



# ECMWF Global Data Monitoring Report

**November 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 coordinate 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	Oct	Nov	Ident	Time	Oct	Nov
02185	(00)	28	13	10035	(00)	2	30
04417	(00)	31	18	17516	(12)	0	13
04417	(12)	31	18	60715	(00)	18	29
17095	(12)	48	23	61660	(00)	30	58
17516	(00)	28	5	61660	(12)	32	57
23955	(00)	29	12	63985	(12)	0	16
28951	(12)	15	0	72230	(00)	10	35
30230	(00)	31	11	72230	(12)	13	40
30230	(12)	31	12	74455	(00)	16	30
30673	(00)	15	0	74455	(12)	16	30
30673	(12)	17	0	78954	(00)	0	26
33008	(00)	30	15	78954	(12)	0	24
33041	(00)	31	15	82026	(00)	17	30
35229	(12)	15	0	89662	(00)	2	29
35394	(12)	15	0	89662	(12)	3	29
35671	(12)	15	0	98646	(00)	3	28
40800	(00)	29	15	98646	(12)	4	28
40811	(12)	31	20	-	-	-	-
40848	(00)	31	20	-	-	-	-
42886	(00)	16	0	-	-	-	-
48327	(00)	14	0	-	-	-	-
61052	(00)	31	2	-	-	-	-
61052	(12)	32	2	-	-	-	-
61980	(12)	20	0	-	-	-	-
74494	(00)	13	0	-	-	-	-
82400	(12)	18	4	-	-	-	-
83525	(12)	28	7	-	-	-	-
83554	(00)	26	6	-	-	-	-
83554	(12)	27	7	-	-	-	-
96011	(00)	30	8	-	-	-	-
96011	(12)	28	12	-	-	-	-
96805	(00)	24	6	-	-	-	-
96805	(12)	24	6	-	-	-	-

## 2.2 Drifting Buoys

Surface pressure observations from **1963** 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.

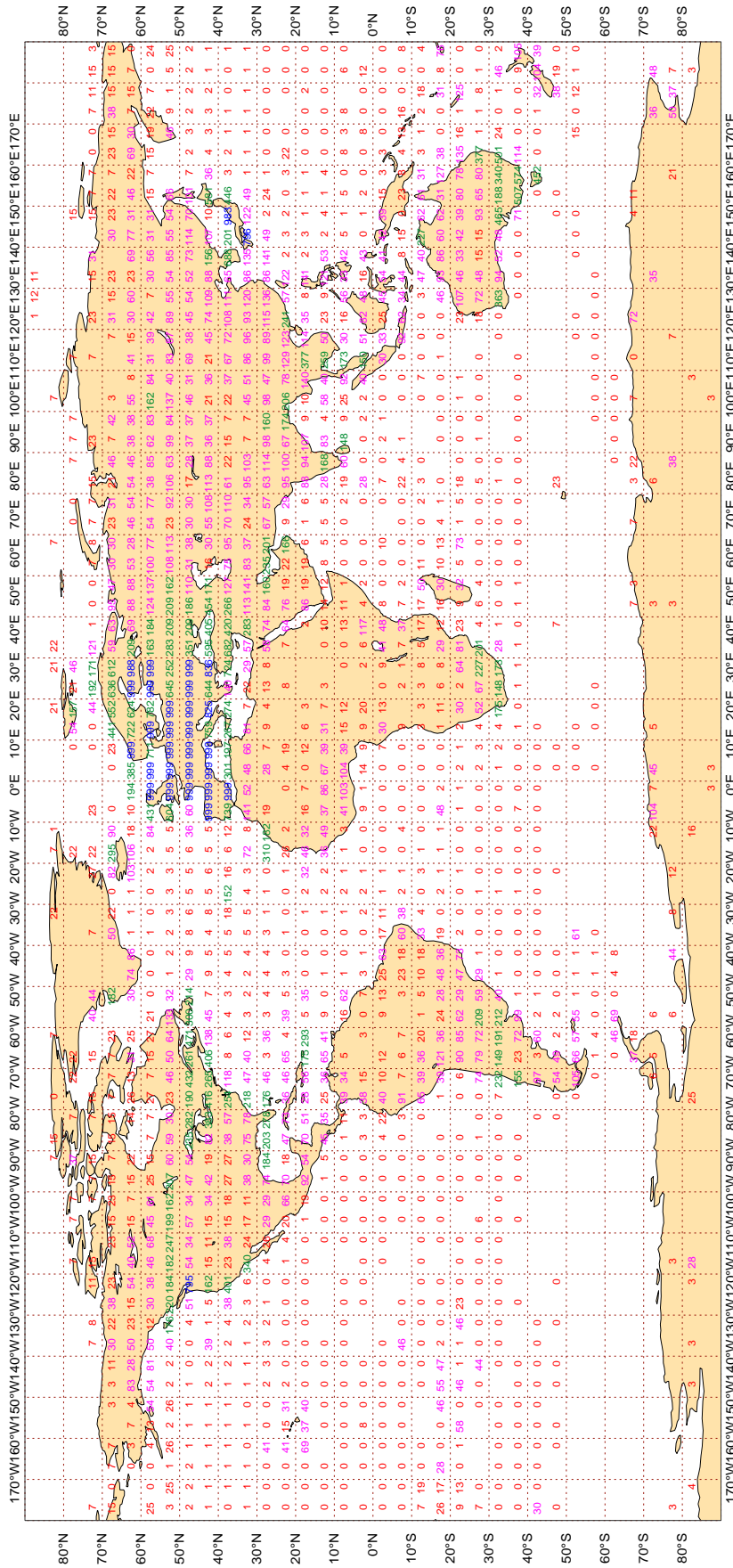
Fig	Parameter	Level/Layer
14	SATOB - Mean observed wind	1000-700 hPa
15	SATOB - Mean observed wind	400-150 hPa
16	SATOB - Mean observed minus first-guess wind	1000-700 hPa
17	SATOB - Mean observed minus first-guess wind	400-150 hPa
18	AIRCRAFT WIND - Mean observed minus first-guess	300-150 hPa

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



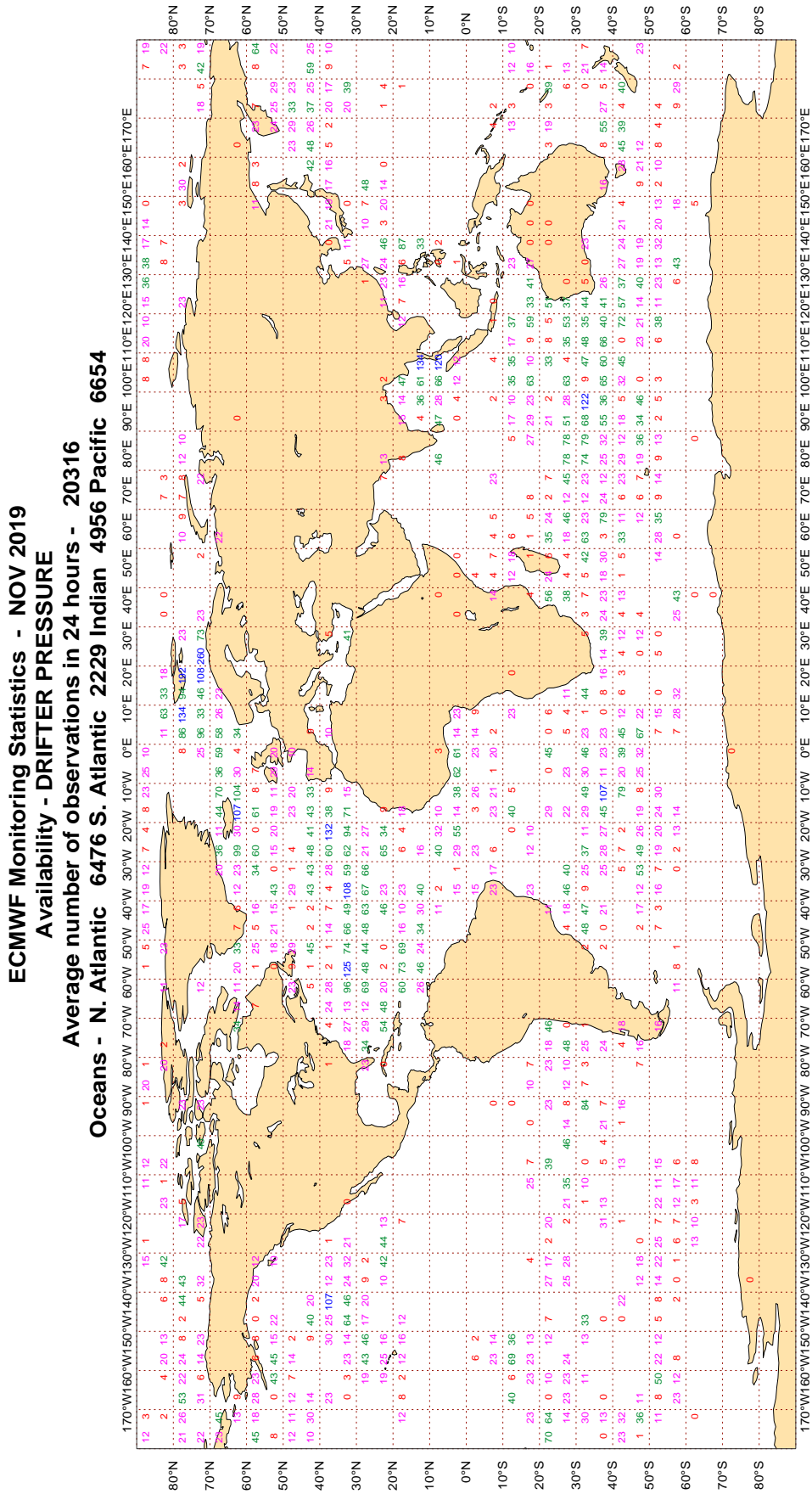
3.2.1 Figure 1 - Availability - SYNOP PRESSURE

**Figure 1**  
 ECMWF Monitoring Statistics - NOV 2019  
 Availability - SYNOP/SHIP (manual, auto) pressure  
 Average number of observations in 24 hours - 122971  
 LAND - WMO Region I: 4539 II:18839 III: 3878 IV: 7189  
 Region V: 8940 VI:64342 Antarctic: 953  
 Oceans - N. Atlantic 8160 S. Atlantic 294 Indian 659 Pacific 5178



3.2.2 Figure 2 - Availability - DRIFTER PRESSURE

Figure 2



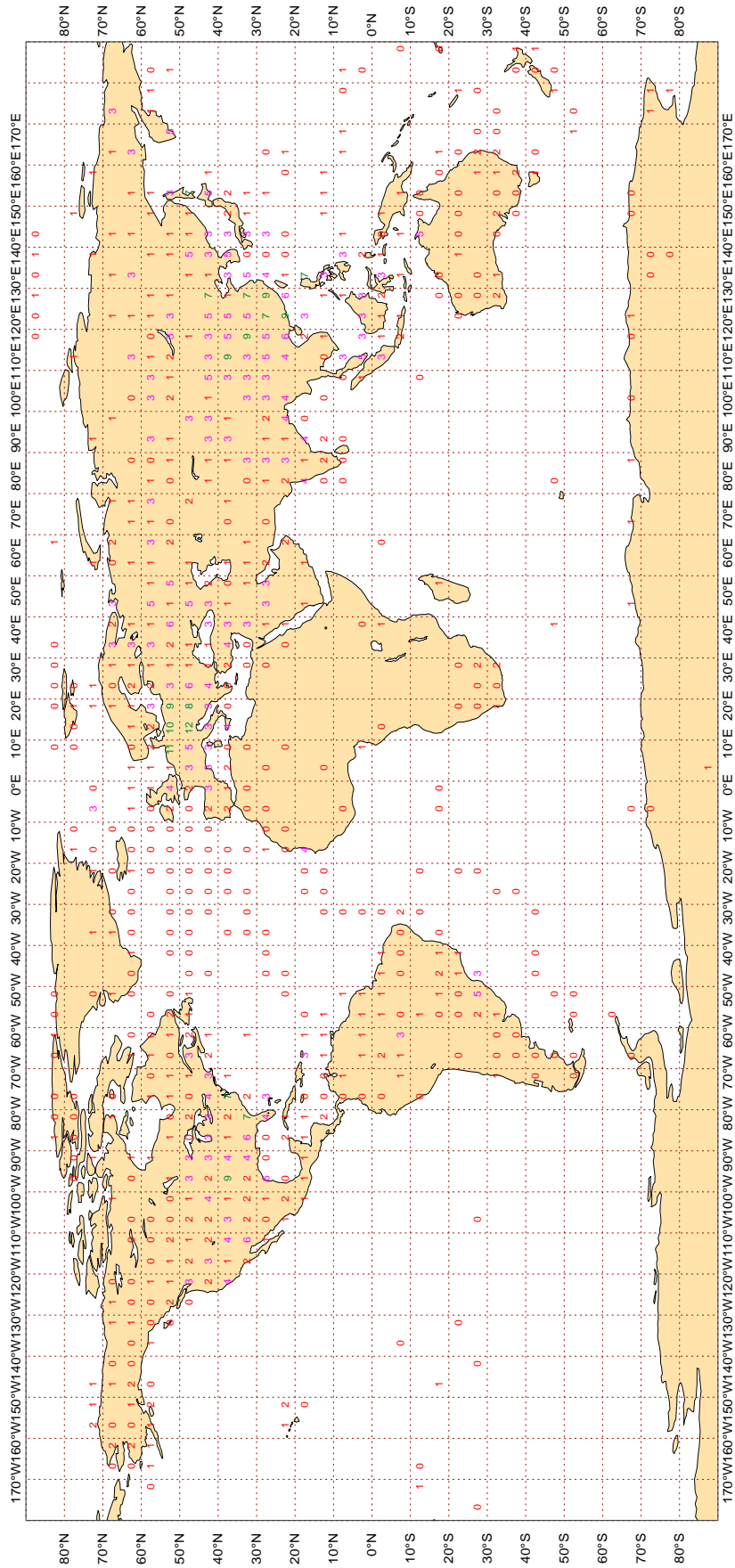
Magicis 3.0.4 (64 bit)



3.2.3 Figure 3 - Availability - TEMP 500 hPa geopotential

Figure 3

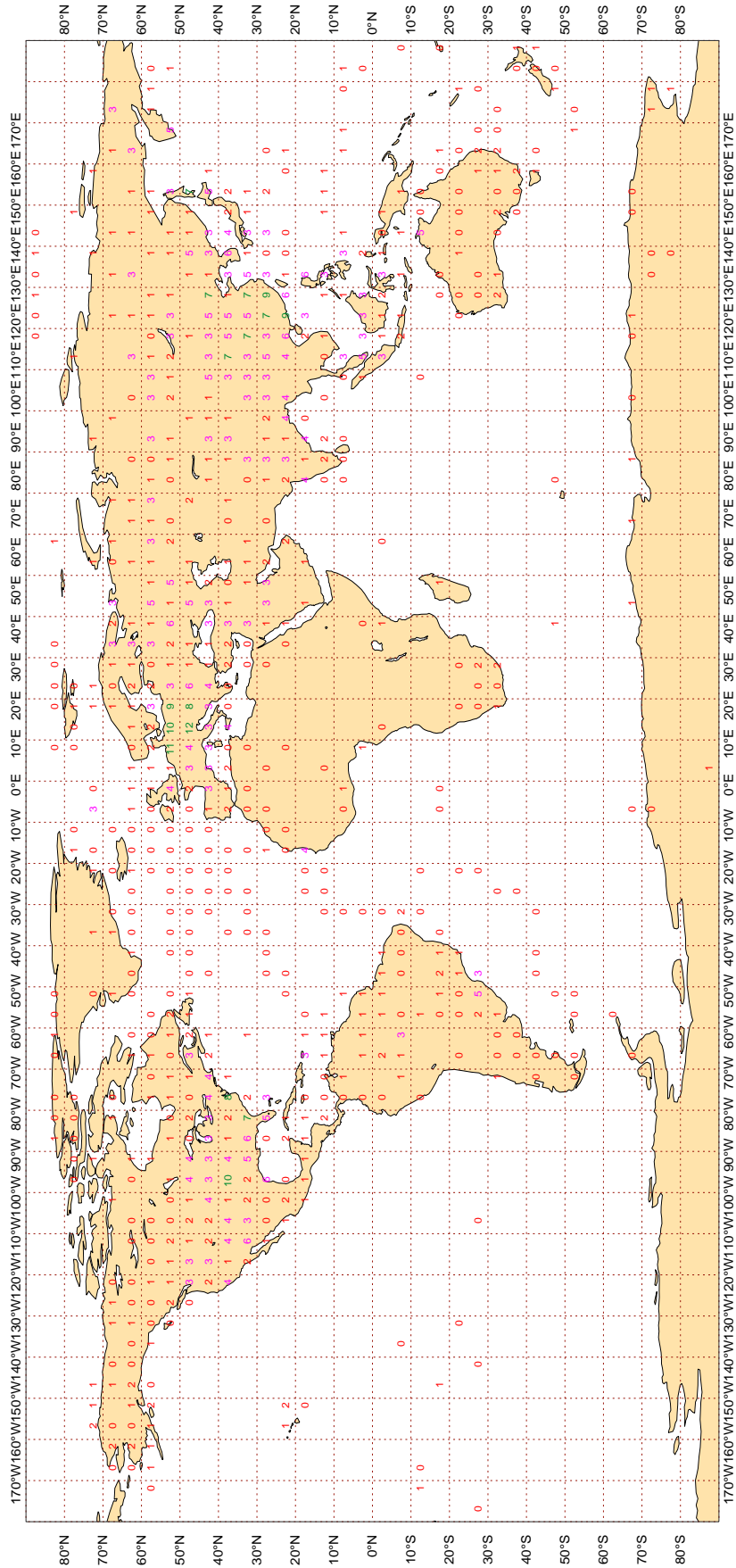
ECMWF Monitoring Statistics - NOV 2019  
 Availability - TEMP 500 hPa Geopotential  
 Average number of observations in 24 hours - 1304  
 LAND - WMO Region I: 34 II: 486 III: 76 IV: 280  
 Region V: 139 VI: 257 Antarctic: 17  
 Oceans - N. Atlantic 7 S. Atlantic 1 Indian 3 Pacific 4



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

Figure 4

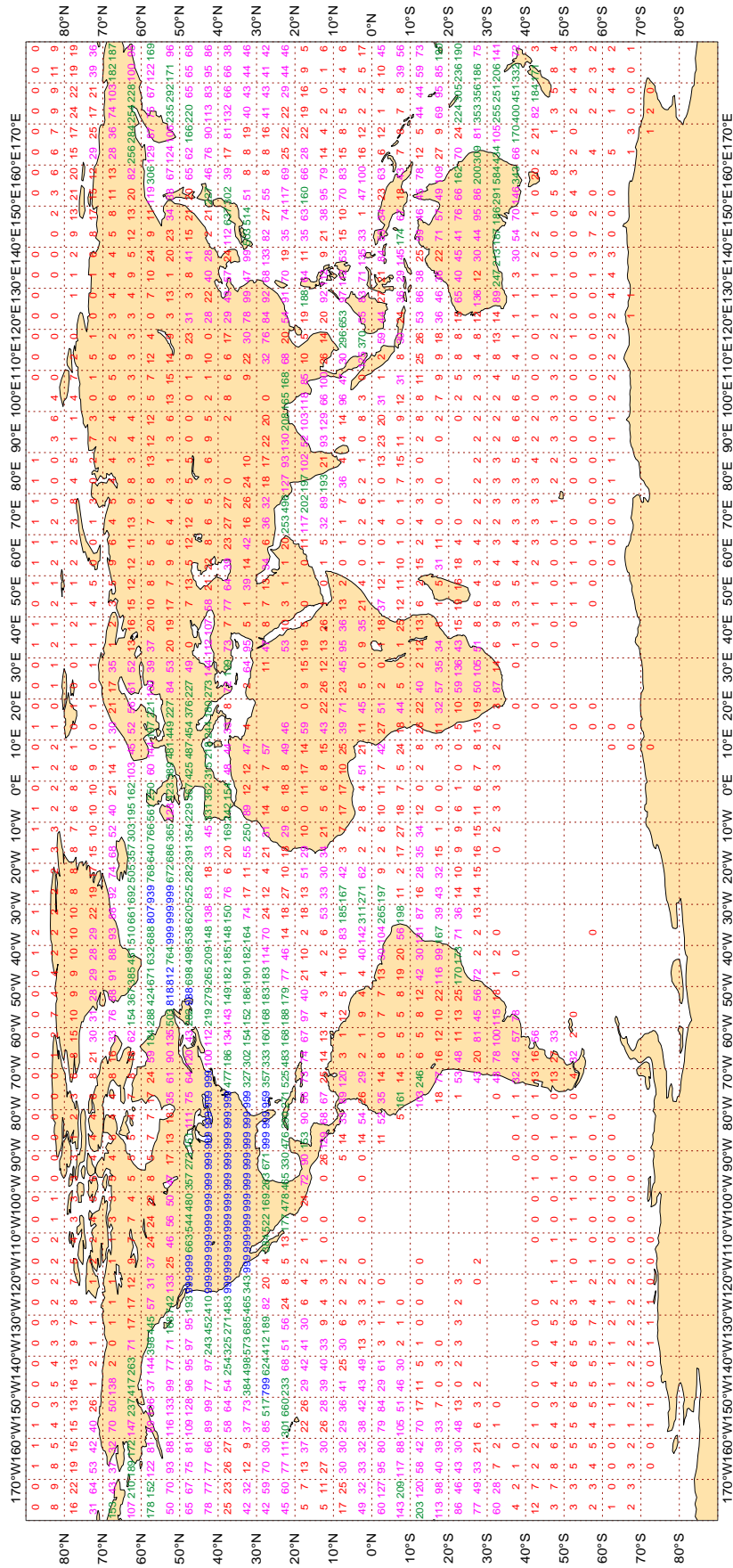
ECMWF Monitoring Statistics - NOV 2019  
 Availability - TEMP/PILOT 300 hPa wind  
 Average number of observations in 24 hours - 1297  
 LAND - WMO Region I: 35 II: 473 III: 76 IV: 288  
 Region V: 138 VI: 255 Antarctic: 17  
 Oceans - N. Atlantic 7 S. Atlantic 1 Indian 3 Pacific 4



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

Figure 5

ECMWF Monitoring Statistics - NOV 2019  
Availability - Aircraft winds 300-150 hPa  
Average number of observations in 24 hours - 218595





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

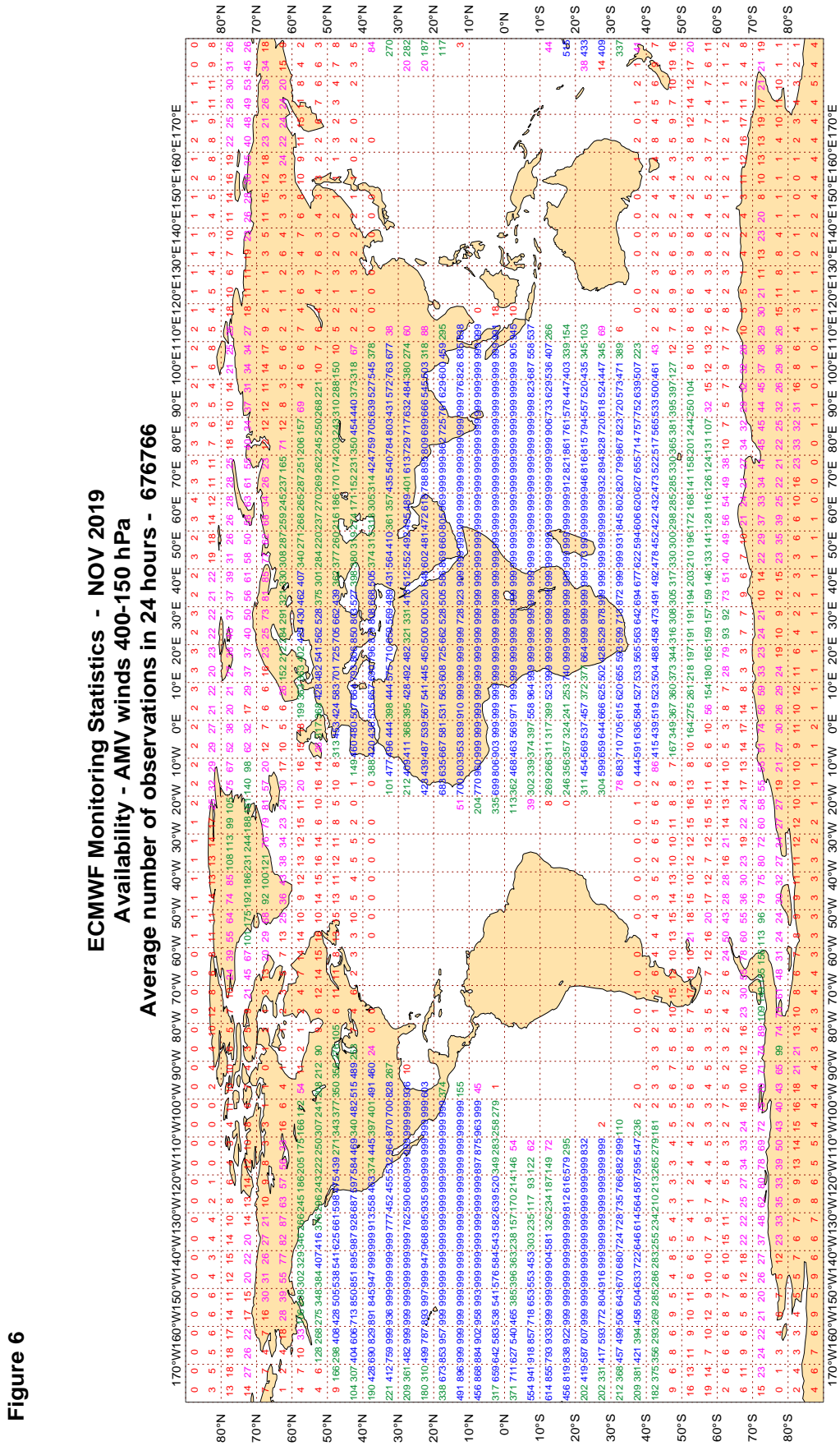


Figure 6

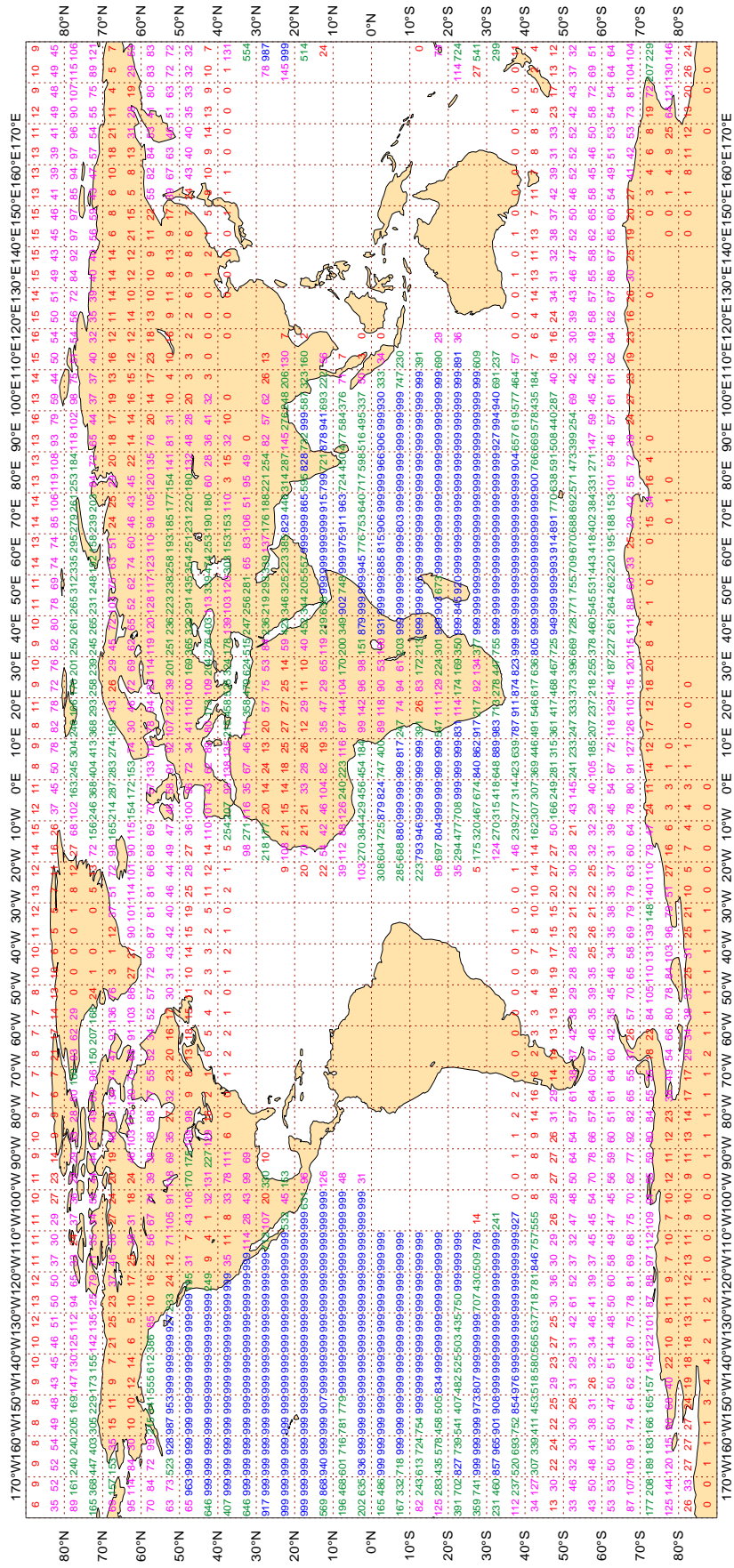


Magics 3.0.4 (64 bit)

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

Figure 7

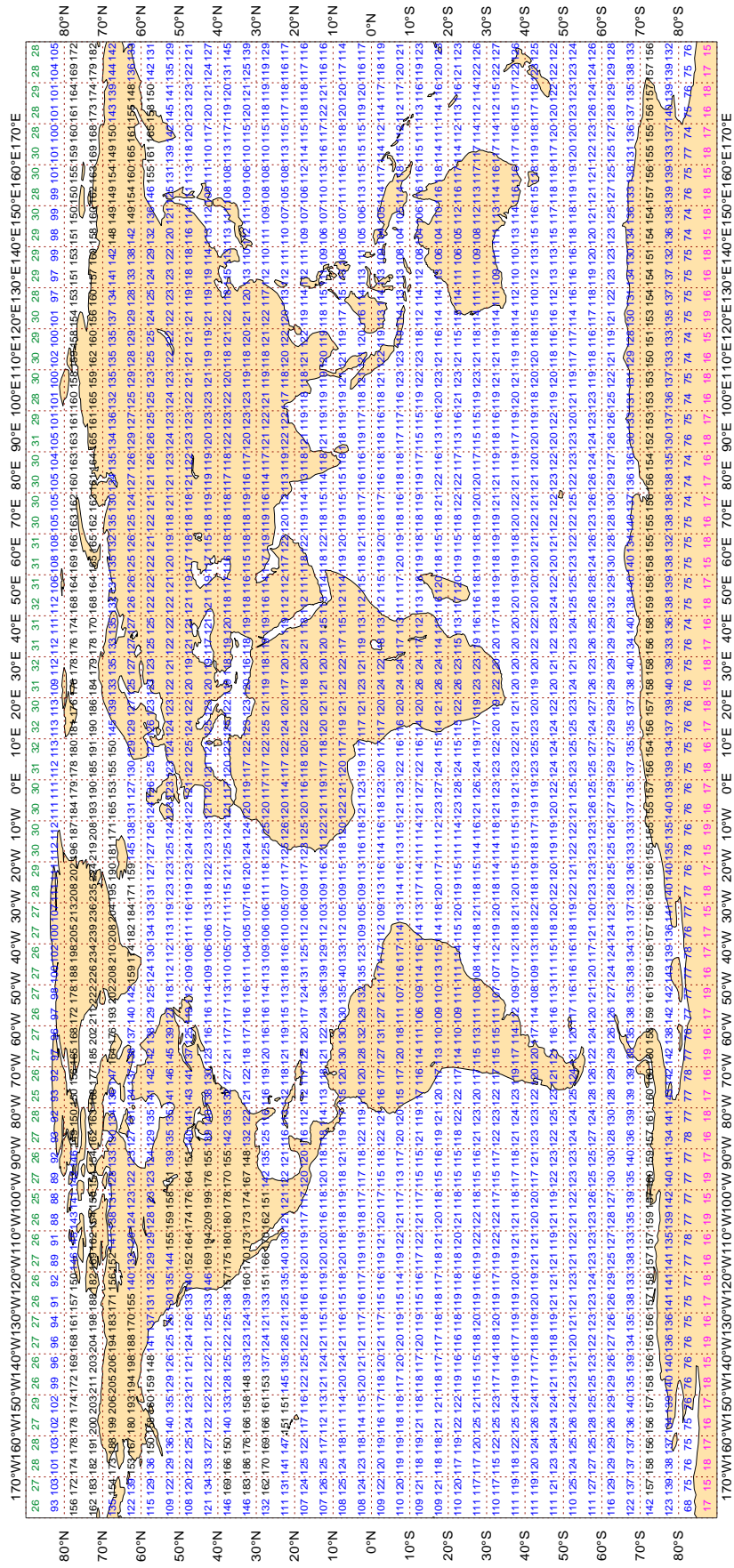
ECMWF Monitoring Statistics - NOV 2019  
Availability - AMV winds 1000-700 hPa  
Average number of observations in 24 hours - 933947



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

Figure 8

ECMWF Monitoring Statistics - NOV 2019  
Availability - NOAA15 ATOVS : AMSU-A  
Average number of observations in 24 hours - 3133311



Magics 3.0.4 (64 bit)

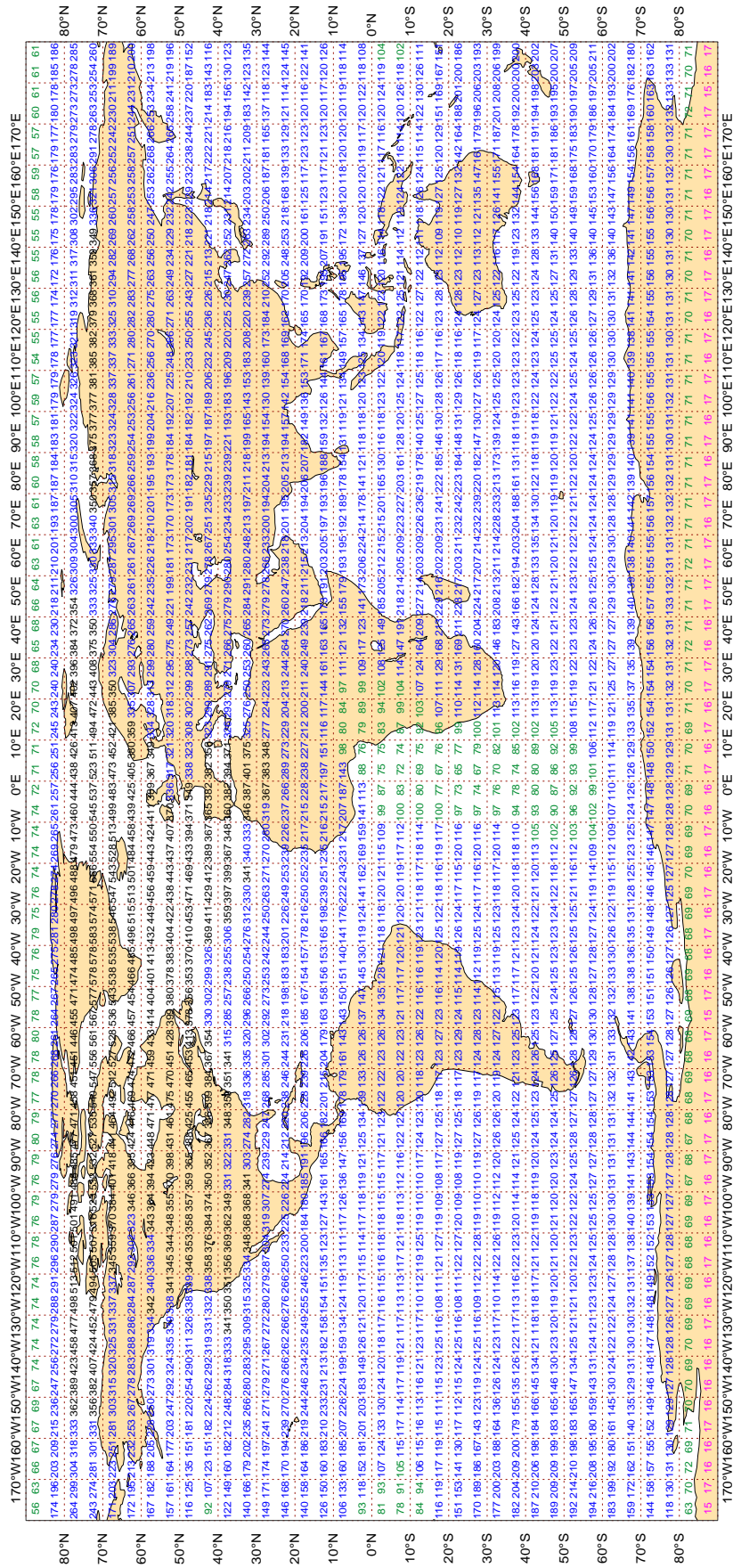




3.2.9 Figure 9.1 - Availability - NOAA18 ATOVS : AMSU-A

Figure 9.1

ECMWF Monitoring Statistics - NOV 2019  
 Availability - NOAA18 ATOVS : AMSU-A  
 Average number of observations in 24 hours - 495898



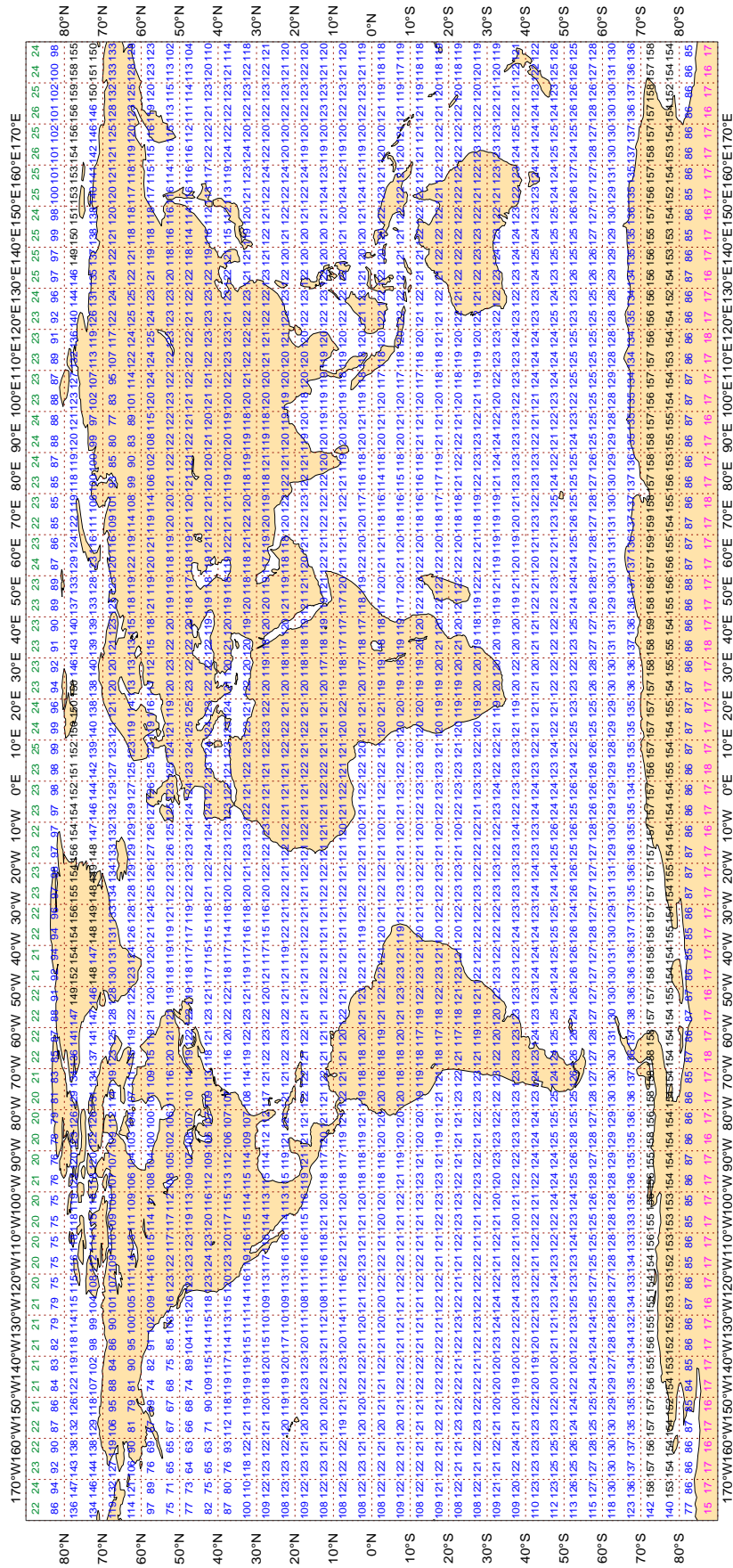
Magics 3.0.4 (64 bit)



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

Figure 9.2

ECMWF Monitoring Statistics - NOV 2019  
Availability - AQUA ATOVS : AMSU-A  
Average number of observations in 24 hours - 301052



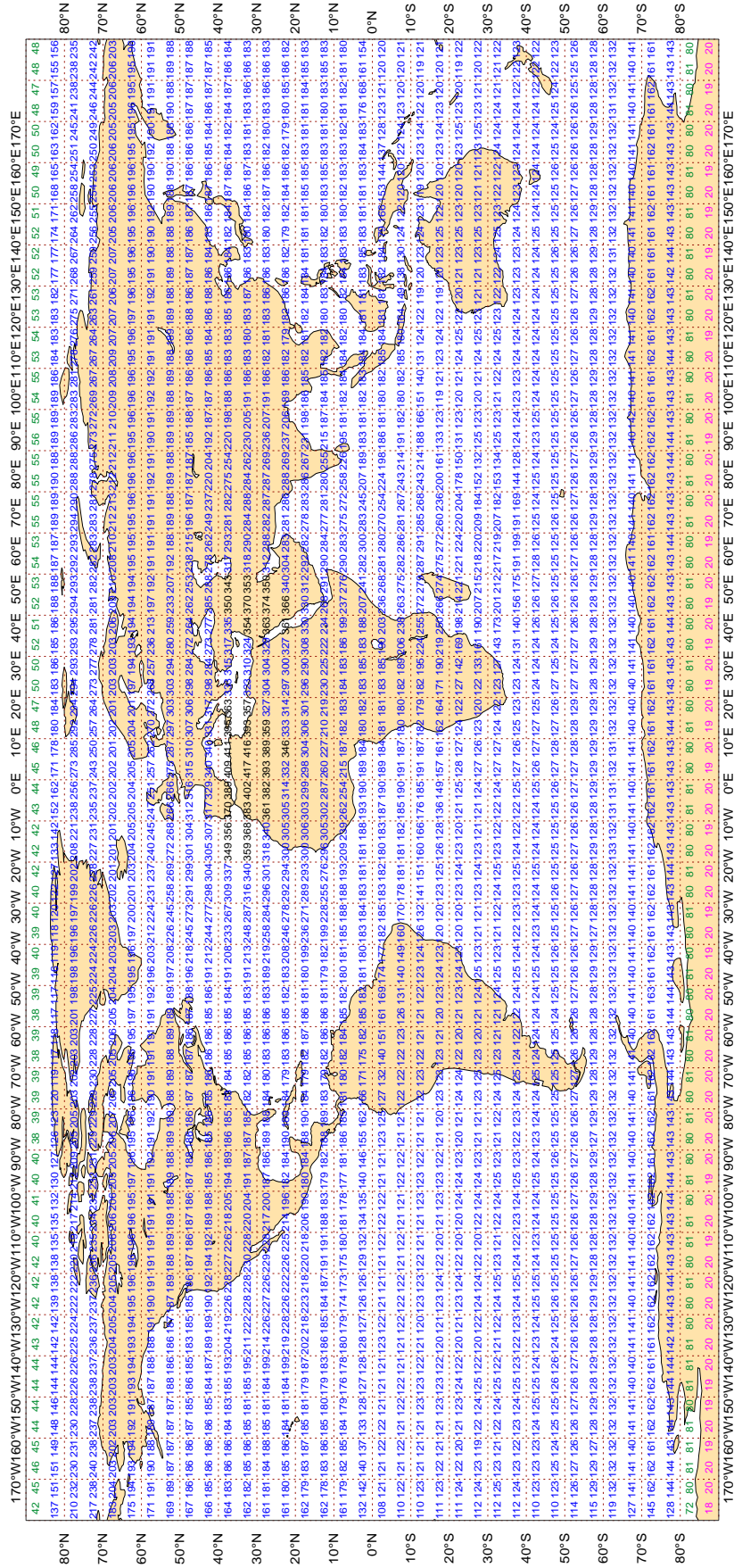
Magics 3.0.4 (64 bit)



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

Figure 9.3

ECMWF Monitoring Statistics - NOV 2019  
Availability - METOP ATOVS : AMSU-A  
Average number of observations in 24 hours - 434670



**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 : NOV 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	18	0	2.2	4.7	5.2
44058	99	P	SUR	94	0	0.7	3.5	3.6
45172	99	P	SUR	73	35	4.0	-2.1	4.5
9HA3047	99	P	SUR	27	0	1.6	-3.5	3.8
9HA4330	99	P	SUR	36	0	2.9	-3.0	4.2
9HJB9	99	P	SUR	19	0	1.7	3.3	3.7
9V2779	99	P	SUR	50	0	2.7	7.4	7.9
9V5241	99	P	SUR	36	0	1.1	4.2	4.3
9V8043	99	P	SUR	27	0	3.5	6.8	7.6
9V9793	99	P	SUR	34	0	0.9	5.0	5.1
C6DP8	99	P	SUR	17	0	1.0	4.2	4.3
C6DP9	99	P	SUR	17	0	6.5	3.4	7.4
C6FV8	99	P	SUR	67	0	1.2	-4.7	4.8
C6LG6	99	P	SUR	52	0	0.8	-3.0	3.2
C6QM8	99	P	SUR	20	0	1.3	3.9	4.1
C6WW4	99	P	SUR	33	0	0.7	4.6	4.6
CQHW	99	P	SUR	36	0	1.0	-3.4	3.6
H3VU	99	P	SUR	23	0	1.8	4.2	4.5
LAHR7	99	P	SUR	16	2	3.8	-8.0	8.9
LAPE7	99	P	SUR	24	0	1.3	4.2	4.4
LAQL7	99	P	SUR	88	0	1.0	3.6	3.8
LOCX	99	P	SUR	33	0	1.8	-3.1	3.6
OYCY2	99	P	SUR	31	0	0.8	8.3	8.3
OZ2049	99	P	SUR	56	1	1.1	-7.0	7.0
PBGJ	99	P	SUR	15	0	2.1	-6.6	6.9
UBXS	99	P	SUR	79	0	2.1	-3.8	4.4
UGZM	99	P	SUR	20	6	5.0	-1.3	5.1
V7FA7	99	P	SUR	17	0	0.8	4.3	4.3
VRBH6	99	P	SUR	17	1	0.7	8.0	8.1
VRDJ3	99	P	SUR	132	0	2.4	-3.3	4.1
VRFX2	99	P	SUR	55	0	1.8	-3.7	4.1
VRFX5	99	P	SUR	16	0	1.2	3.4	3.6

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

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	SD	BIAS	RMS
VRIB3	99	P	SUR	100	45	3.9	-5.8	7.0
VRIR7	99	P	SUR	26	1	3.3	7.5	8.2
VRLJ2	99	P	SUR	21	0	1.1	-6.3	6.4
VRMW7	99	P	SUR	24	0	1.2	3.5	3.7
VRRB5	99	P	SUR	42	0	1.1	3.6	3.8
VRRB6	99	P	SUR	38	0	1.7	3.8	4.2
VRRQ5	99	P	SUR	34	13	3.9	10.6	11.3
VRSO9	99	P	SUR	26	0	0.7	-4.4	4.4
VTGB	99	P	SUR	103	0	1.0	4.0	4.2
VTWS	99	P	SUR	100	58	7.8	-4.1	8.8
WDG8555	99	P	SUR	17	0	2.8	5.0	5.7

**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 : NOV 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
62132	99	SPEED	SUR	126	0	0	3.7	-4.2	5.6



**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 : NOV 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
44072	99	DIRN	SUR	132	0	0	15.3	-81.6	83.0
45173	99	DIRN	SUR	38	0	0	28.5	-32.7	43.4
45175	99	DIRN	SUR	81	0	0	63.5	-34.4	72.2
66022	99	DIRN	SUR	95	0	0	74.0	50.9	89.8

**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 : NOV 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
1501515	99	P	SUR	-7	40	504	0	0.7	-4.9	4.9
1601527	99	P	SUR	-18	113	719	695	3.7	-3.3	4.9
1601577	99	P	SUR	-50	86	719	5	2.4	5.4	5.9
1701533	99	P	SUR	-37	-12	227	0	0.9	-6.1	6.2
1701535	99	P	SUR	-37	-12	54	0	0.8	-6.0	6.0
1701536	99	P	SUR	-37	-12	88	0	1.0	-6.4	6.5
1701539	99	P	SUR	-37	-12	171	0	1.0	-6.2	6.3
2301788	99	P	SUR	16	92	471	69	6.2	8.0	10.1
2301792	99	P	SUR	12	93	141	0	0.4	-7.1	7.1
2501539	99	P	SUR	73	165	720	81	1.5	10.6	10.7
2501540	99	P	SUR	74	173	719	37	2.6	-10.3	10.7
2501663	99	P	SUR	80	65	703	659	1.7	0.5	1.8
2501667	99	P	SUR	77	113	719	275	8.1	0.4	8.1
2501669	99	P	SUR	78	144	440	419	0.9	13.0	13.1
2601625	99	P	SUR	77	17	714	107	6.6	-2.5	7.1
4500001	99	P	SUR	48	-88	2559	1866	1.0	-0.3	1.1
4500002	99	P	SUR	45	-86	1578	1578	0.0	0.0	0.0
4500003	99	P	SUR	45	-83	442	308	0.5	-1.2	1.3
4500004	99	P	SUR	48	-87	2441	1860	0.5	-0.5	0.7
4500005	99	P	SUR	42	-82	3566	1871	0.4	-0.1	0.5
4500006	99	P	SUR	47	-90	440	310	0.4	-0.8	0.9
4500007	99	P	SUR	43	-87	1853	1853	0.0	0.0	0.0
4500008	99	P	SUR	44	-82	2544	1859	0.5	-0.9	1.0
4500012	99	P	SUR	44	-77	2799	0	4.4	-6.4	7.8
4500172	99	P	SUR	47	-86	2548	1350	3.7	-2.1	4.3
45172	99	P	SUR	47	-86	487	247	3.6	-1.9	4.1
4601633	99	P	SUR	48	162	719	0	1.8	4.2	4.6
4701658	99	P	SUR	72	-95	720	233	6.2	-5.7	8.4
4701660	99	P	SUR	70	-102	713	713	0.0	0.0	0.0
4800770	99	P	SUR	57	-35	712	712	0.0	0.0	0.0
4801612	99	P	SUR	81	-160	504	504	0.0	0.0	0.0
4801652	99	P	SUR	84	-157	690	81	7.7	-5.7	9.5



LIST OF SUSPECT STATIONS : DRIFTER  
 MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : SURFACE PRESSURE (HPA)  
 (CONTINUED)

WMO IDENT	OBS TIME	ELM	ME LAT	N LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	
4801654	99	P	SUR	70	175	682	502	3.9	-9.5	10.3
4801655	99	P	SUR	76	-179	675	169	2.4	-0.3	2.4
4801663	99	P	SUR	78	-172	573	234	5.0	-6.2	7.9
5301765	99	P	SUR	62	-11	156	73	3.5	-1.8	3.9
6202685	99	P	SUR	40	3	204	72	0.4	0.3	0.5
6202686	99	P	SUR	40	3	204	72	0.4	0.2	0.4
6202687	99	P	SUR	40	3	204	72	0.4	0.4	0.5
6203577	99	P	SUR	64	-23	55	37	1.6	-6.7	6.8
6301503	99	P	SUR	82	34	27	12	3.1	9.8	10.3
6301539	99	P	SUR	79	6	95	0	1.4	8.1	8.3
7401502	99	P	SUR	-41	51	719	16	2.5	4.5	5.1

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

LIST OF SUSPECT STATIONS : DRIFTER  
 MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND SPEED (M/S)  
 AREA : GLOBAL  
 PERIOD : NOV 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
4400069	99	SPEED	SUR	41	-73	1368	0	0	2.8	5.3	6.0

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

LIST OF SUSPECT STATIONS : DRIFTER  
 MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND DIRECTION (DEGREES)  
 PERIOD : NOV 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	346	0	0	12.6	-58.0	59.3
0066022	99	DIRN	SUR	54	14	143	0	0	68.8	58.2	90.1
1300130	99	DIRN	SUR	28	-16	297	0	0	11.2	61.7	62.7
1400047	99	DIRN	SUR	-4	57	85	0	0	130.5	39.8	136.4
1500001	99	DIRN	SUR	-10	-10	670	0	0	80.4	12.4	81.4
1500002	99	DIRN	SUR	0	-10	149	0	0	114.3	87.7	144.1
2200191	99	DIRN	SUR	36	124	115	0	0	59.0	-25.2	64.1
2200192	99	DIRN	SUR	34	123	120	1	0	65.5	-13.8	66.9
2300004	99	DIRN	SUR	0	90	61	0	0	20.5	-20.5	29.0
23093	99	DIRN	SUR	16	88	32	0	0	69.5	54.2	88.1
23094	99	DIRN	SUR	14	84	387	0	0	15.6	-23.6	28.3
23170	99	DIRN	SUR	15	74	23	0	0	62.1	6.8	62.5
23451	99	DIRN	SUR	15	69	67	0	0	15.6	-27.9	31.9
23452	99	DIRN	SUR	12	69	67	0	0	77.1	9.6	77.7
23454	99	DIRN	SUR	10	73	20	0	0	26.5	27.5	38.2
23456	99	DIRN	SUR	19	67	54	0	0	169.7	-36.6	173.6
23459	99	DIRN	SUR	14	87	79	0	0	11.1	-21.1	23.8
23492	99	DIRN	SUR	11	72	75	0	0	23.9	-59.7	64.3
3100003	99	DIRN	SUR	-8	-31	244	0	0	10.5	25.8	27.8
3100053	99	DIRN	SUR	-23	-44	263	0	0	21.8	-27.9	35.4
4100029	99	DIRN	SUR	33	-80	104	0	0	21.2	-22.1	30.6
41029	99	DIRN	SUR	33	-80	120	0	0	24.4	-20.5	31.9
4200085	99	DIRN	SUR	18	-67	2863	0	0	23.0	21.0	31.2
4400072	99	DIRN	SUR	37	-76	3093	0	0	13.9	-78.7	79.9
44072	99	DIRN	SUR	37	-76	666	0	0	14.6	-81.2	82.5
44139	99	DIRN	SUR	44	-57	634	0	0	15.1	-23.2	27.7
4500023	99	DIRN	SUR	47	-89	1572	0	0	55.4	-21.7	59.5
4500173	99	DIRN	SUR	47	-87	975	3	0	44.6	-31.3	54.5
4500175	99	DIRN	SUR	46	-85	2328	0	0	63.2	-30.3	70.1
4500186	99	DIRN	SUR	42	-88	805	0	0	19.9	28.8	35.0
45023	99	DIRN	SUR	47	-89	459	0	0	54.2	-20.8	58.0

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
45149	99	DIRN	SUR	44	-82	503	0	0	16.4	29.7	33.9
45173	99	DIRN	SUR	47	-87	235	2	0	41.0	-30.9	51.4
45175	99	DIRN	SUR	46	-85	442	0	0	64.3	-26.4	69.5
45186	99	DIRN	SUR	42	-88	298	0	0	19.8	28.2	34.4
4600060	99	DIRN	SUR	61	-147	516	0	0	27.4	22.9	35.7
46060	99	DIRN	SUR	61	-147	531	0	0	27.6	21.9	35.3
5300040	99	DIRN	SUR	-8	95	685	0	0	154.2	78.0	172.8
5300056	99	DIRN	SUR	-5	95	710	0	0	116.8	121.9	168.8
53040	99	DIRN	SUR	-8	95	673	0	0	152.4	80.3	172.3
53056	99	DIRN	SUR	-5	95	697	0	0	114.4	123.6	168.4
62120	99	DIRN	SUR	56	2	684	0	0	26.8	25.1	36.8
66022	99	DIRN	SUR	54	14	528	0	0	73.2	53.9	90.9

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

LIST OF SUSPECT STATIONS : RADIOSONDES  
 MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : GEOPOTENTIAL HEIGHT (METRES)  
 AREA : GLOBAL  
 PERIOD : NOV 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

ONLY THE WORST LEVEL IS SHOWN (WITH UNWEIGHTED RMS)

WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
01400	00	Z	1000	57	3	28	1	17.9	71.5	73.7
01400	12	Z	1000	57	3	29	0	5.5	76.8	77.0
04417	00	Z	1000	73	-38	18	6	13.5	-69.3	70.6
04417	12	Z	1000	73	-38	18	5	16.5	-67.3	69.3
24122	00	Z	300	69	112	27	0	41.9	-54.2	68.5
24507	00	Z	200	64	100	25	11	100.8	-99.9	141.9
24507	12	Z	300	64	100	22	8	70.3	-104.7	126.1
26075	00	Z	200	60	31	30	1	68.6	49.1	84.4
33791	12	Z	200	48	33	20	0	64.8	-101.6	120.5
33837	00	Z	200	46	31	13	1	63.3	128.0	142.8
37259	12	Z	30	43	47	25	0	125.3	210.3	244.8
42634	00	Z	700	23	70	24	0	9.4	54.6	55.4
42706	00	Z	500	23	87	29	1	30.5	47.9	56.8
5QPW8X	00	Z	1000	62	-10	11	0	5.1	32.4	32.8
65578	12	Z	850	5	-4	24	1	3.9	-77.2	77.3
76394	00	Z	250	26	-100	24	11	103.8	149.6	182.1

**3.2.19 Table 8 - Suspect radiosondes: Wind (m/s)**

LIST OF SUSPECT STATIONS : RADIOSONDES  
 MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND (M/S)  
 AREA : GLOBAL  
 PERIOD : NOV 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
40848	00	V	250	30	53	20	0	4.7	-0.6	15.9
42314	00	V	100	27	95	12	0	-10.6	-1.2	16.5

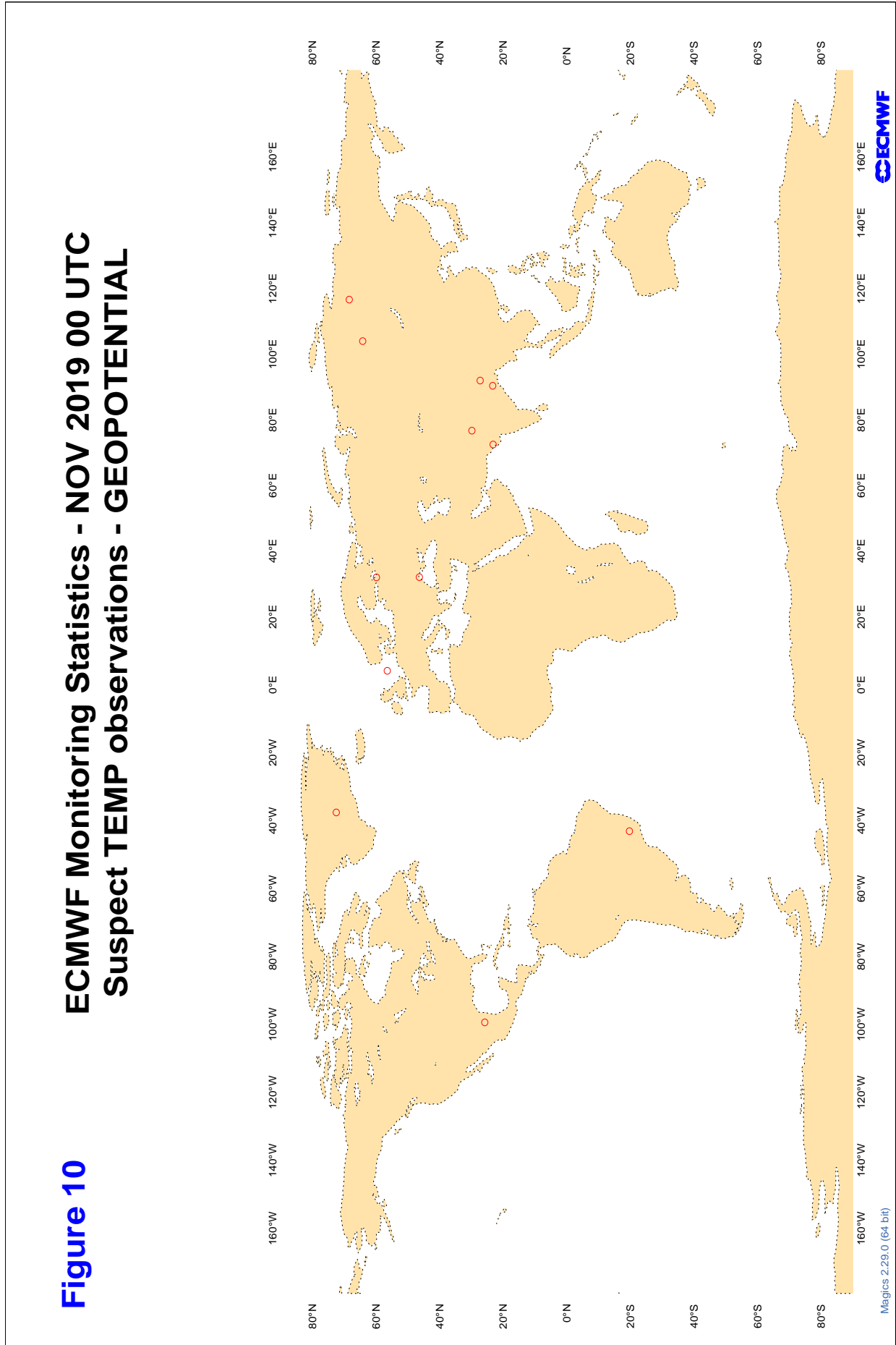
**3.2.20 Table 9 - Suspect radiosondes: Wind direction (degrees)**

LIST OF SUSPECT STATIONS : RADIOSONDES  
 MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : WIND DIRECTION (DEGREES)  
 AREA : GLOBAL  
 PERIOD : NOV 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)

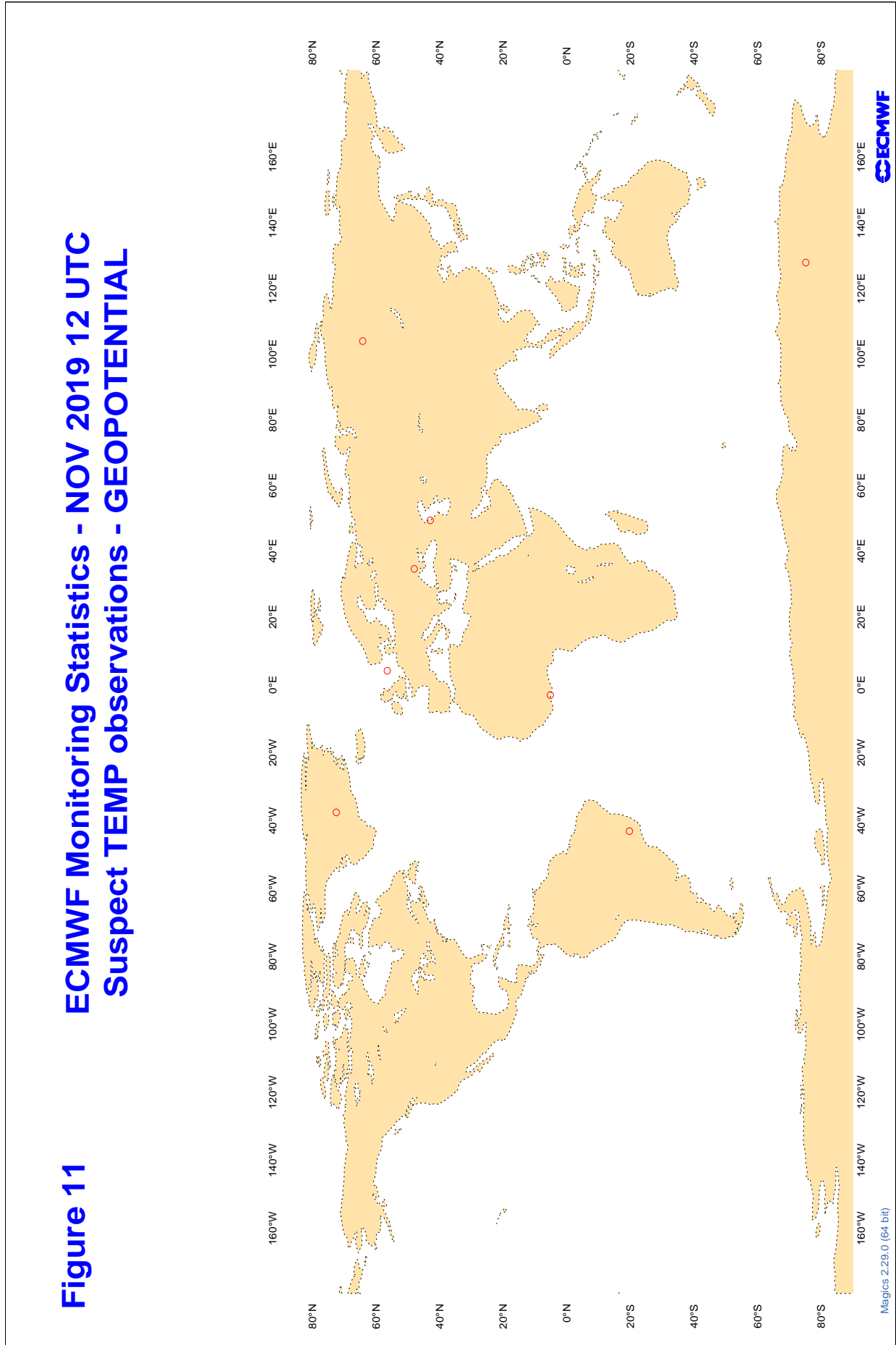
WMO IDENT	OBS TIME	ELM	LAT	LONG	NUM OBS	BIAS	MAX SPREAD	SD
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3.2.21 Figure 10 - Suspect TEMP observations - geopotential : 00 UTC

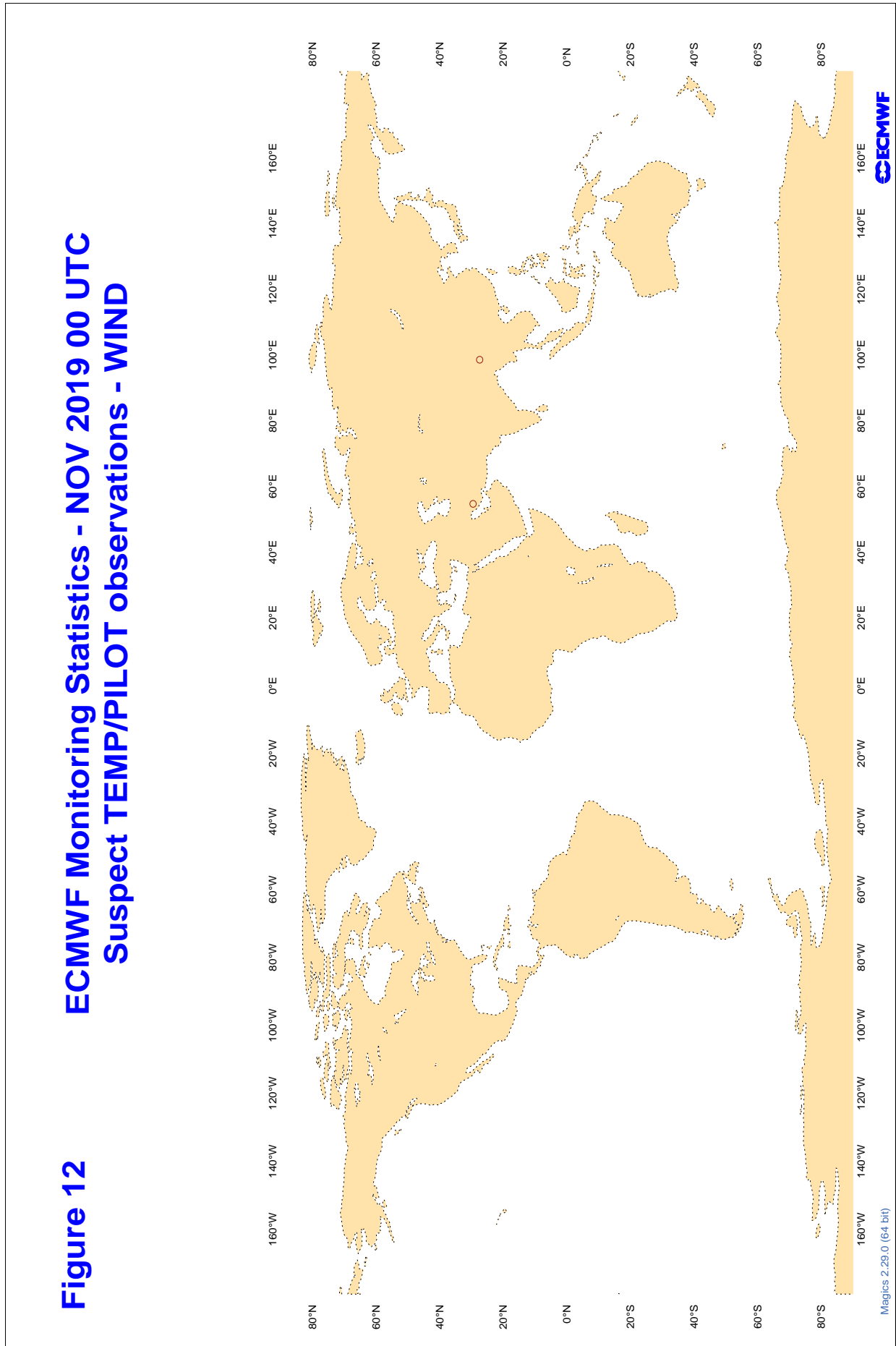




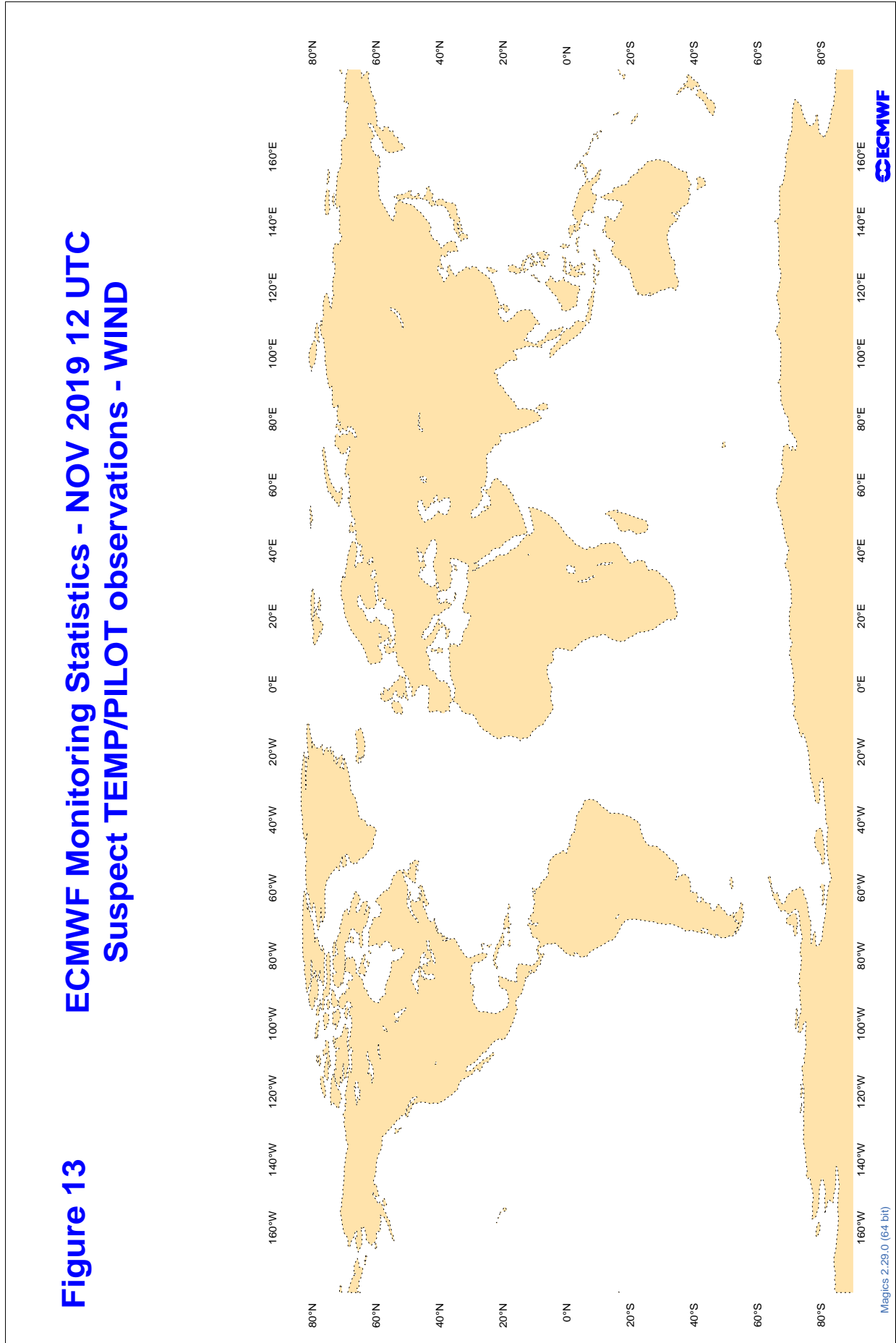
3.2.22 Figure 11 - Suspect TEMP observations - geopotential : 12 UTC



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 : NOV 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
5QPW8X	12	Z	100	14	21.6	20.9
5QPW8X	00	Z	100	9	24.3	23.0
7JUNA4	12	Z	100	2	68.4	59.3
7JUNA4	00	Z	100	4	17.1	13.2
ASDE09	12	Z	100	2	36.8	35.9
ASUK01	12	Z	100	11	10.1	6.3
BPMWB2	00	Z	100	4	13.2	12.3
BPMWB2	12	Z	100	2	26.4	25.4
DBLK	12	Z	100	29	3.5	0.0
DBLK	00	Z	100	29	3.4	0.8
FHM5UJ	12	Z	100	8	20.8	17.3
FHM5UJ	00	Z	100	6	17.7	12.1
FPUW5G	12	Z	100	6	24.0	23.4
JGQH	00	Z	100	0	0.0	0.0
JMLVCM	00	Z	100	23	15.8	14.1
JMLVCM	12	Z	100	26	20.6	19.0
JNKN7J	00	Z	100	1	26.6	26.6
JNKN7J	12	Z	100	3	47.8	47.7
JNSR	00	Z	100	1	4.2	-4.2
KJF9X	00	Z	100	7	18.4	14.9
KJF9X	12	Z	100	10	19.2	17.9
KMPLHP	00	Z	100	4	17.8	11.5
KMPLHP	12	Z	100	4	28.4	28.4
LRYQE3	00	Z	100	3	23.7	17.4
LRYQE3	12	Z	100	6	28.5	28.5
WDK38H	12	Z	100	11	8.9	-1.9
XKQLWQ	12	Z	100	11	61.1	53.0
XQFJRG	00	Z	100	4	14.5	-12.2
XQFJRG	12	Z	100	5	7.4	5.3
YL96W	00	Z	100	7	14.0	-4.4
YL96W	12	Z	100	5	26.5	22.5
ZVQEQC	12	Z	100	11	16.9	16.0
ZVQEQC	00	Z	100	6	21.6	20.8

### 3.2.26 Table 11 - Radiosonde monitoring statistics (SHIPS): Wind (m/s)

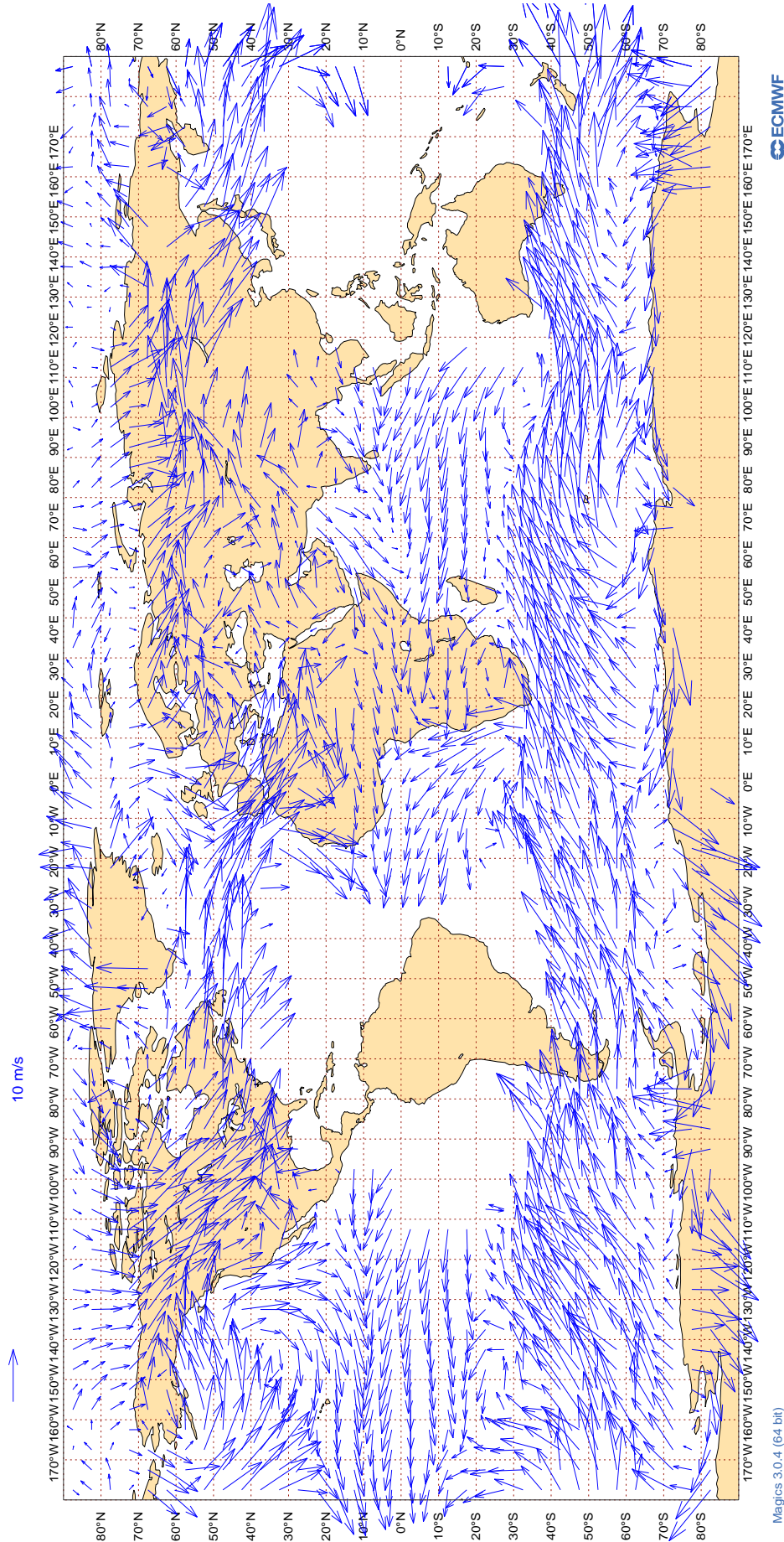
#### RADIOSONDE MONITORING STATISTICS (SHIPS)

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
5QPW8X	12	V	100	13	2.4	0.3	-0.3
5QPW8X	00	V	100	9	2.1	0.7	0.4
7JUNA4	12	V	100	2	1.5	-0.9	1.2
7JUNA4	00	V	100	4	3.6	-0.9	0.0
ASDE09	12	V	100	2	3.9	1.9	1.5
ASUK01	12	V	100	11	3.8	1.1	0.8
BPMWB2	00	V	100	4	3.6	0.2	2.4
BPMWB2	12	V	100	2	2.7	0.9	1.4
DBLK	12	V	100	29	1.8	0.6	0.0
DBLK	00	V	100	29	2.1	0.4	-0.2
FHM5UJ	12	V	100	8	1.6	0.3	-0.3
FHM5UJ	00	V	100	6	2.7	0.7	0.5
FPUW5G	12	V	100	6	4.0	-1.2	-1.4
JGQH	00	V	100	0	0.0	0.0	0.0
JMLVCM	00	V	100	13	3.3	-0.7	-2.7
JMLVCM	12	V	100	12	3.9	0.0	-0.7
JNKN7J	00	V	100	1	1.8	1.5	1.0
JNKN7J	12	V	100	2	3.0	-0.8	2.0
JNSR	00	V	100	1	1.6	0.7	-1.4
KJJF9X	00	V	100	7	4.8	-2.9	0.4
KJJF9X	12	V	100	10	4.7	-0.7	-0.5
KMPLHP	00	V	100	4	4.8	-2.7	2.8
KMPLHP	12	V	100	4	4.3	1.4	-1.3
LRYQE3	00	V	100	3	1.7	1.3	-0.4
LRYQE3	12	V	100	6	3.5	0.7	1.3
WDK38H	12	V	100	10	3.2	-1.6	0.1
XKQLWQ	12	V	100	11	3.3	-0.3	-1.4
XQFJRG	00	V	100	4	3.2	-0.4	0.3
XQFJRG	12	V	100	5	3.3	0.0	-0.9
YLV96W	00	V	100	7	2.8	-0.5	1.3
YLV96W	12	V	100	5	5.0	2.6	0.2
ZVQEQC	12	V	100	11	5.1	0.4	2.3
ZVQEQC	00	V	100	6	2.7	1.2	0.1

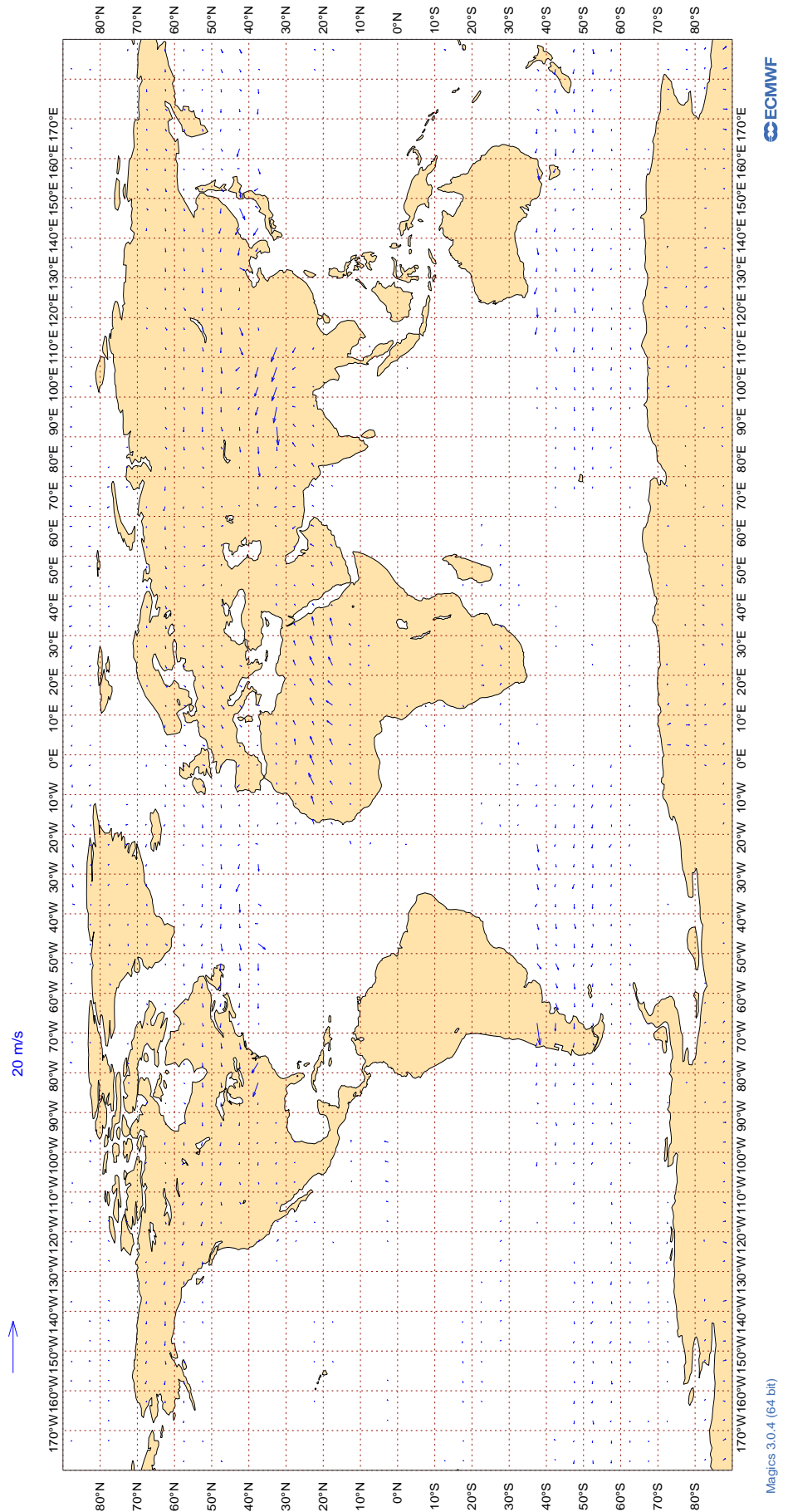
3.2.27 Figure 14 - SATOB Winds: 700-1000hPa

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



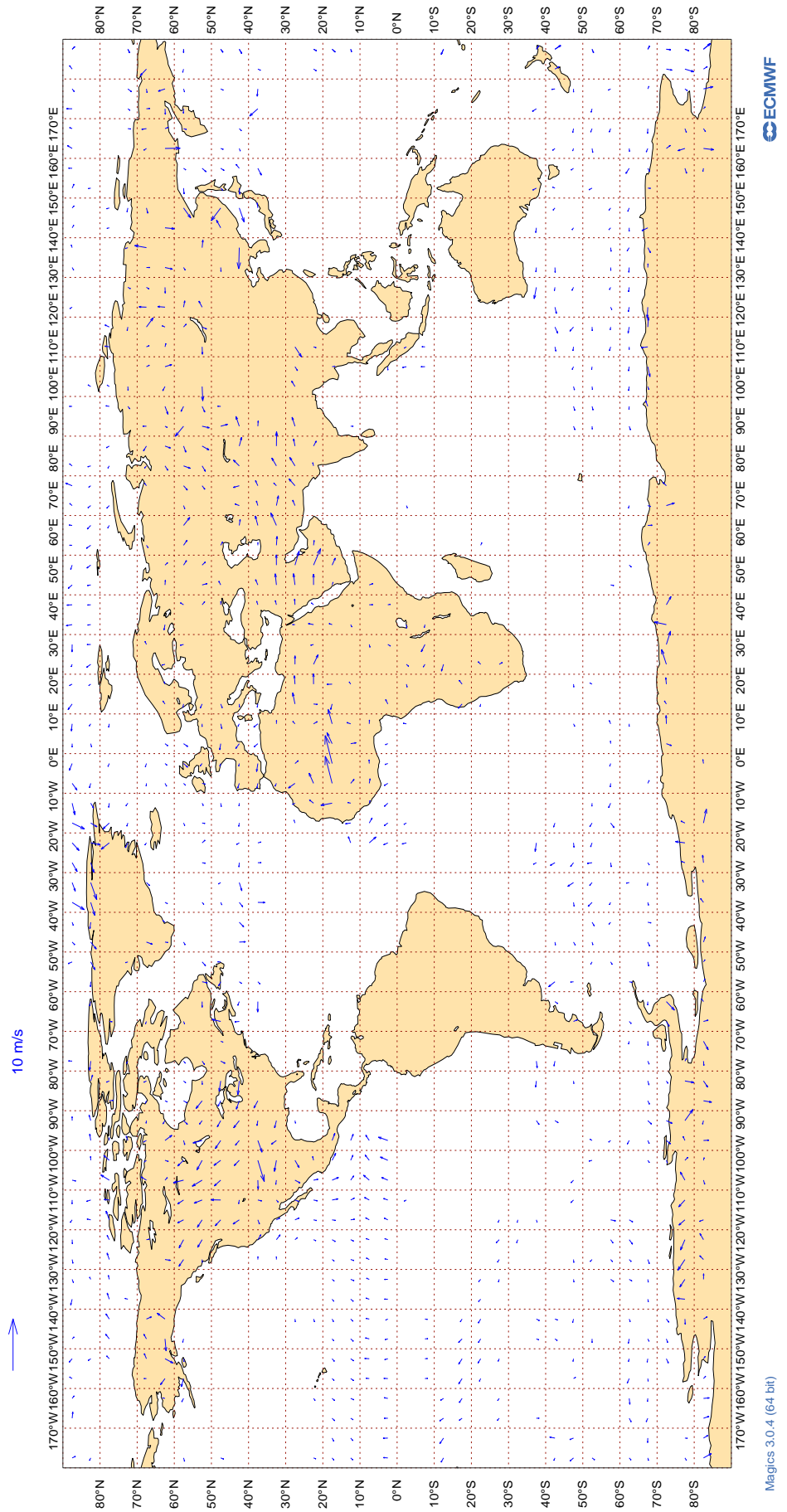
3.2.28 Figure 15 - SATOB Winds: 150- 400hPa

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



3.2.29 Figure 16 - SATOB Winds: 700-1000hPa

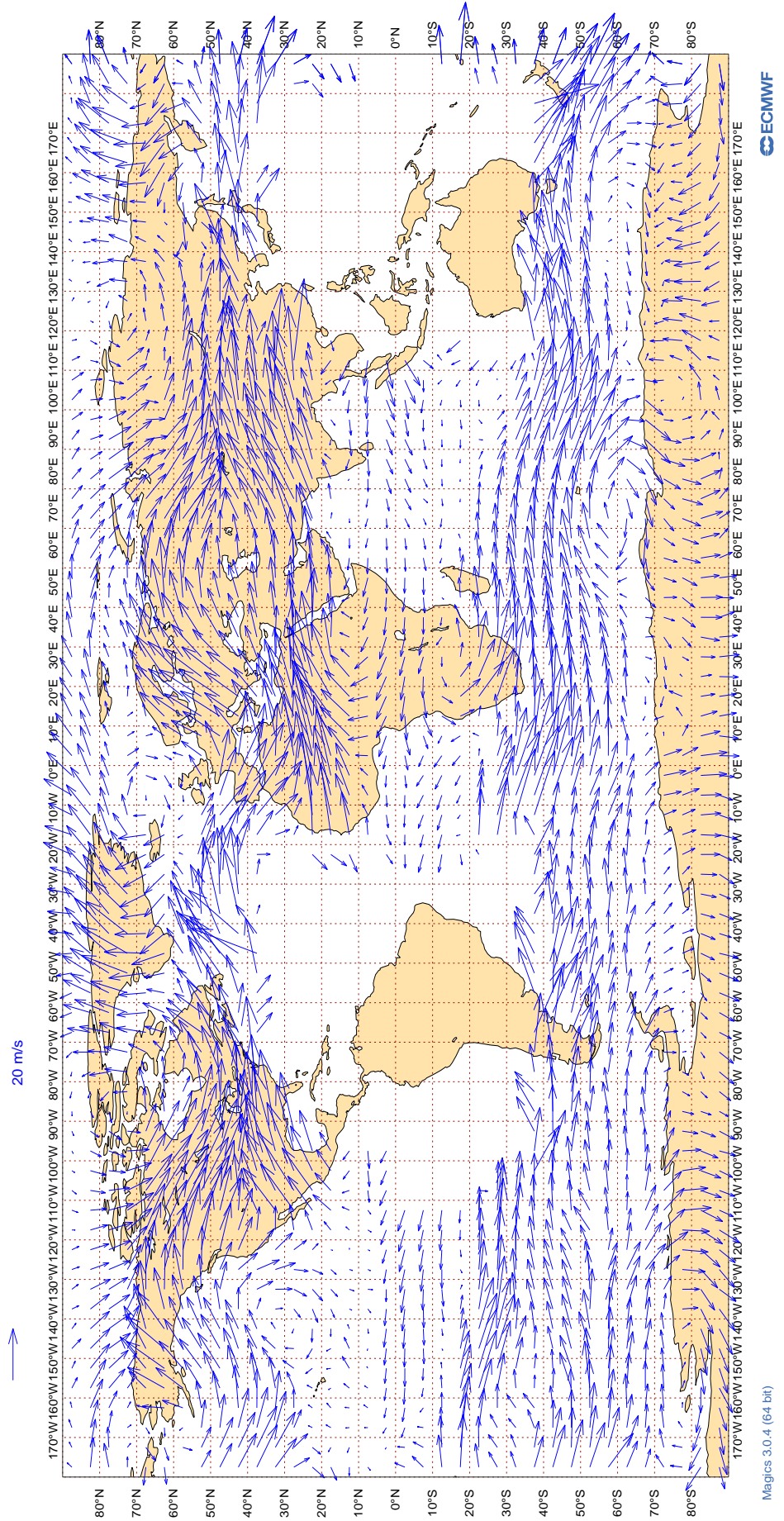
**Figure 16**  
**ECMWF Monitoring Statistics: Nov 2019**  
**AMV Winds: 700-1000hPa**  
**Wind bias: Observation - FG**





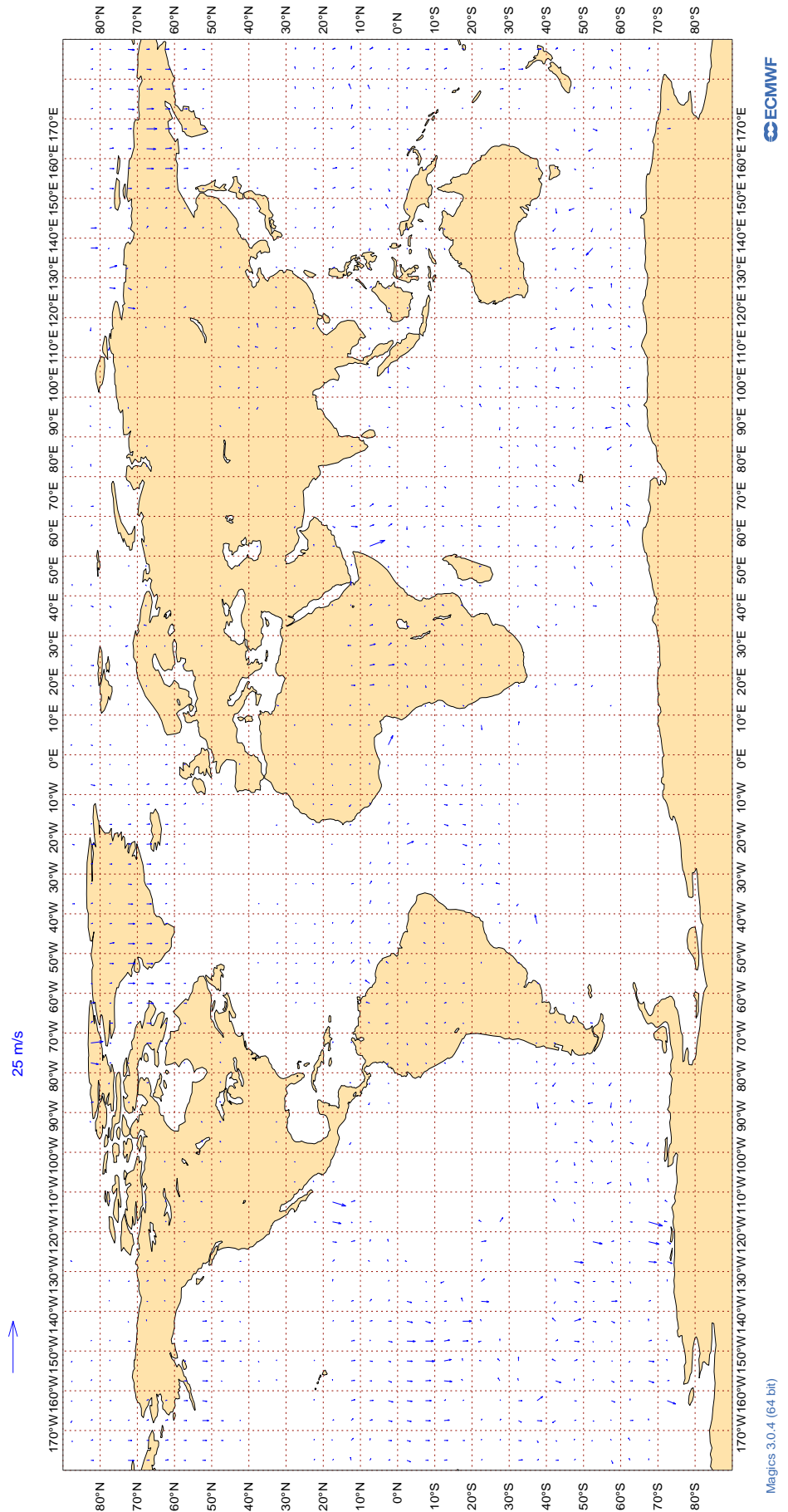
3.2.30 Figure 17 - SATOB Winds: 150- 400hPa

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



3.2.31 Figure 18 - AIRCRAFT Winds: 150- 300hPa

**Figure 18**  
**ECMWF Monitoring Statistics: Nov 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 : NOV 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

SELECTION CRITERIA: NO. OF OBS. >= 20

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

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
AAB	99	V	300-150	29	0	0	3.5	1.3
AAL	99	V	300-150	39789	2	0	6.0	0.4
AAR	99	V	300-150	262	0	0	6.5	-1.0
ABB	99	V	300-150	69	0	0	4.1	1.3
ABD	99	V	300-150	548	0	0	4.3	-0.0
ABG	99	V	300-150	264	0	0	3.5	-0.2
ABR	99	V	300-150	20	0	0	5.9	1.3
ABW	99	V	300-150	506	0	0	3.7	-0.9
ACA	99	V	300-150	24053	4	0	6.4	0.2
ACI	99	V	300-150	2825	0	0	3.5	0.5
AEA	99	V	300-150	956	1	1	4.6	0.0
AFL	99	V	300-150	1905	0	0	3.3	0.3
AFR	99	V	300-150	25007	1	0	4.0	0.3
AHO	99	V	300-150	64	0	0	4.4	-0.1
AHY	99	V	300-150	170	17	0	11.1	-0.2
AIC	99	V	300-150	1722	1	0	5.0	0.2
AIZ	99	V	300-150	30	0	0	3.7	0.8
ALK	99	V	300-150	1099	0	0	3.4	0.8
AMX	99	V	300-150	3007	8	0	8.4	-0.1
ANZ	99	V	300-150	27878	3	0	6.2	0.4
AOJ	99	V	300-150	50	0	0	4.0	1.4
ASA	99	V	300-150	58	0	2	4.8	0.7
ASL	99	V	300-150	280	0	0	3.5	0.2
ASY	99	V	300-150	292	0	0	3.7	0.2
ATC	99	V	300-150	71	3	0	11.9	0.5
ATN	99	V	300-150	90	0	2	5.2	0.2

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	3996	0	0	4.0	0.0
AUH	99	V	300-150	182	5	1	6.8	0.3
AUI	99	V	300-150	600	0	0	3.3	0.3
AVA	99	V	300-150	665	1	1	4.5	0.2
AWC	99	V	300-150	29	0	0	3.2	-0.1
AXM	99	V	300-150	135	1	0	4.8	0.4
AXY	99	V	300-150	35	0	0	4.1	0.3
AZA	99	V	300-150	5730	0	0	4.0	0.5
AZG	99	V	300-150	194	0	0	3.6	-0.3
BAW	99	V	300-150	45814	1	0	4.8	0.2
BBA	99	V	300-150	43	0	0	3.8	0.7
BBC	99	V	300-150	176	1	0	3.7	1.0
BCS	99	V	300-150	767	0	0	3.5	0.0
BEL	99	V	300-150	1321	0	0	3.5	0.3
BLU	99	V	300-150	74	0	0	3.9	-0.5
BLX	99	V	300-150	199	11	0	5.6	0.1
BMW	99	V	300-150	41	0	0	3.7	-0.8
BOE	99	V	300-150	37	0	0	4.4	-0.6
BOS	99	V	300-150	1394	0	0	4.2	0.4
BOX	99	V	300-150	2310	0	0	3.7	0.0
BOX	99	V	300-150	102	0	0	3.2	0.0
BRK	99	V	300-150	22	0	0	6.2	-1.1
BWJ	99	V	300-150	39	0	0	3.8	0.8
CAJ	99	V	300-150	46	0	0	3.7	0.9
CAL	99	V	300-150	343	0	0	4.2	0.7
CAT	99	V	300-150	31	0	0	7.8	-0.7
CAZ	99	V	300-150	130	0	0	4.3	-0.8
CCA	99	V	300-150	1386	9	0	7.0	0.3
CEB	99	V	300-150	61	0	0	2.9	0.7
CEF	99	V	300-150	22	0	0	3.2	0.6
CES	99	V	300-150	2027	6	0	6.7	0.4
CFC	99	V	300-150	377	0	0	5.0	0.8
CFG	99	V	300-150	4537	0	0	4.4	-0.0
CHH	99	V	300-150	343	12	0	8.2	0.3
CJT	99	V	300-150	142	0	0	4.2	-0.3
CKS	99	V	300-150	1639	0	0	3.8	-0.4
CLU	99	V	300-150	357	0	0	4.6	-0.6
CLX	99	V	300-150	3168	0	0	4.0	-0.6
CMB	99	V	300-150	701	0	0	3.8	0.1
CNK	99	V	300-150	24	0	0	4.3	0.2
CNV	99	V	300-150	130	0	0	3.6	0.4
CPA	99	V	300-150	971	0	0	3.5	0.3
CRL	99	V	300-150	1372	0	0	3.8	0.2

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS  
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
CSC	99	V	300-150	219	0	0	3.6	0.4
CSN	99	V	300-150	852	8	0	9.5	0.1
CTM	99	V	300-150	82	0	0	3.9	0.8
CXA	99	V	300-150	22	41	0	17.2	0.3
CXB	99	V	300-150	97	0	0	3.8	-0.2
DAH	99	V	300-150	466	0	0	3.5	-0.2
DAL	99	V	300-150	45743	0	0	3.7	0.2
DCM	99	V	300-150	32	0	0	4.3	0.3
DCS	99	V	300-150	35	0	0	3.3	0.0
DGX	99	V	300-150	46	0	0	3.3	-0.3
DHK	99	V	300-150	1231	0	0	5.2	-0.9
DJT	99	V	300-150	1688	0	0	3.8	0.4
DLH	99	V	300-150	25948	0	0	3.7	0.1
DSO	99	V	300-150	65	0	0	4.4	-0.7
EAU	99	V	300-150	45	0	0	3.8	-0.3
EAV	99	V	300-150	32	0	0	4.5	0.4
EDC	99	V	300-150	32	0	0	3.8	-2.1
EDG	99	V	300-150	56	41	0	12.8	-0.6
EDW	99	V	300-150	1194	0	0	3.9	0.5
EIN	99	V	300-150	15781	0	0	3.6	0.3
EJM	99	V	300-150	890	5	0	4.8	0.1
ELY	99	V	300-150	3881	7	0	7.0	0.1
ETD	99	V	300-150	5837	2	0	5.4	0.3
ETH	99	V	300-150	3898	3	0	5.8	0.3
EWG	99	V	300-150	3237	0	0	3.8	0.4
EXS	99	V	300-150	194	0	1	3.7	0.3
FAF	99	V	300-150	23	0	0	3.3	0.5
FBU	99	V	300-150	798	0	0	4.3	0.2
FDX	99	V	300-150	7392	0	0	3.7	0.2
FEX	99	V	300-150	30	0	0	4.3	-0.8
FIN	99	V	300-150	997	0	0	3.2	0.1
FJI	99	V	300-150	7035	0	0	3.9	0.6
FRH	99	V	300-150	344	0	0	4.5	-0.5
FRV	99	V	300-150	24	0	8	3.5	-1.1
FWI	99	V	300-150	1560	0	0	3.8	0.5
FYG	99	V	300-150	36	0	0	5.4	3.4
GAF	99	V	300-150	33	0	0	3.8	0.7
GCK	99	V	300-150	38	0	0	3.1	0.3
GCT	99	V	300-150	50	0	0	3.8	-0.5
GEC	99	V	300-150	2455	0	0	3.6	0.2
GES	99	V	300-150	89	17	1	8.1	0.0
GFA	99	V	300-150	318	1	0	3.2	0.5
GIA	99	V	300-150	479	0	0	3.4	0.6

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS  
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
GLO	99	V	300-150	27	0	4	12.9	-0.9
GMA	99	V	300-150	22	0	0	5.5	2.9
GTH	99	V	300-150	93	0	0	4.5	0.2
GTI	99	V	300-150	2752	0	0	4.0	-0.2
HAL	99	V	300-150	3745	0	0	4.3	0.9
HRT	99	V	300-150	85	0	0	4.2	0.4
HUA	99	V	300-150	36	0	0	3.9	0.3
HWA	99	V	300-150	37	0	0	3.0	1.0
IAE	99	V	300-150	38	0	0	3.7	-0.1
IAM	99	V	300-150	67	0	0	4.4	1.1
IBE	99	V	300-150	3861	0	1	3.8	0.4
ICE	99	V	300-150	111	0	11	5.1	1.8
ICL	99	V	300-150	529	0	0	4.8	-1.2
ICV	99	V	300-150	216	0	0	3.6	-0.3
IFA	99	V	300-150	31	0	0	2.9	-0.8
IJM	99	V	300-150	133	0	0	4.5	-0.3
ISS	99	V	300-150	1687	0	0	3.7	0.4
JAF	99	V	300-150	932	5	0	5.7	0.3
JAS	99	V	300-150	248	0	0	3.9	0.0
JBU	99	V	300-150	28	0	75	5.6	0.1
JCL	99	V	300-150	33	0	0	3.8	0.0
JCO	99	V	300-150	20	0	0	5.4	1.1
JET	99	V	300-150	49	0	0	4.1	-1.9
JJA	99	V	300-150	76	4	0	5.2	1.0
JME	99	V	300-150	52	0	0	3.5	-0.7
JST	99	V	300-150	1772	4	0	7.0	0.3
KAC	99	V	300-150	1225	0	0	3.5	0.4
KAI	99	V	300-150	76	1	0	5.9	-0.2
KAL	99	V	300-150	1567	0	0	3.2	0.3
KCE	99	V	300-150	50	0	0	4.0	0.5
KIW	99	V	300-150	53	0	0	4.4	0.1
KLM	99	V	300-150	18056	3	0	5.7	0.2
KQA	99	V	300-150	260	8	0	6.8	-0.1
KTK	99	V	300-150	650	0	0	3.3	0.3
LAN	99	V	300-150	2097	12	0	8.7	0.1
LCO	99	V	300-150	69	0	0	3.6	-2.0
LEA	99	V	300-150	90	0	0	4.2	-0.1
LGT	99	V	300-150	41	0	0	3.8	1.1
LHO	99	V	300-150	27	0	4	4.1	-0.5
LNI	99	V	300-150	383	0	0	3.2	0.4
LNX	99	V	300-150	69	0	0	3.8	0.1
LOT	99	V	300-150	3683	7	0	7.2	0.1
LUC	99	V	300-150	59	0	0	4.7	0.2

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS  
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
LXA	99	V	300-150	37	0	0	5.3	2.0
LXJ	99	V	300-150	135	0	0	5.2	-0.6
MAS	99	V	300-150	786	0	0	3.4	0.4
MAU	99	V	300-150	276	0	0	4.5	1.1
MED	99	V	300-150	114	0	0	3.6	0.5
MHV	99	V	300-150	88	0	0	3.8	0.2
MJF	99	V	300-150	32	0	0	3.6	0.5
MLM	99	V	300-150	35	0	0	3.5	-0.2
MMD	99	V	300-150	240	0	0	3.9	0.2
MPH	99	V	300-150	644	0	0	4.1	-0.9
MSR	99	V	300-150	1717	6	0	8.0	0.2
NAF	99	V	300-150	58	0	0	4.5	-0.3
NAX	99	V	300-150	6306	9	0	8.1	0.1
NCA	99	V	300-150	196	0	0	4.7	-0.8
NJE	99	V	300-150	320	0	0	3.7	0.4
NOS	99	V	300-150	475	3	0	5.9	-0.1
NRS	99	V	300-150	6615	9	0	7.3	0.2
NSH	99	V	300-150	43	0	0	3.5	-1.1
NWS	99	V	300-150	920	0	0	3.5	0.4
OAE	99	V	300-150	1025	0	0	4.8	-0.4
OMA	99	V	300-150	563	3	0	6.0	0.6
ORF	99	V	300-150	33	0	0	2.5	0.4
PAC	99	V	300-150	296	0	0	4.1	-0.2
PAL	99	V	300-150	604	0	0	3.3	0.1
PAT	99	V	300-150	34	0	0	3.3	0.2
PEG	99	V	300-150	104	0	1	5.0	0.7
PIA	99	V	300-150	149	0	0	3.0	-0.1
PJZ	99	V	300-150	23	0	0	3.0	0.2
PRD	99	V	300-150	32	0	0	4.0	0.3
QFA	99	V	300-150	18189	1	0	5.5	0.4
QQE	99	V	300-150	64	0	0	3.9	0.6
QTR	99	V	300-150	15188	0	0	3.9	0.3
RAC	99	V	300-150	36	0	0	4.1	0.5
RAM	99	V	300-150	517	14	1	5.9	0.4
RBA	99	V	300-150	41	2	0	5.1	0.7
RCH	99	V	300-150	4193	0	0	4.5	0.3
RDN	99	V	300-150	130	0	0	2.9	0.1
REN	99	V	300-150	38	0	0	4.5	-0.5
RJA	99	V	300-150	1073	10	0	7.4	-0.1
RJE	99	V	300-150	34	0	0	5.4	-1.2
ROU	99	V	300-150	1519	0	0	4.4	0.2
RRR	99	V	300-150	297	0	0	3.6	0.2
RSY	99	V	300-150	41	0	0	2.8	0.9

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS  
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
RWD	99	V	300-150	42	0	0	3.2	0.7
RZO	99	V	300-150	122	0	6	4.9	0.7
SAM	99	V	300-150	437	0	0	4.0	0.3
SAS	99	V	300-150	4071	0	0	3.3	0.2
SAZ	99	V	300-150	23	0	0	3.0	-0.1
SCX	99	V	300-150	81	0	0	5.4	0.9
SEY	99	V	300-150	83	0	0	3.8	0.7
SHE	99	V	300-150	130	0	0	3.2	0.3
SIA	99	V	300-150	4177	0	0	3.9	0.1
SLE	99	V	300-150	88	0	0	3.2	0.8
SLM	99	V	300-150	165	0	0	3.5	0.6
SOO	99	V	300-150	455	0	0	3.6	-0.2
SPA	99	V	300-150	175	0	0	3.9	0.8
SVA	99	V	300-150	4294	0	0	4.5	0.5
SVF	99	V	300-150	26	0	0	6.6	-1.9
SVW	99	V	300-150	73	0	0	4.7	0.1
SWA	99	V	300-150	71	1	0	4.5	0.2
SWR	99	V	300-150	9839	0	0	3.9	0.5
SXN	99	V	300-150	63	0	0	3.9	-0.8
SYB	99	V	300-150	99	0	0	3.2	-0.5
TAM	99	V	300-150	60	0	2	8.5	-0.7
TAP	99	V	300-150	2001	0	1	4.3	0.4
TAR	99	V	300-150	182	0	0	3.8	0.6
TAY	99	V	300-150	330	0	0	3.9	-0.4
TEU	99	V	300-150	81	0	0	4.7	0.3
TFL	99	V	300-150	1400	6	0	7.1	0.2
TGW	99	V	300-150	66	11	0	5.0	0.6
THA	99	V	300-150	380	10	0	10.2	-0.3
THT	99	V	300-150	2916	5	0	10.8	0.8
THY	99	V	300-150	8865	2	0	4.8	0.2
TMN	99	V	300-150	246	0	0	4.3	0.4
TOM	99	V	300-150	5115	5	0	6.2	0.1
TOW	99	V	300-150	79	0	0	4.1	-0.1
TPA	99	V	300-150	234	0	0	4.0	0.2
TRK	99	V	300-150	41	0	0	4.1	0.4
TSC	99	V	300-150	3651	0	0	4.0	0.5
TWB	99	V	300-150	23	9	4	5.9	1.8
TWY	99	V	300-150	397	0	0	3.9	0.1
UAE	99	V	300-150	14917	0	0	3.7	0.4
UAL	99	V	300-150	71254	2	2	6.0	0.2
ULC	99	V	300-150	89	0	1	3.4	-0.2
UPS	99	V	300-150	4196	0	0	4.0	-0.0
UZB	99	V	300-150	100	10	0	11.0	-0.3



AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS  
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
VAJ	99	V	300-150	22	0	0	3.5	0.4
VAL	99	V	300-150	42	0	0	4.6	0.0
VCG	99	V	300-150	57	0	0	3.7	-0.4
VCJ	99	V	300-150	34	0	0	3.5	-0.6
VCN	99	V	300-150	53	0	0	3.9	-0.8
VIR	99	V	300-150	19784	2	0	5.2	0.2
VJT	99	V	300-150	764	0	0	3.7	0.2
VKG	99	V	300-150	268	0	0	3.6	0.8
VMP	99	V	300-150	76	0	0	4.3	0.5
VOZ	99	V	300-150	5188	0	0	3.9	0.5
VXS	99	V	300-150	32	0	0	4.9	0.2
WGT	99	V	300-150	51	0	0	3.6	0.3
WJA	99	V	300-150	2758	5	0	7.7	0.3
XAX	99	V	300-150	70	0	0	3.1	0.7

## 4 EUCOS Area Monitoring Statistics

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

Tables 13, 14 (50 hPa level), 15, 16 (100 hPa level) 17, 18 (500 hPa level) 19 and 20 (850 hPa level) provide quality statistics for all TEMPSHIPS and PILOTSHIPS received during the month in the area 10°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 : NOV 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	00	Z	50	27	22.2	19.4
01001	12	Z	50	29	16.4	11.4
01028	12	Z	50	30	14.1	12.3
01028	00	Z	50	29	12.9	11.4
01400	12	Z	50	29	89.0	88.6
01400	00	Z	50	27	88.8	86.7
01415	12	Z	50	30	15.6	14.3
01415	00	Z	50	30	16.8	15.6
02365	12	Z	50	11	14.7	13.8
02365	00	Z	50	17	15.1	13.5
02591	00	Z	50	26	20.8	20.1
02591	12	Z	50	28	17.9	17.0
02836	12	Z	50	29	11.1	9.3
02836	00	Z	50	29	12.9	12.4
02963	00	Z	50	26	15.0	14.3
02963	12	Z	50	28	12.9	12.0
03005	12	Z	50	29	12.2	10.4
03005	00	Z	50	30	13.3	11.8
03238	00	Z	50	29	14.5	12.6
03238	12	Z	50	2	5.7	4.5
03808	00	Z	50	25	19.6	16.6
03808	12	Z	50	29	15.6	14.1
03918	00	Z	50	26	20.3	18.5
03918	12	Z	50	2	21.3	21.3
03953	12	Z	50	27	35.7	32.9
03953	00	Z	50	25	27.0	23.7
04018	00	Z	50	29	15.8	14.4
04018	12	Z	50	27	10.6	8.1
04220	00	Z	50	27	17.1	15.4
04220	12	Z	50	28	11.7	9.9
04270	12	Z	50	29	10.6	6.0
04270	00	Z	50	28	14.9	10.4
04320	00	Z	50	30	13.4	11.8
04320	12	Z	50	30	12.8	10.8
04339	00	Z	50	30	20.2	15.9
04339	12	Z	50	29	15.9	10.2
04360	12	Z	50	26	12.4	7.8
04360	00	Z	50	25	14.6	9.5
06011	00	Z	50	28	14.3	12.2

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	50	29	26.5	24.6
06260	12	Z	50	4	22.3	21.0
06260	00	Z	50	30	15.1	13.8
06610	00	Z	50	30	17.2	15.3
06610	12	Z	50	31	20.9	19.2
07110	12	Z	50	29	34.4	22.6
07110	00	Z	50	26	69.0	23.8
07510	12	Z	50	29	31.3	28.7
07510	00	Z	50	31	26.3	22.3
07645	00	Z	50	27	21.8	20.3
07645	12	Z	50	30	26.1	23.8
07761	12	Z	50	28	39.9	32.7
07761	00	Z	50	24	26.2	23.4
08001	12	Z	50	25	20.3	18.0
08001	00	Z	50	21	20.8	18.6
08221	00	Z	50	28	23.8	22.3
08221	12	Z	50	30	26.4	25.2
08302	12	Z	50	29	12.0	9.4
08302	00	Z	50	29	17.0	15.1
08508	12	Z	50	30	16.2	15.6
08522	12	Z	50	29	16.1	15.1
08579	12	Z	50	29	31.0	24.8
10035	00	Z	50	28	25.8	25.1
10035	12	Z	50	28	22.7	21.9
10393	00	Z	50	30	16.2	14.9
10393	12	Z	50	30	14.6	10.9
10410	12	Z	50	30	11.7	10.1
10410	00	Z	50	29	15.1	13.5
10739	12	Z	50	30	19.9	18.3
10739	00	Z	50	30	20.4	18.6
11035	00	Z	50	29	27.4	26.1
11035	12	Z	50	30	38.4	36.0
12982	00	Z	50	28	21.3	17.6
12982	12	Z	50	29	43.3	40.7
16080	00	Z	50	27	16.2	13.7
16080	12	Z	50	30	14.9	12.2
16245	00	Z	50	28	20.6	16.9
16245	12	Z	50	28	17.1	14.3
16320	12	Z	50	25	21.6	19.5
16320	00	Z	50	29	25.3	23.9
16429	12	Z	50	30	19.9	16.7
16429	00	Z	50	28	22.4	20.6
16622	00	Z	50	24	38.1	37.3

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16754	00	Z	50	29	24.2	22.3
17607	12	Z	50	30	18.5	16.9
26435	12	Z	50	15	10.5	8.9
5QPW8X	12	Z	50	12	29.0	28.3
5QPW8X	00	Z	50	9	35.1	33.7
60018	12	Z	50	29	15.9	15.1
60018	00	Z	50	28	21.5	20.8
7JUNA4	12	Z	50	1	48.7	48.7
7JUNA4	00	Z	50	2	315.2	315.2
ASDE09	12	Z	50	2	53.5	53.0
BPMWB2	00	Z	50	4	30.6	30.0
BPMWB2	12	Z	50	2	36.5	35.8
FHM5UJ	12	Z	50	8	30.6	26.8
FHM5UJ	00	Z	50	4	31.3	31.1
FPUW5G	12	Z	50	4	24.4	23.4
JNKN7J	00	Z	50	1	39.0	39.0
JNKN7J	12	Z	50	2	70.3	70.0
KJFF9X	00	Z	50	7	34.9	31.4
KJFF9X	12	Z	50	10	30.2	29.2
KMPLHP	00	Z	50	2	8.7	8.7
KMPLHP	12	Z	50	3	48.2	48.2
LRYQE3	00	Z	50	2	16.2	16.1
LRYQE3	12	Z	50	5	60.8	59.4
WDK38H	12	Z	50	2	4.5	3.1
XKQLWQ	12	Z	50	9	90.4	79.9
XQFJRG	00	Z	50	4	3.3	1.7
XQFJRG	12	Z	50	5	34.1	30.5
YLV96W	00	Z	50	6	102.9	43.0
YLV96W	12	Z	50	2	63.3	59.9

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	00	V	50	19	3.0	0.1	-0.6
01001	12	V	50	28	3.1	0.6	0.3
01028	12	V	50	29	3.0	-0.4	0.6
01028	00	V	50	22	3.6	0.5	0.6
01400	12	V	50	29	3.2	0.3	-0.6
01400	00	V	50	20	3.5	-0.1	0.5
01415	12	V	50	30	3.1	-0.1	-0.2
01415	00	V	50	23	3.3	-0.3	0.7
02365	12	V	50	7	3.3	0.2	-0.9
02365	00	V	50	13	3.7	-0.5	0.8
02591	00	V	50	25	3.2	0.2	0.0
02591	12	V	50	23	2.8	-0.3	-0.5
02836	12	V	50	29	2.9	0.4	0.3
02836	00	V	50	25	3.6	0.3	-0.7
02963	00	V	50	22	2.6	0.0	-0.3
02963	12	V	50	27	3.3	0.8	-0.2
03005	12	V	50	29	2.5	0.4	0.0
03005	00	V	50	22	3.9	0.8	-0.9
03238	00	V	50	21	3.8	0.4	0.5
03238	12	V	50	2	2.7	-0.9	-1.6
03808	00	V	50	19	4.5	-0.1	-0.8
03808	12	V	50	28	3.3	0.9	0.1
03918	00	V	50	19	3.5	0.5	-0.5
03918	12	V	50	2	3.6	-0.7	2.7
03953	12	V	50	27	3.2	1.3	-0.1
03953	00	V	50	19	3.1	0.2	-0.5
04018	00	V	50	26	3.1	0.8	-0.2
04018	12	V	50	27	3.0	0.6	0.5
04220	00	V	50	22	3.5	-0.1	0.4
04220	12	V	50	28	3.0	0.4	0.3
04270	12	V	50	28	3.4	1.2	0.5
04270	00	V	50	22	3.4	-0.6	-0.9
04320	00	V	50	26	3.2	0.2	-1.0
04320	12	V	50	30	3.4	1.0	-0.3
04339	00	V	50	23	3.8	0.0	-0.4
04339	12	V	50	29	2.9	0.0	-0.1
04360	12	V	50	26	2.8	0.2	-0.2
04360	00	V	50	21	3.0	-0.1	0.3
06011	00	V	50	23	3.0	-0.2	0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	50	29	3.7	0.9	0.5
06260	12	V	50	4	3.7	2.0	1.4
06260	00	V	50	23	3.4	0.3	0.0
06610	00	V	50	23	4.3	0.2	-0.5
06610	12	V	50	30	3.6	-0.7	0.2
07110	12	V	50	29	3.4	-0.1	0.1
07110	00	V	50	17	3.1	0.1	-0.5
07510	12	V	50	29	3.4	-0.1	0.2
07510	00	V	50	26	4.1	0.9	-0.4
07645	00	V	50	24	4.0	-0.1	-0.1
07645	12	V	50	30	4.6	0.1	-1.3
07761	12	V	50	28	4.0	0.7	0.0
07761	00	V	50	20	4.4	1.1	0.6
08001	12	V	50	22	3.9	-0.2	-0.6
08001	00	V	50	13	3.9	-0.5	1.4
08221	00	V	50	23	4.4	1.2	0.3
08221	12	V	50	30	3.8	-0.5	0.2
08302	12	V	50	28	3.8	0.4	0.3
08302	00	V	50	21	3.7	-0.1	-1.3
08508	12	V	50	30	3.8	0.1	0.5
08522	12	V	50	29	3.6	0.6	1.1
08579	12	V	50	29	3.7	-0.1	0.8
10035	00	V	50	27	3.7	0.5	0.4
10035	12	V	50	27	3.0	0.7	-0.3
10393	00	V	50	28	3.8	0.8	-0.5
10393	12	V	50	30	3.0	-0.1	-0.1
10410	12	V	50	30	3.1	0.1	0.3
10410	00	V	50	29	3.1	0.1	0.5
10739	12	V	50	30	3.5	-0.2	0.3
10739	00	V	50	27	3.3	0.8	-0.7
11035	00	V	50	19	3.3	1.4	-0.6
11035	12	V	50	30	3.5	0.5	-1.0
12982	00	V	50	24	3.5	0.0	0.3
12982	12	V	50	29	3.2	0.4	0.3
16080	00	V	50	21	3.0	0.1	0.5
16080	12	V	50	30	3.6	0.8	-0.8
16245	00	V	50	22	3.6	1.4	0.1
16245	12	V	50	26	4.0	0.6	-0.7
16320	12	V	50	25	4.0	1.4	-0.5
16320	00	V	50	23	4.3	0.4	-0.3
16429	12	V	50	30	3.6	0.0	0.2
16429	00	V	50	22	4.3	0.6	0.5
16622	00	V	50	19	4.1	0.4	1.4

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16754	00	V	50	21	4.4	0.8	0.4
17607	12	V	50	6	4.4	-2.2	-2.3
26435	12	V	50	15	2.9	0.6	0.1
5QPW8X	12	V	50	12	3.1	0.4	0.2
5QPW8X	00	V	50	9	2.9	0.2	-1.0
60018	12	V	50	29	3.2	-0.3	-0.3
60018	00	V	50	24	3.5	0.4	0.7
7JUNA4	12	V	50	1	2.9	1.5	-2.5
7JUNA4	00	V	50	2	1.3	-1.0	-0.9
ASDE09	12	V	50	2	2.7	0.0	2.0
BPMWB2	00	V	50	4	3.5	0.9	-0.6
BPMWB2	12	V	50	2	4.7	-3.4	-1.1
FHM5UJ	12	V	50	8	3.3	-0.2	-0.6
FHM5UJ	00	V	50	4	3.1	1.1	-0.5
FPUW5G	12	V	50	4	1.5	0.1	-0.1
JNKN7J	00	V	50	1	5.7	4.4	-3.7
JNKN7J	12	V	50	2	2.9	-1.0	0.8
KJFF9X	00	V	50	7	4.8	-1.2	1.2
KJFF9X	12	V	50	10	2.3	0.1	0.6
KMPLHP	00	V	50	2	6.7	-0.6	2.5
KMPLHP	12	V	50	3	3.5	0.0	0.2
LRYQE3	00	V	50	2	1.8	-0.8	0.4
LRYQE3	12	V	50	5	2.7	0.0	-0.5
WDK38H	12	V	50	0	0.0	0.0	0.0
XKQLWQ	12	V	50	9	3.3	-0.4	0.8
XQFJRG	00	V	50	4	2.3	1.1	1.8
XQFJRG	12	V	50	4	1.3	0.0	-0.6
YLV96W	00	V	50	6	3.4	0.2	-0.4
YLV96W	12	V	50	2	2.3	1.1	0.1



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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	00	Z	100	28	10.5	5.4
01001	12	Z	100	30	9.5	-0.2
01028	12	Z	100	30	5.9	2.2
01028	00	Z	100	30	4.8	2.4
01400	12	Z	100	29	80.2	79.9
01400	00	Z	100	28	78.5	76.3
01415	12	Z	100	30	5.7	3.5
01415	00	Z	100	30	7.6	4.7
02365	12	Z	100	22	8.0	3.2
02365	00	Z	100	21	7.2	5.1
02591	00	Z	100	28	11.5	10.5
02591	12	Z	100	29	10.3	9.8
02836	12	Z	100	30	4.6	1.3
02836	00	Z	100	30	5.1	3.4
02963	00	Z	100	27	6.3	4.7
02963	12	Z	100	28	5.6	4.1
03005	12	Z	100	30	5.0	-0.1
03005	00	Z	100	30	3.7	1.5
03238	00	Z	100	29	6.1	2.6
03238	12	Z	100	2	8.2	-0.6
03808	00	Z	100	27	11.3	6.7
03808	12	Z	100	30	6.9	4.9
03918	00	Z	100	27	10.0	8.0
03918	12	Z	100	2	8.8	8.6
03953	12	Z	100	27	18.0	14.8
03953	00	Z	100	27	14.9	9.2
04018	00	Z	100	29	6.5	3.1
04018	12	Z	100	27	4.1	1.9
04220	00	Z	100	27	8.9	6.7
04220	12	Z	100	28	5.4	3.4
04270	12	Z	100	29	8.1	1.2
04270	00	Z	100	30	9.9	2.0
04320	00	Z	100	30	6.1	4.4
04320	12	Z	100	30	6.5	3.2
04339	00	Z	100	30	13.1	7.3
04339	12	Z	100	30	11.5	2.0
04360	12	Z	100	26	9.9	-5.4
04360	00	Z	100	25	9.4	-0.9
06011	00	Z	100	29	6.7	4.8

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	100	29	13.8	12.5
06260	12	Z	100	4	14.4	12.0
06260	00	Z	100	30	6.2	1.4
06610	00	Z	100	31	7.0	3.9
06610	12	Z	100	31	7.8	6.6
07110	12	Z	100	30	17.8	5.7
07110	00	Z	100	28	40.6	6.7
07510	12	Z	100	30	15.6	13.2
07510	00	Z	100	31	14.1	8.5
07645	00	Z	100	29	10.2	6.0
07645	12	Z	100	30	14.1	11.7
07761	12	Z	100	28	22.5	16.1
07761	00	Z	100	25	11.8	8.0
08001	12	Z	100	27	9.0	5.9
08001	00	Z	100	29	10.2	6.8
08221	00	Z	100	29	13.4	10.6
08221	12	Z	100	31	15.6	14.0
08302	12	Z	100	30	5.8	-0.1
08302	00	Z	100	30	7.8	2.6
08508	12	Z	100	30	10.3	9.4
08522	12	Z	100	29	11.2	10.5
08579	12	Z	100	29	26.2	17.7
10035	00	Z	100	30	15.4	14.6
10035	12	Z	100	30	15.4	14.6
10393	00	Z	100	30	7.0	5.4
10393	12	Z	100	30	7.5	3.7
10410	12	Z	100	30	5.7	1.7
10410	00	Z	100	30	5.3	2.2
10739	12	Z	100	30	9.6	7.2
10739	00	Z	100	30	10.3	8.1
11035	00	Z	100	30	14.9	14.0
11035	12	Z	100	30	25.5	22.5
12982	00	Z	100	29	11.0	6.6
12982	12	Z	100	29	21.3	19.8
16080	00	Z	100	30	9.0	2.6
16080	12	Z	100	30	6.5	2.3
16245	00	Z	100	30	8.8	-0.1
16245	12	Z	100	29	7.4	1.8
16320	12	Z	100	26	11.8	9.1
16320	00	Z	100	29	16.1	12.0
16429	12	Z	100	30	10.1	4.2
16429	00	Z	100	30	9.9	6.2
16622	00	Z	100	30	28.8	27.5

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16754	00	Z	100	29	14.0	10.1
17607	12	Z	100	30	10.5	7.5
26435	12	Z	100	15	4.6	2.6
5QPW8X	12	Z	100	14	21.6	20.9
5QPW8X	00	Z	100	9	24.3	23.0
60018	12	Z	100	30	12.7	11.9
60018	00	Z	100	29	13.0	12.3
7JUNA4	12	Z	100	2	68.4	59.3
7JUNA4	00	Z	100	4	17.1	13.2
ASDE09	12	Z	100	2	36.8	35.9
BPMWB2	00	Z	100	4	13.2	12.3
BPMWB2	12	Z	100	2	26.4	25.4
FHM5UJ	12	Z	100	8	20.8	17.3
FHM5UJ	00	Z	100	6	17.7	12.1
FPUW5G	12	Z	100	6	24.0	23.4
JNKN7J	00	Z	100	1	26.6	26.6
JNKN7J	12	Z	100	3	47.8	47.7
KJFF9X	00	Z	100	7	18.4	14.9
KJFF9X	12	Z	100	10	19.2	17.9
KMPLHP	00	Z	100	4	17.8	11.5
KMPLHP	12	Z	100	4	28.4	28.4
LRQE3	00	Z	100	3	23.7	17.4
LRQE3	12	Z	100	6	28.5	28.5
WDK38H	12	Z	100	11	8.9	-1.9
XKQLWQ	12	Z	100	11	61.1	53.0
XQFJRG	00	Z	100	4	14.5	-12.2
XQFJRG	12	Z	100	5	7.4	5.3
YLV96W	00	Z	100	7	14.0	-4.4
YLV96W	12	Z	100	5	26.5	22.5

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	00	V	100	19	2.3	-0.4	-0.1
01001	12	V	100	29	2.4	1.0	-0.5
01028	12	V	100	30	2.5	0.3	0.1
01028	00	V	100	21	2.0	0.2	0.1
01400	12	V	100	29	2.8	0.6	-0.5
01400	00	V	100	21	3.1	0.7	0.3
01415	12	V	100	30	3.0	0.4	0.1
01415	00	V	100	28	2.7	0.4	-0.3
02365	12	V	100	19	3.4	-0.1	-0.2
02365	00	V	100	16	2.2	0.2	-0.2
02591	00	V	100	25	2.4	0.0	0.1
02591	12	V	100	29	2.7	-0.3	-0.2
02836	12	V	100	30	2.5	0.0	-0.1
02836	00	V	100	26	2.6	0.0	0.0
02963	00	V	100	22	2.9	0.6	0.1
02963	12	V	100	28	2.6	0.6	0.7
03005	12	V	100	30	2.8	-0.2	-0.2
03005	00	V	100	22	2.8	0.6	-0.1
03238	00	V	100	21	3.5	1.1	-0.2
03238	12	V	100	2	2.9	1.2	-2.4
03808	00	V	100	21	3.4	0.9	0.7
03808	12	V	100	29	3.0	-0.5	0.2
03918	00	V	100	20	2.6	0.1	0.5
03918	12	V	100	2	5.5	1.0	3.1
03953	12	V	100	27	3.6	-0.1	-0.5
03953	00	V	100	20	3.5	1.0	-0.1
04018	00	V	100	29	3.1	0.2	0.7
04018	12	V	100	27	2.6	0.4	-0.9
04220	00	V	100	27	2.9	-0.3	0.0
04220	12	V	100	28	2.7	0.7	0.1
04270	12	V	100	29	3.3	0.6	0.4
04270	00	V	100	28	3.0	0.6	0.7
04320	00	V	100	30	3.2	0.1	0.5
04320	12	V	100	30	2.7	-0.4	0.0
04339	00	V	100	30	3.3	0.9	-0.4
04339	12	V	100	29	2.9	0.1	-0.2
04360	12	V	100	26	3.3	-0.4	-0.7
04360	00	V	100	25	3.9	-0.7	0.0
06011	00	V	100	27	3.3	0.6	-0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	100	29	2.3	0.2	0.1
06260	12	V	100	4	4.2	2.3	-0.6
06260	00	V	100	23	3.6	0.5	-0.7
06610	00	V	100	29	3.6	1.1	0.0
06610	12	V	100	30	3.0	0.2	-0.5
07110	12	V	100	30	3.6	0.5	0.0
07110	00	V	100	18	3.2	0.5	-0.3
07510	12	V	100	30	3.5	0.3	-0.7
07510	00	V	100	26	3.0	0.4	-0.5
07645	00	V	100	26	3.9	1.1	0.2
07645	12	V	100	30	4.1	-0.4	-0.2
07761	12	V	100	28	3.7	0.6	-0.4
07761	00	V	100	20	5.0	1.6	-0.8
08001	12	V	100	26	4.1	0.0	-0.4
08001	00	V	100	22	4.2	0.8	0.7
08221	00	V	100	24	4.1	-0.9	-0.4
08221	12	V	100	30	4.4	-0.3	-0.5
08302	12	V	100	30	5.4	-0.2	-0.9
08302	00	V	100	22	4.4	0.0	-0.5
08508	12	V	100	30	4.3	-0.7	0.8
08522	12	V	100	29	3.9	0.8	1.3
08579	12	V	100	29	4.5	-0.7	1.5
10035	00	V	100	30	2.8	0.5	-0.2
10035	12	V	100	28	2.5	0.2	0.1
10393	00	V	100	30	3.6	0.6	0.0
10393	12	V	100	30	3.6	1.1	0.7
10410	12	V	100	30	2.6	0.3	0.3
10410	00	V	100	30	3.1	-0.2	-0.7
10739	12	V	100	30	2.9	-0.3	0.2
10739	00	V	100	30	3.4	0.7	-0.4
11035	00	V	100	21	3.5	0.2	-0.1
11035	12	V	100	30	4.0	0.7	0.1
12982	00	V	100	26	3.7	0.8	0.4
12982	12	V	100	29	3.8	-0.2	-0.9
16080	00	V	100	26	3.9	0.5	-0.1
16080	12	V	100	30	3.8	0.6	0.4
16245	00	V	100	26	4.7	0.7	-0.5
16245	12	V	100	29	4.3	0.5	-0.5
16320	12	V	100	26	4.3	0.0	-0.1
16320	00	V	100	26	4.5	0.3	0.9
16429	12	V	100	30	4.5	1.2	-0.4
16429	00	V	100	26	5.4	0.5	0.9
16622	00	V	100	25	4.5	-0.4	-0.4

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16754	00	V	100	21	4.0	0.3	0.3
17607	12	V	100	6	4.2	1.9	-0.9
26435	12	V	100	15	2.7	-0.1	-1.0
5QPW8X	12	V	100	13	2.4	0.3	-0.3
5QPW8X	00	V	100	9	2.1	0.7	0.4
60018	12	V	100	30	3.7	0.3	-1.0
60018	00	V	100	24	4.0	0.1	0.2
7JUNA4	12	V	100	2	1.5	-0.9	1.2
7JUNA4	00	V	100	4	3.6	-0.9	0.0
ASDE09	12	V	100	2	3.9	1.9	1.5
BPMWB2	00	V	100	4	3.6	0.2	2.4
BPMWB2	12	V	100	2	2.7	0.9	1.4
FHM5UJ	12	V	100	8	1.6	0.3	-0.3
FHM5UJ	00	V	100	6	2.7	0.7	0.5
FPUW5G	12	V	100	6	4.0	-1.2	-1.4
JNKN7J	00	V	100	1	1.8	1.5	1.0
JNKN7J	12	V	100	2	3.0	-0.8	2.0
KJFF9X	00	V	100	7	4.8	-2.9	0.4
KJFF9X	12	V	100	10	4.7	-0.7	-0.5
KMPLHP	00	V	100	4	4.8	-2.7	2.8
KMPLHP	12	V	100	4	4.3	1.4	-1.3
LRYQE3	00	V	100	3	1.7	1.3	-0.4
LRYQE3	12	V	100	6	3.5	0.7	1.3
WDK38H	12	V	100	10	3.2	-1.6	0.1
XKQLWQ	12	V	100	11	3.3	-0.3	-1.4
XQFJRG	00	V	100	4	3.2	-0.4	0.3
XQFJRG	12	V	100	5	3.3	0.0	-0.9
YLV96W	00	V	100	7	2.8	-0.5	1.3
YLV96W	12	V	100	5	5.0	2.6	0.2

#### 4.5 Table 17 - Radiosonde Monitoring Statistics (EUCOS): 500 hPa Geopotential height (metres)

##### RADIOSONDE MONITORING STATISTICS (EUCOS)

MONITORING CENTRE : ECMWF  
 ELEMENT MONITORED : GEOPOTENTIAL HEIGHT (METRES)  
 LEVEL : 500 HPA  
 AREA : 0 - 90N, 100W - 40E  
 PERIOD : NOV 2019  
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	00	Z	500	30	7.8	-5.4
01001	12	Z	500	31	7.6	-5.3
01028	12	Z	500	30	3.6	-0.2
01028	00	Z	500	30	3.9	-0.2
01400	12	Z	500	29	78.2	77.9
01400	00	Z	500	28	73.4	71.2
01415	12	Z	500	30	4.8	3.4
01415	00	Z	500	30	4.4	2.9
02365	12	Z	500	24	5.5	4.4
02365	00	Z	500	22	4.4	3.5
02591	00	Z	500	29	9.0	8.2
02591	12	Z	500	29	9.4	8.9
02836	12	Z	500	30	4.6	1.3
02836	00	Z	500	30	3.4	1.7
02963	00	Z	500	27	4.6	3.9
02963	12	Z	500	28	4.7	3.9
03005	12	Z	500	30	3.3	-0.6
03005	00	Z	500	30	2.4	-0.2
03238	00	Z	500	29	3.3	1.6
03238	12	Z	500	2	2.6	2.3
03808	00	Z	500	27	5.3	3.2
03808	12	Z	500	30	3.9	2.1
03918	00	Z	500	27	6.7	6.3
03918	12	Z	500	3	10.4	10.4
03953	12	Z	500	30	7.0	4.9
03953	00	Z	500	28	8.1	2.8
04018	00	Z	500	29	3.5	2.1
04018	12	Z	500	27	3.3	1.4
04220	00	Z	500	27	8.0	5.2
04220	12	Z	500	28	5.4	3.5
04270	12	Z	500	29	6.8	0.5
04270	00	Z	500	30	10.5	-0.4
04320	00	Z	500	30	3.2	1.6
04320	12	Z	500	30	4.8	1.4
04339	00	Z	500	30	13.7	6.0
04339	12	Z	500	30	11.7	0.9
04360	12	Z	500	29	8.9	-7.8
04360	00	Z	500	29	11.1	-9.3
06011	00	Z	500	30	7.7	6.8

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	500	29	9.8	8.9
06260	12	Z	500	4	4.4	-2.8
06260	00	Z	500	30	5.3	-1.8
06610	00	Z	500	32	3.3	1.0
06610	12	Z	500	32	3.9	1.3
07110	12	Z	500	30	4.6	-1.7
07110	00	Z	500	29	7.2	-4.7
07510	12	Z	500	29	7.1	4.3
07510	00	Z	500	32	7.1	3.0
07645	00	Z	500	30	3.4	0.0
07645	12	Z	500	30	5.2	1.8
07761	12	Z	500	27	6.7	3.2
07761	00	Z	500	27	8.9	3.2
08001	12	Z	500	29	8.6	6.8
08001	00	Z	500	31	5.4	4.1
08221	00	Z	500	29	9.9	8.3
08221	12	Z	500	31	10.7	9.5
08302	12	Z	500	30	7.5	-2.5
08302	00	Z	500	31	4.6	-1.8
08508	12	Z	500	30	7.4	6.4
08522	12	Z	500	30	6.8	6.5
08579	12	Z	500	30	22.7	13.6
10035	00	Z	500	30	10.4	10.0
10035	12	Z	500	30	10.0	9.6
10393	00	Z	500	30	2.5	0.9
10393	12	Z	500	30	2.4	0.8
10410	12	Z	500	30	4.5	-3.1
10410	00	Z	500	30	3.1	-1.5
10739	12	Z	500	30	5.2	3.0
10739	00	Z	500	30	4.3	3.6
11035	00	Z	500	30	8.8	8.2
11035	12	Z	500	30	17.6	15.3
12982	00	Z	500	29	7.1	5.5
12982	12	Z	500	29	7.2	6.3
16080	00	Z	500	30	3.0	-0.6
16080	12	Z	500	31	3.5	-2.1
16245	00	Z	500	30	4.7	-1.8
16245	12	Z	500	29	4.3	-2.2
16320	12	Z	500	26	9.1	7.5
16320	00	Z	500	30	10.2	6.4
16429	12	Z	500	31	6.0	3.6
16429	00	Z	500	31	4.9	2.7
16622	00	Z	500	30	22.5	22.0



RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16754	00	Z	500	29	8.9	4.7
17607	12	Z	500	30	6.0	5.5
26435	12	Z	500	15	3.8	2.1
5QPW8X	12	Z	500	14	24.7	24.4
5QPW8X	00	Z	500	11	27.1	26.3
60018	12	Z	500	30	7.1	6.5
60018	00	Z	500	29	6.5	6.0
7JUNA4	12	Z	500	5	10.2	-3.8
7JUNA4	00	Z	500	4	5.3	0.3
ASDE09	12	Z	500	2	26.6	23.8
BPMWB2	00	Z	500	6	8.2	4.4
BPMWB2	12	Z	500	3	12.1	12.1
FHM5UJ	12	Z	500	9	18.8	17.0
FHM5UJ	00	Z	500	6	15.7	10.8
FPUW5G	12	Z	500	6	10.4	9.8
JNKN7J	00	Z	500	2	35.8	35.6
JNKN7J	12	Z	500	4	40.4	39.9
KJFF9X	00	Z	500	8	6.9	3.1
KJFF9X	12	Z	500	10	6.8	6.2
KMPLHP	00	Z	500	5	43.6	28.8
KMPLHP	12	Z	500	6	53.1	39.9
LRQE3	00	Z	500	3	6.8	-6.0
LRQE3	12	Z	500	7	6.8	3.5
WDK38H	12	Z	500	17	7.2	-5.3
XKQLWQ	12	Z	500	11	28.2	26.4
XQFJRG	00	Z	500	5	15.6	-14.8
XQFJRG	12	Z	500	7	53.6	9.0
YLV96W	00	Z	500	7	10.0	-4.8
YLV96W	12	Z	500	6	9.9	-2.4

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

## RADIOSONDE MONITORING STATISTICS (EUCOS)

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	00	V	500	30	2.5	-0.3	0.1
01001	12	V	500	30	1.8	-0.1	-0.2
01028	12	V	500	30	2.7	-0.4	-0.1
01028	00	V	500	30	2.2	-0.1	-0.3
01400	12	V	500	29	2.6	0.2	0.0
01400	00	V	500	28	2.6	0.1	0.3
01415	12	V	500	30	2.7	0.0	0.1
01415	00	V	500	29	3.0	0.4	0.0
02365	12	V	500	24	3.0	-0.5	-0.1
02365	00	V	500	22	2.7	-0.4	0.1
02591	00	V	500	29	2.6	-0.3	0.7
02591	12	V	500	29	3.0	0.1	0.2
02836	12	V	500	30	3.2	1.3	1.0
02836	00	V	500	30	2.2	0.3	-0.2
02963	00	V	500	27	2.6	0.4	0.2
02963	12	V	500	28	2.2	0.2	-0.2
03005	12	V	500	30	2.5	-0.1	-0.2
03005	00	V	500	30	2.3	-0.1	0.5
03238	00	V	500	29	2.5	-0.2	0.1
03238	12	V	500	2	1.2	-0.9	-0.2
03808	00	V	500	27	2.6	-0.4	0.4
03808	12	V	500	29	3.1	-0.8	-0.4
03918	00	V	500	27	2.8	0.2	-0.6
03918	12	V	500	3	1.7	0.6	0.9
03953	12	V	500	30	3.9	0.4	0.3
03953	00	V	500	28	3.4	-0.2	0.4
04018	00	V	500	29	2.8	-0.1	0.2
04018	12	V	500	27	2.8	-0.3	0.6
04220	00	V	500	27	4.6	1.5	-0.2
04220	12	V	500	28	3.2	-0.1	-0.6
04270	12	V	500	29	4.6	0.1	-0.6
04270	00	V	500	30	3.1	0.4	-0.3
04320	00	V	500	30	2.0	0.5	0.2
04320	12	V	500	30	2.7	0.4	0.0
04339	00	V	500	30	3.2	0.4	-0.5
04339	12	V	500	30	2.4	0.0	0.0
04360	12	V	500	29	2.8	0.1	-0.4
04360	00	V	500	29	3.0	-0.1	0.1
06011	00	V	500	30	2.2	0.7	0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	500	29	2.5	-0.3	0.0
06260	12	V	500	4	2.5	1.0	-0.4
06260	00	V	500	29	2.5	0.4	0.3
06610	00	V	500	29	3.3	0.1	0.7
06610	12	V	500	30	3.1	0.8	0.8
07110	12	V	500	30	3.2	-0.2	-0.7
07110	00	V	500	29	3.1	-0.4	0.3
07510	12	V	500	29	3.7	0.9	-0.2
07510	00	V	500	31	3.7	0.2	-1.2
07645	00	V	500	30	3.9	0.8	0.5
07645	12	V	500	30	3.0	-0.3	0.0
07761	12	V	500	27	4.2	1.4	-0.3
07761	00	V	500	27	4.5	0.6	0.6
08001	12	V	500	29	3.2	0.7	-0.6
08001	00	V	500	30	3.6	0.3	0.6
08221	00	V	500	29	3.9	0.2	-0.4
08221	12	V	500	30	3.7	0.7	-1.4
08302	12	V	500	30	3.2	0.0	-0.7
08302	00	V	500	29	4.0	0.0	-1.1
08508	12	V	500	30	2.2	0.5	0.2
08522	12	V	500	30	2.3	0.3	0.4
08579	12	V	500	30	2.9	0.6	0.0
10035	00	V	500	30	2.5	-0.1	-0.6
10035	12	V	500	29	2.8	-0.8	0.1
10393	00	V	500	30	3.2	0.6	1.0
10393	12	V	500	30	2.5	-0.2	0.2
10410	12	V	500	30	2.9	0.0	-0.8
10410	00	V	500	30	3.0	-0.2	-0.5
10739	12	V	500	30	4.0	0.2	-0.2
10739	00	V	500	30	3.9	0.6	0.5
11035	00	V	500	30	2.8	0.1	0.3
11035	12	V	500	30	3.2	-0.3	0.5
12982	00	V	500	29	2.8	0.4	0.2
12982	12	V	500	29	3.3	-0.7	0.4
16080	00	V	500	30	3.7	0.6	0.3
16080	12	V	500	30	3.9	1.2	-0.1
16245	00	V	500	30	3.9	-0.4	0.7
16245	12	V	500	29	3.9	0.4	-0.2
16320	12	V	500	26	2.5	0.4	0.6
16320	00	V	500	30	3.0	0.7	0.1
16429	12	V	500	30	4.0	-0.4	-0.7
16429	00	V	500	30	3.3	0.1	0.0
16622	00	V	500	30	2.3	0.4	0.2

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16754	00	V	500	25	3.3	0.0	0.9
17607	12	V	500	15	2.9	1.2	-0.8
26435	12	V	500	15	2.3	1.0	0.3
5QPW8X	12	V	500	14	3.9	0.8	-0.3
5QPW8X	00	V	500	11	2.6	0.4	0.4
60018	12	V	500	30	2.7	0.0	0.3
60018	00	V	500	29	2.3	-0.2	0.3
7JUNA4	12	V	500	5	3.8	-0.4	3.0
7JUNA4	00	V	500	4	4.3	-1.4	-0.9
ASDE09	12	V	500	2	1.2	0.2	0.8
BPMWB2	00	V	500	6	2.3	0.6	0.3
BPMWB2	12	V	500	3	1.3	-0.6	0.3
FHM5UJ	12	V	500	9	2.3	-1.1	-0.7
FHM5UJ	00	V	500	6	2.3	-1.1	0.6
FPUW5G	12	V	500	6	2.9	0.6	-0.5
JNKN7J	00	V	500	2	2.7	-1.5	-1.5
JNKN7J	12	V	500	4	3.4	-0.7	-0.8
KJJF9X	00	V	500	8	2.6	-0.3	-0.5
KJJF9X	12	V	500	10	3.0	1.3	-0.3
KMPLHP	00	V	500	5	2.8	0.5	0.5
KMPLHP	12	V	500	6	3.4	-0.1	2.5
LRQEQ3	00	V	500	3	3.9	-2.9	1.0
LRQEQ3	12	V	500	7	3.4	1.7	1.0
WDK38H	12	V	500	17	2.1	0.6	-0.8
XKQLWQ	12	V	500	11	2.8	-0.3	0.2
XQFJRG	00	V	500	5	4.7	0.0	-1.4
XQFJRG	12	V	500	7	2.5	0.3	0.2
YLV96W	00	V	500	7	4.0	0.2	-0.5
YLV96W	12	V	500	6	4.3	1.1	-1.5

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	00	Z	850	30	6.7	-5.9
01001	12	Z	850	32	7.1	-5.8
01028	12	Z	850	30	3.2	-1.4
01028	00	Z	850	30	3.5	-1.8
01400	12	Z	850	29	77.8	77.6
01400	00	Z	850	28	74.0	71.9
01415	12	Z	850	30	3.6	2.3
01415	00	Z	850	30	3.5	2.2
02365	12	Z	850	24	5.3	4.9
02365	00	Z	850	22	4.4	3.9
02591	00	Z	850	29	7.9	7.6
02591	12	Z	850	29	8.7	8.3
02836	12	Z	850	30	3.1	2.4
02836	00	Z	850	30	3.5	2.5
02963	00	Z	850	27	3.0	2.4
02963	12	Z	850	28	4.0	3.2
03005	12	Z	850	30	2.8	-0.7
03005	00	Z	850	30	2.7	-1.5
03238	00	Z	850	29	3.3	2.2
03238	12	Z	850	2	4.3	4.3
03808	00	Z	850	27	6.2	4.0
03808	12	Z	850	30	4.0	2.8
03918	00	Z	850	27	7.5	7.0
03918	12	Z	850	3	8.2	8.0
03953	12	Z	850	30	7.5	6.9
03953	00	Z	850	28	5.7	4.6
04018	00	Z	850	29	2.3	0.7
04018	12	Z	850	27	2.2	0.6
04220	00	Z	850	27	8.3	2.8
04220	12	Z	850	28	3.4	2.0
04270	12	Z	850	29	4.6	1.0
04270	00	Z	850	30	11.3	3.3
04320	00	Z	850	30	3.9	-0.5
04320	12	Z	850	30	5.5	-1.5
04339	00	Z	850	30	14.1	4.1
04339	12	Z	850	30	13.6	-1.7
04360	12	Z	850	29	8.6	-7.9
04360	00	Z	850	29	9.9	-8.3
06011	00	Z	850	30	6.0	5.4

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	12	Z	850	29	6.1	5.5
06260	12	Z	850	4	1.6	-1.2
06260	00	Z	850	30	4.4	-1.9
06610	00	Z	850	33	3.0	2.1
06610	12	Z	850	32	3.3	1.2
07110	12	Z	850	30	2.8	-0.5
07110	00	Z	850	28	3.2	-1.4
07510	12	Z	850	30	4.5	3.1
07510	00	Z	850	32	3.5	2.2
07645	00	Z	850	30	3.1	0.2
07645	12	Z	850	30	2.3	-0.1
07761	12	Z	850	29	3.7	-0.3
07761	00	Z	850	27	3.1	1.1
08001	12	Z	850	29	4.2	2.2
08001	00	Z	850	31	3.4	1.8
08221	00	Z	850	29	6.6	6.0
08221	12	Z	850	31	5.8	5.2
08302	12	Z	850	30	5.8	-5.2
08302	00	Z	850	31	4.8	-4.3
08508	12	Z	850	30	5.2	4.2
08522	12	Z	850	30	4.2	3.6
08579	12	Z	850	30	8.4	7.9
10035	00	Z	850	30	10.2	9.9
10035	12	Z	850	30	10.6	10.3
10393	00	Z	850	30	2.5	0.0
10393	12	Z	850	30	1.8	0.2
10410	12	Z	850	30	3.0	-2.2
10410	00	Z	850	30	3.3	-2.1
10739	12	Z	850	30	4.0	3.0
10739	00	Z	850	30	4.0	3.1
11035	00	Z	850	30	6.6	6.1
11035	12	Z	850	30	16.1	14.6
12982	00	Z	850	29	5.3	3.7
12982	12	Z	850	29	5.4	4.7
16080	00	Z	850	30	2.7	-1.0
16080	12	Z	850	31	3.3	-1.8
16245	00	Z	850	30	2.5	-0.9
16245	12	Z	850	30	2.9	-1.5
16320	12	Z	850	30	9.6	7.8
16320	00	Z	850	30	10.6	7.3
16429	12	Z	850	31	4.0	3.1
16429	00	Z	850	31	3.5	1.8
16622	00	Z	850	30	22.2	21.9

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
16754	00	Z	850	31	7.0	3.0
17607	12	Z	850	30	3.7	3.5
26435	12	Z	850	15	2.5	1.4
5QPW8X	12	Z	850	14	27.2	26.7
5QPW8X	00	Z	850	11	32.6	32.1
60018	12	Z	850	30	3.7	0.9
60018	00	Z	850	30	3.2	0.7
7JUNA4	12	Z	850	5	4.9	-2.4
7JUNA4	00	Z	850	4	8.6	1.0
ASDE09	12	Z	850	2	35.8	35.0
BPMWB2	00	Z	850	6	5.0	1.2
BPMWB2	12	Z	850	3	3.3	3.2
FHM5UJ	12	Z	850	9	20.0	17.6
FHM5UJ	00	Z	850	6	18.9	14.4
FPUW5G	12	Z	850	6	8.4	6.8
JNKN7J	00	Z	850	4	45.8	45.0
JNKN7J	12	Z	850	4	39.8	38.7
KJJF9X	00	Z	850	8	5.1	-0.5
KJJF9X	12	Z	850	10	2.4	0.9
KMPLHP	00	Z	850	5	12.3	8.4
KMPLHP	12	Z	850	5	9.3	6.4
LRYQE3	00	Z	850	3	3.3	-1.4
LRYQE3	12	Z	850	7	23.5	13.4
WDK38H	12	Z	850	17	8.7	-7.8
XKQLWQ	12	Z	850	11	15.7	14.7
XQFJRG	00	Z	850	5	13.9	-13.4
XQFJRG	12	Z	850	7	11.1	-10.6
YLV96W	00	Z	850	8	3.8	0.1
YLV96W	12	Z	850	6	3.3	0.1

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	00	V	850	30	2.7	0.8	-0.1
01001	12	V	850	30	3.5	0.5	-0.9
01028	12	V	850	30	3.8	-0.1	-0.4
01028	00	V	850	30	2.6	0.5	0.0
01400	12	V	850	29	2.5	0.5	-0.1
01400	00	V	850	28	2.6	0.0	0.0
01415	12	V	850	30	3.3	-0.1	0.1
01415	00	V	850	29	2.7	0.0	0.8
02365	12	V	850	24	2.3	0.2	0.6
02365	00	V	850	22	2.1	0.0	0.7
02591	00	V	850	29	2.6	-0.2	-0.1
02591	12	V	850	29	2.7	0.5	0.0
02836	12	V	850	30	2.3	0.0	-0.6
02836	00	V	850	30	2.3	-0.1	0.0
02963	00	V	850	27	2.8	0.2	-0.3
02963	12	V	850	28	2.5	0.1	0.1
03005	12	V	850	30	2.8	-0.5	0.0
03005	00	V	850	30	2.4	-0.7	0.9
03238	00	V	850	29	2.5	0.3	0.3
03238	12	V	850	2	0.9	-0.3	0.2
03808	00	V	850	27	2.2	0.3	-0.4
03808	12	V	850	29	2.5	-0.5	0.2
03918	00	V	850	27	2.8	-0.1	0.1
03918	12	V	850	3	4.3	1.3	-0.3
03953	12	V	850	30	2.1	0.2	0.9
03953	00	V	850	28	2.5	0.7	0.3
04018	00	V	850	29	4.8	-0.9	-0.3
04018	12	V	850	27	3.5	-0.1	0.3
04220	00	V	850	26	4.1	0.5	-1.6
04220	12	V	850	28	3.7	1.1	-0.7
04270	12	V	850	29	3.7	0.6	1.2
04270	00	V	850	30	4.3	-0.1	-0.6
04320	00	V	850	30	2.9	-0.5	0.3
04320	12	V	850	30	3.4	1.1	0.0
04339	00	V	850	30	2.8	0.6	-0.2
04339	12	V	850	30	3.2	0.5	-0.4
04360	12	V	850	29	7.4	2.9	0.1
04360	00	V	850	29	8.8	4.5	0.1
06011	00	V	850	30	2.5	-0.5	0.2



RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	12	V	850	29	2.8	-0.2	0.4
06260	12	V	850	4	4.4	-1.4	-2.1
06260	00	V	850	29	2.8	-0.5	-0.6
06610	00	V	850	30	3.0	0.6	-0.1
06610	12	V	850	30	2.6	0.1	-0.1
07110	12	V	850	30	3.4	-0.3	0.6
07110	00	V	850	28	3.5	0.3	0.3
07510	12	V	850	30	3.7	0.7	-0.1
07510	00	V	850	31	3.5	-0.6	-0.2
07645	00	V	850	30	3.8	-0.9	0.9
07645	12	V	850	30	2.8	-0.8	0.5
07761	12	V	850	29	3.3	0.3	-0.8
07761	00	V	850	27	4.2	0.1	-0.8
08001	12	V	850	29	2.8	-0.4	0.0
08001	00	V	850	30	3.2	-0.2	-0.1
08221	00	V	850	29	3.8	-0.1	-0.6
08221	12	V	850	30	3.2	0.7	-0.3
08302	12	V	850	30	3.3	0.2	0.7
08302	00	V	850	29	3.4	0.1	0.6
08508	12	V	850	30	3.0	-0.4	-0.2
08522	12	V	850	30	3.7	0.1	0.6
08579	12	V	850	30	3.1	0.2	-0.3
10035	00	V	850	30	2.5	0.1	0.1
10035	12	V	850	29	2.1	0.5	0.0
10393	00	V	850	30	2.7	0.3	0.1
10393	12	V	850	30	2.7	0.2	0.4
10410	12	V	850	30	2.3	-0.3	0.4
10410	00	V	850	30	2.3	0.0	0.1
10739	12	V	850	30	3.4	0.4	0.4
10739	00	V	850	30	3.1	-0.2	-0.2
11035	00	V	850	30	3.1	-0.1	1.2
11035	12	V	850	30	3.4	0.0	0.9
12982	00	V	850	29	2.8	0.0	0.0
12982	12	V	850	29	2.8	0.4	0.1
16080	00	V	850	30	3.7	0.1	-0.3
16080	12	V	850	30	3.9	-0.4	-0.1
16245	00	V	850	30	3.5	0.5	1.2
16245	12	V	850	30	3.0	-0.6	0.6
16320	12	V	850	29	2.7	0.1	0.1
16320	00	V	850	30	4.3	0.8	-0.8
16429	12	V	850	30	2.7	0.6	0.2
16429	00	V	850	30	3.1	-0.4	-0.2
16622	00	V	850	30	3.5	-0.8	0.5

RADIOSONDE MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
16754	00	V	850	27	3.4	-0.2	-1.1
17607	12	V	850	28	2.5	0.9	-0.2
26435	12	V	850	15	2.4	-0.6	0.1
5QPW8X	12	V	850	14	3.4	-0.6	0.5
5QPW8X	00	V	850	11	2.9	0.7	-0.7
60018	12	V	850	30	3.7	0.9	-0.7
60018	00	V	850	29	3.7	0.1	-0.2
7JUNA4	12	V	850	5	3.6	-0.4	0.6
7JUNA4	00	V	850	4	2.5	0.8	0.5
ASDE09	12	V	850	2	2.0	-0.7	-1.3
BPMWB2	00	V	850	6	2.7	0.5	0.2
BPMWB2	12	V	850	3	1.6	0.2	-0.9
FHM5UJ	12	V	850	9	3.1	-0.4	1.5
FHM5UJ	00	V	850	6	3.8	0.6	0.1
FPUW5G	12	V	850	6	2.4	-0.8	0.7
JNKN7J	00	V	850	4	9.8	0.4	-4.4
JNKN7J	12	V	850	4	3.3	0.0	-0.6
KJFF9X	00	V	850	8	2.5	0.5	0.0
KJFF9X	12	V	850	10	1.9	-0.4	0.4
KMPLHP	00	V	850	5	2.5	-1.2	0.0
KMPLHP	12	V	850	5	2.4	0.4	1.6
LRYQE3	00	V	850	3	1.9	-0.8	0.7
LRYQE3	12	V	850	7	10.6	3.7	-0.9
WDK38H	12	V	850	17	3.3	0.6	0.5
XKQLWQ	12	V	850	11	2.5	-0.2	-0.4
XQFJRG	00	V	850	5	2.2	0.7	0.3
XQFJRG	12	V	850	7	1.5	0.2	-0.7
YLV96W	00	V	850	8	3.3	0.0	0.5
YLV96W	12	V	850	6	3.9	0.7	1.4

**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 : NOV 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	369	0	0.4	-0.4	0.6
0066022	99	P	SUR	54	14	169	0	0.5	-0.4	0.6
0066023	99	P	SUR	55	11	370	0	0.3	-0.0	0.3
0066024	99	P	SUR	55	13	228	0	0.4	-0.2	0.5
03380	99	P	SUR	54	0	762	0	0.4	-0.2	0.4
0640046	99	P	SUR	60	-4	714	0	0.3	-0.2	0.3
1300001	99	P	SUR	11	-23	694	0	0.4	0.1	0.4
1300008	99	P	SUR	15	-38	594	0	0.3	-0.0	0.3
1300130	99	P	SUR	28	-16	367	0	0.3	0.5	0.6
1300131	99	P	SUR	28	-17	689	0	0.4	0.1	0.4
1301569	99	P	SUR	24	-39	720	0	0.2	-0.2	0.3
1301603	99	P	SUR	30	-61	720	0	0.5	-0.2	0.5
1301605	99	P	SUR	30	-63	719	0	0.8	0.0	0.8
1301608	99	P	SUR	27	-45	719	0	0.3	1.0	1.1
1301609	99	P	SUR	23	-70	720	0	0.3	0.3	0.4
1301610	99	P	SUR	18	-59	714	0	0.4	0.1	0.4
1301612	99	P	SUR	28	-46	714	0	0.4	0.1	0.4
1301618	99	P	SUR	17	-36	715	0	0.3	0.2	0.3
1301619	99	P	SUR	29	-31	718	0	0.2	0.3	0.4
1301620	99	P	SUR	11	-40	716	0	0.4	0.3	0.5
1402559	99	P	SUR	27	-53	312	0	0.4	0.2	0.4
1501531	99	P	SUR	29	-57	720	0	0.4	-0.5	0.6
1501534	99	P	SUR	21	-68	720	0	0.3	-1.4	1.4
2501641	99	P	SUR	87	-6	711	0	0.9	-0.1	0.9
2501643	99	P	SUR	87	-25	718	0	0.5	0.0	0.5
2501644	99	P	SUR	88	-8	718	0	0.5	-0.3	0.6
2501645	99	P	SUR	88	-37	718	0	0.5	0.1	0.5
2501647	99	P	SUR	88	-37	720	0	0.5	0.2	0.5
2501651	99	P	SUR	89	-39	717	0	0.5	-0.3	0.6
2501653	99	P	SUR	87	-5	718	0	0.5	0.4	0.7
2501661	99	P	SUR	82	10	720	0	0.5	0.1	0.5
2601623	99	P	SUR	76	28	720	0	0.8	-0.2	0.8
2601625	99	P	SUR	77	17	714	107	6.6	-2.5	7.1
4100040	99	P	SUR	15	-53	4317	0	0.4	-0.6	0.7
4100043	99	P	SUR	21	-65	1865	0	1.1	0.5	1.2
4100044	99	P	SUR	22	-59	4309	0	0.5	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
4100046	99	P	SUR	24	-68	4101	0	0.4	-0.2	0.5
4100048	99	P	SUR	32	-70	3937	0	0.4	-0.6	0.7
4100049	99	P	SUR	27	-63	4260	0	0.4	0.3	0.6
4100052	99	P	SUR	18	-65	3959	0	0.3	-1.0	1.1
4100053	99	P	SUR	18	-66	4123	0	0.3	-0.7	0.8
4100056	99	P	SUR	18	-65	4046	0	0.3	-0.9	0.9
4100139	99	P	SUR	20	-38	690	0	0.3	-0.1	0.3
4100300	99	P	SUR	16	-57	712	0	0.3	0.1	0.3
4100597	99	P	SUR	35	-23	719	0	0.3	0.4	0.5
4100729	99	P	SUR	31	-32	719	0	0.2	0.4	0.5
4100730	99	P	SUR	30	-34	159	0	2.9	0.4	2.9
4101529	99	P	SUR	32	-62	720	0	0.5	-1.3	1.4
4101530	99	P	SUR	35	-25	670	0	0.2	0.5	0.5
4101531	99	P	SUR	35	-17	720	0	0.3	0.6	0.7
4101536	99	P	SUR	44	-23	680	0	0.4	0.2	0.5
4101537	99	P	SUR	36	-15	716	0	0.3	-0.2	0.4
4101539	99	P	SUR	42	-25	716	0	0.3	0.3	0.4
4101554	99	P	SUR	30	-63	703	0	0.4	0.5	0.7
4101557	99	P	SUR	37	-23	720	0	0.3	0.3	0.4
4101558	99	P	SUR	26	-57	720	0	0.4	0.2	0.5
4101560	99	P	SUR	41	-28	718	0	0.3	0.7	0.7
4101562	99	P	SUR	30	-55	687	0	0.4	0.5	0.6
4101564	99	P	SUR	27	-41	702	0	0.3	-0.0	0.3
4101565	99	P	SUR	28	-33	717	0	0.2	0.3	0.4
4101567	99	P	SUR	34	-47	720	0	0.4	0.5	0.6
4101568	99	P	SUR	33	-56	339	0	0.4	0.1	0.4
4101570	99	P	SUR	29	-61	719	0	0.4	0.1	0.4
4101572	99	P	SUR	50	-14	719	0	0.5	0.3	0.6
4101573	99	P	SUR	34	-35	719	0	0.3	0.2	0.3
4101574	99	P	SUR	35	-63	719	0	0.5	0.1	0.5
4101598	99	P	SUR	16	-61	540	0	0.3	-0.5	0.6
4101603	99	P	SUR	15	-61	713	0	0.3	-0.2	0.4
4101604	99	P	SUR	10	-62	682	0	0.5	-0.2	0.5
4101606	99	P	SUR	43	-9	98	0	0.5	0.5	0.8
4101607	99	P	SUR	40	-14	720	0	0.3	0.3	0.4
4101609	99	P	SUR	38	-21	720	0	0.3	0.2	0.3
4101610	99	P	SUR	66	-9	720	0	0.3	0.3	0.5
4101613	99	P	SUR	33	-13	720	0	0.2	0.6	0.7
4101614	99	P	SUR	34	-19	720	0	0.2	0.1	0.2
4101615	99	P	SUR	14	-57	720	2	0.5	0.2	0.6
4101616	99	P	SUR	39	-22	720	0	0.3	0.0	0.3
4101617	99	P	SUR	32	-26	720	0	0.2	0.4	0.5
4101618	99	P	SUR	31	-24	720	0	0.2	0.3	0.4

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4101620	99	P	SUR	51	-5	714	0	0.4	0.5	0.7
4101621	99	P	SUR	39	-30	720	0	0.3	0.3	0.4
4101622	99	P	SUR	68	-18	720	0	0.4	0.1	0.5
4101623	99	P	SUR	56	-52	720	0	0.5	0.0	0.5
4101627	99	P	SUR	62	-53	720	0	0.5	0.1	0.5
4101630	99	P	SUR	15	-52	720	0	0.4	0.1	0.4
4101660	99	P	SUR	64	-16	367	0	1.0	-0.0	1.0
4101662	99	P	SUR	64	-8	720	0	0.3	0.1	0.3
4101663	99	P	SUR	66	-28	720	0	0.6	0.2	0.6
4101664	99	P	SUR	60	-29	720	0	0.6	0.2	0.6
4101690	99	P	SUR	43	-40	710	0	0.4	0.2	0.4
4101702	99	P	SUR	36	-60	719	0	1.4	-0.3	1.4
4101705	99	P	SUR	29	-33	719	0	0.2	0.0	0.2
4101706	99	P	SUR	36	-27	719	0	0.4	-0.6	0.7
4101707	99	P	SUR	38	-32	647	65	1.8	-0.4	1.9
4101708	99	P	SUR	30	-57	720	0	0.4	-0.7	0.8
4101712	99	P	SUR	39	-36	718	0	0.8	0.2	0.8
4101714	99	P	SUR	29	-31	718	0	0.2	-0.2	0.3
4101715	99	P	SUR	28	-54	716	0	0.5	-0.5	0.7
4101716	99	P	SUR	26	-59	719	0	0.9	-0.6	1.1
4101717	99	P	SUR	27	-62	719	0	0.5	-0.2	0.5
4101718	99	P	SUR	30	-27	716	0	0.3	0.1	0.3
4101719	99	P	SUR	32	-56	715	0	0.4	-0.1	0.4
4101720	99	P	SUR	43	-54	714	0	0.8	0.6	1.0
4101721	99	P	SUR	32	-40	717	0	0.3	0.7	0.8
4101742	99	P	SUR	32	-35	719	0	0.3	0.1	0.3
4101752	99	P	SUR	14	-59	717	0	0.4	-0.0	0.4
4101753	99	P	SUR	22	-26	718	0	0.3	0.3	0.4
4101754	99	P	SUR	14	-54	716	0	0.4	0.0	0.4
4101755	99	P	SUR	21	-27	717	0	0.3	0.2	0.3
4101760	99	P	SUR	28	-49	312	0	0.3	0.3	0.5
4101765	99	P	SUR	60	-12	312	0	0.8	-0.2	0.8
4101767	99	P	SUR	13	-38	309	0	0.4	0.4	0.6
4101768	99	P	SUR	13	-28	158	0	1.0	0.6	1.2
4101771	99	P	SUR	73	5	312	0	0.4	0.1	0.5
4101772	99	P	SUR	79	8	312	0	2.3	-0.6	2.4
41040	99	P	SUR	15	-53	1053	0	0.4	-0.4	0.6
41044	99	P	SUR	22	-59	1128	0	0.5	0.5	0.7
41046	99	P	SUR	24	-68	1510	0	0.4	-0.0	0.4
41048	99	P	SUR	32	-70	1068	0	0.5	-0.4	0.6
41049	99	P	SUR	28	-63	1045	0	0.4	0.5	0.7
41052	99	P	SUR	18	-65	1458	0	0.4	-1.0	1.1
41053	99	P	SUR	19	-66	1459	0	0.3	-0.7	0.8

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
41056	99	P	SUR	18	-66	1425	0	0.3	-0.9	1.0
4200059	99	P	SUR	15	-67	4182	0	0.4	0.3	0.5
4200085	99	P	SUR	18	-67	3992	0	0.3	-0.7	0.8
42059	99	P	SUR	15	-68	1003	0	0.4	0.5	0.6
42085	99	P	SUR	18	-67	1470	0	0.4	-0.7	0.8
4400005	99	P	SUR	43	-69	718	0	0.6	-0.1	0.6
4400008	99	P	SUR	41	-69	4285	0	0.5	0.3	0.6
4400011	99	P	SUR	41	-67	4263	0	0.5	0.1	0.6
4400027	99	P	SUR	44	-67	719	0	0.6	-0.5	0.8
4400032	99	P	SUR	44	-69	687	0	0.5	-1.5	1.6
4400033	99	P	SUR	44	-69	683	0	0.5	-1.1	1.2
4400034	99	P	SUR	44	-68	688	0	0.5	-0.4	0.7
4400037	99	P	SUR	43	-68	680	0	0.5	-0.2	0.5
44005	99	P	SUR	43	-69	753	0	0.6	-0.1	0.6
4400513	99	P	SUR	54	-10	600	0	0.5	-0.3	0.6
4400517	99	P	SUR	30	-69	718	0	0.4	-0.1	0.4
4400521	99	P	SUR	31	-40	278	0	0.2	-1.0	1.0
4400777	99	P	SUR	30	-57	720	0	1.6	-0.2	1.6
44008	99	P	SUR	41	-69	2174	0	0.5	0.5	0.7
4400857	99	P	SUR	33	-35	720	0	0.3	0.4	0.5
4400874	99	P	SUR	34	-23	607	0	0.5	-0.9	1.1
44011	99	P	SUR	41	-67	2064	0	0.6	0.3	0.7
4401531	99	P	SUR	38	-28	719	0	0.2	0.4	0.5
4401536	99	P	SUR	33	-20	717	0	0.2	0.5	0.6
4401537	99	P	SUR	31	-47	708	0	0.4	-1.1	1.2
4401539	99	P	SUR	31	-23	720	0	0.3	-0.5	0.6
4401540	99	P	SUR	33	-35	719	0	0.3	0.2	0.4
4401541	99	P	SUR	30	-39	664	0	0.3	-0.3	0.4
4401542	99	P	SUR	38	-69	719	0	0.5	0.1	0.5
4401551	99	P	SUR	32	-29	719	0	0.3	0.2	0.3
4401556	99	P	SUR	26	-47	720	0	1.4	-0.2	1.4
4401557	99	P	SUR	31	-45	607	0	0.6	0.1	0.6
4401558	99	P	SUR	66	12	718	0	0.5	-0.3	0.6
4401559	99	P	SUR	47	-2	180	0	0.5	-0.9	1.0
4401561	99	P	SUR	31	-48	720	0	0.4	-0.1	0.5
4401562	99	P	SUR	27	-36	717	0	0.2	-0.5	0.5
4401563	99	P	SUR	30	-51	720	0	0.8	-0.4	0.9
4401564	99	P	SUR	38	-23	719	0	0.8	0.9	1.2
4401565	99	P	SUR	62	-27	719	0	0.8	0.2	0.8
4401567	99	P	SUR	54	-20	719	0	0.5	0.2	0.5
4401568	99	P	SUR	53	-25	714	0	0.5	0.1	0.5
4401569	99	P	SUR	55	-28	717	0	0.5	0.0	0.5
4401570	99	P	SUR	42	-12	718	0	0.4	-0.0	0.4

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4401572	99	P	SUR	46	-30	718	0	0.4	0.3	0.5
4401573	99	P	SUR	55	-9	718	0	0.4	0.2	0.5
4401574	99	P	SUR	61	-36	717	0	0.5	0.2	0.6
4401576	99	P	SUR	39	-21	716	0	0.4	0.3	0.5
4401577	99	P	SUR	42	-36	718	0	0.4	0.3	0.5
4401578	99	P	SUR	43	-26	717	0	0.4	0.2	0.5
4401579	99	P	SUR	43	-37	714	0	0.4	0.2	0.4
4401580	99	P	SUR	51	-46	715	0	0.6	0.2	0.6
4401581	99	P	SUR	38	-46	713	0	0.4	0.2	0.4
4401582	99	P	SUR	46	-42	717	0	0.6	0.2	0.6
4401611	99	P	SUR	50	-37	720	0	0.5	0.2	0.6
4401613	99	P	SUR	30	-22	720	0	0.2	0.5	0.6
4401750	99	P	SUR	68	4	686	0	0.3	-1.5	1.5
4401751	99	P	SUR	65	-2	705	0	0.3	0.1	0.3
4401753	99	P	SUR	67	2	334	0	0.3	0.6	0.6
4401799	99	P	SUR	22	-60	663	0	0.4	0.2	0.5
4401822	99	P	SUR	60	-69	698	0	0.6	0.8	1.0
4401825	99	P	SUR	44	-55	585	0	0.8	1.3	1.5
4401826	99	P	SUR	74	-65	401	0	1.6	0.9	1.8
4401827	99	P	SUR	44	-64	99	0	0.5	0.2	0.6
4401856	99	P	SUR	14	-60	720	0	0.3	-0.1	0.4
4401870	99	P	SUR	20	-20	720	0	0.3	0.5	0.6
4401872	99	P	SUR	20	-24	720	0	0.3	0.2	0.3
4401873	99	P	SUR	18	-19	720	0	0.3	0.5	0.6
4401893	99	P	SUR	46	-52	306	0	0.5	0.4	0.7
4401894	99	P	SUR	45	-51	707	0	0.5	0.4	0.7
4402687	99	P	SUR	45	-60	387	0	0.7	0.4	0.8
4402688	99	P	SUR	45	-61	387	0	0.5	0.2	0.5
4402689	99	P	SUR	45	-61	387	0	0.6	0.1	0.6
44027	99	P	SUR	44	-67	766	0	0.6	-0.5	0.8
44032	99	P	SUR	44	-69	689	0	0.6	-1.6	1.7
44033	99	P	SUR	44	-69	686	0	0.5	-1.1	1.2
44034	99	P	SUR	44	-68	689	0	0.6	-0.4	0.7
44037	99	P	SUR	44	-68	684	0	0.5	-0.2	0.5
44137	99	P	SUR	42	-62	711	0	0.6	-0.5	0.8
44139	99	P	SUR	44	-57	714	0	0.7	-0.2	0.7
44150	99	P	SUR	43	-64	712	0	0.6	-0.2	0.6
44258	99	P	SUR	45	-63	710	0	0.6	-0.3	0.6
44521	99	P	SUR	31	-40	270	0	0.2	-1.0	1.0
45138	99	P	SUR	50	-66	705	0	0.6	-0.2	0.6
4602501	99	P	SUR	69	4	312	0	0.3	0.1	0.3
4602502	99	P	SUR	70	1	312	0	0.3	0.2	0.4
4602503	99	P	SUR	73	22	126	0	0.2	-0.0	0.2

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4602504	99	P	SUR	70	5	312	0	0.4	0.3	0.5
4700546	99	P	SUR	31	-56	712	0	0.9	0.1	0.9
4701669	99	P	SUR	46	-18	720	0	0.4	-0.1	0.5
4800770	99	P	SUR	57	-35	712	712	0.0	0.0	0.0
4802505	99	P	SUR	83	-52	720	0	0.5	0.5	0.7
4802512	99	P	SUR	83	-62	353	0	0.4	-0.7	0.8
5301765	99	P	SUR	62	-11	156	73	3.5	-1.8	3.9
6100001	99	P	SUR	43	8	709	0	0.6	0.3	0.6
6100002	99	P	SUR	42	5	716	0	0.4	0.1	0.4
6100196	99	P	SUR	42	4	691	0	0.6	0.1	0.7
6100197	99	P	SUR	40	4	695	0	0.7	0.1	0.7
6100198	99	P	SUR	37	-2	695	0	0.5	0.3	0.6
6100280	99	P	SUR	41	1	690	0	0.6	0.1	0.6
6100281	99	P	SUR	40	0	602	0	0.6	-0.1	0.6
6100417	99	P	SUR	38	0	683	0	0.5	0.5	0.7
6100430	99	P	SUR	40	2	692	0	0.5	-0.0	0.5
6101003	99	P	SUR	40	25	156	0	0.6	0.9	1.1
6101005	99	P	SUR	38	26	177	0	0.6	0.8	1.0
6101007	99	P	SUR	36	25	145	0	0.5	0.1	0.5
6101009	99	P	SUR	35	25	182	0	0.6	-0.8	0.9
6102507	99	P	SUR	33	28	720	0	0.3	0.2	0.3
6102508	99	P	SUR	35	26	720	0	0.6	-0.3	0.6
6200024	99	P	SUR	44	-3	82	0	0.6	-0.4	0.7
6200025	99	P	SUR	44	-6	694	0	0.6	0.2	0.6
6200082	99	P	SUR	44	-8	649	0	0.7	-0.1	0.7
6200083	99	P	SUR	43	-9	693	0	0.7	-0.2	0.7
6200084	99	P	SUR	42	-9	652	0	0.5	-0.0	0.5
6200085	99	P	SUR	36	-7	679	0	0.5	0.3	0.5
6200091	99	P	SUR	53	-5	717	0	0.5	-0.2	0.5
6200092	99	P	SUR	51	-11	380	2	2.6	-1.3	2.9
6200093	99	P	SUR	55	-10	717	0	0.5	-0.1	0.5
6200094	99	P	SUR	52	-7	717	0	0.5	-0.0	0.5
6200095	99	P	SUR	53	-15	717	0	0.6	-0.4	0.7
62001	99	P	SUR	45	-5	758	0	0.5	0.0	0.5
6200191	99	P	SUR	41	-10	6	3	1.1	-0.9	1.4
6200192	99	P	SUR	40	-10	221	0	0.4	-0.5	0.6
6200200	99	P	SUR	36	-8	327	0	0.3	0.2	0.4
6201030	99	P	SUR	44	-4	584	0	0.7	-0.3	0.8
62023	99	P	SUR	51	-8	499	0	0.4	-0.2	0.5
6202613	99	P	SUR	20	-25	720	0	0.3	0.3	0.4
6202638	99	P	SUR	16	-44	720	0	0.3	0.0	0.3
6202639	99	P	SUR	26	-43	720	0	0.2	0.2	0.3
6202640	99	P	SUR	21	-44	720	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
6202641	99	P	SUR	18	-57	720	0	0.4	0.2	0.5
6202642	99	P	SUR	17	-56	720	0	0.4	-0.1	0.4
6202643	99	P	SUR	19	-51	720	0	0.4	-0.2	0.4
6202644	99	P	SUR	23	-45	720	0	0.3	0.1	0.3
6202645	99	P	SUR	12	-48	720	0	0.4	-0.1	0.4
6202646	99	P	SUR	12	-47	720	0	0.4	0.1	0.4
6202647	99	P	SUR	15	-51	720	0	0.3	-0.0	0.3
6202670	99	P	SUR	57	-15	627	0	2.4	1.6	2.9
6202671	99	P	SUR	58	-19	653	0	2.0	1.4	2.4
6202672	99	P	SUR	61	-13	642	8	2.5	1.8	3.2
6202673	99	P	SUR	60	-28	643	2	2.6	1.8	3.2
6202674	99	P	SUR	62	-18	201	3	3.3	1.8	3.8
6202675	99	P	SUR	58	-18	687	0	0.5	0.2	0.6
6202676	99	P	SUR	63	-17	692	0	0.8	0.3	0.9
6202677	99	P	SUR	60	-16	710	0	0.5	0.1	0.5
6202678	99	P	SUR	58	-32	649	0	0.5	0.3	0.6
6202679	99	P	SUR	62	-41	673	0	0.6	0.3	0.7
6202680	99	P	SUR	61	-14	663	0	0.6	0.3	0.6
6202681	99	P	SUR	63	-17	691	0	0.8	0.2	0.8
6202682	99	P	SUR	63	-17	709	0	0.7	0.1	0.8
6202683	99	P	SUR	60	-11	679	0	0.6	0.4	0.7
6202684	99	P	SUR	64	-24	683	0	0.6	0.5	0.8
6202685	99	P	SUR	40	3	204	72	0.4	0.3	0.5
6202686	99	P	SUR	40	3	204	72	0.4	0.2	0.4
6202687	99	P	SUR	40	3	204	72	0.4	0.4	0.5
62029	99	P	SUR	49	-13	923	0	0.5	-0.2	0.5
6203503	99	P	SUR	43	-10	52	0	0.4	0.1	0.4
6203523	99	P	SUR	71	-1	696	0	0.3	-0.8	0.9
6203528	99	P	SUR	27	-27	660	0	0.3	-0.4	0.5
6203574	99	P	SUR	63	-54	715	0	0.5	0.6	0.8
6203576	99	P	SUR	55	-56	690	0	0.5	0.6	0.7
6203577	99	P	SUR	64	-23	55	37	1.6	-6.7	6.8
6203580	99	P	SUR	68	-14	702	0	0.4	0.3	0.5
6203581	99	P	SUR	64	-2	642	0	0.3	0.0	0.3
6203582	99	P	SUR	63	-27	700	0	0.7	0.5	0.8
6203583	99	P	SUR	59	-28	686	0	0.6	0.2	0.6
6203585	99	P	SUR	69	-18	714	0	0.4	0.3	0.5
6203586	99	P	SUR	67	-12	715	0	0.4	0.4	0.6
6203587	99	P	SUR	63	-10	656	0	0.4	-0.2	0.4
6203588	99	P	SUR	61	-28	707	0	0.6	0.8	1.0
6203601	99	P	SUR	30	-19	717	0	0.2	0.6	0.7
6203607	99	P	SUR	35	-21	714	0	0.3	0.3	0.4
6203608	99	P	SUR	48	-5	150	0	0.6	0.2	0.7

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
6203609	99	P	SUR	42	-18	718	0	0.3	-0.2	0.4
6203706	99	P	SUR	28	-65	311	0	0.5	0.0	0.5
6203707	99	P	SUR	29	-34	312	0	0.3	0.3	0.4
6203708	99	P	SUR	29	-42	311	0	0.4	0.3	0.5
6203710	99	P	SUR	64	-24	311	0	0.7	0.0	0.7
6203715	99	P	SUR	73	30	311	0	0.3	-0.0	0.3
6203718	99	P	SUR	71	24	312	0	0.3	0.2	0.4
6203719	99	P	SUR	75	10	311	0	0.5	0.3	0.6
62050	99	P	SUR	50	-4	756	0	0.4	0.3	0.5
62091	99	P	SUR	53	-5	706	0	0.5	-0.2	0.5
62092	99	P	SUR	51	-11	376	2	2.5	-1.2	2.8
62093	99	P	SUR	55	-10	706	0	0.5	-0.1	0.5
62094	99	P	SUR	52	-7	706	0	0.5	-0.0	0.5
62095	99	P	SUR	53	-15	706	0	0.6	-0.3	0.7
62102	99	P	SUR	58	2	761	0	0.5	0.4	0.7
62103	99	P	SUR	50	-3	504	0	0.7	0.4	0.8
62104	99	P	SUR	57	1	762	0	0.4	0.2	0.5
62105	99	P	SUR	55	-13	1353	0	0.7	-0.2	0.7
62107	99	P	SUR	50	-6	1332	0	0.5	0.3	0.6
62112	99	P	SUR	58	0	760	0	0.3	0.4	0.5
62113	99	P	SUR	58	0	760	0	0.3	0.1	0.3
62114	99	P	SUR	58	0	1331	0	0.3	0.5	0.6
62115	99	P	SUR	58	-3	760	0	0.3	-0.1	0.3
62116	99	P	SUR	58	1	758	0	0.4	0.2	0.4
62118	99	P	SUR	58	1	763	0	0.4	0.5	0.7
62119	99	P	SUR	57	2	762	0	0.4	-0.1	0.4
62120	99	P	SUR	56	2	751	0	0.5	0.2	0.6
62121	99	P	SUR	54	3	574	3	1.1	0.4	1.1
62122	99	P	SUR	57	2	1333	0	0.4	0.0	0.4
62124	99	P	SUR	54	-4	730	0	0.4	0.3	0.5
62127	99	P	SUR	54	1	749	0	0.4	0.7	0.8
62129	99	P	SUR	58	0	524	0	0.3	-0.1	0.3
62130	99	P	SUR	59	1	758	0	0.3	-0.0	0.3
62131	99	P	SUR	54	1	762	0	0.5	0.7	0.8
62132	99	P	SUR	56	2	758	0	0.3	0.3	0.5
62133	99	P	SUR	57	1	762	0	0.5	0.4	0.6
62134	99	P	SUR	58	1	760	0	0.3	0.6	0.6
62135	99	P	SUR	54	2	762	0	0.6	0.7	0.9
62136	99	P	SUR	54	3	762	0	0.5	0.7	0.9
62138	99	P	SUR	54	0	1326	0	0.4	0.7	0.8
62140	99	P	SUR	57	1	1333	0	0.3	0.3	0.5
62141	99	P	SUR	58	-4	691	0	0.4	-2.1	2.1
62143	99	P	SUR	58	2	760	0	0.4	0.8	0.9

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62144	99	P	SUR	53	2	762	0	0.4	0.2	0.5
62145	99	P	SUR	53	3	1333	0	0.4	0.4	0.6
62146	99	P	SUR	57	2	762	0	0.3	-0.0	0.3
62148	99	P	SUR	54	2	762	0	0.4	0.6	0.7
62149	99	P	SUR	54	1	742	0	0.4	0.8	0.9
62151	99	P	SUR	57	2	1331	0	0.3	0.4	0.5
62152	99	P	SUR	57	2	762	0	0.3	0.3	0.4
62153	99	P	SUR	57	2	1333	0	0.5	0.6	0.8
62154	99	P	SUR	56	2	762	0	0.3	0.0	0.3
62155	99	P	SUR	58	1	762	0	0.3	0.3	0.4
62157	99	P	SUR	58	0	760	0	0.3	0.0	0.3
62160	99	P	SUR	57	2	1331	0	0.4	0.7	0.8
62161	99	P	SUR	58	1	757	0	0.3	-0.2	0.3
62162	99	P	SUR	57	1	760	0	0.3	0.2	0.4
62163	99	P	SUR	48	-8	725	0	0.5	0.3	0.6
62165	99	P	SUR	54	1	737	0	0.4	0.7	0.8
62168	99	P	SUR	58	1	754	0	0.3	0.0	0.3
62170	99	P	SUR	51	2	1	0	0.0	-2.3	2.3
62296	99	P	SUR	53	2	762	0	0.4	0.1	0.4
62297	99	P	SUR	59	2	1327	0	0.3	0.1	0.3
62302	99	P	SUR	61	-2	746	0	0.3	-0.1	0.3
62304	99	P	SUR	51	2	705	0	0.4	0.9	1.0
62305	99	P	SUR	50	0	760	0	0.4	0.3	0.5
6301503	99	P	SUR	82	34	27	12	3.1	9.8	10.3
6301508	99	P	SUR	73	22	714	0	0.3	0.0	0.3
6301509	99	P	SUR	72	20	713	0	0.3	-0.0	0.3
6301535	99	P	SUR	72	20	708	0	0.3	0.1	0.4
6301536	99	P	SUR	71	22	711	0	0.4	0.3	0.5
6301537	99	P	SUR	71	24	688	0	0.4	0.2	0.5
6301538	99	P	SUR	78	8	708	0	0.6	-0.0	0.6
6301539	99	P	SUR	79	6	95	0	1.4	8.1	8.3
6301540	99	P	SUR	79	4	715	34	2.4	0.8	2.5
6301541	99	P	SUR	79	7	660	0	0.6	0.3	0.7
6301542	99	P	SUR	80	5	669	32	3.8	1.1	4.0
6301543	99	P	SUR	74	21	710	0	0.4	0.3	0.5
6301544	99	P	SUR	74	18	703	0	0.4	0.2	0.4
6301545	99	P	SUR	73	21	710	0	0.4	0.1	0.4
6301546	99	P	SUR	71	17	707	0	0.4	0.3	0.5
6301548	99	P	SUR	79	7	716	0	0.7	0.3	0.8
6301549	99	P	SUR	78	9	503	3	4.9	2.3	5.4
6301558	99	P	SUR	66	-15	720	0	0.4	-0.1	0.4
6301562	99	P	SUR	54	-50	718	0	0.7	0.2	0.7
6301563	99	P	SUR	51	-47	607	0	0.8	0.9	1.2

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
6301564	99	P	SUR	62	-20	719	0	0.6	0.4	0.7
6301681	99	P	SUR	73	8	312	0	0.5	0.2	0.5
6301682	99	P	SUR	72	0	312	0	0.8	0.8	1.2
6301683	99	P	SUR	77	4	710	0	0.5	-0.2	0.5
6301684	99	P	SUR	79	6	712	0	0.8	0.0	0.8
6301685	99	P	SUR	78	8	730	1	1.5	-0.3	1.5
6301686	99	P	SUR	78	12	644	77	4.1	0.5	4.1
6301687	99	P	SUR	79	6	328	26	3.3	-0.3	3.3
6301688	99	P	SUR	73	21	691	0	0.4	0.1	0.4
6301689	99	P	SUR	78	2	652	0	1.3	-0.3	1.3
6301690	99	P	SUR	79	8	402	0	1.6	-0.2	1.6
63055	99	P	SUR	61	2	762	0	0.3	-0.1	0.3
63056	99	P	SUR	60	2	762	0	0.3	0.3	0.4
63057	99	P	SUR	59	2	759	0	0.3	0.1	0.3
63058	99	P	SUR	53	2	2099	0	0.4	0.4	0.6
63059	99	P	SUR	58	-1	729	0	0.3	0.5	0.6
63101	99	P	SUR	61	1	762	0	0.3	0.0	0.3
63102	99	P	SUR	61	1	760	0	0.3	-0.1	0.3
63103	99	P	SUR	61	1	762	0	0.3	0.1	0.3
63104	99	P	SUR	61	2	761	0	0.2	0.1	0.3
63108	99	P	SUR	61	2	762	0	0.3	-0.3	0.4
63109	99	P	SUR	60	2	749	0	0.4	-0.2	0.4
63110	99	P	SUR	60	2	762	0	0.3	-0.0	0.3
63112	99	P	SUR	61	1	762	0	0.3	-0.3	0.5
63115	99	P	SUR	62	1	762	0	0.4	0.0	0.4
63117	99	P	SUR	61	1	1333	0	0.3	0.3	0.4
63118	99	P	SUR	57	2	1198	0	0.7	-0.1	0.8
63120	99	P	SUR	54	2	74	0	0.5	0.4	0.6
6401502	99	P	SUR	74	8	694	0	0.4	0.2	0.5
6401503	99	P	SUR	66	5	329	0	0.4	0.5	0.7
6401506	99	P	SUR	70	-1	634	0	0.3	0.3	0.4
6401531	99	P	SUR	59	-35	720	0	0.5	0.2	0.6
6401539	99	P	SUR	52	-46	718	0	0.5	0.6	0.8
6401556	99	P	SUR	71	24	718	0	0.4	-0.0	0.4
6401561	99	P	SUR	66	-3	718	0	0.3	-0.0	0.3
6401568	99	P	SUR	62	1	714	0	0.2	0.4	0.5
6401569	99	P	SUR	68	-4	717	0	0.3	0.3	0.4
6401570	99	P	SUR	68	9	576	0	2.8	-0.7	2.9
6401784	99	P	SUR	76	15	2831	0	0.4	0.1	0.4
6401785	99	P	SUR	78	7	721	0	0.4	0.1	0.5
6401786	99	P	SUR	76	15	677	0	1.8	0.7	1.9
6401787	99	P	SUR	76	16	673	0	0.4	0.3	0.5
6401788	99	P	SUR	78	11	713	0	0.6	0.1	0.6

DRIFTER MONITORING STATISTICS (EUCOS)  
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
6401789	99	P	SUR	74	21	673	0	0.3	0.0	0.3
6401795	99	P	SUR	74	19	703	0	0.3	0.2	0.4
6401796	99	P	SUR	74	22	704	0	0.4	0.1	0.4
6401797	99	P	SUR	73	19	696	0	0.4	0.2	0.4
6401798	99	P	SUR	74	22	306	0	0.4	0.3	0.5
6401799	99	P	SUR	78	12	675	0	1.0	-0.3	1.1
6401800	99	P	SUR	78	14	719	0	0.5	-0.1	0.5
6401801	99	P	SUR	79	2	40	0	0.4	0.0	0.4
6401803	99	P	SUR	78	5	708	0	0.4	0.2	0.5
6401804	99	P	SUR	74	20	706	0	0.4	0.1	0.4
6401806	99	P	SUR	74	21	700	0	0.4	0.0	0.4
6401807	99	P	SUR	74	20	702	0	0.3	0.0	0.3
6401808	99	P	SUR	73	22	692	0	0.4	0.0	0.4
64041	99	P	SUR	61	-3	760	0	0.3	0.1	0.3
64045	99	P	SUR	59	-12	1191	0	0.6	-0.2	0.6
64046	99	P	SUR	61	-4	752	0	0.3	-0.1	0.3
6501556	99	P	SUR	72	10	719	0	0.4	0.2	0.4
66023	99	P	SUR	55	11	749	0	0.4	-0.0	0.4
95243	99	P	SUR	37	-16	1	0	0.0	2.2	2.2

**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 : NOV 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	369	0	0	1.4	1.6	2.1
0066022	99	SPEED	SUR	54	14	169	0	0	1.8	0.1	1.8
0066023	99	SPEED	SUR	55	11	372	0	0	1.4	2.0	2.5
0066024	99	SPEED	SUR	55	13	227	0	0	1.1	0.8	1.4
0640046	99	SPEED	SUR	60	-4	714	0	0	1.2	-0.6	1.3
1300001	99	SPEED	SUR	11	-23	694	0	0	0.8	0.6	1.0
1300002	99	SPEED	SUR	20	-23	690	0	0	0.8	0.2	0.9
1300008	99	SPEED	SUR	15	-38	594	0	0	0.8	0.2	0.8
1300130	99	SPEED	SUR	28	-16	365	0	0	1.2	-0.2	1.2
1300131	99	SPEED	SUR	28	-17	682	0	0	2.1	1.9	2.8
4100026	99	SPEED	SUR	12	-38	253	0	0	0.9	-0.1	0.9
4100040	99	SPEED	SUR	15	-53	4316	0	0	1.2	0.6	1.3
4100043	99	SPEED	SUR	21	-65	4317	0	0	1.2	-0.2	1.2
4100044	99	SPEED	SUR	22	-59	4314	0	0	1.3	0.3	1.3
4100046	99	SPEED	SUR	24	-68	2958	0	0	1.5	0.2	1.5
4100048	99	SPEED	SUR	32	-70	3925	0	0	1.4	0.1	1.4
4100049	99	SPEED	SUR	27	-63	4258	0	0	1.3	0.3	1.4
4100052	99	SPEED	SUR	18	-65	3959	0	0	1.1	-0.1	1.1
4100053	99	SPEED	SUR	18	-66	4123	0	0	1.3	1.0	1.7
4100056	99	SPEED	SUR	18	-65	4066	0	0	1.1	-0.2	1.1
4100139	99	SPEED	SUR	20	-38	690	0	0	0.9	0.1	0.9
4100300	99	SPEED	SUR	16	-57	712	0	0	1.1	0.2	1.1
41040	99	SPEED	SUR	15	-53	1053	0	0	1.2	0.3	1.2
41043	99	SPEED	SUR	21	-65	1003	0	0	1.2	-0.3	1.3
41044	99	SPEED	SUR	22	-59	1131	0	0	1.4	-0.1	1.4
41046	99	SPEED	SUR	24	-68	1028	0	0	1.5	0.3	1.5
41048	99	SPEED	SUR	32	-70	1066	0	0	1.4	0.1	1.4
41049	99	SPEED	SUR	28	-63	1043	0	0	1.4	0.2	1.4
41052	99	SPEED	SUR	18	-65	1458	0	0	1.1	-0.0	1.1
41053	99	SPEED	SUR	19	-66	1459	0	0	1.4	0.6	1.5
41056	99	SPEED	SUR	18	-66	1431	0	0	1.1	0.0	1.1
4200059	99	SPEED	SUR	15	-67	4191	0	0	1.0	0.4	1.1
4200085	99	SPEED	SUR	18	-67	4007	0	0	1.4	-0.1	1.4
42059	99	SPEED	SUR	15	-68	1010	0	0	1.0	0.2	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
42085	99	SPEED	SUR	18	-67	1474	0	0	1.4	0.2	1.4
4400005	99	SPEED	SUR	43	-69	718	0	0	1.2	0.3	1.2
4400008	99	SPEED	SUR	41	-69	4285	0	0	1.5	0.6	1.6
4400027	99	SPEED	SUR	44	-67	719	0	0	1.3	0.7	1.4
4400032	99	SPEED	SUR	44	-69	687	0	0	1.4	0.3	1.5
4400033	99	SPEED	SUR	44	-69	683	0	0	1.3	0.1	1.3
4400034	99	SPEED	SUR	44	-68	688	0	0	1.3	0.2	1.4
4400037	99	SPEED	SUR	43	-68	680	0	0	1.1	0.2	1.1
44005	99	SPEED	SUR	43	-69	753	0	0	1.2	0.3	1.2
44008	99	SPEED	SUR	41	-69	2188	0	0	1.4	-0.2	1.5
44027	99	SPEED	SUR	44	-67	766	0	0	1.3	0.7	1.5
44032	99	SPEED	SUR	44	-69	689	0	0	1.5	0.4	1.6
44033	99	SPEED	SUR	44	-69	686	0	0	1.4	0.5	1.4
44034	99	SPEED	SUR	44	-68	689	0	0	1.4	0.2	1.4
44037	99	SPEED	SUR	44	-68	684	0	0	1.1	0.3	1.2
44139	99	SPEED	SUR	44	-57	714	0	0	1.7	-0.0	1.7
44150	99	SPEED	SUR	43	-64	708	0	0	1.4	0.3	1.5
44258	99	SPEED	SUR	45	-63	713	0	0	1.7	0.6	1.8
45138	99	SPEED	SUR	50	-66	712	0	0	1.4	0.6	1.5
6100001	99	SPEED	SUR	43	8	708	0	0	1.8	0.4	1.9
6100002	99	SPEED	SUR	42	5	716	0	0	1.6	-0.1	1.6
6100196	99	SPEED	SUR	42	4	687	0	0	1.8	-0.4	1.8
6100197	99	SPEED	SUR	40	4	694	0	0	1.5	-0.8	1.7
6100198	99	SPEED	SUR	37	-2	681	0	0	2.0	-0.2	2.0
6100280	99	SPEED	SUR	41	1	686	0	0	1.7	-0.9	1.9
6100281	99	SPEED	SUR	40	0	536	0	0	2.3	2.0	3.0
6100417	99	SPEED	SUR	38	0	680	0	0	1.7	-0.0	1.7
6100430	99	SPEED	SUR	40	2	690	0	0	1.6	-0.1	1.6
6101003	99	SPEED	SUR	40	25	156	0	0	3.7	-3.6	5.2
6101005	99	SPEED	SUR	38	26	178	0	0	1.9	-0.2	1.9
6101007	99	SPEED	SUR	36	25	146	0	0	2.3	-0.2	2.3
6101009	99	SPEED	SUR	35	25	184	0	0	2.0	1.0	2.3
6200024	99	SPEED	SUR	44	-3	82	0	0	2.0	-0.7	2.1
6200025	99	SPEED	SUR	44	-6	694	0	0	1.8	-0.8	2.0
6200083	99	SPEED	SUR	43	-9	692	0	0	1.4	-0.8	1.6
6200084	99	SPEED	SUR	42	-9	650	0	0	1.5	-1.2	1.9
6200085	99	SPEED	SUR	36	-7	673	0	0	1.2	-0.5	1.3
6200091	99	SPEED	SUR	53	-5	717	0	0	1.3	0.1	1.3
6200092	99	SPEED	SUR	51	-11	717	0	0	1.4	-0.4	1.5
6200093	99	SPEED	SUR	55	-10	717	0	0	1.5	0.1	1.5
6200094	99	SPEED	SUR	52	-7	717	0	0	1.3	0.3	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
6200095	99	SPEED	SUR	53	-15	717	0	0	1.4	-0.9	1.7
62001	99	SPEED	SUR	45	-5	760	0	0	1.6	0.5	1.7
6200192	99	SPEED	SUR	40	-10	356	0	0	1.2	-0.5	1.3
6200200	99	SPEED	SUR	36	-8	502	0	0	1.2	0.2	1.2
6201030	99	SPEED	SUR	44	-4	584	0	0	1.9	-0.4	2.0
62023	99	SPEED	SUR	51	-8	403	0	0	1.8	0.7	1.9
6202670	99	SPEED	SUR	57	-15	627	0	0	1.5	3.6	3.9
6202671	99	SPEED	SUR	58	-19	653	0	0	1.4	3.7	4.0
6202672	99	SPEED	SUR	61	-13	642	0	0	1.3	3.6	3.8
6202673	99	SPEED	SUR	60	-28	643	0	0	1.6	3.7	4.0
6202674	99	SPEED	SUR	62	-18	201	0	0	1.4	3.8	4.0
62029	99	SPEED	SUR	49	-13	923	0	0	1.3	0.2	1.3
62050	99	SPEED	SUR	50	-4	759	0	0	1.3	0.5	1.4
62091	99	SPEED	SUR	53	-5	706	0	0	1.4	0.2	1.4
62092	99	SPEED	SUR	51	-11	706	0	0	1.4	-0.4	1.5
62093	99	SPEED	SUR	55	-10	706	0	0	1.5	0.1	1.5
62094	99	SPEED	SUR	52	-7	706	0	0	1.3	0.3	1.3
62095	99	SPEED	SUR	53	-15	706	0	0	1.5	-1.0	1.8
62102	99	SPEED	SUR	58	2	761	0	0	2.3	-0.8	2.4
62103	99	SPEED	SUR	50	-3	403	1	0	2.2	1.3	2.5
62104	99	SPEED	SUR	57	1	762	0	0	1.4	-1.1	1.8
62105	99	SPEED	SUR	55	-13	1353	0	0	1.2	0.1	1.2
62107	99	SPEED	SUR	50	-6	1332	0	0	3.2	0.8	3.3
62112	99	SPEED	SUR	58	0	760	0	0	1.9	-0.8	2.1
62113	99	SPEED	SUR	58	0	760	0	0	1.4	-0.2	1.5
62114	99	SPEED	SUR	58	0	1328	0	0	1.5	0.2	1.5
62118	99	SPEED	SUR	58	1	763	0	0	1.4	0.3	1.4
62119	99	SPEED	SUR	57	2	762	0	0	1.5	-0.9	1.8
62120	99	SPEED	SUR	56	2	751	0	0	1.4	-0.6	1.5
62121	99	SPEED	SUR	54	3	559	0	0	1.5	-0.7	1.7
62122	99	SPEED	SUR	57	2	1333	0	0	1.8	-0.2	1.8
62129	99	SPEED	SUR	58	0	524	0	0	1.2	-0.5	1.3
62131	99	SPEED	SUR	54	1	762	0	0	2.4	-0.9	2.6
62132	99	SPEED	SUR	56	2	751	0	0	3.9	-4.0	5.6
62133	99	SPEED	SUR	57	1	762	0	0	1.5	-0.0	1.5
62134	99	SPEED	SUR	58	1	760	0	0	1.5	-0.4	1.5
62140	99	SPEED	SUR	57	1	1333	0	0	1.5	-0.3	1.5
62143	99	SPEED	SUR	58	2	760	0	0	1.6	-0.6	1.7
62144	99	SPEED	SUR	53	2	762	0	0	2.0	-1.3	2.4
62145	99	SPEED	SUR	53	3	1333	0	0	1.4	-0.2	1.5
62146	99	SPEED	SUR	57	2	762	0	0	1.7	-0.1	1.7



## DRIFTER MONITORING STATISTICS (EUCOS)

MONITORING CENTRE : ECMWF

ELEMENT MONITORED : WIND SPEED (M/S)

(CONTINU

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
62148	99	SPEED	SUR	54	2	762	0	0	1.5	-0.5	1.6
62149	99	SPEED	SUR	54	1	742	0	0	1.7	-0.1	1.8
62153	99	SPEED	SUR	57	2	1333	0	0	2.2	-0.9	2.3
62154	99	SPEED	SUR	56	2	761	0	0	1.7	-1.0	2.0
62155	99	SPEED	SUR	58	1	760	0	0	1.4	-0.4	1.5
62163	99	SPEED	SUR	48	-8	725	0	0	1.3	-0.3	1.3
62165	99	SPEED	SUR	54	1	737	0	0	1.5	-0.5	1.6
62305	99	SPEED	SUR	50	0	759	0	0	1.7	1.7	2.4
63055	99	SPEED	SUR	61	2	762	0	0	1.3	-0.7	1.5
63056	99	SPEED	SUR	60	2	760	0	0	1.4	-0.0	1.4
63057	99	SPEED	SUR	59	2	759	0	0	1.3	-0.1	1.3
63058	99	SPEED	SUR	53	2	1343	0	0	1.3	-0.3	1.3
63101	99	SPEED	SUR	61	1	762	0	0	1.4	-0.3	1.4
63103	99	SPEED	SUR	61	1	762	0	0	1.3	-0.8	1.5
63104	99	SPEED	SUR	61	2	761	0	0	1.3	-0.6	1.4
63106	99	SPEED	SUR	61	2	385	0	0	1.7	-1.3	2.1
63108	99	SPEED	SUR	61	2	762	0	0	1.6	-1.2	2.0
63109	99	SPEED	SUR	60	2	703	0	0	1.3	-0.3	1.4
63110	99	SPEED	SUR	60	2	762	0	0	1.8	-0.7	1.9
63112	99	SPEED	SUR	61	1	762	0	0	1.3	-0.9	1.6
63115	99	SPEED	SUR	62	1	762	0	0	1.3	-0.8	1.5
63117	99	SPEED	SUR	61	1	1333	0	0	1.3	-0.5	1.4
64041	99	SPEED	SUR	61	-3	760	0	0	1.2	-0.6	1.3
64045	99	SPEED	SUR	59	-12	1191	0	0	1.3	0.6	1.4
64046	99	SPEED	SUR	61	-4	754	0	0	1.1	0.6	1.3
66022	99	SPEED	SUR	54	14	609	0	0	1.6	0.2	1.6
66023	99	SPEED	SUR	55	11	749	0	0	1.4	1.3	1.9
66024	99	SPEED	SUR	55	13	718	0	0	1.2	1.0	1.6
95243	99	SPEED	SUR	37	-16	1	0	0	0.0	4.9	4.9

**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 : NOV 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	664	0	0	14.4	1.9	14.5
1300001	99	DIRN	SUR	11	-23	670	0	0	10.3	3.8	10.9
1300002	99	DIRN	SUR	20	-23	673	0	0	8.6	0.1	8.6
1300008	99	DIRN	SUR	15	-38	594	0	0	7.4	3.8	8.3
1300130	99	DIRN	SUR	28	-16	297	0	0	11.2	61.7	62.7
1300131	99	DIRN	SUR	28	-17	453	0	0	20.5	3.5	20.8
4100001	99	DIRN	SUR	35	-73	2019	0	0	20.8	3.0	21.0
4100002	99	DIRN	SUR	32	-75	3583	0	0	27.0	6.5	27.7
4100004	99	DIRN	SUR	33	-79	3428	0	0	24.8	9.2	26.4
4100008	99	DIRN	SUR	31	-81	551	0	0	15.7	-6.5	17.0
4100009	99	DIRN	SUR	29	-80	2943	0	0	19.0	7.3	20.4
4100010	99	DIRN	SUR	29	-78	2808	0	0	16.7	10.6	19.8
4100013	99	DIRN	SUR	33	-78	3012	0	0	18.2	6.3	19.3
4100024	99	DIRN	SUR	34	-78	468	0	0	24.6	-8.0	25.9
4100025	99	DIRN	SUR	35	-75	3926	0	0	16.8	6.6	18.1
4100026	99	DIRN	SUR	12	-38	252	0	0	10.2	6.2	12.0
4100029	99	DIRN	SUR	33	-80	104	0	0	21.2	-22.1	30.6
4100033	99	DIRN	SUR	32	-80	538	0	0	18.5	-15.8	24.3
4100037	99	DIRN	SUR	34	-77	585	0	0	17.4	-8.3	19.2
4100038	99	DIRN	SUR	34	-78	547	0	0	17.3	-6.2	18.4
4100040	99	DIRN	SUR	15	-53	3954	0	0	17.4	6.9	18.7
4100043	99	DIRN	SUR	21	-65	3686	0	0	18.0	3.8	18.4
4100044	99	DIRN	SUR	22	-59	3925	0	0	17.9	4.6	18.5
4100046	99	DIRN	SUR	24	-68	2625	0	0	17.1	9.2	19.5
4100047	99	DIRN	SUR	28	-71	3048	0	0	48.5	-8.9	49.4
4100048	99	DIRN	SUR	32	-70	3583	0	0	15.6	11.0	19.1
4100049	99	DIRN	SUR	27	-63	3849	0	0	20.1	7.0	21.2
4100052	99	DIRN	SUR	18	-65	3353	0	0	14.7	5.7	15.7
4100053	99	DIRN	SUR	18	-66	1955	0	0	17.4	-2.0	17.5
4100056	99	DIRN	SUR	18	-65	3387	0	0	14.7	3.5	15.1
4100064	99	DIRN	SUR	34	-77	575	0	0	18.2	-16.2	24.3
41001	99	DIRN	SUR	35	-73	482	0	0	19.3	0.4	19.3

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
4100139	99	DIRN	SUR	20	-38	689	0	0	9.3	4.8	10.5
41002	99	DIRN	SUR	32	-75	1005	0	0	26.6	6.5	27.4
4100300	99	DIRN	SUR	16	-57	574	0	0	11.9	3.3	12.4
41004	99	DIRN	SUR	33	-79	814	0	0	25.0	7.7	26.2
41008	99	DIRN	SUR	31	-81	576	0	0	15.8	-7.2	17.3
41009	99	DIRN	SUR	29	-80	908	0	0	19.2	5.1	19.9
41010	99	DIRN	SUR	29	-79	621	0	0	15.4	8.8	17.7
41013	99	DIRN	SUR	33	-78	935	0	0	20.1	6.4	21.1
41024	99	DIRN	SUR	34	-79	478	0	0	25.0	-8.3	26.3
41025	99	DIRN	SUR	35	-75	898	0	0	16.6	5.0	17.3
41029	99	DIRN	SUR	33	-80	120	0	0	24.4	-20.5	31.9
41033	99	DIRN	SUR	32	-80	521	0	0	18.5	-16.6	24.9
41037	99	DIRN	SUR	34	-77	585	0	0	18.4	-9.0	20.5
41038	99	DIRN	SUR	34	-78	529	0	0	20.1	-4.5	20.6
41040	99	DIRN	SUR	15	-53	933	0	0	15.9	7.7	17.6
41043	99	DIRN	SUR	21	-65	849	0	0	17.3	3.7	17.7
41044	99	DIRN	SUR	22	-59	997	0	0	16.5	3.3	16.9
41046	99	DIRN	SUR	24	-68	847	0	0	18.0	7.7	19.6
41047	99	DIRN	SUR	28	-72	844	0	0	15.3	-6.7	16.7
41048	99	DIRN	SUR	32	-70	952	0	0	15.7	9.4	18.2
41049	99	DIRN	SUR	28	-63	932	0	0	20.6	5.4	21.3
41052	99	DIRN	SUR	18	-65	1195	0	0	15.4	4.4	16.0
41053	99	DIRN	SUR	19	-66	772	0	0	21.8	-1.1	21.8
41056	99	DIRN	SUR	18	-66	1141	0	0	15.1	3.3	15.5
41064	99	DIRN	SUR	34	-77	563	0	0	18.5	-16.4	24.7
4200013	99	DIRN	SUR	27	-83	1160	0	0	19.9	-4.3	20.4
4200022	99	DIRN	SUR	28	-84	1198	0	0	17.6	1.9	17.7
4200023	99	DIRN	SUR	26	-83	1180	0	0	18.2	-4.2	18.7
4200026	99	DIRN	SUR	25	-83	1189	0	0	16.6	3.2	16.9
4200036	99	DIRN	SUR	29	-85	3536	0	0	14.3	12.7	19.1
4200056	99	DIRN	SUR	20	-85	3505	0	0	18.1	4.0	18.5
4200057	99	DIRN	SUR	17	-81	3115	0	0	12.1	1.0	12.2
4200058	99	DIRN	SUR	15	-75	3681	0	0	8.7	1.8	8.9
4200059	99	DIRN	SUR	15	-67	3584	0	0	12.2	-8.8	15.0
4200085	99	DIRN	SUR	18	-67	2863	0	0	23.0	21.0	31.2
42013	99	DIRN	SUR	27	-83	1135	0	0	20.5	-5.7	21.3
42022	99	DIRN	SUR	28	-84	1154	0	0	19.5	1.5	19.6
42023	99	DIRN	SUR	26	-83	1038	0	0	18.0	-4.5	18.5
42026	99	DIRN	SUR	25	-84	1138	0	0	15.7	3.0	16.0
42036	99	DIRN	SUR	29	-85	1934	0	0	14.8	11.7	18.9
42056	99	DIRN	SUR	20	-85	935	0	0	16.8	3.0	17.1

## 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
42057	99	DIRN	SUR	17	-81	927	0	0	11.7	4.6	12.6
42058	99	DIRN	SUR	15	-75	1013	0	0	8.9	1.3	9.0
42059	99	DIRN	SUR	15	-68	832	0	0	11.5	-11.7	16.5
42085	99	DIRN	SUR	18	-67	970	0	0	20.8	18.8	28.0
4400005	99	DIRN	SUR	43	-69	675	0	0	12.8	6.3	14.2
4400007	99	DIRN	SUR	44	-70	646	0	0	17.1	0.5	17.1
4400008	99	DIRN	SUR	41	-69	3823	0	0	15.5	7.7	17.3
4400009	99	DIRN	SUR	38	-75	622	0	0	10.7	12.6	16.5
4400013	99	DIRN	SUR	42	-71	649	0	0	18.8	5.7	19.6
4400014	99	DIRN	SUR	37	-75	619	0	0	13.2	3.8	13.8
4400018	99	DIRN	SUR	42	-70	659	0	0	17.8	8.7	19.8
4400020	99	DIRN	SUR	41	-70	11	0	0	28.3	-89.2	93.6
4400022	99	DIRN	SUR	41	-74	1021	0	0	13.1	9.3	16.1
4400025	99	DIRN	SUR	40	-73	665	0	0	12.8	0.9	12.8
4400027	99	DIRN	SUR	44	-67	677	0	0	12.1	3.9	12.7
4400029	99	DIRN	SUR	43	-71	609	0	0	17.5	-2.6	17.7
4400030	99	DIRN	SUR	43	-70	626	0	0	16.8	4.3	17.3
4400032	99	DIRN	SUR	44	-69	635	0	0	16.0	2.5	16.2
4400033	99	DIRN	SUR	44	-69	605	0	0	18.0	-5.0	18.7
4400034	99	DIRN	SUR	44	-68	654	0	0	12.9	3.0	13.2
4400037	99	DIRN	SUR	43	-68	648	0	0	11.2	2.5	11.5
4400040	99	DIRN	SUR	41	-74	946	0	0	17.5	2.2	17.6
4400042	99	DIRN	SUR	38	-76	4011	0	0	24.8	5.9	25.5
4400058	99	DIRN	SUR	38	-76	1016	0	0	25.2	-6.9	26.1
4400062	99	DIRN	SUR	39	-76	2676	0	0	28.6	-16.2	32.9
4400063	99	DIRN	SUR	39	-76	4065	0	0	22.5	-18.6	29.2
4400064	99	DIRN	SUR	37	-76	2957	0	0	16.0	-18.0	24.1
4400065	99	DIRN	SUR	40	-74	3706	0	0	12.6	4.2	13.3
4400066	99	DIRN	SUR	40	-73	3938	0	0	11.8	2.2	12.0
4400072	99	DIRN	SUR	37	-76	3093	0	0	13.9	-78.7	79.9
44005	99	DIRN	SUR	43	-69	703	0	0	13.0	5.5	14.1
44007	99	DIRN	SUR	44	-70	709	0	0	17.5	0.8	17.5
44008	99	DIRN	SUR	41	-69	1918	0	0	14.7	3.8	15.2
44009	99	DIRN	SUR	39	-75	634	0	0	11.1	11.9	16.3
44013	99	DIRN	SUR	42	-71	678	0	0	18.6	4.0	19.1
44014	99	DIRN	SUR	37	-75	625	0	0	13.1	3.2	13.5
44018	99	DIRN	SUR	42	-70	695	0	0	17.4	8.4	19.3
44020	99	DIRN	SUR	42	-70	11	0	0	27.2	-84.5	88.8
44022	99	DIRN	SUR	41	-74	362	0	0	14.7	8.5	17.0
44025	99	DIRN	SUR	40	-73	705	0	0	13.4	0.0	13.4
44027	99	DIRN	SUR	44	-67	718	0	0	12.6	3.3	13.0

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
44029	99	DIRN	SUR	43	-71	652	0	0	18.3	-3.7	18.7
44030	99	DIRN	SUR	43	-70	626	0	0	17.0	4.4	17.5
44032	99	DIRN	SUR	44	-69	626	0	0	15.2	2.1	15.4
44033	99	DIRN	SUR	44	-69	607	0	0	17.7	-5.4	18.5
44034	99	DIRN	SUR	44	-68	649	0	0	13.3	2.9	13.7
44037	99	DIRN	SUR	44	-68	646	0	0	11.8	2.5	12.1
44040	99	DIRN	SUR	41	-74	452	0	0	16.4	1.1	16.5
44042	99	DIRN	SUR	38	-76	661	0	0	24.9	6.1	25.6
44058	99	DIRN	SUR	38	-76	361	0	0	23.8	-9.0	25.4
44062	99	DIRN	SUR	39	-76	770	0	0	27.1	-18.4	32.8
44063	99	DIRN	SUR	39	-76	820	0	0	23.3	-19.4	30.3
44064	99	DIRN	SUR	37	-76	704	0	0	15.6	-19.6	25.1
44065	99	DIRN	SUR	40	-74	1044	0	0	13.6	2.8	13.9
44066	99	DIRN	SUR	40	-73	1982	0	0	11.8	0.5	11.8
44069	99	DIRN	SUR	41	-73	588	0	0	18.0	0.1	18.0
44072	99	DIRN	SUR	37	-76	666	0	0	14.6	-81.2	82.5
44139	99	DIRN	SUR	44	-57	634	0	0	15.1	-23.2	27.7
44150	99	DIRN	SUR	43	-64	641	0	0	14.4	-1.2	14.4
44258	99	DIRN	SUR	45	-63	636	0	0	14.8	-8.5	17.1
4500003	99	DIRN	SUR	45	-83	421	0	0	19.7	-8.5	21.5
4500005	99	DIRN	SUR	42	-82	3229	0	0	12.9	7.2	14.8
4500008	99	DIRN	SUR	44	-82	2515	0	0	12.2	4.9	13.2
4500012	99	DIRN	SUR	44	-77	2630	0	0	13.8	9.1	16.5
4500175	99	DIRN	SUR	46	-85	2328	0	0	63.2	-30.3	70.1
45003	99	DIRN	SUR	45	-83	435	0	0	19.0	-7.6	20.5
45005	99	DIRN	SUR	42	-82	870	0	0	14.5	8.4	16.7
45008	99	DIRN	SUR	44	-82	1244	0	0	13.1	4.1	13.8
45012	99	DIRN	SUR	44	-77	1194	0	0	12.2	4.2	12.9
45132	99	DIRN	SUR	43	-81	560	0	0	14.6	-0.8	14.6
45135	99	DIRN	SUR	44	-77	425	0	0	14.4	2.2	14.6
45137	99	DIRN	SUR	46	-81	646	0	0	14.1	-7.1	15.8
45138	99	DIRN	SUR	50	-66	625	0	0	14.3	-2.3	14.5
45139	99	DIRN	SUR	43	-80	372	0	0	16.6	-1.7	16.6
45142	99	DIRN	SUR	43	-79	504	0	0	19.3	-6.9	20.5
45143	99	DIRN	SUR	45	-81	577	0	0	16.5	1.0	16.5
45149	99	DIRN	SUR	44	-82	503	0	0	16.4	29.7	33.9
45151	99	DIRN	SUR	45	-79	251	0	0	14.7	-0.7	14.7
45154	99	DIRN	SUR	46	-83	517	0	0	17.3	3.6	17.6
45159	99	DIRN	SUR	44	-79	365	0	0	15.8	-0.3	15.8
45175	99	DIRN	SUR	46	-85	442	0	0	64.3	-26.4	69.5
6100198	99	DIRN	SUR	37	-2	425	0	0	21.5	5.9	22.3

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
6100281	99	DIRN	SUR	40	0	470	0	0	25.0	2.2	25.1
6100417	99	DIRN	SUR	38	0	600	0	0	20.2	2.4	20.4
6200024	99	DIRN	SUR	44	-3	58	0	0	24.2	11.9	27.0
6200025	99	DIRN	SUR	44	-6	605	0	0	18.0	-3.0	18.3
6200083	99	DIRN	SUR	43	-9	662	0	0	14.5	5.7	15.6
6200084	99	DIRN	SUR	42	-9	596	0	0	19.8	5.8	20.7
6200085	99	DIRN	SUR	36	-7	539	0	0	13.2	2.2	13.4
6200091	99	DIRN	SUR	53	-5	644	0	0	13.5	2.5	13.7
6200092	99	DIRN	SUR	51	-11	666	0	0	13.4	5.3	14.4
6200093	99	DIRN	SUR	55	-10	649	0	0	15.9	0.1	15.9
6200094	99	DIRN	SUR	52	-7	681	0	0	13.4	0.8	13.4
6200095	99	DIRN	SUR	53	-15	655	0	0	16.1	-2.9	16.4
62001	99	DIRN	SUR	45	-5	726	0	0	14.2	3.1	14.5
6200192	99	DIRN	SUR	40	-10	343	0	0	14.2	-1.6	14.3
6200200	99	DIRN	SUR	36	-8	409	0	0	12.5	1.4	12.5
6201030	99	DIRN	SUR	44	-4	502	0	0	22.8	1.2	22.9
62023	99	DIRN	SUR	51	-8	377	0	0	11.4	3.3	11.8
6202670	99	DIRN	SUR	57	-15	559	0	0	19.5	3.0	19.7
6202671	99	DIRN	SUR	58	-19	579	0	0	17.9	-6.7	19.1
6202672	99	DIRN	SUR	61	-13	612	0	0	19.6	-0.1	19.6
6202673	99	DIRN	SUR	60	-28	560	0	0	20.9	-13.5	24.9
6202674	99	DIRN	SUR	62	-18	167	0	0	20.5	-5.3	21.2
62029	99	DIRN	SUR	49	-13	890	0	0	12.8	5.9	14.1
62050	99	DIRN	SUR	50	-4	705	0	0	13.4	3.5	13.8
62091	99	DIRN	SUR	53	-5	630	0	0	13.2	2.0	13.3
62092	99	DIRN	SUR	51	-11	649	0	0	13.0	4.8	13.9
62093	99	DIRN	SUR	55	-10	629	0	0	16.2	-0.5	16.2
62094	99	DIRN	SUR	52	-7	668	0	0	13.1	0.2	13.1
62095	99	DIRN	SUR	53	-15	641	0	0	16.4	-3.0	16.7
62103	99	DIRN	SUR	50	-3	372	1	0	36.9	-7.9	37.8
62105	99	DIRN	SUR	55	-13	1266	0	0	16.4	6.3	17.6
62107	99	DIRN	SUR	50	-6	1248	0	0	15.4	0.9	15.4
62112	99	DIRN	SUR	58	0	683	0	0	11.6	-4.7	12.5
62114	99	DIRN	SUR	58	0	1244	0	0	10.7	0.9	10.8
62163	99	DIRN	SUR	48	-8	693	0	0	14.2	-0.9	14.2
62305	99	DIRN	SUR	50	0	704	0	0	19.6	4.0	20.0
64041	99	DIRN	SUR	61	-3	697	0	0	11.2	9.0	14.4
64045	99	DIRN	SUR	59	-12	1099	0	0	23.4	5.6	24.1
64046	99	DIRN	SUR	61	-4	696	0	0	12.8	-1.0	12.8
95243	99	DIRN	SUR	37	-16	1	0	0	0.0	23.9	23.9

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

ASDE09	ASUK01	BPMWB2N	DBLK	FHM5UJH	FPUW5GN	JNKN7JF	KJJF9XN	KMPLHPW
LRYQE3U	VLMJ_YMC		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	04089	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	29612	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	60155	60571	60630	60656	60680	61052	61901	61998
63741	67083	68263	68424	68442	68512	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	71823	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	76644	76679	76692
76743	76805	76903	78897	78954	81405	82765	82900	82983
83525	83649	85442	85469	85586	85799	85934	87155	87344
87418	87576	87623	87715	87860	88889	89002	89062	89564
89571	89592	89611	89625	89642	89662	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	ASUK01	BPMWB2N	DBLK	FHM5UJH	FPUW5GN	JNKN7JF	KJJF9XN
KMPLHPW	LRYQE3U	VLMJ_YMC		WDK38HS	XKQLWQB	XQFJRGX	YLV96WM	ZVQEQCM
5QPW8XG	7JUNA4N	01001	01010	01028	01241	01400	01415	01492
02836	02963	06610	07110	07145	07510	07645	07761	11010
11035	11120	11240	17607	40186	47155	61998	73033	73110
76743	76903	78897	81405	84384	89642	89859	91592	91938
93817	94653							



## 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 TEMPSHIPS and PILOTSHIPS this position is obtained from the first report of the month. The gross error limits for first-guess deviations of geopotential in table 7 are as follows:

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

The corresponding limits for wind (table 8) are:

Level	Wind
1000	$35\text{ms}^{-1}$
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.