78	889	0	0	13.4	5.6	14.6
41024	99	DIRN	SUR	34	-79	557	0	0	20.1	-6.9	21.2
41025	99	DIRN	SUR	35	-75	790	0	0	19.3	8.3	21.0
41026	99	DIRN	SUR	12	-38	122	0	0	23.9	6.8	24.8
41029	99	DIRN	SUR	33	-80	707	3	0	13.9	-16.9	21.8
41033	99	DIRN	SUR	32	-80	631	0	0	15.5	-14.9	21.5
41037	99	DIRN	SUR	34	-77	550	0	0	16.9	-13.8	21.9
41038	99	DIRN	SUR	34	-78	583	0	0	16.8	-3.1	17.1
41040	99	DIRN	SUR	15	-53	865	0	0	16.4	7.4	18.0
41043	99	DIRN	SUR	21	-65	1016	0	0	21.5	-14.3	25.8
41044	99	DIRN	SUR	22	-59	988	0	0	14.1	3.0	14.4
41046	99	DIRN	SUR	24	-68	933	0	0	27.2	7.6	28.2
41047	99	DIRN	SUR	28	-72	1062	0	0	12.3	-9.0	15.2
41048	99	DIRN	SUR	32	-70	1041	1	0	14.0	7.4	15.8
41049	99	DIRN	SUR	28	-63	959	0	0	23.3	5.0	23.8
41053	99	DIRN	SUR	19	-66	719	0	0	22.5	3.3	22.8
41056	99	DIRN	SUR	18	-66	1120	0	0	24.9	3.8	25.1
41064	99	DIRN	SUR	34	-77	527	0	0	14.1	-19.6	24.2
41300	99	DIRN	SUR	16	-58	414	0	0	17.4	2.0	17.5
4200013	99	DIRN	SUR	27	-83	790	0	0	116.9	-25.8	119.7
4200022	99	DIRN	SUR	28	-84	1160	0	0	12.1	-0.3	12.1
4200023	99	DIRN	SUR	26	-83	1185	0	0	15.3	-7.0	16.9
4200026	99	DIRN	SUR	25	-83	1015	0	0	14.1	1.0	14.2
4200036	99	DIRN	SUR	29	-85	3297	0	0	12.6	10.5	16.3
4200056	99	DIRN	SUR	20	-85	3174	0	0	15.7	2.3	15.9
4200057	99	DIRN	SUR	17	-81	2665	0	0	16.2	4.0	16.7
4200058	99	DIRN	SUR	15	-75	3133	0	0	11.3	4.3	12.2
4200059	99	DIRN	SUR	15	-67	3895	0	0	13.7	-7.7	15.7
4200085	99	DIRN	SUR	18	-67	3005	0	0	29.1	21.7	36.2
42013	99	DIRN	SUR	27	-83	762	0	0	115.1	-27.8	118.4
42022	99	DIRN	SUR	28	-84	1114	0	0	12.2	-0.5	12.2
42023	99	DIRN	SUR	26	-83	1045	0	0	15.5	-6.9	17.0
42026	99	DIRN	SUR	25	-84	987	0	0	14.6	0.5	14.6
42036	99	DIRN	SUR	29	-85	1146	0	0	12.5	10.4	16.2
42056	99	DIRN	SUR	20	-85	1113	0	0	15.4	1.5	15.4
42057	99	DIRN	SUR	17	-81	589	0	0	14.6	5.8	15.7

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
42058	99	DIRN	SUR	15	-75	894	0	0	12.6	1.7	12.8
42059	99	DIRN	SUR	15	-68	1184	0	0	14.5	-8.6	16.8
42085	99	DIRN	SUR	18	-67	1076	0	0	26.8	18.8	32.8
4400005	99	DIRN	SUR	43	-69	565	0	0	13.6	9.5	16.6
4400007	99	DIRN	SUR	44	-70	507	0	0	20.2	1.7	20.3
4400008	99	DIRN	SUR	41	-69	3630	0	0	18.2	6.6	19.3
4400009	99	DIRN	SUR	38	-75	554	0	0	14.6	12.8	19.4
4400011	99	DIRN	SUR	41	-67	1126	0	0	23.9	9.4	25.7
4400013	99	DIRN	SUR	42	-71	592	0	0	20.0	10.7	22.7
4400014	99	DIRN	SUR	37	-75	504	0	0	13.3	2.5	13.6
4400018	99	DIRN	SUR	42	-70	559	0	0	15.1	11.9	19.2
4400020	99	DIRN	SUR	41	-70	1916	0	0	14.2	-0.4	14.2
4400022	99	DIRN	SUR	41	-74	83	0	0	20.6	-3.2	20.9
4400025	99	DIRN	SUR	40	-73	604	0	0	12.8	0.6	12.9
4400027	99	DIRN	SUR	44	-67	549	0	0	16.5	7.2	18.0
4400029	99	DIRN	SUR	43	-71	580	0	0	14.2	3.2	14.6
4400030	99	DIRN	SUR	43	-70	535	0	0	17.5	3.5	17.9
4400032	99	DIRN	SUR	44	-69	526	0	0	15.4	5.3	16.3
4400033	99	DIRN	SUR	44	-69	452	0	0	22.3	1.6	22.3
4400034	99	DIRN	SUR	44	-68	481	0	0	18.2	8.0	19.9
4400037	99	DIRN	SUR	43	-68	604	0	0	13.5	3.8	14.1
4400040	99	DIRN	SUR	41	-74	60	0	0	20.3	-7.7	21.7
4400042	99	DIRN	SUR	38	-76	4671	0	0	23.6	-1.0	23.6
4400058	99	DIRN	SUR	38	-76	1311	0	0	24.5	-6.2	25.3
4400062	99	DIRN	SUR	39	-76	2333	0	0	28.5	-15.5	32.4
4400063	99	DIRN	SUR	39	-76	3445	0	0	25.4	-23.4	34.5
4400064	99	DIRN	SUR	37	-76	3031	0	0	16.4	-14.9	22.1
4400065	99	DIRN	SUR	40	-74	3352	0	0	15.6	5.5	16.6
4400066	99	DIRN	SUR	40	-73	3721	0	0	12.4	5.4	13.5
4400072	99	DIRN	SUR	37	-76	2897	0	0	16.2	-76.5	78.2
44005	99	DIRN	SUR	43	-69	609	0	0	13.4	8.4	15.8
44007	99	DIRN	SUR	44	-70	558	0	0	20.0	1.1	20.0
44008	99	DIRN	SUR	41	-69	1274	0	0	16.9	3.2	17.2
44009	99	DIRN	SUR	39	-75	560	0	0	14.4	12.5	19.1
44011	99	DIRN	SUR	41	-67	316	1	0	22.7	8.6	24.3
44013	99	DIRN	SUR	42	-71	620	0	0	18.7	10.6	21.5
44014	99	DIRN	SUR	37	-75	514	0	0	13.1	1.9	13.2
44018	99	DIRN	SUR	42	-70	612	0	0	15.5	11.2	19.1
44020	99	DIRN	SUR	42	-70	871	0	0	15.5	-1.5	15.5
44022	99	DIRN	SUR	41	-74	36	0	0	21.3	-3.0	21.5
44025	99	DIRN	SUR	40	-73	653	0	0	12.8	0.1	12.8

## 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
44027	99	DIRN	SUR	44	-67	592	0	0	16.3	6.2	17.5
44029	99	DIRN	SUR	43	-71	594	0	0	14.9	3.2	15.2
44030	99	DIRN	SUR	43	-70	525	0	0	19.3	2.7	19.5
44032	99	DIRN	SUR	44	-69	518	0	0	16.6	4.7	17.2
44033	99	DIRN	SUR	44	-69	428	0	0	23.2	1.4	23.3
44034	99	DIRN	SUR	44	-68	453	0	0	17.0	7.2	18.5
44037	99	DIRN	SUR	44	-68	596	0	0	13.9	4.0	14.5
44040	99	DIRN	SUR	41	-74	36	0	0	20.5	-12.5	24.0
44042	99	DIRN	SUR	38	-76	1077	0	0	22.3	-2.1	22.4
44058	99	DIRN	SUR	38	-76	587	0	0	25.2	-5.8	25.9
44062	99	DIRN	SUR	39	-76	751	0	0	29.9	-15.6	33.7
44063	99	DIRN	SUR	39	-76	782	0	0	25.5	-24.0	35.0
44064	99	DIRN	SUR	37	-76	774	0	0	16.0	-16.9	23.2
44065	99	DIRN	SUR	40	-74	964	0	0	15.2	2.3	15.4
44066	99	DIRN	SUR	40	-73	1294	0	0	12.1	2.9	12.5
44069	99	DIRN	SUR	41	-73	587	0	0	18.0	-1.6	18.1
44072	99	DIRN	SUR	37	-76	801	1	0	16.8	-78.4	80.2
44139	99	DIRN	SUR	44	-57	627	0	0	11.4	-25.1	27.6
44150	99	DIRN	SUR	43	-64	601	0	0	16.2	-2.3	16.3
44258	99	DIRN	SUR	45	-63	594	0	0	13.9	-10.2	17.3
4500003	99	DIRN	SUR	45	-83	545	0	0	24.0	3.4	24.3
4500005	99	DIRN	SUR	42	-82	3341	0	0	24.1	6.0	24.8
4500008	99	DIRN	SUR	44	-82	3426	0	0	19.0	2.7	19.2
4500012	99	DIRN	SUR	44	-77	3138	0	0	18.0	8.0	19.7
4500162	99	DIRN	SUR	45	-83	184	0	0	22.8	6.4	23.7
4500163	99	DIRN	SUR	44	-84	1501	0	0	19.0	0.4	19.0
4500165	99	DIRN	SUR	42	-83	2933	0	0	31.7	7.3	32.6
4500166	99	DIRN	SUR	45	-73	1528	0	0	17.2	-39.5	43.1
4500169	99	DIRN	SUR	42	-82	3146	0	0	39.6	-14.4	42.1
4500175	99	DIRN	SUR	46	-85	2691	0	0	70.4	-21.0	73.5
4500176	99	DIRN	SUR	42	-82	1342	0	0	114.1	-12.7	114.8
45003	99	DIRN	SUR	45	-83	557	0	0	24.6	1.4	24.6
45005	99	DIRN	SUR	42	-82	926	0	0	23.4	3.3	23.7
45008	99	DIRN	SUR	44	-82	1206	0	0	19.6	3.0	19.8
45012	99	DIRN	SUR	44	-77	1017	0	0	19.4	3.6	19.7
45132	99	DIRN	SUR	43	-81	566	0	0	18.5	-3.8	18.8
45135	99	DIRN	SUR	44	-77	529	0	0	18.7	-0.3	18.7
45137	99	DIRN	SUR	46	-81	510	0	0	20.6	-6.2	21.5
45138	99	DIRN	SUR	50	-66	594	0	0	17.6	2.7	17.8
45139	99	DIRN	SUR	43	-80	278	0	0	14.6	-7.6	16.4
45142	99	DIRN	SUR	43	-79	532	0	0	21.1	-6.6	22.1

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
45143	99	DIRN	SUR	45	-81	533	0	0	18.5	-2.1	18.6
45149	99	DIRN	SUR	44	-82	498	0	0	23.3	22.9	32.7
45151	99	DIRN	SUR	45	-79	437	0	0	20.0	4.8	20.5
45152	99	DIRN	SUR	46	-80	385	0	0	17.0	-3.0	17.3
45154	99	DIRN	SUR	46	-83	419	0	0	15.5	1.0	15.5
45159	99	DIRN	SUR	44	-79	391	0	0	23.8	4.4	24.2
45162	99	DIRN	SUR	45	-83	102	0	0	21.6	7.3	22.8
45163	99	DIRN	SUR	44	-84	588	0	0	18.7	-0.4	18.7
45165	99	DIRN	SUR	42	-83	644	0	0	31.1	5.6	31.6
45166	99	DIRN	SUR	45	-73	519	0	0	16.9	-40.5	43.9
45169	99	DIRN	SUR	42	-82	690	0	0	40.6	-15.4	43.5
45175	99	DIRN	SUR	46	-85	617	0	0	73.8	-17.8	75.9
45176	99	DIRN	SUR	42	-82	551	0	0	112.6	-23.2	114.9
6100198	99	DIRN	SUR	37	-2	404	0	0	20.7	-2.0	20.8
6100281	99	DIRN	SUR	40	0	374	0	0	32.4	-2.9	32.5
6100417	99	DIRN	SUR	38	0	415	0	0	23.9	3.8	24.2
6200024	99	DIRN	SUR	44	-3	401	0	0	21.5	7.9	22.9
6200025	99	DIRN	SUR	44	-6	422	0	0	18.5	-2.0	18.6
6200082	99	DIRN	SUR	44	-8	697	0	0	9.7	7.5	12.3
6200083	99	DIRN	SUR	43	-9	671	0	0	10.8	0.0	10.8
6200084	99	DIRN	SUR	42	-9	463	0	0	13.2	2.3	13.4
6200085	99	DIRN	SUR	36	-7	357	0	0	16.4	3.5	16.7
6200091	99	DIRN	SUR	53	-5	583	0	0	13.7	4.0	14.2
6200092	99	DIRN	SUR	51	-11	689	0	0	10.3	6.7	12.3
6200093	99	DIRN	SUR	55	-10	589	0	0	10.9	2.2	11.1
6200094	99	DIRN	SUR	52	-7	643	0	0	9.4	-0.1	9.4
6200095	99	DIRN	SUR	53	-16	675	0	0	14.8	-3.7	15.3
62001	99	DIRN	SUR	45	-5	713	0	0	11.6	2.7	11.9
6200191	99	DIRN	SUR	41	-10	191	0	0	16.4	27.8	32.3
6200192	99	DIRN	SUR	40	-10	397	0	0	13.9	-3.8	14.4
6200200	99	DIRN	SUR	36	-8	347	0	0	18.1	6.9	19.4
6201030	99	DIRN	SUR	44	-4	448	0	0	17.8	-2.3	17.9
62023	99	DIRN	SUR	51	-8	644	0	0	10.6	11.1	15.4
6202670	99	DIRN	SUR	58	-20	103	0	0	35.9	-2.2	35.9
6202671	99	DIRN	SUR	57	-17	105	0	0	13.1	-4.3	13.8
6202672	99	DIRN	SUR	60	-16	79	0	0	16.8	1.0	16.9
6202673	99	DIRN	SUR	61	-22	109	0	0	12.0	-5.0	13.0
6202674	99	DIRN	SUR	59	-21	108	0	0	24.0	-16.8	29.3
62029	99	DIRN	SUR	49	-12	1185	0	0	10.6	6.7	12.5
62050	99	DIRN	SUR	50	-4	729	0	0	12.8	2.5	13.1
62081	99	DIRN	SUR	51	-13	716	0	0	10.9	6.2	12.5

## 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
62091	99	DIRN	SUR	53	-5	571	0	0	13.9	3.7	14.3
62092	99	DIRN	SUR	51	-11	680	0	0	10.6	6.2	12.2
62093	99	DIRN	SUR	55	-10	580	0	0	10.9	1.6	11.0
62094	99	DIRN	SUR	52	-7	636	0	0	10.5	-0.3	10.5
62095	99	DIRN	SUR	53	-16	672	0	0	14.9	-4.4	15.6
62103	99	DIRN	SUR	50	-3	708	0	0	15.2	5.0	16.0
62105	99	DIRN	SUR	55	-13	1218	0	0	10.0	6.9	12.2
62107	99	DIRN	SUR	50	-6	1306	0	0	12.6	1.6	12.7
62112	99	DIRN	SUR	58	0	656	0	0	11.3	-2.4	11.6
62114	99	DIRN	SUR	58	0	1261	0	0	12.1	-0.1	12.1
62163	99	DIRN	SUR	48	-8	658	0	0	9.9	-1.0	10.0
62305	99	DIRN	SUR	50	0	682	0	0	14.0	3.6	14.5
62442	99	DIRN	SUR	49	-16	567	0	0	11.0	-2.4	11.2
64041	99	DIRN	SUR	61	-3	721	0	0	11.2	7.9	13.8
64045	99	DIRN	SUR	59	-12	879	0	0	16.3	6.3	17.5
64046	99	DIRN	SUR	61	-4	698	0	0	11.0	-1.6	11.1

**4.12 Table 24 - List of Assimilated BUFR Encoded Radiosonde Stations**

	ASDE09	BPMWB2N	DBLK	DSQL7	DWDEASAP		FHM5UJH	FPUW5GN
HTXUH4H	JNKN7JF	KJJF9XN	KMPLHPW	WDK38HS	XKQLWQB	XQFJRGX	YLV96WM	ZVQEQCM
5QPW8XG	7JUNA4N	01001	01004	01010	01028	01241	01400	01415
01492	02185	02365	02527	02591	02836	02963	03005	03238
03354	03502	03743	03808	03882	03918	03953	04018	04220
04270	04320	04339	04360	04417	06011	06060	06260	06458
06610	07110	07145	07510	07645	07761	08001	08023	08190
08221	08302	08383	08430	08508	08522	08579	10035	10113
10184	10238	10304	10393	10410	10548	10618	10739	10771
10868	10954	10962	11010	11035	11120	11240	11520	11747
11952	12120	12374	12425	12843	12982	13275	13388	14015
14240	14430	15420	15614	16045	16080	16113	16144	16245
16320	16429	16546	16622	16716	16754	17030	17064	17095
17220	17240	17281	17516	17607	22008	23205	23472	23884
26038	26435	26850	27707	27713	33008	33041	37789	40179
40186	45004	47102	47104	47138	47155	47169	47186	47401
47412	47418	47582	47600	47646	47678	47741	47778	47807
47827	47909	47918	47945	47971	47991	48698	60018	60096
60390	60571	60630	60656	60680	61052	61901	61980	61998
63741	67083	68263	68424	68442	68538	68816	68842	70026
70133	70200	70219	70231	70261	70308	70316	70326	70350
70361	70398	71043	71081	71082	71109	71119	71603	71722
71802	71811	71815	71816	71836	71845	71867	71906	71907
71908	71909	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	72694	72712	72747	72764	72768
72776	72786	72797	73033	73110	74389	74494	74560	76225
76405	76458	76526	76612	76679	76692	76743	76805	76903
78897	81405	82765	82983	83525	83649	85442	85469	85586
85799	85934	87155	87344	87418	87576	87623	87715	87860
88889	89002	89062	89564	89571	89592	89611	89625	89642
89859	91212	91285	91592	91610	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	BPMWB2N	DBLK	DSQL7	DWDEASAP		FHM5UJH	FPUW5GN
HTXUH4H	JNKN7JF	KJJF9XN	KMPLHPW	OTREC_NU		STCZOTRE		WDK38HS
XKQLWQB	XQFJRGX	YLV96WM	ZVQEQCM	labtest	5QPW8XG	7JUNA4N	01001	01010
01028	01241	01400	01415	01492	02836	02963	06610	07110
07145	07510	07645	07761	17607	40186	47155	61998	73033
73110	76743	76903	89642	93817	94653	94767		



## 5 Annex - Explanations of figures and tables

### 5.1 General

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

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

### 5.2 Data Availability

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

### 5.3 Data Quality

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

It should be noted that:

- (i) all results are based on software that may undergo further development;
- (ii) although the quality of the ECMWF first-guess fields is of a generally high standard this is only true to a limited extent in the tropics, where small-scale processes such as convection are of much greater importance than in mid-latitudes, and the observations will sometimes not be representative of the scales of motion given by the first-guess;
- (iii) the first-guess fields themselves will vary in accuracy depending on the density and quality of data, particularly in the upstream regions and over Antarctica and the southern hemisphere mid-latitudes. Direct comparisons between stations (or airlines) should preferably be restricted to observations in a reasonably homogeneous climatic region.

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

standard pressure level are shown. Units of RMS, standard deviation and bias are hPa in tables 1 and 4, m in table 7 and  $\text{ms}^{-1}$  in tables 2, 5 and 8. In tables 7 and 8 the station position is indicated; in the case of TEMP Ships and PILOT Ships 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	$35\text{ms}^{-1}$
925	$35\text{ms}^{-1}$
850	$35\text{ms}^{-1}$
700	$40\text{ms}^{-1}$
500	$45\text{ms}^{-1}$
400	$50\text{ms}^{-1}$
300	$60\text{ms}^{-1}$
250	$60\text{ms}^{-1}$
200	$50\text{ms}^{-1}$
150	$50\text{ms}^{-1}$
100	$45\text{ms}^{-1}$

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.