



ECMWF Global Data Monitoring Report

June 2019

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

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Summary of Revisions (in reverse order)

- Revision 28 (June 15) - Monitoring of SYNOP and SYNOP-SHIPs now includes BUFR encoded observations for those which were assimilated as well as for those without TAC counterpart.
- Revision 27 (Feb 15) - Selection criteria for SHIPs are modified as per SOT-7/Doc.9.1.1. Different criteria applied to Manual and Automatic SHIPs.
- Revision 26 (Dec 14) - Coverage chart for ATOVS AMSU-A for Noaa_16 removed
- Revision 25 (Mar 13) - Monitoring of Radiosondes and ASAPs now includes BUFR encoded observations for those which were assimilated as well as for those without TAC counterpart. Tables 24 and 25 are also added to show the identifiers of these BUFR observations separately.
- Revision 24 (Aug 06) - North Atlantic Monitoring statistics replaced by EUCOS Area Monitoring Statistics (tables 13 to 23). Airep tables removed from this section.
- Revision 23 (Dec 00) - Coverage charts for Noaa_14 MSU replaced by ATOVS AMSU-A for Noaa_16.
- Revision 22 (Aug 99) - Coverage charts for TOVS thickness 300-100 hPa replaced by (A)TOVS AMSU-A and MSU (Noaa_15 and Noaa_14).
- Revision 21 (May 99) - Monitoring statistics ceased for Noaa_11 as satellite is no more available.
- Revision 20 (Sep 98) - Changes to tables and annex to remove all mention about data usage. Two more levels (50 and 850 hPa) added to the COSNA statistics for Sondes.
- Revision 19 (Jul 98) - From June 29th, 1998 ECMWF model assimilates temperature data instead of geopotential from radiosondes. As a consequence the number of used geopotential data drops to zero in tables 7, 10, 13 and 15.
- Revision 18 (Apr 98) - Changes to tables and annex to introduce the usage of accepted numbers and observations instead of percentage of rejection.

1 Introduction

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

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

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

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

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

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

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

2 Data summary - History of events

2.1 Radiosondes

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

Ident	Time	May	Jun	Ident	Time	May	Jun
29612	(12)	31	0	41112	(12)	15	28
30309	(00)	18	0	41923	(00)	8	24
30309	(12)	17	0	41923	(12)	8	26
30715	(00)	17	2	42647	(12)	0	19
30715	(12)	16	4	43466	(12)	4	26
31300	(00)	29	14	43599	(00)	4	25
31300	(12)	29	11	61442	(12)	0	29
42667	(00)	28	16	61660	(00)	0	32
43311	(00)	31	5	61660	(12)	0	32
47169	(12)	18	6	65578	(00)	0	29
61980	(00)	25	0	65578	(12)	0	29
70133	(12)	23	0	67083	(00)	16	30
71823	(00)	31	18	67083	(12)	12	30
71823	(12)	31	17	70133	(00)	4	24
72208	(00)	35	0	70326	(00)	5	26
72476	(00)	13	0	70326	(12)	2	27
72476	(12)	16	0	71126	(00)	2	17
76679	(00)	27	15	74006	(12)	1	14
76679	(12)	28	16	74494	(00)	15	29
78397	(12)	31	20	76225	(00)	0	12
78988	(00)	31	10	76225	(12)	0	22
78988	(12)	31	10	76458	(00)	1	20
80001	(12)	31	19	76612	(00)	0	20
82281	(00)	23	11	76654	(00)	5	29
83779	(00)	24	5	76692	(00)	0	21
83779	(12)	24	5	76692	(12)	6	23
91680	(12)	30	16	76805	(00)	2	15
94302	(12)	12	0	76805	(12)	1	17
97072	(00)	31	15	78897	(00)	0	20
97072	(12)	31	15	82397	(12)	0	23

2.2 Drifting Buoys

Surface pressure observations from **1809** 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.

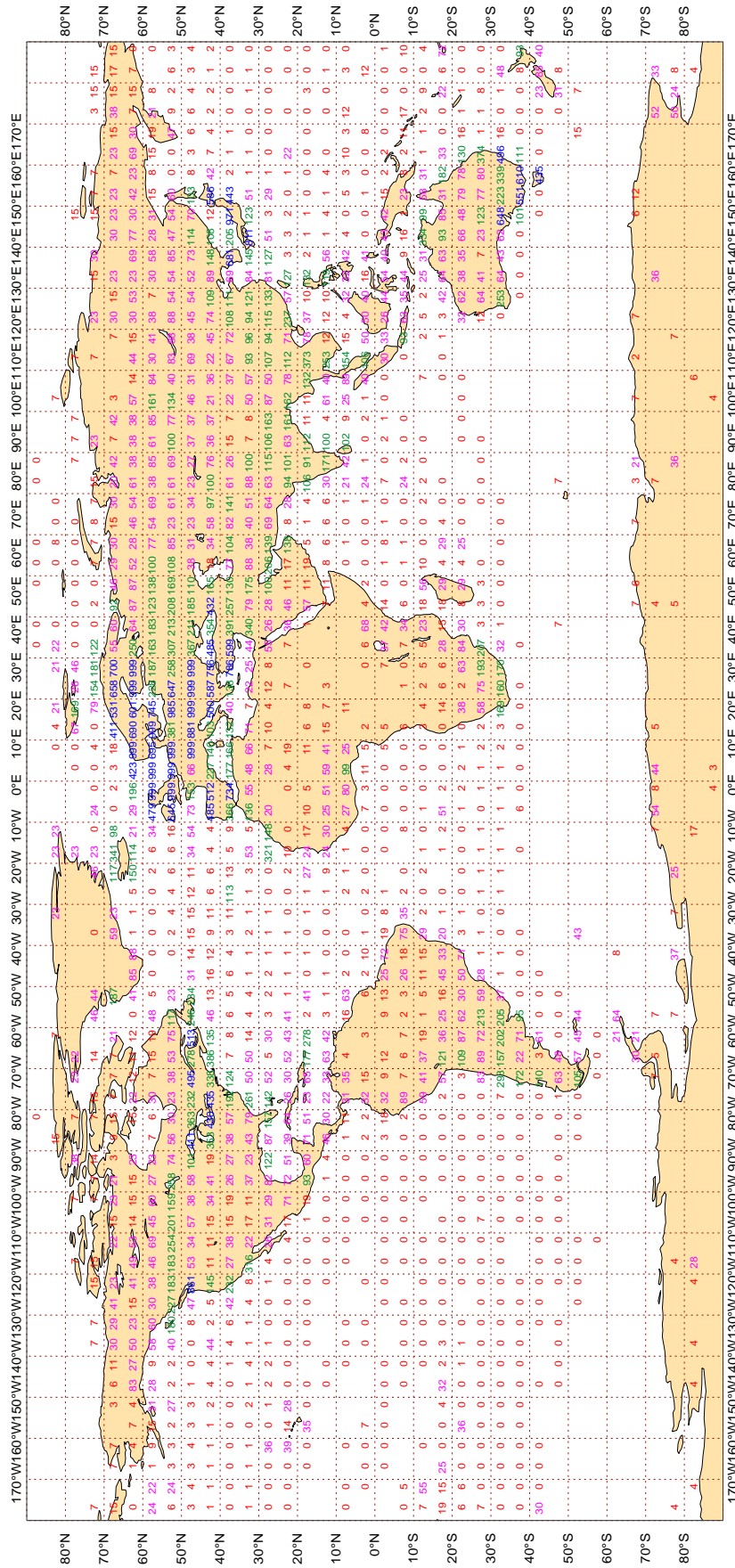
Fig	Parameter	Level/Layer
14	SATOB - Mean observed wind	1000-700 hPa
15	SATOB - Mean observed wind	400-150 hPa
16	SATOB - Mean observed minus first-guess wind	1000-700 hPa
17	SATOB - Mean observed minus first-guess wind	400-150 hPa
18	AIRCRAFT WIND - Mean observed minus first-guess	300-150 hPa

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

3.2.1 Figure 1 - Availability - SYNOP PRESSURE

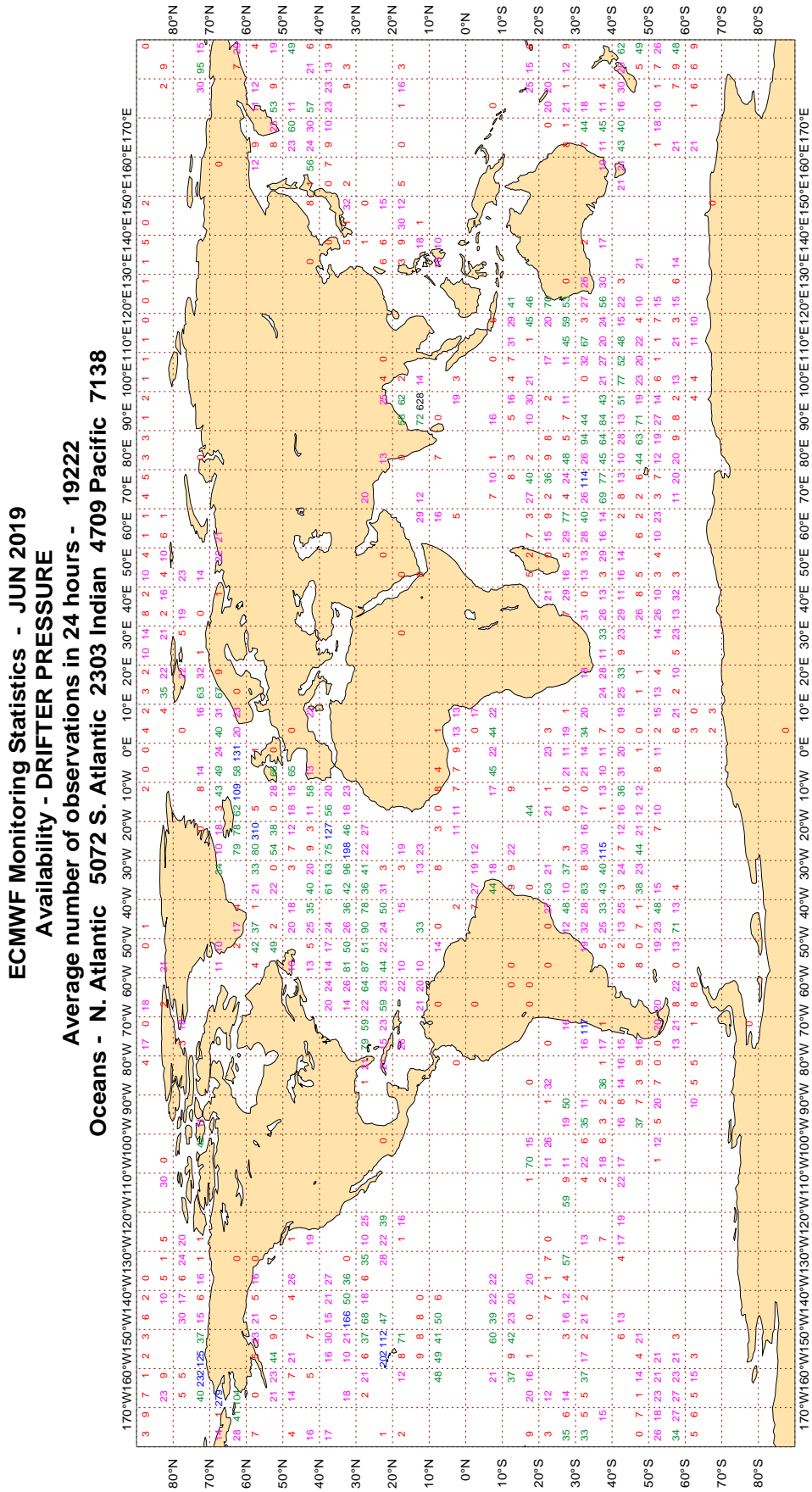
Figure 1

ECMWF Monitoring Statistics - JUN 2019
 Availability - SYNOP/SHIP (manual, auto) pressure
 Average number of observations in 24 hours - 97300
 LAND - WMO Region I: 4014 II:18034 III: 4011 IV: 7156
 Region V: 8644 VI:39893 Antarctic: 798
 Oceans - N. Atlantic 8775 S. Atlantic 167 Indian 610 Pacific 5200



3.2.2 Figure 2 - Availability - DRIFTER PRESSURE

Figure 2



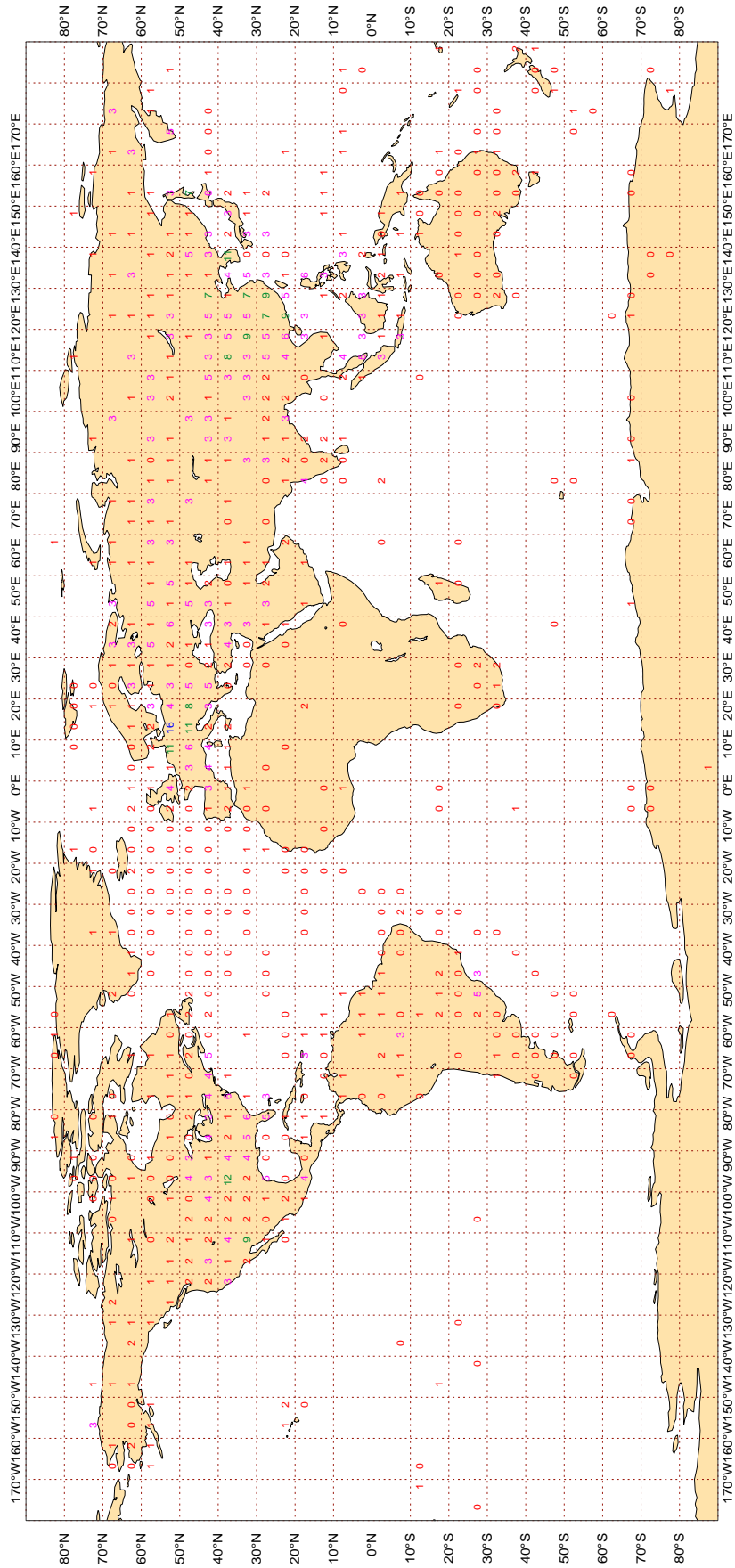
Magics 3.0.4 (64 bit)



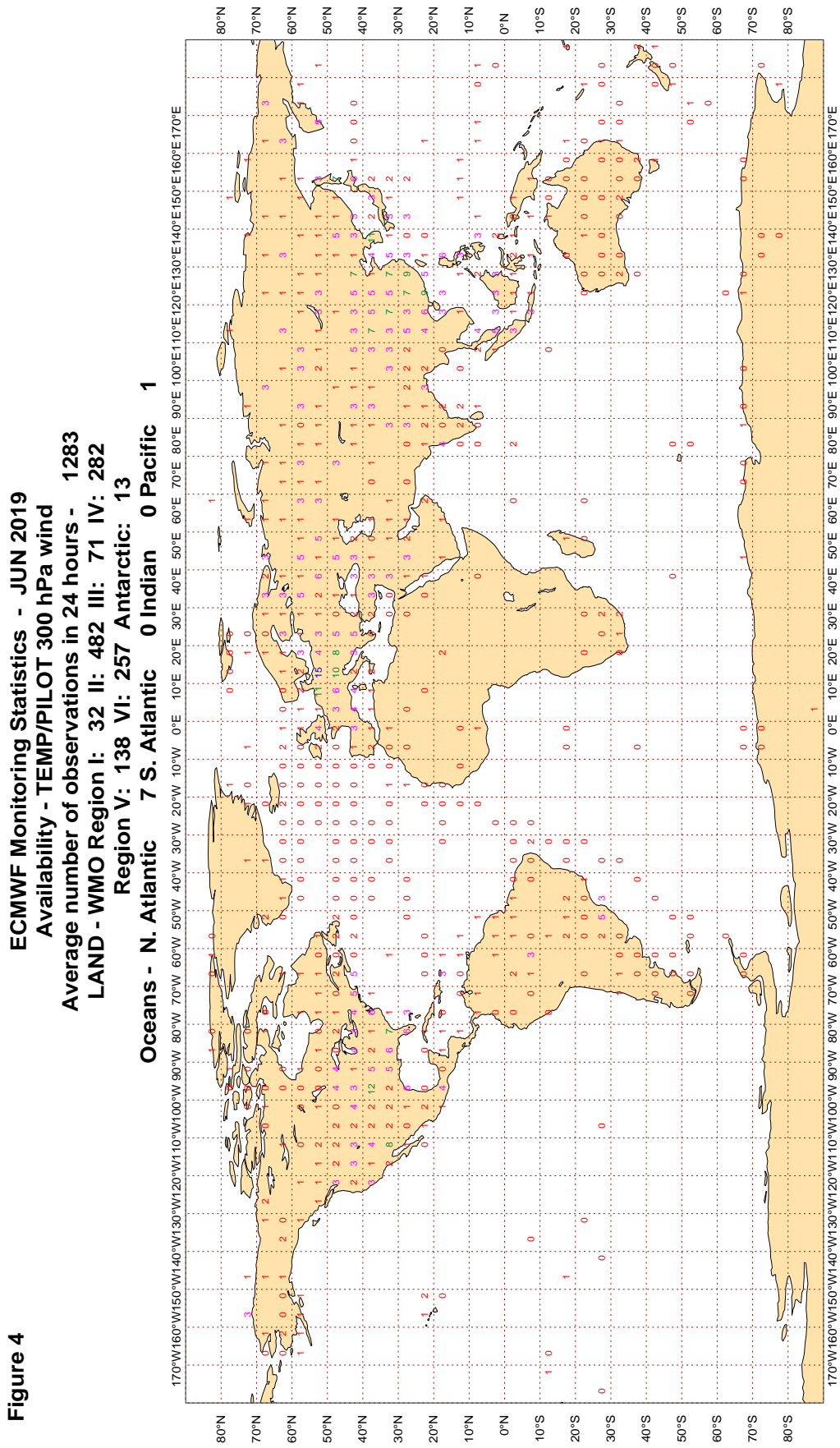
3.2.3 Figure 3 - Availability - TEMP 500 hPa geopotential

Figure 3

ECMWF Monitoring Statistics - JUN 2019
 Availability - TEMP 500 hPa Geopotential
 Average number of observations in 24 hours - 1292
 LAND - WMO Region I: 32 II: 494 III: 72 IV: 272
 Region V: 139 VI: 260 Antarctic: 13
 Oceans - N. Atlantic 8 S. Atlantic 0 Indian 0 Pacific 1



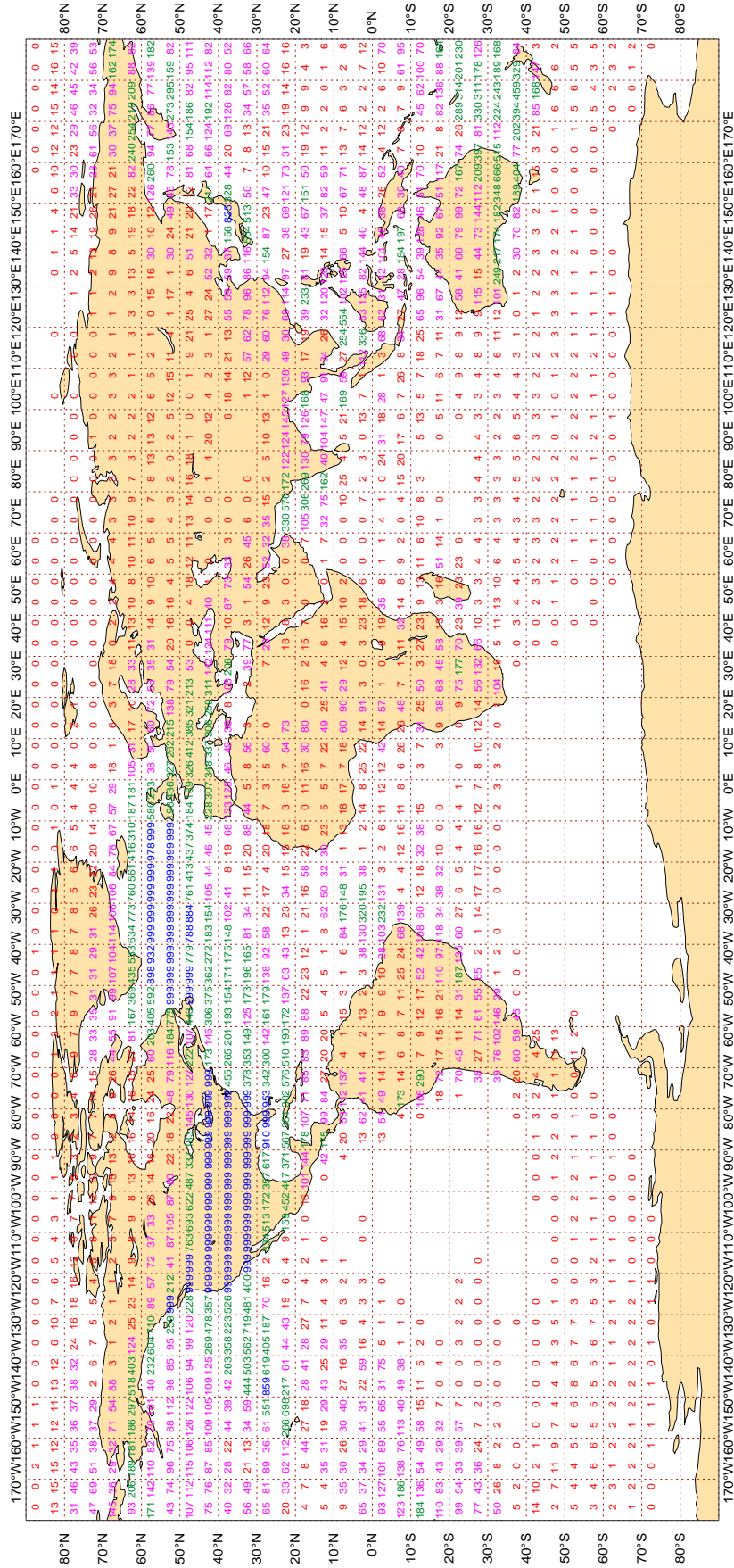
3.2.4 Figure 4 - Availability - TEMP/PILOT 300 hPa wind



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

Figure 5

ECMWF Monitoring Statistics - JUN 2019
Availability - Aircraft winds 300-150 hPa
Average number of observations in 24 hours - 240130



Magics 3.0.4 (64 bit)



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

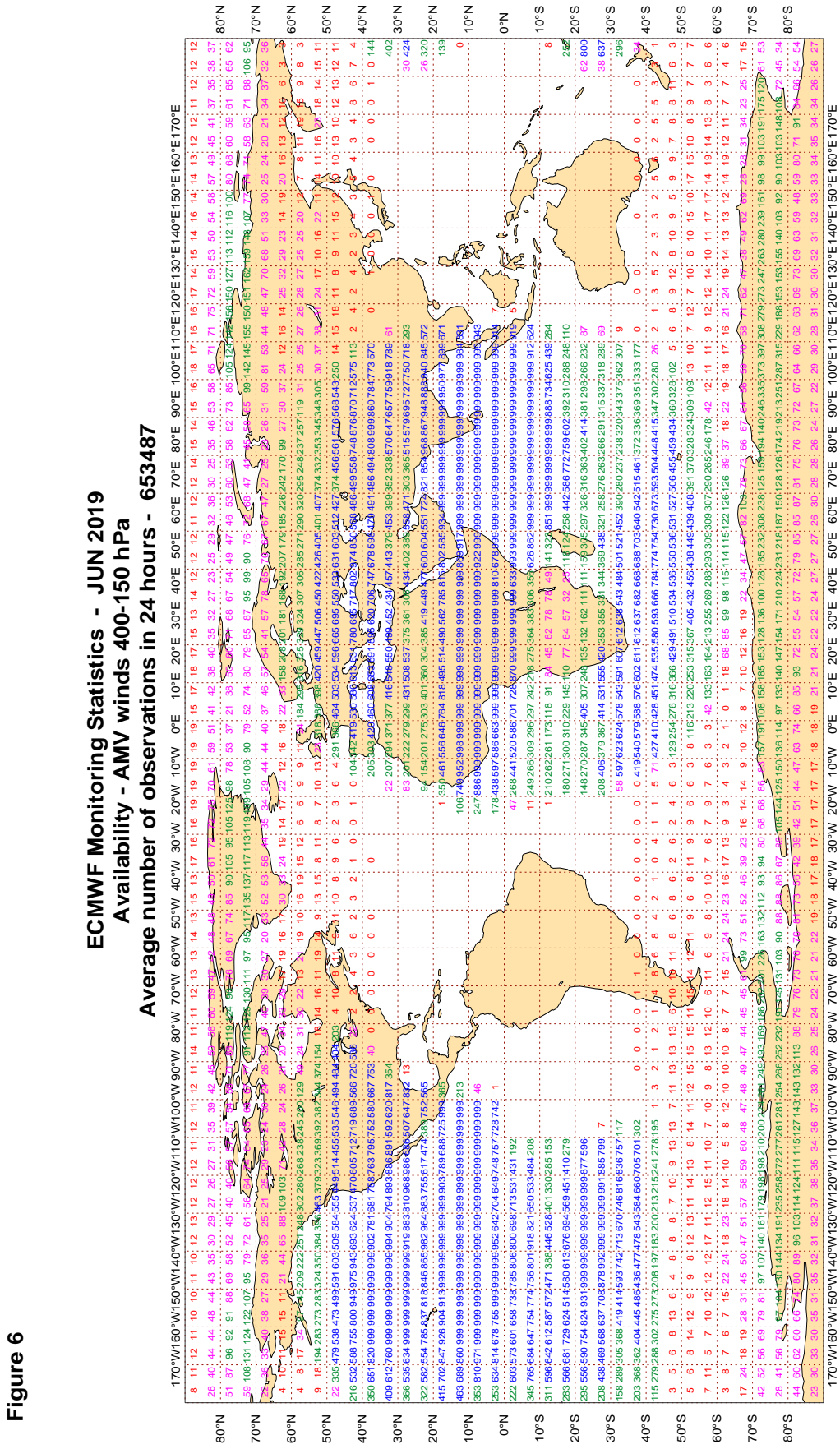


Figure 6

Magics 3.0.4 (64 bit)



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

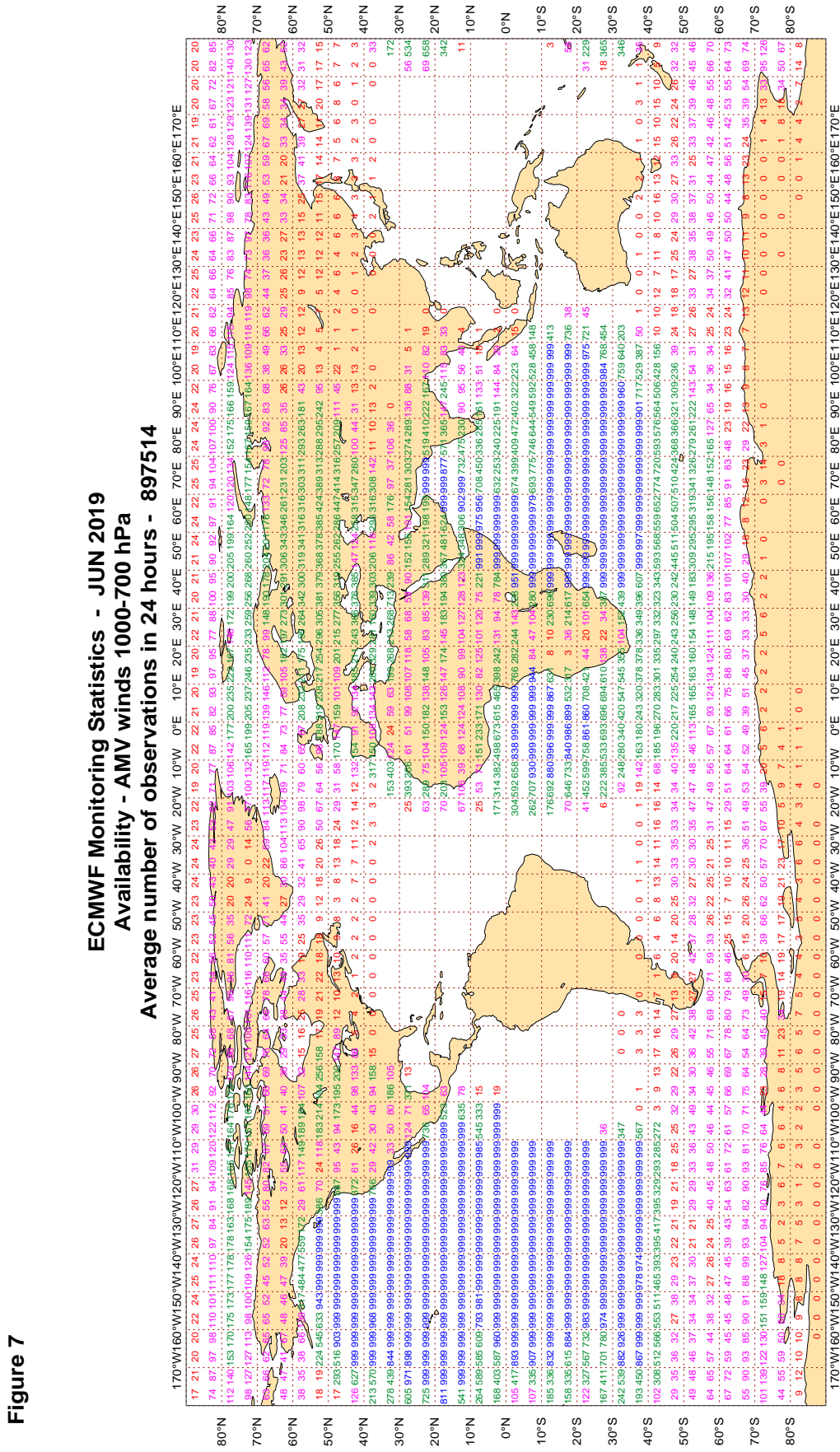


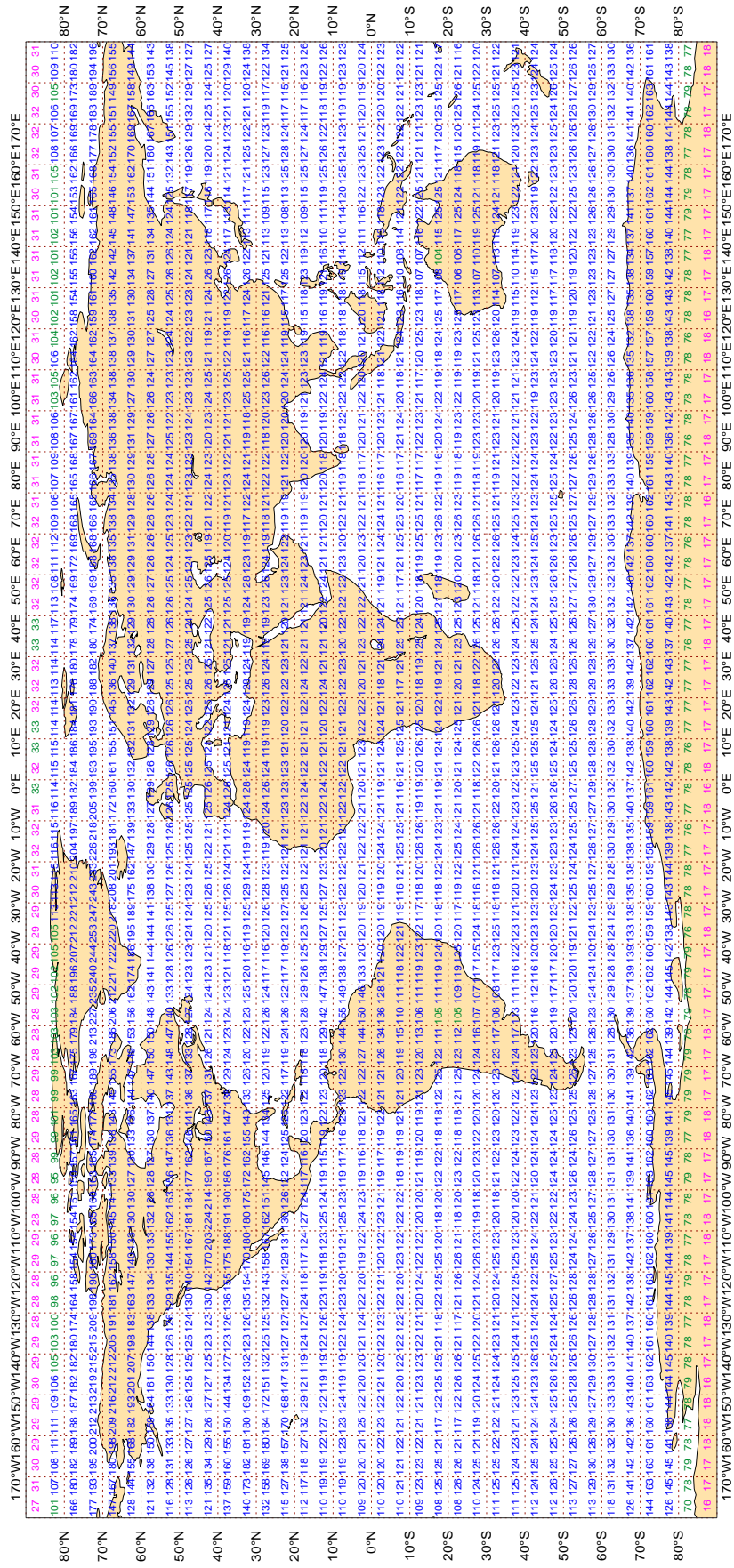
Figure 7



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

Figure 8

ECMWF Monitoring Statistics - JUN 2019
Availability - NOAA15 ATOVS : AMSU-A
Average number of observations in 24 hours - 323494



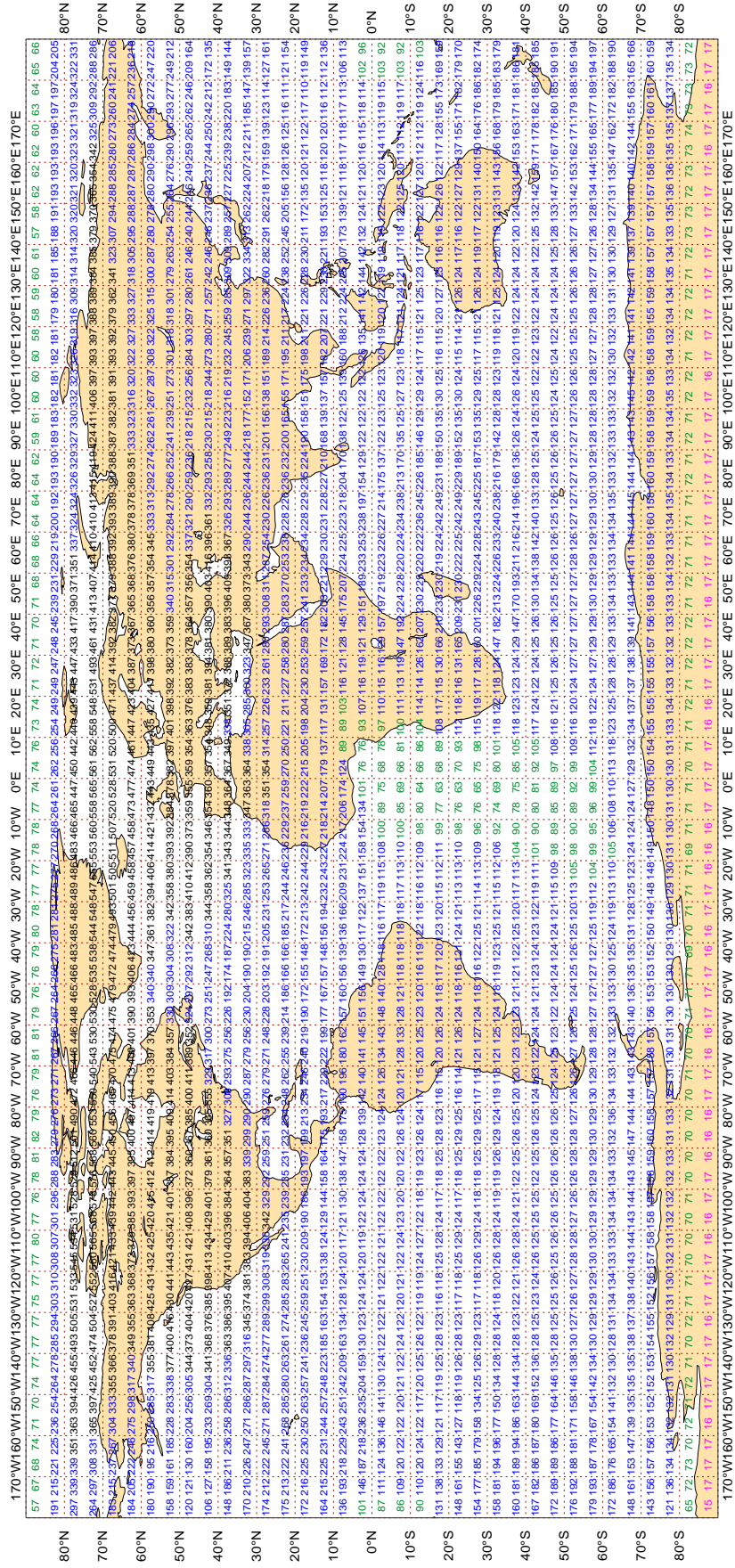
Magics 3.0.4 (64 bit)



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

Figure 9.1

ECMWF Monitoring Statistics - JUN 2019
Availability - NOAA18 ATOVS : AMSU-A
Average number of observations in 24 hours - 521524



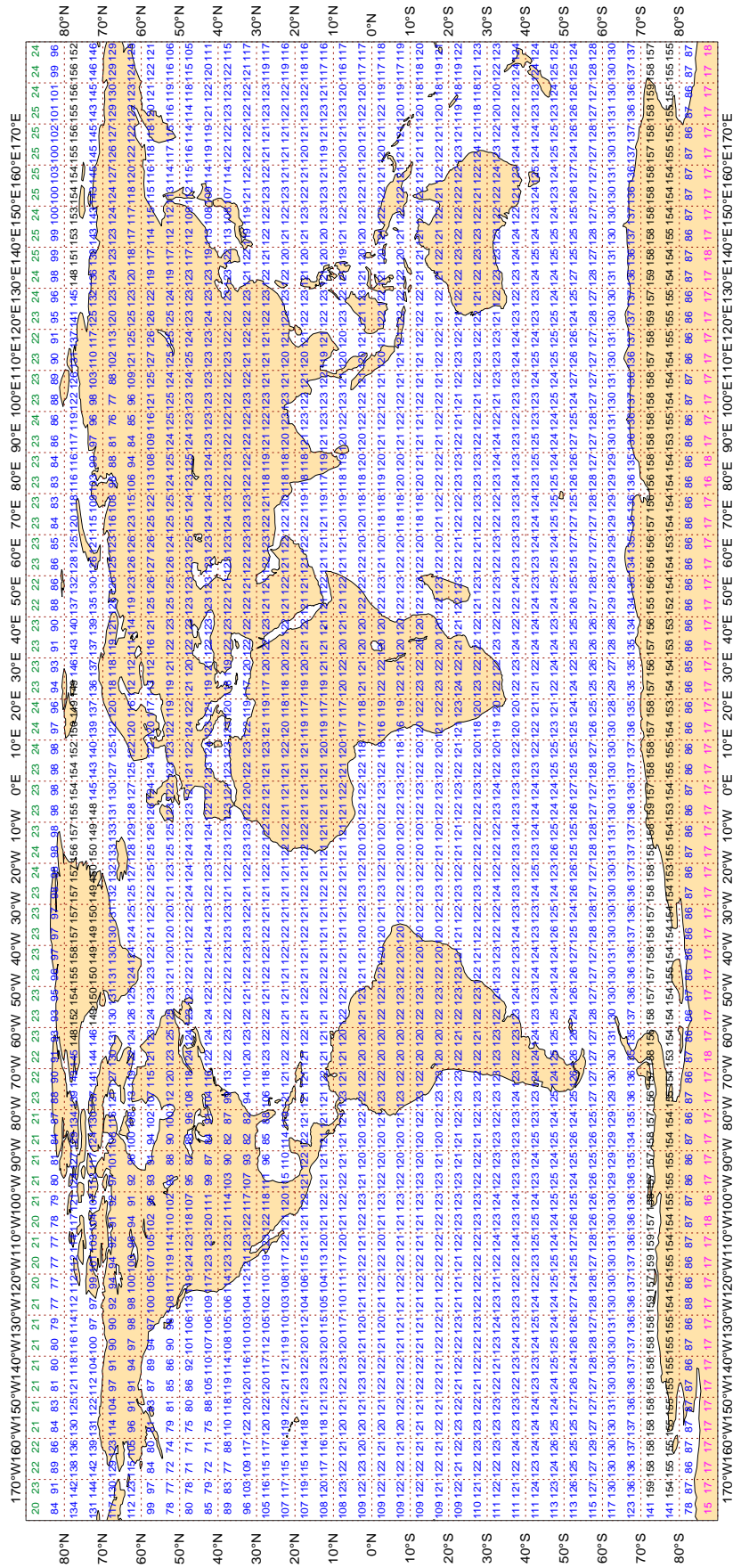
Magics 3.0.4 (64 bit)



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

Figure 9.2

ECMWF Monitoring Statistics - JUN 2019
Availability - AQUA ATOVS : AMSU-A
Average number of observations in 24 hours - 301872



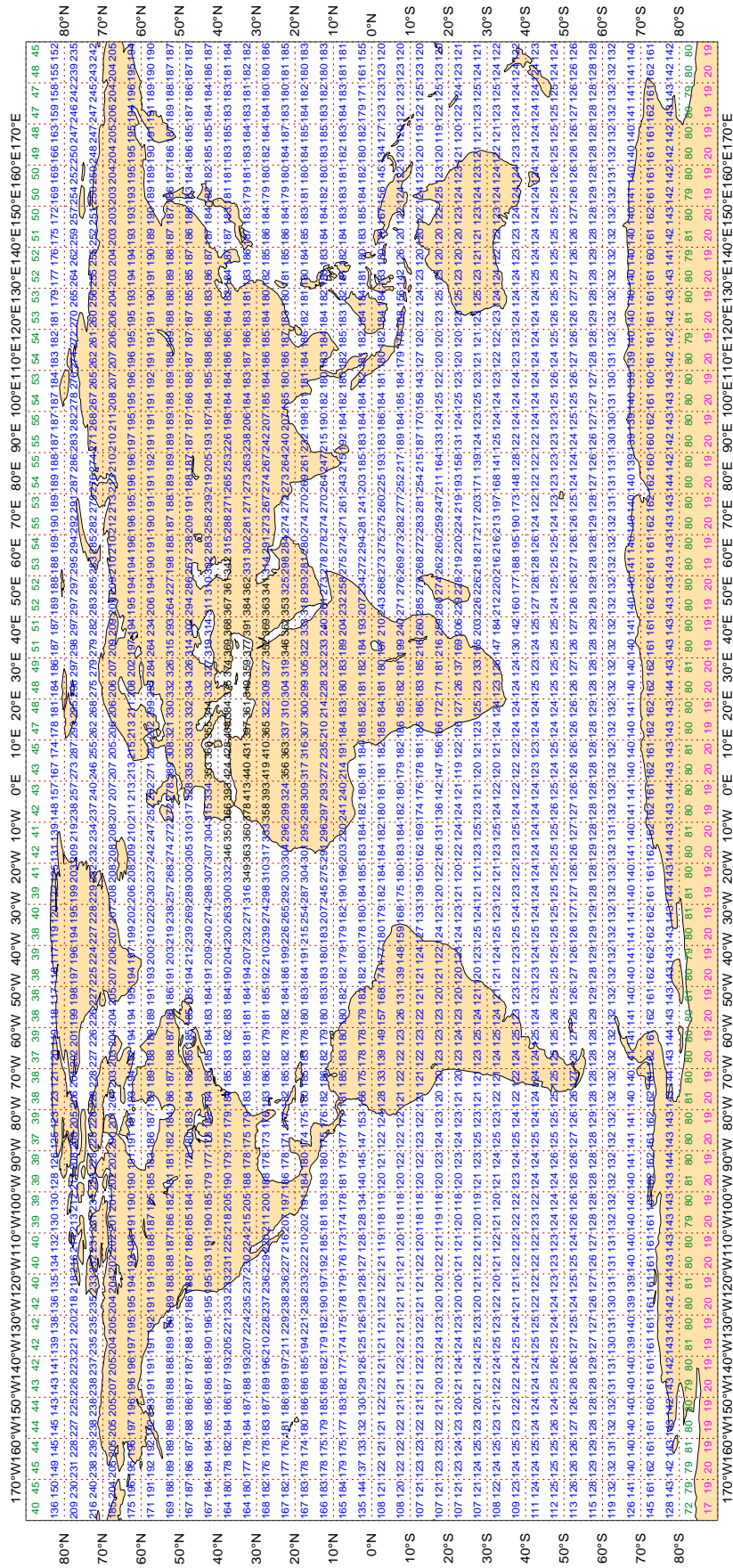
Magics 3.0.4 (64 bit)



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

Figure 9.3

ECMWF Monitoring Statistics - JUN 2019
Availability - METOP ATOVS : AMSU-A
Average number of observations in 24 hours - 435223



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 : JUN 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
3ETA7	99	P	SUR	27	0	0.8	-3.7	3.8
3FFA5	99	P	SUR	29	0	1.4	4.2	4.4
3FSR7	99	P	SUR	16	0	0.8	5.0	5.1
45169	99	P	SUR	189	0	0.5	3.2	3.3
7KEG	99	P	SUR	21	0	0.4	-6.5	6.5
9HJB9	99	P	SUR	31	0	0.8	10.6	10.7
9HJC9	99	P	SUR	31	0	1.3	-3.3	3.6
9HJD9	99	P	SUR	28	0	1.9	4.8	5.2
9HRJ9	99	P	SUR	57	0	1.9	4.4	4.8
9V2737	99	P	SUR	20	0	2.3	3.2	3.9
9V3533	99	P	SUR	70	0	0.9	4.9	5.0
9V6221	99	P	SUR	29	0	1.0	-4.1	4.2
9V7989	99	P	SUR	22	2	5.1	2.8	5.8
9V8208	99	P	SUR	33	0	0.5	4.0	4.0
9V8584	99	P	SUR	41	0	2.0	3.4	4.0
9V8838	99	P	SUR	51	0	0.8	3.2	3.2
9V9404	99	P	SUR	15	0	1.1	9.6	9.6
9V9793	99	P	SUR	26	1	2.6	4.3	5.0
9V9V5	99	P	SUR	53	0	3.8	6.0	7.1
A8OS6	99	P	SUR	33	0	0.4	4.2	4.2
AWUU	99	P	SUR	17	0	2.1	3.9	4.4
BKIZ	99	P	SUR	28	0	1.0	-4.4	4.5
C6BX8	99	P	SUR	47	0	1.7	5.7	5.9
C6FV8	99	P	SUR	48	0	1.8	-5.4	5.7
C6QM8	99	P	SUR	34	0	2.3	3.9	4.5
CQHW	99	P	SUR	31	0	0.9	-4.2	4.3
D5KR2	99	P	SUR	16	0	1.4	3.5	3.8
LAQL7	99	P	SUR	34	0	1.6	4.2	4.5
OWCH2	99	P	SUR	41	0	3.0	4.6	5.5
OXGX2	99	P	SUR	27	0	1.7	7.4	7.6
OZ2049	99	P	SUR	43	0	0.9	-6.0	6.1
UAEV	99	P	SUR	44	1	2.0	3.4	4.0

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

WMO IDENT	OBS TIME	ELM	LEVEL	NUM OBS	NUM GROSS	SD	BIAS	RMS
UBRW	99	P	SUR	17	0	2.8	-4.5	5.3
V7FA7	99	P	SUR	29	0	0.6	3.9	4.0
VRBH6	99	P	SUR	33	0	1.6	3.4	3.8
VRDU6	99	P	SUR	17	0	2.4	6.0	6.5
VRFX2	99	P	SUR	29	0	2.0	-5.0	5.4
VRIS8	99	P	SUR	45	0	1.4	10.7	10.7
VRJZ9	99	P	SUR	22	0	1.4	4.7	4.9
VRLA2	99	P	SUR	16	0	5.5	3.5	6.5
VRNR5	99	P	SUR	33	0	1.5	6.2	6.4
VROO5	99	P	SUR	59	0	1.6	3.2	3.5
VRRB5	99	P	SUR	117	0	1.3	-3.4	3.7
VRRD7	99	P	SUR	52	0	3.4	4.4	5.6
VRRQ5	99	P	SUR	33	10	2.0	12.4	12.5
VRSB3	99	P	SUR	34	0	1.0	4.3	4.4
VWTI	99	P	SUR	59	0	0.6	-3.5	3.5
WCEU	99	P	SUR	59	0	1.8	4.6	5.0
WDJ3192	99	P	SUR	53	0	1.9	3.9	4.3
WGAE	99	P	SUR	64	0	0.7	4.4	4.5
WPKW	99	P	SUR	22	0	2.8	6.0	6.6
WTOI	99	P	SUR	68	0	2.4	3.0	3.9
WZZF	99	P	SUR	52	0	1.6	3.3	3.7

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 : JUN 2019
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

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

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

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

LIST OF SUSPECT STATIONS : SHIPS + FIXED MARINE PLATFORMS
 MONITORING CENTRE : ECMWF
 ELEMENT MONITORED : WIND DIRECTION (DEGREES)
 AREA : GLOBAL
 PERIOD : JUN 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
42012	99	DIRN	SUR	18	0	0	23.7	37.5	44.4
45024	99	DIRN	SUR	89	0	0	20.7	33.3	39.2
45168	99	DIRN	SUR	95	0	0	32.8	34.8	47.8
45176	99	DIRN	SUR	40	0	0	96.8	-34.6	102.8
62304	99	DIRN	SUR	15	0	0	124.6	-46.9	133.1

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 : JUN 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
1701511	99	P	SUR	-27	72	184	78	5.5	-3.9	6.7
1701575	99	P	SUR	-66	5	292	101	5.7	-6.1	8.4
2301552	99	P	SUR	-30	46	182	1	6.2	-3.8	7.3
2301714	99	P	SUR	25	62	636	347	9.3	-1.7	9.4
2301719	99	P	SUR	21	89	611	201	3.1	2.0	3.7
2302610	99	P	SUR	6	80	23	14	5.7	-2.5	6.2
3101537	99	P	SUR	-46	14	473	0	1.4	5.1	5.3
3301521	99	P	SUR	-26	-42	663	0	0.9	4.4	4.5
4500001	99	P	SUR	48	-88	4009	4009	0.0	0.0	0.0
4500002	99	P	SUR	45	-86	3781	3781	0.0	0.0	0.0
4500003	99	P	SUR	45	-83	664	664	0.0	0.0	0.0
4500004	99	P	SUR	48	-87	4000	4000	0.0	0.0	0.0
4500005	99	P	SUR	42	-82	3860	3860	0.0	0.0	0.0
4500006	99	P	SUR	47	-90	675	675	0.0	0.0	0.0
4500007	99	P	SUR	43	-87	3998	3998	0.0	0.0	0.0
4500008	99	P	SUR	44	-82	4004	4004	0.0	0.0	0.0
4500012	99	P	SUR	44	-77	3997	0	0.4	-9.5	9.5
4500026	99	P	SUR	42	-87	4201	4201	0.0	0.0	0.0
4500029	99	P	SUR	43	-86	4209	4209	0.0	0.0	0.0
4500168	99	P	SUR	42	-86	4211	4211	0.0	0.0	0.0
4701658	99	P	SUR	70	-98	355	101	4.4	2.4	5.0
4800770	99	P	SUR	67	-31	646	646	0.0	0.0	0.0
4801625	99	P	SUR	82	171	364	0	1.8	5.6	5.8
4801639	99	P	SUR	75	-132	130	0	3.9	4.4	5.9
6401565	99	P	SUR	71	30	28	3	7.2	3.6	8.1

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 : JUN 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	1383	0	0	2.5	5.1	5.7

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

LIST OF SUSPECT STATIONS : DRIFTER
 MONITORING CENTRE : ECMWF
 ELEMENT MONITORED : WIND DIRECTION (DEGREES)
 PERIOD : JUN 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
1500001	99	DIRN	SUR	-10	-10	600	0	0	118.2	-30.3	122.1
1500002	99	DIRN	SUR	0	-10	249	0	0	157.6	38.8	162.3
15002	99	DIRN	SUR	0	-10	239	0	0	157.7	35.7	161.7
2300007	99	DIRN	SUR	8	89	585	0	0	69.5	-44.1	82.3
23092	99	DIRN	SUR	17	89	69	0	0	26.6	-28.0	38.7
23093	99	DIRN	SUR	16	88	149	0	0	143.1	12.0	143.6
23094	99	DIRN	SUR	14	84	356	0	0	21.3	-28.1	35.2
23452	99	DIRN	SUR	12	69	141	0	0	68.3	17.3	70.4
23456	99	DIRN	SUR	19	67	146	10	0	152.8	-76.2	170.7
23459	99	DIRN	SUR	14	87	150	0	0	18.7	-21.5	28.5
23492	99	DIRN	SUR	11	72	153	0	0	50.5	-42.5	66.0
3100003	99	DIRN	SUR	-8	-31	252	0	0	15.5	26.9	31.1
3100231	99	DIRN	SUR	-27	-47	171	0	0	153.8	-28.7	156.4
31003	99	DIRN	SUR	-8	-31	250	0	0	15.4	26.0	30.2
31231	99	DIRN	SUR	-27	-47	172	1	0	154.5	-23.9	156.3
4100064	99	DIRN	SUR	34	-77	507	0	0	22.8	-23.5	32.8
41064	99	DIRN	SUR	34	-77	495	0	0	22.7	-25.0	33.8
4400013	99	DIRN	SUR	42	-71	453	0	0	28.4	20.9	35.3
4400063	99	DIRN	SUR	39	-76	2084	0	0	30.6	-20.3	36.8
44058	99	DIRN	SUR	38	-76	105	0	0	29.0	-23.1	37.1
44063	99	DIRN	SUR	39	-76	452	0	0	32.5	-20.2	38.3
4500004	99	DIRN	SUR	48	-87	2265	0	0	23.2	20.1	30.7
4500006	99	DIRN	SUR	47	-90	326	0	0	25.9	21.0	33.3
4500007	99	DIRN	SUR	43	-87	2442	0	0	27.7	20.4	34.4
4500024	99	DIRN	SUR	44	-87	2086	0	0	24.4	33.8	41.7
45001	99	DIRN	SUR	48	-88	890	0	0	25.1	22.7	33.8
4500168	99	DIRN	SUR	42	-86	2278	0	0	43.7	33.0	54.8
4500175	99	DIRN	SUR	46	-85	1997	0	0	72.7	-24.7	76.7
4500176	99	DIRN	SUR	42	-82	1004	0	0	96.3	-38.0	103.6
4500186	99	DIRN	SUR	42	-88	888	0	0	26.0	23.0	34.7
45004	99	DIRN	SUR	48	-87	1014	0	0	22.8	20.8	30.9

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
45006	99	DIRN	SUR	47	-90	482	0	0	26.3	21.0	33.7
45024	99	DIRN	SUR	44	-87	535	0	0	26.7	33.8	43.1
45025	99	DIRN	SUR	47	-88	268	0	0	63.0	22.2	66.8
45149	99	DIRN	SUR	44	-82	382	0	0	21.3	29.2	36.1
45168	99	DIRN	SUR	42	-86	515	0	0	40.1	31.4	50.9
45175	99	DIRN	SUR	46	-85	481	0	0	73.0	-27.2	78.0
45176	99	DIRN	SUR	42	-82	267	0	0	97.4	-29.8	101.8
45186	99	DIRN	SUR	42	-88	412	0	0	28.8	23.1	36.9
4600081	99	DIRN	SUR	61	-148	115	0	0	45.3	21.6	50.2
4600087	99	DIRN	SUR	48	-125	650	0	0	30.2	21.7	37.2
46081	99	DIRN	SUR	61	-148	110	0	0	48.6	20.2	52.6
5100015	99	DIRN	SUR	5	-125	40	0	0	22.1	-50.0	54.7
51015	99	DIRN	SUR	5	-125	40	0	0	22.4	-49.9	54.7
5300040	99	DIRN	SUR	-8	95	694	0	0	168.7	27.5	171.0
5300056	99	DIRN	SUR	-5	95	641	0	0	137.8	94.9	167.3
53040	99	DIRN	SUR	-8	95	689	0	0	168.5	26.5	170.6
53056	99	DIRN	SUR	-5	95	630	0	0	136.6	96.3	167.2
62304	99	DIRN	SUR	51	2	78	0	0	116.8	-59.5	131.1

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 : JUN 2019
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

ONLY THE WORST LEVEL IS SHOWN (WITH UNWEIGHTED RMS)

WMO IDENT	OBS TIME	ELM	LEV	LAT	LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
01400	12	Z	1000	57	3	23	0	5.6	77.9	78.1
01400	00	Z	1000	57	3	23	0	6.9	79.7	80.0
24343	12	Z	250	67	123	27	2	76.7	60.3	97.6
24343	00	Z	250	67	123	25	1	57.0	83.0	100.7
38064	12	Z	50	45	66	18	3	164.7	67.6	178.0
56046	00	Z	50	34	100	23	2	170.9	-6.7	171.0
57245	00	Z	50	33	109	27	2	135.0	-20.0	136.5
61660	12	Z	1000	15	17	32	0	20.4	50.2	54.2
61660	00	Z	1000	15	17	32	0	17.3	46.6	49.7
76394	12	Z	200	26	-100	28	0	103.4	84.6	133.6

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 : JUN 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
61660	12	V	200	15	17	14	0	4.8	12.9	19.3
61660	00	V	200	15	17	16	0	3.9	11.9	17.0

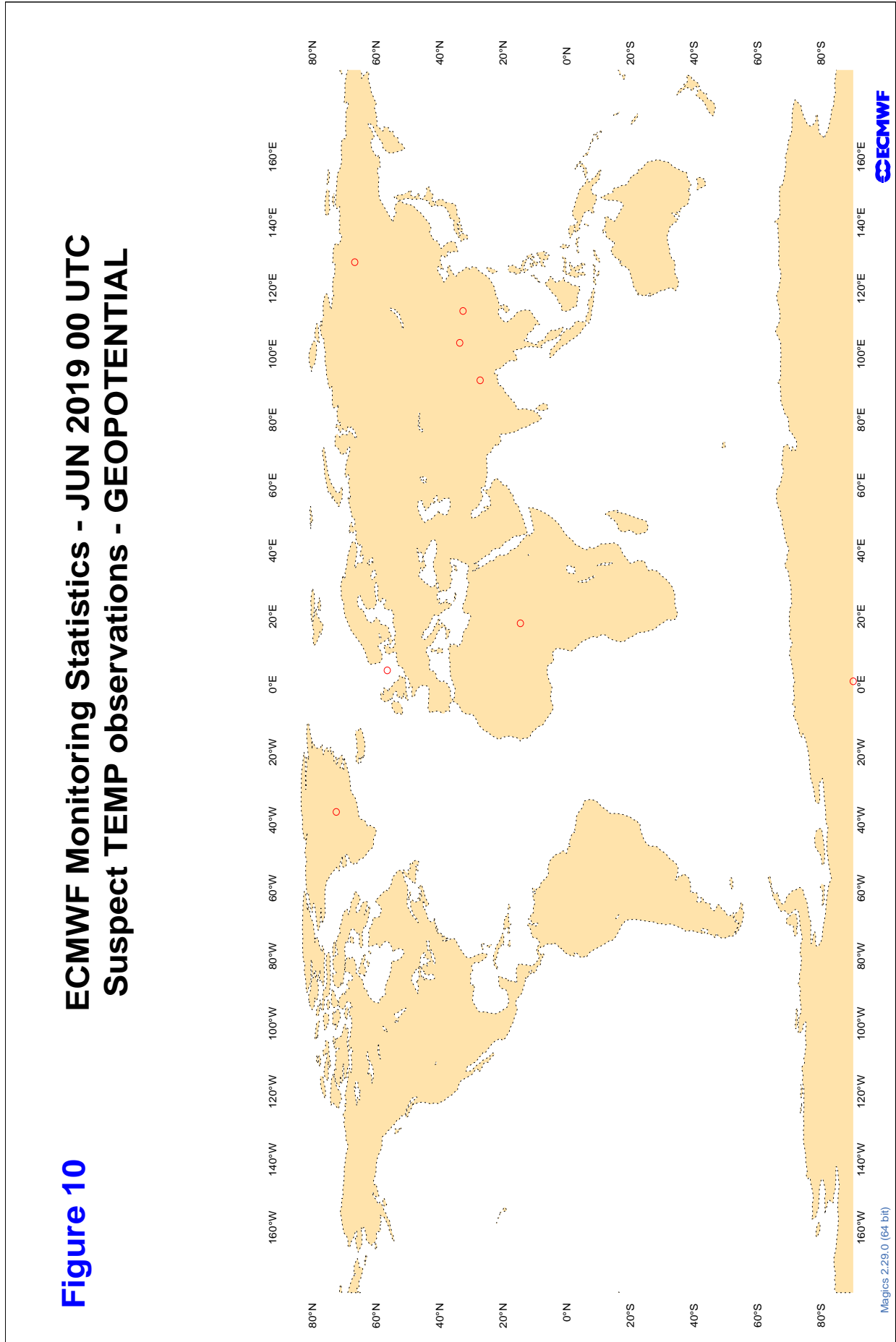
3.2.20 Table 9 - Suspect radiosondes: Wind direction (degrees)

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

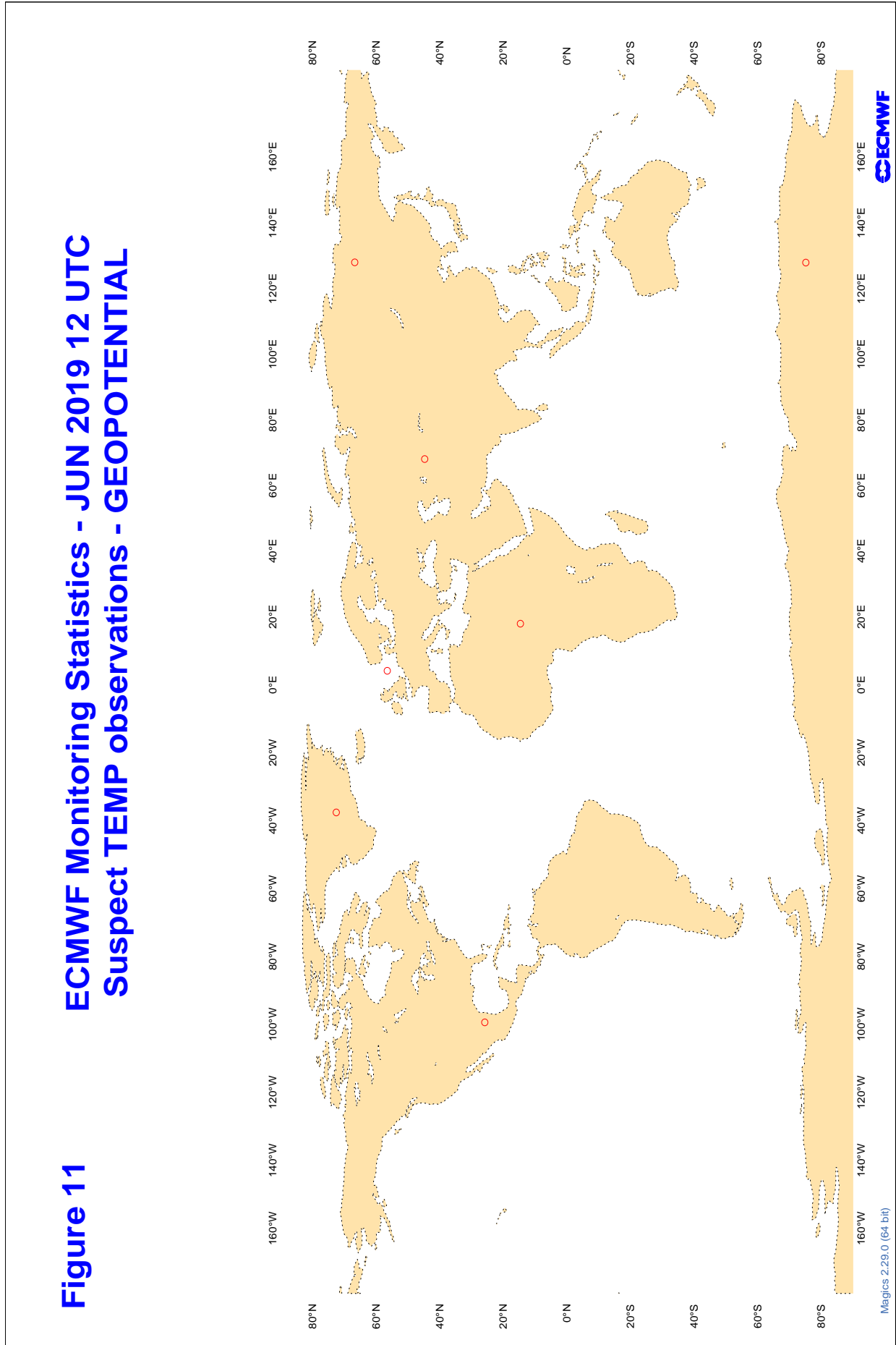
SELECTION CRITERIA: OBSERVED/FORECAST WIND SPEEDS \geq 5 M/S
 NO. OF OBSERVATIONS \geq 5, AND,
 ABSOLUTE BIAS \geq 10 DEGREES, WITH
 STANDARD DEVIATION $<$ 30 DEGREES, AND,
 VERTICAL SPREAD $<$ 10 DEGREES
 (AVERAGE BETWEEN 500 AND 150 HPA)

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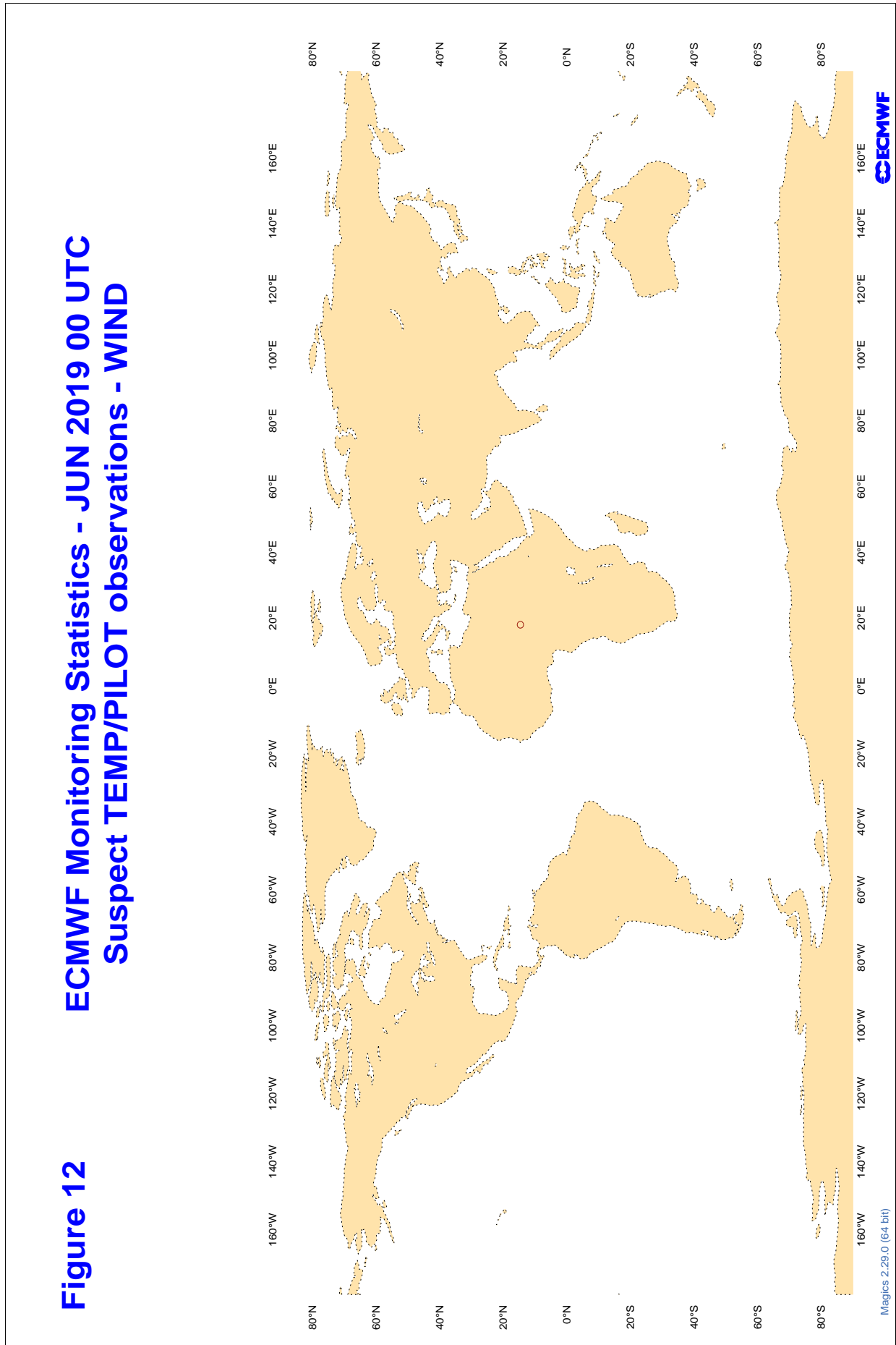
3.2.21 Figure 10 - Suspect TEMP observations - geopotential : 00 UTC



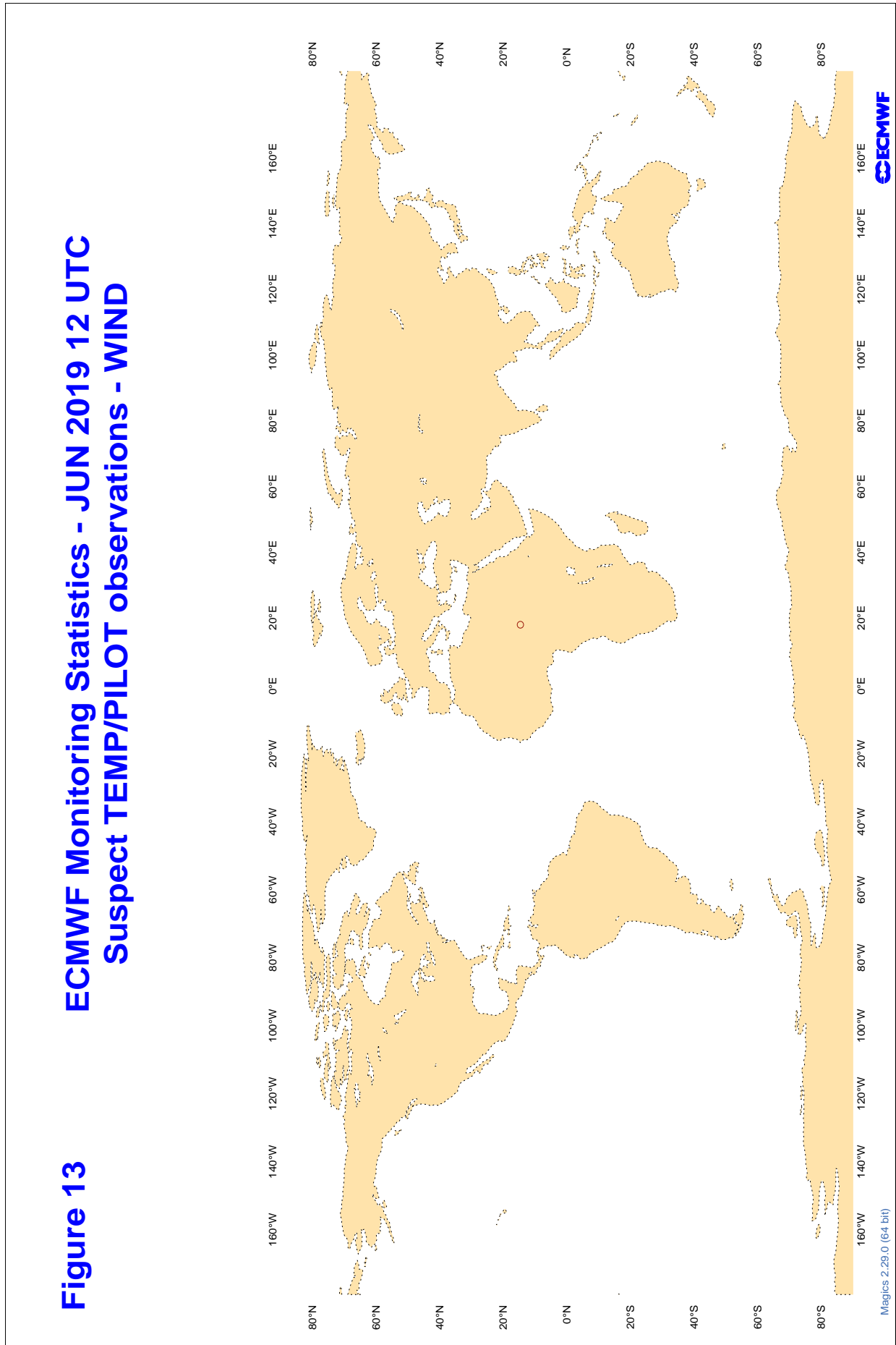
3.2.22 Figure 11 - Suspect TEMP observations - geopotential : 12 UTC



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 : JUN 2019
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
5QPW8X	12	Z	100	10	22.0	20.5
5QPW8X	00	Z	100	12	20.4	19.5
7JUNA4	00	Z	100	0	0.0	0.0
7JUNA4	12	Z	100	0	0.0	0.0
ASDE09	12	Z	100	3	19.2	18.7
DBLK	12	Z	100	21	10.1	6.5
FHM5UJ	12	Z	100	8	7.4	3.7
FHM5UJ	00	Z	100	7	4.9	4.2
HTXUH4	12	Z	100	9	7.8	1.2
HTXUH4	00	Z	100	14	6.7	1.2
JGQH	00	Z	100	4	10.6	9.5
JGQH	12	Z	100	4	4.5	-1.8
JNKN7J	00	Z	100	8	42.6	42.2
JNKN7J	12	Z	100	8	57.8	57.3
KMPLHP	00	Z	100	7	5.0	1.5
KMPLHP	12	Z	100	5	19.7	19.1
QCY3TG	12	Z	100	2	11.1	11.0
QCY3TG	00	Z	100	4	7.6	5.5
USSIO	00	Z	100	1	10.4	10.4
VKB4L5	00	Z	100	6	45.3	44.7
VKB4L5	12	Z	100	5	43.9	43.9
WDK38H	12	Z	100	0	0.0	0.0
XKQLWQ	12	Z	100	16	37.9	31.0
XQFJRG	00	Z	100	0	0.0	0.0
XQFJRG	12	Z	100	2	9.7	-8.0
YLV96W	12	Z	100	7	70.7	69.8
YLV96W	00	Z	100	7	52.9	52.3
ZVQEQC	00	Z	100	0	0.0	0.0
ZVQEQC	12	Z	100	13	29.6	29.0

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

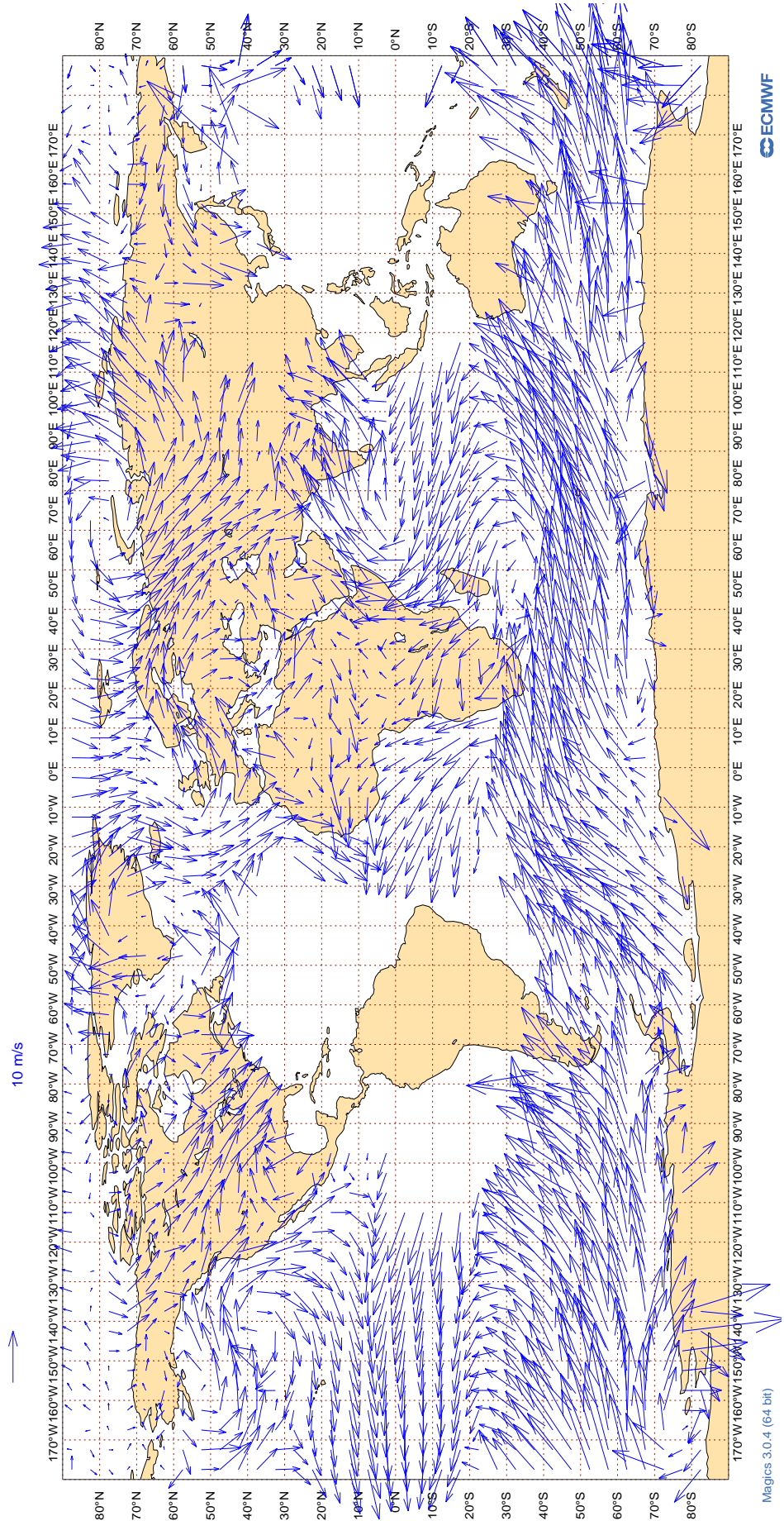
RADIOSONDE MONITORING STATISTICS (SHIPS)

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

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
5QPW8X	12	V	100	10	2.5	1.0	0.1
5QPW8X	00	V	100	12	2.5	-0.3	0.9
7JUNA4	00	V	100	0	0.0	0.0	0.0
7JUNA4	12	V	100	0	0.0	0.0	0.0
ASDE09	12	V	100	3	1.6	1.2	0.2
DBLK	12	V	100	21	3.9	0.6	-1.2
FHM5UJ	12	V	100	8	2.4	0.2	0.1
FHM5UJ	00	V	100	7	1.9	-0.5	-0.1
HTXUH4	12	V	100	7	2.9	0.9	0.6
HTXUH4	00	V	100	13	2.4	0.4	0.4
JGQH	00	V	100	4	2.3	-0.6	0.4
JGQH	12	V	100	4	4.9	0.8	-1.1
JNKN7J	00	V	100	8	3.1	0.1	0.0
JNKN7J	12	V	100	8	2.9	-0.2	0.8
KMPLHP	00	V	100	7	2.9	1.2	0.7
KMPLHP	12	V	100	5	3.5	-2.3	-0.2
QCY3TG	12	V	100	2	2.9	2.8	0.9
QCY3TG	00	V	100	4	3.5	0.7	3.2
USSIO	00	V	100	1	1.4	-1.3	-0.4
VKB4L5	00	V	100	6	2.1	0.9	-1.0
VKB4L5	12	V	100	5	2.1	-1.3	-1.4
WDK38H	12	V	100	0	0.0	0.0	0.0
XKQLWQ	12	V	100	16	2.6	0.6	-0.5
XQFJRG	00	V	100	0	0.0	0.0	0.0
XQFJRG	12	V	100	2	3.9	-0.8	-3.0
YLV96W	12	V	100	7	4.8	-0.8	-0.6
YLV96W	00	V	100	7	2.1	0.0	-0.4
ZVQEQC	00	V	100	0	0.0	0.0	0.0
ZVQEQC	12	V	100	13	3.6	-0.2	-1.0

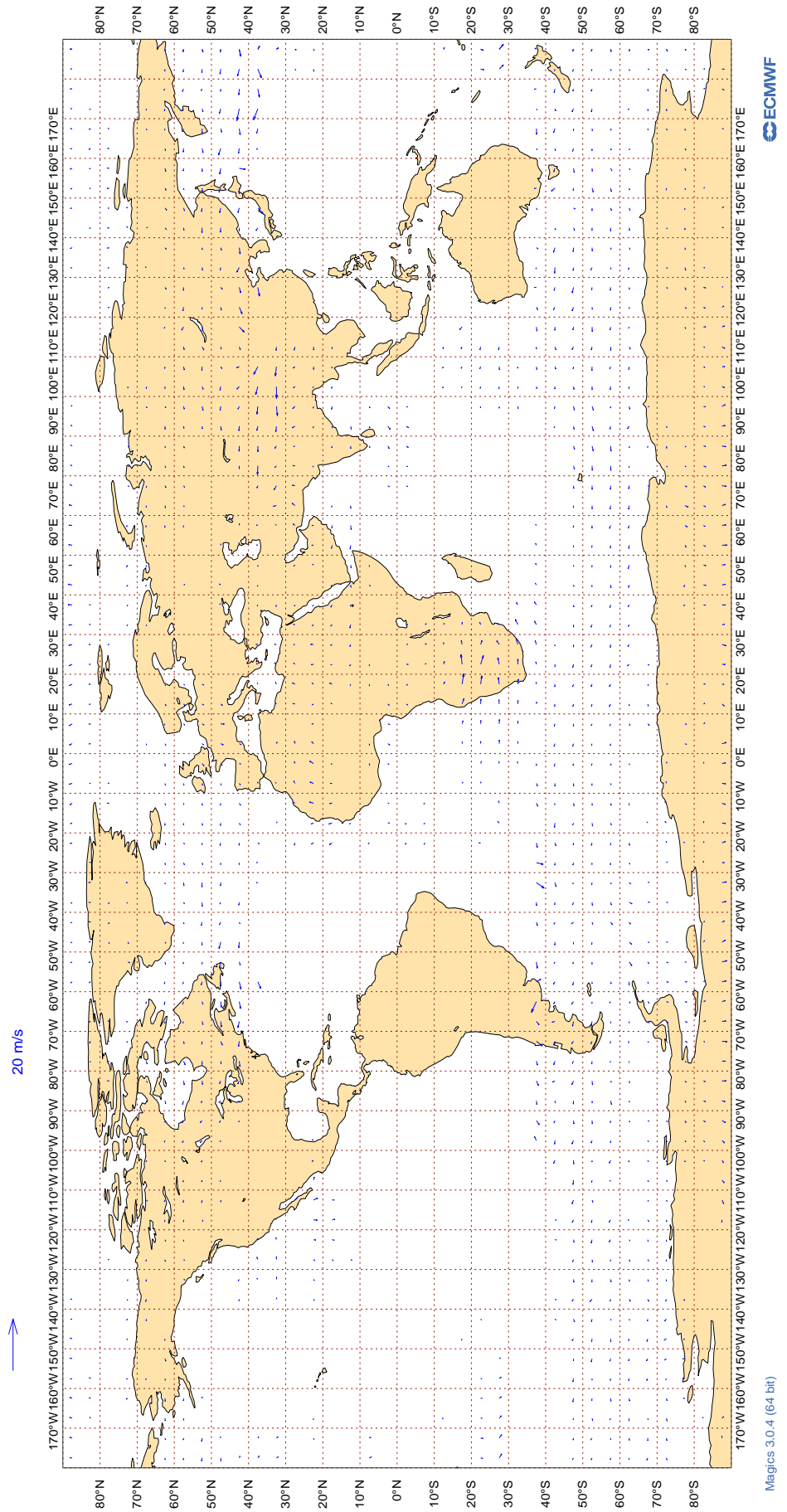
3.2.27 Figure 14 - SATOB Winds: 700-1000hPa

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



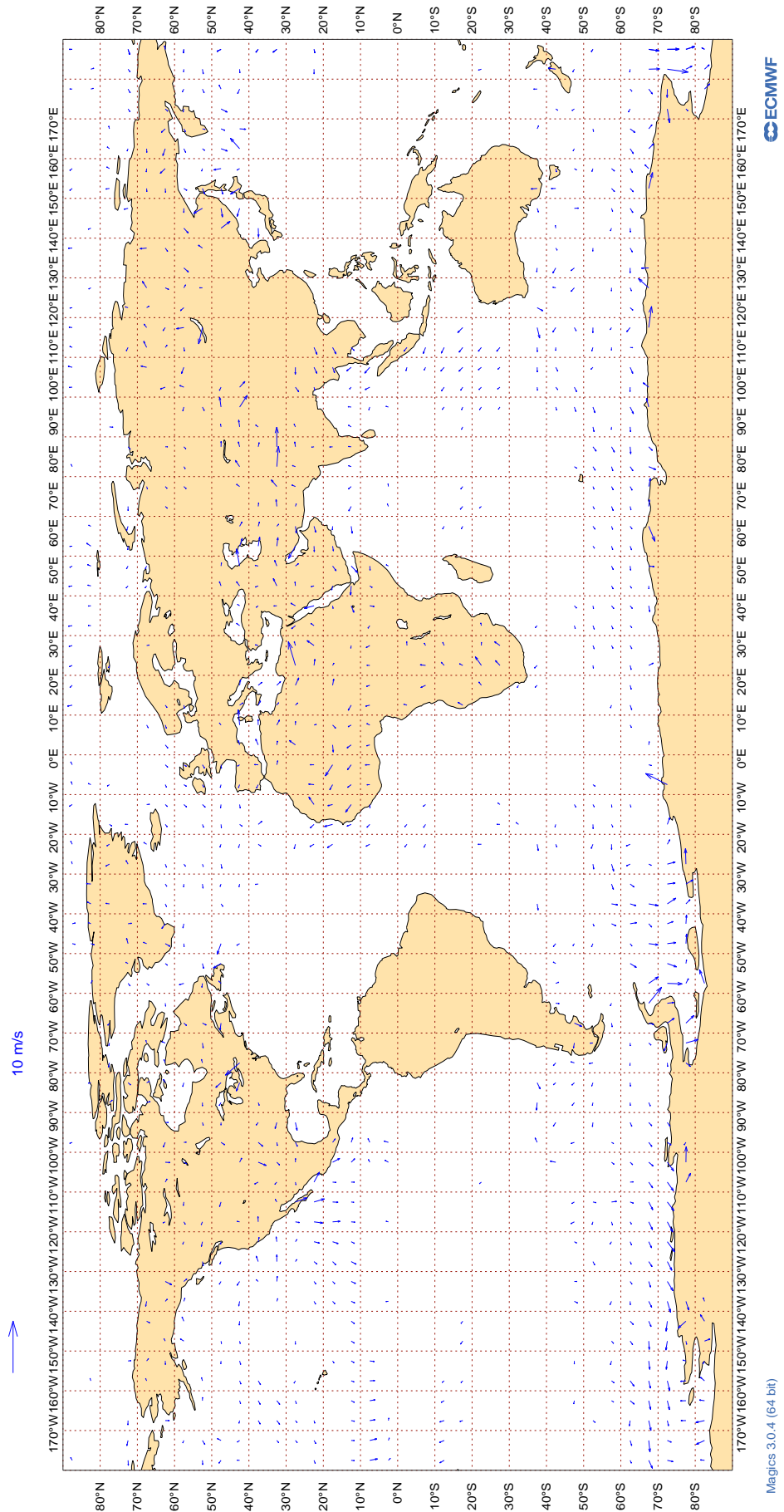
3.2.28 Figure 15 - SATOB Winds: 150- 400hPa

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



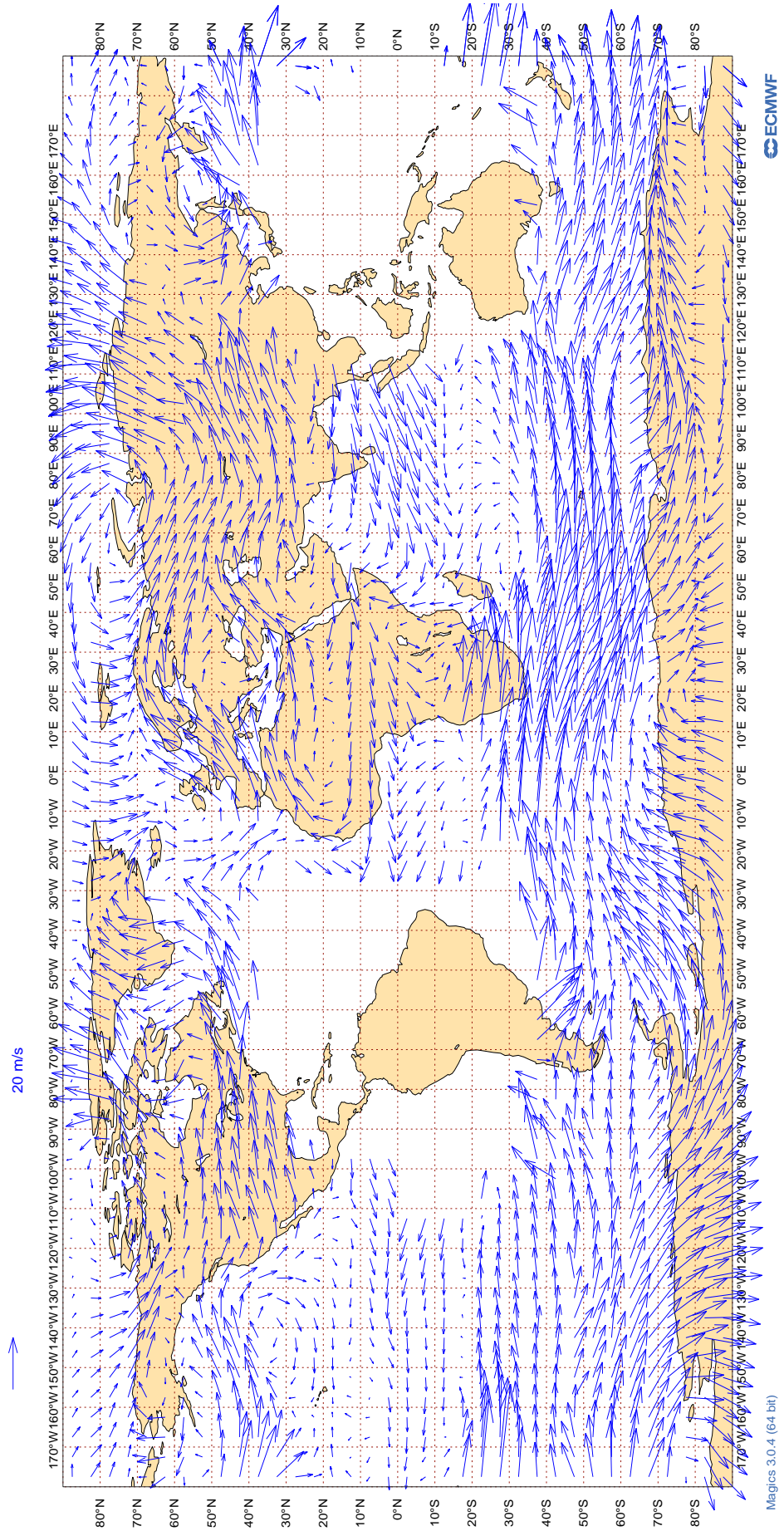
3.2.29 Figure 16 - SATOB Winds: 700-1000hPa

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



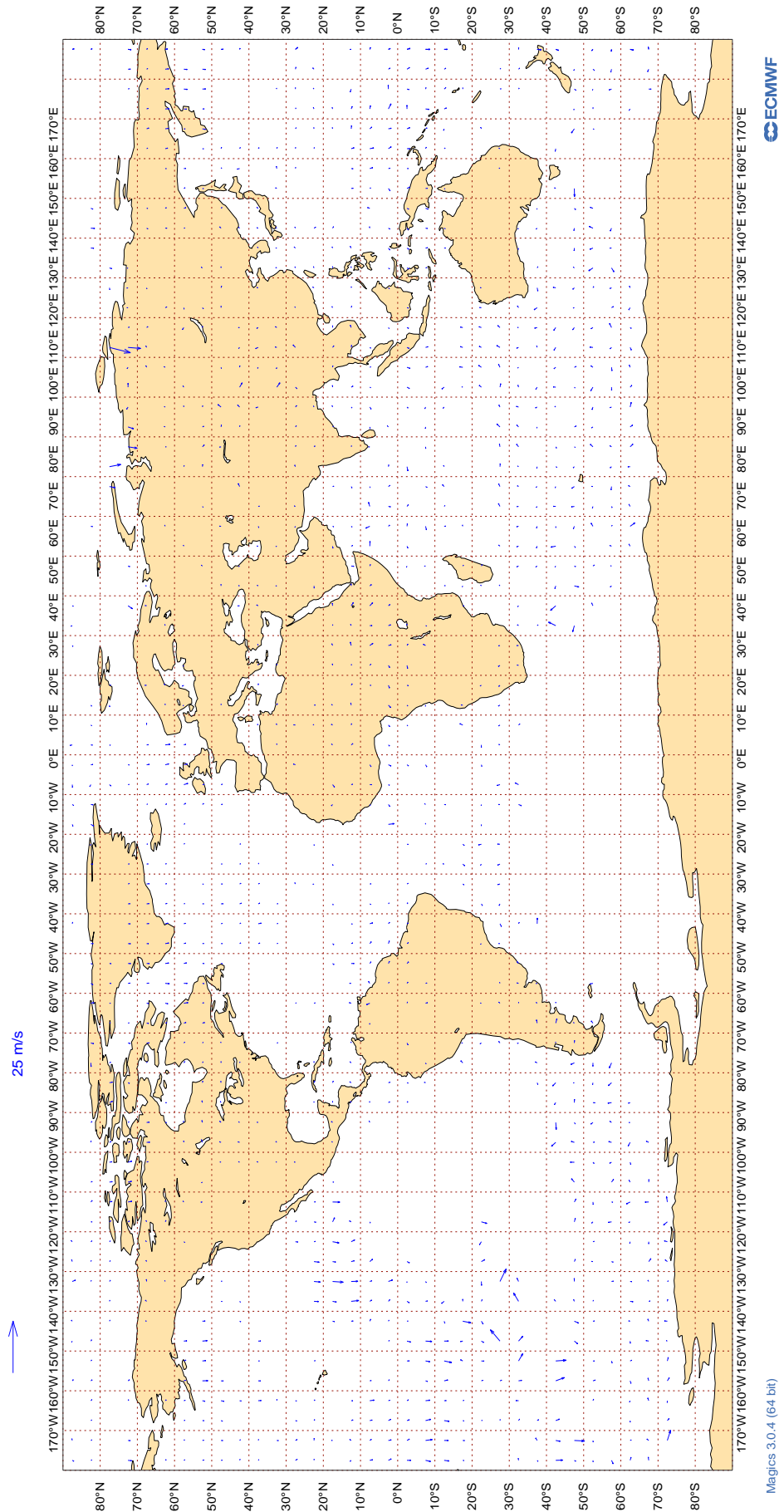
3.2.30 Figure 17 - SATOB Winds: 150- 400hPa

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



3.2.31 Figure 18 - AIRCRAFT Winds: 150- 300hPa

Figure 18
ECMWF Monitoring Statistics: Jun 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 : JUN 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	73	0	0	2.9	0.8
AAL	99	V	300-150	68489	3	0	5.8	0.2
AAR	99	V	300-150	265	0	0	3.3	-0.5
ABD	99	V	300-150	674	0	0	3.7	-0.1
ABP	99	V	300-150	37	0	0	3.1	0.1
ABW	99	V	300-150	684	0	0	2.9	-0.3
ACA	99	V	300-150	33514	3	0	6.5	0.2
ACI	99	V	300-150	3073	0	0	4.0	0.5
AEA	99	V	300-150	686	1	1	3.9	0.0
AFL	99	V	300-150	2200	0	0	3.2	0.5
AFR	99	V	300-150	31669	1	0	4.6	0.2
AHO	99	V	300-150	33	0	0	4.0	0.5
AHY	99	V	300-150	179	12	0	11.4	0.3
AIC	99	V	300-150	2530	0	0	5.1	0.3
AIZ	99	V	300-150	28	0	0	6.8	0.0
ALK	99	V	300-150	1021	0	0	4.7	0.6
AMX	99	V	300-150	3742	10	0	10.2	-0.0
ANZ	99	V	300-150	26460	3	0	5.1	0.5
AOJ	99	V	300-150	56	0	0	2.6	0.2
ASA	99	V	300-150	68	0	6	4.7	-0.2
ASL	99	V	300-150	694	0	0	2.9	0.3
ASP	99	V	300-150	49	14	0	21.0	-0.4

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
ASY	99	V	300-150	487	2	0	8.9	1.9
ATN	99	V	300-150	127	0	1	5.5	0.5
AUA	99	V	300-150	6066	0	0	3.6	-0.0
AUI	99	V	300-150	1236	0	0	2.8	0.3
AVA	99	V	300-150	768	5	0	9.7	0.1
AXB	99	V	300-150	28	0	0	4.1	0.1
AXM	99	V	300-150	174	1	2	5.0	0.3
AZA	99	V	300-150	10699	0	0	3.1	0.3
AZG	99	V	300-150	241	0	0	3.7	0.3
BAH	99	V	300-150	63	0	0	3.9	-0.4
BAW	99	V	300-150	58210	2	0	5.2	0.2
BBA	99	V	300-150	20	0	0	3.6	-0.6
BBC	99	V	300-150	311	0	0	6.6	0.6
BEL	99	V	300-150	2777	0	0	3.2	0.4
BMW	99	V	300-150	29	0	0	2.7	0.2
BOE	99	V	300-150	20	20	0	17.8	0.4
BOS	99	V	300-150	1370	0	0	3.3	0.3
BOX	99	V	300-150	2684	0	0	3.1	0.1
BOX	99	V	300-150	178	0	0	3.0	0.2
BPA	99	V	300-150	20	0	0	3.8	1.0
CAL	99	V	300-150	445	0	0	4.2	0.6
CAT	99	V	300-150	75	0	0	7.7	-0.4
CAZ	99	V	300-150	94	0	0	3.1	-0.2
CCA	99	V	300-150	879	8	0	5.5	0.3
CEB	99	V	300-150	51	0	4	3.8	1.0
CEF	99	V	300-150	22	0	0	3.3	0.2
CES	99	V	300-150	2033	0	0	4.3	0.4
CFC	99	V	300-150	440	0	0	4.1	0.6
CFG	99	V	300-150	5712	0	0	3.5	0.2
CHH	99	V	300-150	205	6	0	7.6	0.5
CJT	99	V	300-150	259	0	0	4.0	-0.0
CKK	99	V	300-150	24	4	0	3.7	-0.8
CKS	99	V	300-150	1591	0	0	3.1	0.1
CLU	99	V	300-150	894	0	0	3.4	0.0
CLX	99	V	300-150	3459	0	0	3.4	-0.2
CMB	99	V	300-150	1331	0	0	3.5	0.2
CNK	99	V	300-150	74	0	0	3.2	0.3
CNV	99	V	300-150	172	0	1	3.6	0.4
CPA	99	V	300-150	889	0	0	3.8	0.7
CRL	99	V	300-150	1776	0	0	3.2	0.2
CRV	99	V	300-150	37	0	0	3.8	0.2
CSC	99	V	300-150	219	0	0	3.8	0.8
CSN	99	V	300-150	881	8	0	7.5	0.6

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
CTM	99	V	300-150	52	0	0	3.3	-0.1
CWG	99	V	300-150	32	0	0	2.4	0.8
DAH	99	V	300-150	838	0	0	3.0	0.2
DAL	99	V	300-150	84530	0	0	3.2	0.2
DGX	99	V	300-150	21	0	0	3.1	-1.1
DHK	99	V	300-150	2053	0	0	4.3	-0.2
DJT	99	V	300-150	2594	0	0	3.7	0.2
DLH	99	V	300-150	36145	0	0	3.1	0.1
DSO	99	V	300-150	47	0	0	2.4	-0.1
DUB	99	V	300-150	33	0	0	3.9	0.9
EAU	99	V	300-150	21	0	0	4.8	1.1
EDG	99	V	300-150	330	2	0	7.8	0.2
EDW	99	V	300-150	2624	0	0	3.0	0.4
EGS	99	V	300-150	94	0	0	4.2	-0.7
EIN	99	V	300-150	16537	0	0	3.2	0.3
EJM	99	V	300-150	1498	0	0	5.0	0.0
ELY	99	V	300-150	3992	8	0	8.1	-0.0
ETD	99	V	300-150	6185	2	0	5.7	0.3
ETH	99	V	300-150	3516	2	0	4.9	0.3
EVA	99	V	300-150	55	0	0	3.8	0.6
EWG	99	V	300-150	4617	0	0	3.2	0.3
EXS	99	V	300-150	132	0	2	2.6	-0.3
FBU	99	V	300-150	635	0	0	4.3	0.4
FDX	99	V	300-150	6550	0	0	3.1	0.2
FEX	99	V	300-150	34	0	0	4.0	0.5
FIN	99	V	300-150	832	0	0	2.9	0.3
FJI	99	V	300-150	7218	0	0	4.3	0.4
FWI	99	V	300-150	1230	0	0	3.3	0.3
FYG	99	V	300-150	27	0	0	4.3	-0.6
GAJ	99	V	300-150	56	0	0	3.6	-0.5
GCK	99	V	300-150	43	0	0	3.7	0.2
GCT	99	V	300-150	39	0	0	2.7	-0.1
GEC	99	V	300-150	2255	0	0	3.0	0.3
GES	99	V	300-150	161	0	0	3.3	0.3
GFA	99	V	300-150	601	0	0	3.8	0.4
GIA	99	V	300-150	305	0	0	4.7	0.8
GLO	99	V	300-150	36	3	3	11.1	-1.1
GOL	99	V	300-150	124	0	0	3.9	-0.3
GRI	99	V	300-150	37	0	0	5.7	0.4
GTH	99	V	300-150	67	0	1	3.9	-0.2
GTI	99	V	300-150	3257	0	0	3.7	0.0
HAL	99	V	300-150	3803	0	0	4.2	0.7
HRT	99	V	300-150	197	5	1	7.6	0.5

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
HWA	99	V	300-150	56	0	0	3.3	0.0
IAM	99	V	300-150	43	0	0	2.9	0.1
IBE	99	V	300-150	4346	0	0	3.0	0.3
IBK	99	V	300-150	1044	0	0	3.0	0.1
ICE	99	V	300-150	981	0	1	3.8	0.5
ICL	99	V	300-150	814	0	0	4.4	-0.1
ICV	99	V	300-150	304	0	0	3.7	0.0
IFA	99	V	300-150	74	0	1	4.3	-0.6
IJM	99	V	300-150	78	0	1	4.9	2.3
ISS	99	V	300-150	3406	0	0	3.1	0.2
JAF	99	V	300-150	1145	7	0	10.0	0.0
JAS	99	V	300-150	360	0	0	3.5	0.6
JBU	99	V	300-150	28	0	54	3.7	-0.1
JCO	99	V	300-150	43	0	0	3.0	0.0
JEF	99	V	300-150	25	0	0	3.0	0.7
JET	99	V	300-150	94	0	0	3.2	-0.1
JJA	99	V	300-150	52	2	0	6.8	0.9
JME	99	V	300-150	79	0	0	4.4	0.3
JST	99	V	300-150	2608	7	0	8.4	0.4
JSX	99	V	300-150	38	0	0	2.6	-0.2
JTL	99	V	300-150	20	30	0	17.4	0.5
JTS	99	V	300-150	32	0	0	3.7	0.5
KAC	99	V	300-150	1475	0	0	3.2	0.3
KAI	99	V	300-150	69	0	0	3.8	0.2
KAL	99	V	300-150	1508	0	0	3.9	0.6
KAY	99	V	300-150	141	0	0	2.7	0.3
KCE	99	V	300-150	31	0	0	3.2	0.2
KIW	99	V	300-150	94	0	0	4.1	1.2
KLM	99	V	300-150	18885	2	0	5.6	0.2
KQA	99	V	300-150	264	4	0	9.2	0.4
KTK	99	V	300-150	96	0	0	2.9	0.2
LAN	99	V	300-150	2368	12	0	7.3	0.2
LCO	99	V	300-150	41	0	0	3.4	-0.1
LDX	99	V	300-150	39	0	0	3.8	0.7
LGT	99	V	300-150	40	0	0	4.6	-0.1
LHO	99	V	300-150	40	0	0	3.7	0.8
LMJ	99	V	300-150	35	0	0	2.8	0.2
LNI	99	V	300-150	33	0	0	3.5	0.2
LNK	99	V	300-150	36	0	0	2.8	-0.2
LOT	99	V	300-150	5574	8	0	9.8	0.2
LUC	99	V	300-150	30	0	0	2.9	-0.7
LXJ	99	V	300-150	351	6	0	9.3	0.2
MAS	99	V	300-150	543	0	0	4.0	0.8

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
MAU	99	V	300-150	271	0	0	5.9	1.1
MED	99	V	300-150	101	0	0	3.7	-0.0
MHV	99	V	300-150	74	0	1	3.6	0.1
MJF	99	V	300-150	20	0	0	4.0	0.7
MMD	99	V	300-150	291	0	0	3.2	-0.1
MOO	99	V	300-150	79	0	0	5.0	1.0
MPH	99	V	300-150	677	0	0	3.5	-0.4
MSR	99	V	300-150	1984	2	0	4.9	0.2
NAS	99	V	300-150	361	0	0	4.3	-0.1
NAX	99	V	300-150	14326	10	0	10.7	0.1
NCA	99	V	300-150	170	0	0	3.2	-0.7
NJE	99	V	300-150	228	0	0	3.0	0.1
NOJ	99	V	300-150	33	0	0	2.8	-0.3
NOS	99	V	300-150	222	5	0	7.9	0.4
NRS	99	V	300-150	9277	6	0	8.7	0.2
NSH	99	V	300-150	26	0	0	4.5	-0.1
NWS	99	V	300-150	156	0	0	2.6	0.2
OAE	99	V	300-150	999	0	0	3.7	0.3
OLI	99	V	300-150	44	0	0	2.4	0.4
OMA	99	V	300-150	485	0	0	5.2	0.4
OPM	99	V	300-150	20	0	0	2.4	0.6
PAC	99	V	300-150	211	0	1	4.2	0.4
PAL	99	V	300-150	947	0	0	3.8	0.7
PAO	99	V	300-150	41	0	46	8.4	0.4
PAT	99	V	300-150	71	0	0	4.0	-0.2
PIA	99	V	300-150	187	0	0	2.7	0.2
PLF	99	V	300-150	70	0	0	3.5	-0.1
PLM	99	V	300-150	29	0	0	6.0	-0.8
QAF	99	V	300-150	41	0	0	2.5	0.3
QFA	99	V	300-150	19400	2	0	6.0	0.2
QQE	99	V	300-150	119	0	1	3.0	0.2
QTR	99	V	300-150	16251	0	0	3.9	0.3
RAM	99	V	300-150	754	6	0	7.8	0.6
RBA	99	V	300-150	69	0	0	8.2	0.9
RCH	99	V	300-150	5624	0	0	4.3	0.5
RDN	99	V	300-150	199	0	0	2.7	-0.0
REN	99	V	300-150	36	0	0	3.0	0.2
RJA	99	V	300-150	2093	9	0	11.2	-0.0
ROJ	99	V	300-150	61	0	0	3.8	0.0
ROM	99	V	300-150	120	0	0	3.9	-0.3
ROU	99	V	300-150	11388	0	0	3.8	0.2
RRR	99	V	300-150	249	0	0	3.3	0.5
RZO	99	V	300-150	379	0	2	4.5	0.3

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
SAM	99	V	300-150	341	0	0	3.1	0.3
SAS	99	V	300-150	5053	0	0	3.0	0.3
SAZ	99	V	300-150	49	0	0	4.0	0.2
SCX	99	V	300-150	429	0	0	4.1	0.5
SHE	99	V	300-150	196	0	0	3.8	0.5
SIA	99	V	300-150	4104	0	0	3.7	0.2
SIO	99	V	300-150	31	0	0	3.3	1.1
SIS	99	V	300-150	37	0	0	3.0	0.1
SLM	99	V	300-150	70	0	0	3.1	-0.6
SOO	99	V	300-150	439	0	0	3.1	0.3
SPA	99	V	300-150	215	0	0	3.2	-0.0
SPU	99	V	300-150	25	0	0	2.5	0.6
SVA	99	V	300-150	4728	0	0	4.0	0.4
SVW	99	V	300-150	151	0	0	4.5	0.2
SWA	99	V	300-150	67	0	6	4.7	0.2
SWR	99	V	300-150	11287	0	1	3.1	0.3
SXN	99	V	300-150	38	0	0	2.7	-1.2
TAM	99	V	300-150	22	0	0	7.5	0.4
TAP	99	V	300-150	2021	0	1	3.4	0.2
TAR	99	V	300-150	484	0	0	2.7	0.4
TAY	99	V	300-150	409	0	0	3.7	-0.2
TCX	99	V	300-150	6804	0	0	3.1	0.3
TFF	99	V	300-150	22	0	0	4.0	0.0
TFL	99	V	300-150	1430	7	0	9.5	0.1
TGW	99	V	300-150	87	0	1	8.5	0.8
THA	99	V	300-150	576	10	0	6.1	0.3
THT	99	V	300-150	3421	2	0	7.0	0.5
THY	99	V	300-150	10119	0	0	3.3	0.3
TIH	99	V	300-150	20	0	0	4.0	0.7
TMN	99	V	300-150	232	0	0	4.0	1.0
TOM	99	V	300-150	6326	8	0	9.8	0.1
TOW	99	V	300-150	63	0	0	3.3	0.2
TPA	99	V	300-150	304	0	0	3.5	0.3
TRE	99	V	300-150	73	0	0	4.3	1.1
TSC	99	V	300-150	18014	0	0	3.1	0.2
TSR	99	V	300-150	40	0	0	4.3	-0.8
TWY	99	V	300-150	896	0	0	3.5	0.2
UAE	99	V	300-150	16536	0	0	3.6	0.2
UAL	99	V	300-150	87089	2	1	6.0	0.2
ULC	99	V	300-150	66	0	0	3.4	0.2
UPS	99	V	300-150	4936	0	0	3.7	0.2
UZB	99	V	300-150	133	11	0	13.4	0.3
VCG	99	V	300-150	32	0	0	1.8	0.8

AIREP MONITORING STATISTICS FOR AIRLINE CARRIERS
(CONTINUED)

IDENT	OBS TIME	ELM	LEVEL	NUM OBS	% GROSS	% CALM	VECTOR RMS	SPEE D BIAS
VCN	99	V	300-150	49	0	0	3.3	0.1
VIR	99	V	300-150	25015	2	0	5.8	0.2
VJT	99	V	300-150	1441	0	0	3.2	0.5
VKG	99	V	300-150	24	0	0	3.0	-0.7
VMP	99	V	300-150	47	0	0	3.1	0.2
VOZ	99	V	300-150	6330	0	0	4.2	0.4
VXS	99	V	300-150	23	0	0	4.3	1.3
WDW	99	V	300-150	39	0	0	4.2	0.1
WDY	99	V	300-150	24	0	0	3.2	0.1
WGT	99	V	300-150	92	0	0	3.3	0.5
WJA	99	V	300-150	5995	1	0	5.1	0.1
WWI	99	V	300-150	25	0	0	2.6	-0.5
XAX	99	V	300-150	55	0	0	4.4	0.4
XLF	99	V	300-150	1690	0	0	3.2	0.3
XRO	99	V	300-150	38	0	0	3.7	0.8

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 : JUN 2019
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	50	30	6.6	4.5
01001	00	Z	50	30	8.2	7.0
01028	00	Z	50	29	8.7	8.0
01028	12	Z	50	30	6.0	2.2
01400	00	Z	50	22	94.7	94.1
01400	12	Z	50	22	88.6	88.3
01415	00	Z	50	27	17.0	15.6
01415	12	Z	50	28	12.7	10.7
02365	00	Z	50	21	13.7	12.8
02365	12	Z	50	27	7.0	3.3
02591	12	Z	50	30	11.9	10.2
02591	00	Z	50	28	22.4	22.0
02836	00	Z	50	30	21.2	14.1
02836	12	Z	50	30	16.0	6.9
02963	00	Z	50	30	15.9	15.5
02963	12	Z	50	30	8.8	6.7
03005	00	Z	50	28	13.8	11.0
03005	12	Z	50	30	33.4	14.4
03238	00	Z	50	29	18.9	18.4
03238	12	Z	50	2	8.2	7.9
03808	00	Z	50	30	18.5	16.9
03808	12	Z	50	28	14.1	12.5
03918	12	Z	50	3	16.9	13.0
03918	00	Z	50	14	23.3	22.8
03953	00	Z	50	29	18.6	15.1
03953	12	Z	50	30	39.1	35.0
04018	00	Z	50	28	10.5	9.5
04018	12	Z	50	28	5.8	3.6
04220	00	Z	50	30	9.9	9.0
04220	12	Z	50	30	7.9	6.0
04270	00	Z	50	30	11.3	7.7
04270	12	Z	50	29	9.4	7.3
04320	00	Z	50	30	9.1	7.3
04320	12	Z	50	30	10.4	6.8
04339	12	Z	50	30	15.9	10.5
04339	00	Z	50	30	14.7	7.2
04360	00	Z	50	27	15.8	-2.4
04360	12	Z	50	27	10.7	-0.6
06011	12	Z	50	29	20.6	19.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	50	28	19.5	7.0
06260	00	Z	50	29	17.7	16.9
06260	12	Z	50	5	11.5	10.6
06610	00	Z	50	30	22.0	20.6
06610	12	Z	50	30	11.6	8.5
07110	00	Z	50	30	20.6	15.6
07110	12	Z	50	30	14.5	10.7
07510	12	Z	50	29	31.8	29.0
07510	00	Z	50	30	30.2	28.3
07645	00	Z	50	29	25.5	24.4
07645	12	Z	50	30	17.3	14.6
07761	12	Z	50	28	22.4	21.1
07761	00	Z	50	25	33.5	32.1
08001	00	Z	50	24	24.3	23.7
08001	12	Z	50	28	15.7	13.2
08221	12	Z	50	30	14.8	13.4
08221	00	Z	50	29	24.3	23.1
08302	00	Z	50	29	17.6	17.0
08302	12	Z	50	30	6.3	4.5
08508	12	Z	50	28	17.0	15.4
08522	12	Z	50	29	19.4	17.9
08579	12	Z	50	30	18.4	17.7
10035	12	Z	50	30	12.4	11.0
10393	00	Z	50	29	20.1	19.2
10393	12	Z	50	30	7.9	5.7
10410	00	Z	50	30	17.0	15.4
10410	12	Z	50	30	8.1	6.4
10739	12	Z	50	30	21.9	12.9
10739	00	Z	50	29	20.2	18.4
11035	00	Z	50	30	30.4	29.6
11035	12	Z	50	30	34.7	32.5
12982	12	Z	50	29	25.2	23.9
12982	00	Z	50	28	28.5	27.2
16080	00	Z	50	30	17.4	15.6
16080	12	Z	50	30	8.8	4.4
16245	12	Z	50	29	7.3	3.8
16245	00	Z	50	30	25.7	22.3
16320	00	Z	50	29	28.4	27.3
16320	12	Z	50	29	14.4	12.5
16429	00	Z	50	30	25.2	24.5
16429	12	Z	50	30	14.2	11.9
16622	00	Z	50	27	26.8	26.1
16754	00	Z	50	25	32.3	31.7

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	50	26	16.8	12.8
26435	12	Z	50	15	8.1	6.1
5QPW8X	12	Z	50	10	33.5	31.2
5QPW8X	00	Z	50	10	28.5	28.2
60018	00	Z	50	28	25.7	25.2
60018	12	Z	50	29	13.4	12.2
7JUNA4	00	Z	50	0	0.0	0.0
7JUNA4	12	Z	50	0	0.0	0.0
ASDE09	12	Z	50	1	30.1	30.1
FHM5UJ	12	Z	50	6	12.5	10.6
FHM5UJ	00	Z	50	5	15.7	15.5
HTXUH4	12	Z	50	6	12.7	10.2
HTXUH4	00	Z	50	10	8.9	5.8
JNKN7J	00	Z	50	6	91.5	75.5
JNKN7J	12	Z	50	9	76.2	75.3
KMPLHP	00	Z	50	6	14.0	11.1
KMPLHP	12	Z	50	5	35.0	34.7
QCY3TG	12	Z	50	2	26.2	25.8
QCY3TG	00	Z	50	4	17.5	16.3
VKB4L5	00	Z	50	6	56.9	56.6
VKB4L5	12	Z	50	5	50.2	50.1
WDK38H	12	Z	50	0	0.0	0.0
XKQLWQ	12	Z	50	16	48.6	42.9
XQFJRG	00	Z	50	0	0.0	0.0
XQFJRG	12	Z	50	2	13.0	10.8
YLV96W	12	Z	50	6	89.8	88.2
YLV96W	00	Z	50	6	63.9	63.7
ZVQEQC	00	Z	50	0	0.0	0.0
ZVQEQC	12	Z	50	13	31.9	31.4

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 : JUN 2019
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	50	30	2.3	0.3	0.1
01001	00	V	50	24	2.9	0.0	0.3
01028	00	V	50	23	2.4	0.0	0.2
01028	12	V	50	30	2.3	0.4	0.1
01400	00	V	50	16	2.5	0.4	0.4
01400	12	V	50	21	2.6	-0.2	-0.6
01415	00	V	50	22	2.5	-0.1	0.1
01415	12	V	50	28	2.9	0.1	-0.6
02365	00	V	50	14	2.5	0.6	0.5
02365	12	V	50	25	2.5	-0.3	0.0
02591	12	V	50	29	3.0	-0.7	-0.2
02591	00	V	50	23	2.8	-0.8	0.4
02836	00	V	50	27	3.3	0.2	0.2
02836	12	V	50	30	3.4	0.3	0.6
02963	00	V	50	25	3.3	0.2	1.0
02963	12	V	50	30	2.5	-0.4	0.2
03005	00	V	50	24	3.0	-0.5	0.9
03005	12	V	50	30	3.0	0.1	0.2
03238	00	V	50	24	2.5	0.0	-0.4
03238	12	V	50	2	1.2	-0.7	0.6
03808	00	V	50	25	3.1	0.1	-0.3
03808	12	V	50	28	2.9	0.1	-0.4
03918	12	V	50	3	2.1	1.0	0.5
03918	00	V	50	11	3.5	0.9	0.2
03953	00	V	50	23	2.9	0.2	-0.1
03953	12	V	50	30	2.8	0.1	0.3
04018	00	V	50	24	2.8	0.2	-0.1
04018	12	V	50	27	2.5	0.5	-0.4
04220	00	V	50	25	2.6	0.6	0.7
04220	12	V	50	30	2.8	0.6	0.5
04270	00	V	50	23	2.7	-0.6	-0.3
04270	12	V	50	29	2.6	-0.3	0.3
04320	00	V	50	22	2.5	-0.1	-0.4
04320	12	V	50	30	2.4	-0.2	-0.3
04339	12	V	50	30	2.5	-0.2	-0.8
04339	00	V	50	25	2.8	-0.4	0.1
04360	00	V	50	22	2.7	0.1	1.4
04360	12	V	50	27	2.8	0.5	1.0
06011	12	V	50	29	2.9	0.1	-0.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	50	23	2.5	-0.2	0.8
06260	00	V	50	21	2.8	0.2	-0.3
06260	12	V	50	5	3.4	-0.3	0.8
06610	00	V	50	26	3.0	0.4	-0.5
06610	12	V	50	30	3.4	0.4	-1.0
07110	00	V	50	23	3.0	0.5	-0.5
07110	12	V	50	30	3.0	0.3	-0.4
07510	12	V	50	29	2.6	0.3	-0.2
07510	00	V	50	23	3.3	0.6	0.4
07645	00	V	50	23	3.0	0.0	0.1
07645	12	V	50	30	2.6	0.1	-0.8
07761	12	V	50	28	2.8	0.8	-0.4
07761	00	V	50	21	3.1	-0.4	0.1
08001	00	V	50	19	3.3	0.5	0.1
08001	12	V	50	26	2.4	0.7	0.1
08221	12	V	50	29	3.3	0.9	0.1
08221	00	V	50	23	3.2	0.3	0.1
08302	00	V	50	24	3.0	0.2	0.0
08302	12	V	50	30	3.6	0.1	-0.9
08508	12	V	50	28	3.1	0.5	0.6
08522	12	V	50	29	3.4	0.9	0.5
08579	12	V	50	30	3.1	0.9	-0.5
10035	12	V	50	29	2.8	0.3	-0.1
10393	00	V	50	25	3.4	0.4	-0.3
10393	12	V	50	30	3.1	-0.1	0.1
10410	00	V	50	30	2.9	0.1	-0.1
10410	12	V	50	30	2.7	-0.2	-0.2
10739	12	V	50	30	2.6	0.4	-0.1
10739	00	V	50	28	3.1	1.0	-0.2
11035	00	V	50	25	3.5	0.7	0.1
11035	12	V	50	30	2.9	0.1	0.1
12982	12	V	50	29	3.5	0.6	-0.5
12982	00	V	50	25	3.3	-0.4	0.6
16080	00	V	50	26	3.7	0.0	-0.1
16080	12	V	50	30	3.5	0.8	-0.3
16245	12	V	50	29	3.5	0.3	0.1
16245	00	V	50	24	3.3	0.5	0.1
16320	00	V	50	24	3.6	0.3	-0.1
16320	12	V	50	29	3.8	0.1	-0.3
16429	00	V	50	24	3.1	-0.4	0.1
16429	12	V	50	30	3.2	0.5	0.2
16622	00	V	50	23	3.9	0.2	1.6
16754	00	V	50	16	3.7	0.4	-0.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	50	6	6.3	-0.6	-0.8
26435	12	V	50	14	3.1	0.0	0.1
5QPW8X	12	V	50	10	3.4	0.1	0.0
5QPW8X	00	V	50	9	2.9	0.3	-1.1
60018	00	V	50	26	3.4	0.2	0.3
60018	12	V	50	29	3.0	0.1	0.2
7JUNA4	00	V	50	0	0.0	0.0	0.0
7JUNA4	12	V	50	0	0.0	0.0	0.0
ASDE09	12	V	50	1	2.8	-2.4	-1.4
FHM5UJ	12	V	50	6	2.0	-0.1	-0.2
FHM5UJ	00	V	50	5	2.1	-0.1	-0.2
HTXUH4	12	V	50	6	4.5	1.4	-2.5
HTXUH4	00	V	50	9	2.1	-0.7	0.1
JNKN7J	00	V	50	6	3.0	0.6	-1.0
JNKN7J	12	V	50	9	3.1	1.0	0.4
KMPLHP	00	V	50	6	2.4	0.8	-0.9
KMPLHP	12	V	50	5	2.5	1.7	0.3
QCY3TG	12	V	50	2	0.8	-0.3	0.5
QCY3TG	00	V	50	4	1.0	0.1	0.0
VKB4L5	00	V	50	6	3.6	-1.1	-0.8
VKB4L5	12	V	50	5	2.9	1.3	0.9
WDK38H	12	V	50	0	0.0	0.0	0.0
XKQLWQ	12	V	50	14	3.2	1.0	-0.5
XQFJRG	00	V	50	0	0.0	0.0	0.0
XQFJRG	12	V	50	2	5.5	0.8	5.2
YLV96W	12	V	50	6	3.3	1.6	-0.8
YLV96W	00	V	50	6	2.1	0.4	0.4
ZVQEQC	00	V	50	0	0.0	0.0	0.0
ZVQEQC	12	V	50	13	5.3	-0.6	1.1

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 : JUN 2019
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	100	30	5.3	-3.5
01001	00	Z	100	30	4.4	-0.5
01028	00	Z	100	29	3.6	0.4
01028	12	Z	100	30	7.4	-4.3
01400	00	Z	100	23	85.0	84.6
01400	12	Z	100	22	79.8	79.5
01415	00	Z	100	27	8.6	6.0
01415	12	Z	100	28	6.3	3.3
02365	00	Z	100	23	3.3	0.6
02365	12	Z	100	27	5.4	-1.7
02591	12	Z	100	30	6.1	3.6
02591	00	Z	100	29	14.4	14.0
02836	00	Z	100	30	11.1	3.7
02836	12	Z	100	30	10.7	-0.5
02963	00	Z	100	30	6.5	5.2
02963	12	Z	100	30	4.3	-1.1
03005	00	Z	100	30	5.3	1.6
03005	12	Z	100	31	30.4	5.0
03238	00	Z	100	29	8.4	6.8
03238	12	Z	100	2	1.0	0.5
03808	00	Z	100	30	8.2	6.2
03808	12	Z	100	30	6.5	3.8
03918	12	Z	100	4	10.6	5.4
03918	00	Z	100	19	10.7	9.8
03953	00	Z	100	29	9.3	2.9
03953	12	Z	100	30	20.6	16.1
04018	00	Z	100	30	4.4	-1.0
04018	12	Z	100	28	4.6	-2.9
04220	00	Z	100	30	3.9	2.2
04220	12	Z	100	30	5.1	0.3
04270	00	Z	100	30	6.1	-1.2
04270	12	Z	100	29	4.3	0.4
04320	00	Z	100	30	4.6	-1.7
04320	12	Z	100	30	5.4	-0.3
04339	12	Z	100	30	11.8	2.5
04339	00	Z	100	30	13.2	-1.8
04360	00	Z	100	27	15.4	-10.4
04360	12	Z	100	27	11.0	-8.8
06011	12	Z	100	29	11.5	10.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	100	29	15.7	0.5
06260	00	Z	100	29	7.9	6.7
06260	12	Z	100	5	2.6	0.8
06610	00	Z	100	30	12.3	8.3
06610	12	Z	100	31	6.8	3.1
07110	00	Z	100	30	10.3	2.2
07110	12	Z	100	30	6.4	0.1
07510	12	Z	100	29	18.0	15.6
07510	00	Z	100	30	15.6	13.9
07645	00	Z	100	30	10.8	8.2
07645	12	Z	100	30	8.0	4.7
07761	12	Z	100	28	12.5	11.0
07761	00	Z	100	25	19.0	17.5
08001	00	Z	100	27	9.7	8.5
08001	12	Z	100	29	7.6	4.8
08221	12	Z	100	30	7.2	4.7
08221	00	Z	100	30	12.5	11.4
08302	00	Z	100	29	7.0	5.5
08302	12	Z	100	30	4.7	-3.7
08508	12	Z	100	29	11.2	9.6
08522	12	Z	100	30	11.0	9.4
08579	12	Z	100	30	12.2	11.5
10035	12	Z	100	30	5.4	3.7
10393	00	Z	100	29	10.0	8.9
10393	12	Z	100	31	4.1	-1.1
10410	00	Z	100	30	7.6	5.5
10410	12	Z	100	30	3.3	-1.3
10739	12	Z	100	31	18.0	6.3
10739	00	Z	100	29	11.4	9.5
11035	00	Z	100	30	20.0	18.8
11035	12	Z	100	31	22.5	20.1
12982	12	Z	100	30	13.0	10.7
12982	00	Z	100	29	15.9	14.7
16080	00	Z	100	30	8.4	4.3
16080	12	Z	100	30	5.3	-1.6
16245	12	Z	100	30	5.2	-3.0
16245	00	Z	100	30	16.2	11.1
16320	00	Z	100	29	18.3	16.9
16320	12	Z	100	30	8.5	4.0
16429	00	Z	100	30	11.7	10.4
16429	12	Z	100	30	8.2	4.3
16622	00	Z	100	29	17.5	16.8
16754	00	Z	100	29	18.6	17.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	100	27	24.6	5.7
26435	12	Z	100	15	5.3	-2.7
5QPW8X	12	Z	100	10	22.0	20.5
5QPW8X	00	Z	100	12	20.4	19.5
60018	00	Z	100	30	15.5	15.0
60018	12	Z	100	29	10.2	9.3
7JUNA4	00	Z	100	0	0.0	0.0
7JUNA4	12	Z	100	0	0.0	0.0
ASDE09	12	Z	100	3	19.2	18.7
FHM5UJ	12	Z	100	8	7.4	3.7
FHM5UJ	00	Z	100	7	4.9	4.2
HTXUH4	12	Z	100	9	7.8	1.2
HTXUH4	00	Z	100	14	6.7	1.2
JNKN7J	00	Z	100	8	42.6	42.2
JNKN7J	12	Z	100	8	57.8	57.3
KMPLHP	00	Z	100	7	5.0	1.5
KMPLHP	12	Z	100	5	19.7	19.1
QCY3TG	12	Z	100	2	11.1	11.0
QCY3TG	00	Z	100	4	7.6	5.5
VKB4L5	00	Z	100	6	45.3	44.7
VKB4L5	12	Z	100	5	43.9	43.9
WDK38H	12	Z	100	0	0.0	0.0
XKQLWQ	12	Z	100	16	37.9	31.0
XQFJRG	00	Z	100	0	0.0	0.0
XQFJRG	12	Z	100	2	9.7	-8.0
YLV96W	12	Z	100	7	70.7	69.8
YLV96W	00	Z	100	7	52.9	52.3
ZVQEQC	00	Z	100	0	0.0	0.0
ZVQEQC	12	Z	100	13	29.6	29.0

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 : JUN 2019
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	100	30	2.0	0.2	0.2
01001	00	V	100	24	1.8	-0.4	0.3
01028	00	V	100	23	2.2	0.6	-0.2
01028	12	V	100	30	1.9	0.2	0.0
01400	00	V	100	18	2.7	0.5	-0.1
01400	12	V	100	22	2.7	0.3	-0.2
01415	00	V	100	23	2.8	0.3	-0.1
01415	12	V	100	28	2.8	0.0	-0.5
02365	00	V	100	17	2.9	-0.1	-0.4
02365	12	V	100	27	3.2	-0.6	-0.6
02591	12	V	100	30	3.3	0.3	-0.6
02591	00	V	100	25	3.2	-0.2	0.4
02836	00	V	100	27	3.1	-0.3	-0.4
02836	12	V	100	30	3.3	-0.3	0.3
02963	00	V	100	25	2.5	0.8	-0.2
02963	12	V	100	30	3.1	-0.4	0.1
03005	00	V	100	25	2.3	0.4	-0.1
03005	12	V	100	30	2.8	0.2	0.3
03238	00	V	100	24	3.4	-0.2	0.0
03238	12	V	100	2	1.5	-0.3	-0.2
03808	00	V	100	25	3.3	-0.7	0.2
03808	12	V	100	30	2.9	0.7	0.4
03918	12	V	100	4	2.4	0.3	-1.0
03918	00	V	100	14	2.2	-0.4	0.0
03953	00	V	100	23	2.8	0.7	0.6
03953	12	V	100	30	2.6	-0.3	0.0
04018	00	V	100	30	2.6	0.6	-0.6
04018	12	V	100	28	2.3	0.0	0.4
04220	00	V	100	27	1.6	0.0	0.1
04220	12	V	100	30	2.5	0.4	-0.4
04270	00	V	100	30	2.4	0.7	-0.2
04270	12	V	100	29	2.3	0.5	0.3
04320	00	V	100	26	2.8	-0.1	0.2
04320	12	V	100	30	2.9	0.0	0.4
04339	12	V	100	30	2.2	-0.2	-0.2
04339	00	V	100	28	2.1	-0.3	0.0
04360	00	V	100	23	2.1	-0.2	-0.3
04360	12	V	100	27	2.1	-0.3	0.1
06011	12	V	100	29	2.9	-0.2	0.9

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	100	26	2.6	0.3	0.0
06260	00	V	100	21	2.7	1.1	0.1
06260	12	V	100	5	1.9	0.6	0.9
06610	00	V	100	30	3.0	0.1	0.0
06610	12	V	100	30	3.2	-0.3	-0.8
07110	00	V	100	23	3.3	0.7	-0.1
07110	12	V	100	30	2.8	0.2	-0.4
07510	12	V	100	29	3.2	-0.2	-0.5
07510	00	V	100	23	2.8	-0.2	0.3
07645	00	V	100	23	3.3	-0.5	0.5
07645	12	V	100	30	3.4	0.3	-0.7
07761	12	V	100	28	3.2	1.0	-0.6
07761	00	V	100	21	3.2	0.4	0.8
08001	00	V	100	20	3.7	0.8	0.7
08001	12	V	100	29	2.7	0.4	-0.4
08221	12	V	100	30	4.5	0.7	-0.2
08221	00	V	100	23	4.2	-0.3	0.0
08302	00	V	100	24	3.6	-0.1	-0.2
08302	12	V	100	30	3.2	0.9	0.2
08508	12	V	100	29	3.4	0.5	0.6
08522	12	V	100	30	3.3	0.9	-0.3
08579	12	V	100	30	2.1	0.0	-0.1
10035	12	V	100	30	3.0	-0.4	-0.4
10393	00	V	100	29	3.4	0.5	0.8
10393	12	V	100	30	3.0	-0.1	-0.8
10410	00	V	100	30	2.6	1.0	0.1
10410	12	V	100	30	3.2	0.2	-0.7
10739	12	V	100	30	3.0	0.1	0.4
10739	00	V	100	29	2.8	0.4	-0.5
11035	00	V	100	25	3.3	1.1	-0.4
11035	12	V	100	30	3.3	0.6	-0.4
12982	12	V	100	30	2.8	0.4	0.1
12982	00	V	100	27	3.0	1.0	-0.2
16080	00	V	100	28	3.0	0.3	-0.1
16080	12	V	100	30	3.2	0.0	-0.4
16245	12	V	100	30	3.4	0.0	-0.7
16245	00	V	100	24	3.5	0.6	0.6
16320	00	V	100	25	3.6	1.0	0.3
16320	12	V	100	30	3.1	0.2	-0.4
16429	00	V	100	28	3.7	0.3	0.7
16429	12	V	100	30	3.8	0.6	-0.2
16622	00	V	100	25	3.7	0.8	-0.3
16754	00	V	100	22	4.0	-0.1	1.1

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	100	9	5.9	1.4	-0.7
26435	12	V	100	15	3.5	-1.0	-1.1
5QPW8X	12	V	100	10	2.5	1.0	0.1
5QPW8X	00	V	100	12	2.5	-0.3	0.9
60018	00	V	100	28	3.9	0.9	0.9
60018	12	V	100	29	4.4	1.0	0.6
7JUNA4	00	V	100	0	0.0	0.0	0.0
7JUNA4	12	V	100	0	0.0	0.0	0.0
ASDE09	12	V	100	3	1.6	1.2	0.2
FHM5UJ	12	V	100	8	2.4	0.2	0.1
FHM5UJ	00	V	100	7	1.9	-0.5	-0.1
HTXUH4	12	V	100	7	2.9	0.9	0.6
HTXUH4	00	V	100	13	2.4	0.4	0.4
JNKN7J	00	V	100	8	3.1	0.1	0.0
JNKN7J	12	V	100	8	2.9	-0.2	0.8
KMPLHP	00	V	100	7	2.9	1.2	0.7
KMPLHP	12	V	100	5	3.5	-2.3	-0.2
QCY3TG	12	V	100	2	2.9	2.8	0.9
QCY3TG	00	V	100	4	3.5	0.7	3.2
VKB4L5	00	V	100	6	2.1	0.9	-1.0
VKB4L5	12	V	100	5	2.1	-1.3	-1.4
WDK38H	12	V	100	0	0.0	0.0	0.0
XKQLWQ	12	V	100	16	2.6	0.6	-0.5
XQFJRG	00	V	100	0	0.0	0.0	0.0
XQFJRG	12	V	100	2	3.9	-0.8	-3.0
YLV96W	12	V	100	7	4.8	-0.8	-0.6
YLV96W	00	V	100	7	2.1	0.0	-0.4
ZVQEQC	00	V	100	0	0.0	0.0	0.0
ZVQEQC	12	V	100	13	3.6	-0.2	-1.0

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 : JUN 2019
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	500	30	3.7	-2.5
01001	00	Z	500	30	3.5	-1.3
01028	00	Z	500	29	3.6	-0.7
01028	12	Z	500	31	6.2	-2.6
01400	00	Z	500	23	80.7	80.5
01400	12	Z	500	23	77.4	77.3
01415	00	Z	500	27	3.9	2.2
01415	12	Z	500	28	4.4	2.9
02365	00	Z	500	25	3.4	2.1
02365	12	Z	500	28	3.9	1.8
02591	12	Z	500	30	9.0	8.6
02591	00	Z	500	30	9.7	9.4
02836	00	Z	500	30	4.9	2.9
02836	12	Z	500	30	3.6	0.7
02963	00	Z	500	30	4.5	4.0
02963	12	Z	500	30	4.6	2.9
03005	00	Z	500	31	3.8	-0.8
03005	12	Z	500	31	5.7	-3.4
03238	00	Z	500	29	4.8	3.6
03238	12	Z	500	2	2.0	1.8
03808	00	Z	500	30	3.5	2.6
03808	12	Z	500	31	2.8	1.3
03918	12	Z	500	4	4.7	4.2
03918	00	Z	500	20	7.3	7.0
03953	00	Z	500	30	5.7	-0.3
03953	12	Z	500	30	9.0	2.8
04018	00	Z	500	30	2.5	0.0
04018	12	Z	500	28	3.0	-1.1
04220	00	Z	500	30	3.8	2.7
04220	12	Z	500	30	3.8	0.6
04270	00	Z	500	30	4.5	0.2
04270	12	Z	500	29	2.3	0.2
04320	00	Z	500	30	3.2	0.7
04320	12	Z	500	30	2.9	-0.2
04339	12	Z	500	30	11.8	2.2
04339	00	Z	500	30	13.3	-1.8
04360	00	Z	500	27	20.6	-5.6
04360	12	Z	500	27	8.9	-7.7
06011	12	Z	500	30	7.1	4.5

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	500	30	15.4	-1.4
06260	00	Z	500	29	3.8	2.5
06260	12	Z	500	5	3.9	-2.5
06610	00	Z	500	31	5.1	3.9
06610	12	Z	500	31	3.6	1.1
07110	00	Z	500	30	5.5	-2.8
07110	12	Z	500	30	6.7	-4.1
07510	12	Z	500	29	9.0	8.3
07510	00	Z	500	30	8.1	6.3
07645	00	Z	500	30	5.1	2.2
07645	12	Z	500	30	3.9	2.5
07761	12	Z	500	28	6.6	6.0
07761	00	Z	500	27	6.7	5.9
08001	00	Z	500	28	5.1	3.9
08001	12	Z	500	30	3.7	2.2
08221	12	Z	500	30	6.8	5.8
08221	00	Z	500	31	8.1	7.4
08302	00	Z	500	30	2.4	0.4
08302	12	Z	500	31	3.4	-2.7
08508	12	Z	500	29	6.3	5.5
08522	12	Z	500	30	6.7	6.0
08579	12	Z	500	30	8.5	7.7
10035	12	Z	500	30	5.4	3.7
10393	00	Z	500	30	3.8	2.0
10393	12	Z	500	31	2.3	1.0
10410	00	Z	500	30	3.6	1.0
10410	12	Z	500	30	4.1	-1.7
10739	12	Z	500	31	12.4	6.0
10739	00	Z	500	30	8.5	7.7
11035	00	Z	500	30	12.0	11.1
11035	12	Z	500	32	31.8	22.4
12982	12	Z	500	30	10.0	8.2
12982	00	Z	500	30	7.9	6.7
16080	00	Z	500	30	3.1	1.8
16080	12	Z	500	31	2.8	-1.2
16245	12	Z	500	30	2.8	-1.3
16245	00	Z	500	30	14.0	3.7
16320	00	Z	500	29	11.3	8.3
16320	12	Z	500	30	9.9	6.7
16429	00	Z	500	30	5.9	5.0
16429	12	Z	500	31	8.8	4.5
16622	00	Z	500	30	7.5	6.5
16754	00	Z	500	30	6.3	5.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	500	29	4.9	4.1
26435	12	Z	500	15	2.7	1.4
5QPW8X	12	Z	500	11	24.6	23.8
5QPW8X	00	Z	500	12	22.3	22.0
60018	00	Z	500	30	6.0	5.3
60018	12	Z	500	29	5.3	4.7
7JUNA4	00	Z	500	1	0.1	-0.1
7JUNA4	12	Z	500	4	7.5	6.4
ASDE09	12	Z	500	4	12.4	11.1
FHM5UJ	12	Z	500	8	8.1	4.5
FHM5UJ	00	Z	500	7	8.0	7.3
HTXUH4	12	Z	500	9	5.3	0.2
HTXUH4	00	Z	500	13	4.0	1.4
JNKN7J	00	Z	500	8	41.9	41.4
JNKN7J	12	Z	500	9	43.5	43.0
KMPLHP	00	Z	500	8	3.6	1.7
KMPLHP	12	Z	500	7	8.9	4.8
QCY3TG	12	Z	500	3	10.6	10.1
QCY3TG	00	Z	500	4	1.7	0.4
VKB4L5	00	Z	500	6	39.1	39.0
VKB4L5	12	Z	500	6	40.3	40.0
WDK38H	12	Z	500	0	0.0	0.0
XKQLWQ	12	Z	500	16	29.0	22.2
XQFJRG	00	Z	500	2	11.4	-10.1
XQFJRG	12	Z	500	7	11.1	-10.2
YLV96W	12	Z	500	8	66.7	66.2
YLV96W	00	Z	500	8	61.2	61.0
ZVQEQC	00	Z	500	1	15.6	15.6
ZVQEQC	12	Z	500	13	23.6	23.4

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 : JUN 2019
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	500	30	2.0	0.2	0.1
01001	00	V	500	30	2.1	0.2	-0.3
01028	00	V	500	29	2.1	0.3	0.0
01028	12	V	500	30	2.3	0.9	0.0
01400	00	V	500	21	3.6	0.5	0.5
01400	12	V	500	23	3.0	-0.8	-0.1
01415	00	V	500	27	2.2	0.6	-0.2
01415	12	V	500	28	2.5	0.4	0.0
02365	00	V	500	24	3.7	1.9	0.5
02365	12	V	500	28	3.0	-0.1	0.0
02591	12	V	500	30	2.7	-0.3	0.0
02591	00	V	500	30	3.0	-0.2	-0.2
02836	00	V	500	30	3.1	1.2	-0.4
02836	12	V	500	30	3.3	1.2	-0.3
02963	00	V	500	30	2.5	0.1	0.3
02963	12	V	500	30	2.7	0.5	0.6
03005	00	V	500	30	2.6	0.0	0.6
03005	12	V	500	30	3.0	0.6	0.4
03238	00	V	500	29	2.6	-0.5	0.7
03238	12	V	500	2	2.0	-0.8	0.0
03808	00	V	500	30	2.5	-0.1	0.2
03808	12	V	500	30	3.8	0.2	0.6
03918	12	V	500	4	2.3	1.3	-0.6
03918	00	V	500	20	2.4	-0.4	-0.5
03953	00	V	500	30	2.9	-0.4	0.6
03953	12	V	500	30	2.8	0.3	0.7
04018	00	V	500	30	2.1	0.2	0.2
04018	12	V	500	28	1.8	0.0	0.6
04220	00	V	500	30	2.2	-0.4	-0.4
04220	12	V	500	30	2.0	0.1	0.5
04270	00	V	500	30	3.0	0.1	0.1
04270	12	V	500	29	2.8	0.6	0.0
04320	00	V	500	30	2.4	0.3	0.1
04320	12	V	500	30	2.3	-0.3	0.5
04339	12	V	500	30	2.1	-0.3	0.2
04339	00	V	500	30	2.3	-0.1	0.0
04360	00	V	500	27	1.9	-0.4	-0.1
04360	12	V	500	27	2.2	-0.2	0.2
06011	12	V	500	30	2.3	-0.1	0.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	500	30	2.6	0.0	-0.7
06260	00	V	500	29	2.9	0.2	0.3
06260	12	V	500	5	2.8	1.4	-1.4
06610	00	V	500	30	3.3	0.7	0.3
06610	12	V	500	30	3.3	0.9	-0.1
07110	00	V	500	30	3.6	0.4	0.6
07110	12	V	500	30	2.3	0.1	0.1
07510	12	V	500	29	2.3	-0.3	-0.4
07510	00	V	500	30	3.2	-0.1	-0.2
07645	00	V	500	30	2.8	0.2	0.1
07645	12	V	500	30	2.4	0.4	0.6
07761	12	V	500	28	2.1	0.0	-0.1
07761	00	V	500	27	2.2	-0.3	0.0
08001	00	V	500	28	3.0	0.0	0.7
08001	12	V	500	30	2.5	0.0	1.0
08221	12	V	500	30	2.3	-0.2	-0.1
08221	00	V	500	30	2.3	-0.6	0.4
08302	00	V	500	29	2.5	0.3	0.4
08302	12	V	500	30	2.2	0.2	0.0
08508	12	V	500	29	2.5	-0.4	-0.5
08522	12	V	500	30	1.9	0.2	-0.2
08579	12	V	500	30	2.1	0.4	0.1
10035	12	V	500	30	2.5	-0.7	-0.3
10393	00	V	500	29	3.0	1.0	-0.1
10393	12	V	500	30	2.1	0.7	0.1
10410	00	V	500	30	2.6	-0.5	-0.1
10410	12	V	500	30	2.5	0.6	0.3
10739	12	V	500	30	3.5	0.0	-0.1
10739	00	V	500	30	2.8	0.6	0.3
11035	00	V	500	30	2.9	0.3	0.1
11035	12	V	500	30	2.5	-0.1	-0.6
12982	12	V	500	30	2.2	-0.2	0.3
12982	00	V	500	29	2.6	0.0	-0.5
16080	00	V	500	30	2.7	0.7	-0.3
16080	12	V	500	30	2.6	-0.1	0.1
16245	12	V	500	30	3.4	0.1	0.3
16245	00	V	500	30	2.3	0.5	-0.1
16320	00	V	500	29	2.6	1.1	-0.3
16320	12	V	500	30	2.4	0.6	0.0
16429	00	V	500	30	3.2	0.8	0.1
16429	12	V	500	30	2.3	0.3	-0.2
16622	00	V	500	30	2.5	0.7	0.0
16754	00	V	500	25	3.4	1.3	0.0

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	500	19	3.3	1.0	0.2
26435	12	V	500	15	2.4	0.1	0.2
5QPW8X	12	V	500	11	4.0	-1.0	0.9
5QPW8X	00	V	500	12	3.7	1.3	-0.2
60018	00	V	500	30	2.5	0.1	0.3
60018	12	V	500	29	2.7	0.8	0.5
7JUNA4	00	V	500	1	1.7	0.3	1.7
7JUNA4	12	V	500	4	3.5	1.3	1.2
ASDE09	12	V	500	4	1.8	0.1	0.2
FHM5UJ	12	V	500	8	2.2	-0.2	-0.1
FHM5UJ	00	V	500	7	1.5	-0.3	-0.1
HTXUH4	12	V	500	9	2.5	-0.4	-1.1
HTXUH4	00	V	500	13	1.5	-0.3	0.2
JNKN7J	00	V	500	8	3.4	-0.5	-0.3
JNKN7J	12	V	500	9	2.6	0.3	0.3
KMPLHP	00	V	500	8	2.3	0.2	-0.8
KMPLHP	12	V	500	7	2.3	-0.5	0.0
QCY3TG	12	V	500	3	2.4	0.1	1.4
QCY3TG	00	V	500	4	2.6	-1.4	-1.1
VKB4L5	00	V	500	6	2.6	1.0	0.9
VKB4L5	12	V	500	5	2.3	0.8	-0.6
WDK38H	12	V	500	0	0.0	0.0	0.0
XKQLWQ	12	V	500	16	2.1	0.2	-0.1
XQFJRG	00	V	500	2	2.0	-1.7	0.4
XQFJRG	12	V	500	7	2.6	-0.8	0.1
YLV96W	12	V	500	8	2.1	0.2	-0.4
YLV96W	00	V	500	8	3.2	-0.1	-1.2
ZVQEQC	00	V	500	1	2.6	0.6	-2.5
ZVQEQC	12	V	500	13	2.2	-0.1	-0.4

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 : JUN 2019
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
01001	12	Z	850	30	2.7	-1.0
01001	00	Z	850	30	2.2	0.2
01028	00	Z	850	29	4.2	1.2
01028	12	Z	850	31	6.8	0.7
01400	00	Z	850	23	80.3	80.1
01400	12	Z	850	23	78.3	78.1
01415	00	Z	850	28	4.8	3.5
01415	12	Z	850	28	4.1	3.3
02365	00	Z	850	25	4.0	3.3
02365	12	Z	850	28	4.4	2.5
02591	12	Z	850	30	9.8	9.5
02591	00	Z	850	30	9.1	8.9
02836	00	Z	850	30	3.9	3.2
02836	12	Z	850	30	2.8	1.8
02963	00	Z	850	30	4.3	4.0
02963	12	Z	850	30	4.7	4.1
03005	00	Z	850	31	3.6	-1.7
03005	12	Z	850	31	3.8	-1.8
03238	00	Z	850	29	4.1	3.5
03238	12	Z	850	2	4.4	4.3
03808	00	Z	850	30	3.4	2.5
03808	12	Z	850	31	2.7	1.4
03918	12	Z	850	4	6.5	6.5
03918	00	Z	850	20	7.6	7.3
03953	00	Z	850	30	4.2	3.5
03953	12	Z	850	30	5.2	4.0
04018	00	Z	850	30	3.0	2.1
04018	12	Z	850	28	2.3	-0.3
04220	00	Z	850	30	4.0	3.1
04220	12	Z	850	30	3.3	2.6
04270	00	Z	850	30	3.0	2.0
04270	12	Z	850	29	4.2	2.0
04320	00	Z	850	30	4.9	3.4
04320	12	Z	850	30	4.0	2.1
04339	12	Z	850	30	13.5	4.4
04339	00	Z	850	30	14.3	-1.0
04360	00	Z	850	27	7.2	-4.5
04360	12	Z	850	27	7.3	-6.8
06011	12	Z	850	30	5.8	4.9

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
06011	00	Z	850	30	16.6	0.0
06260	00	Z	850	30	3.3	2.2
06260	12	Z	850	5	3.0	1.0
06610	00	Z	850	31	4.6	3.9
06610	12	Z	850	31	5.1	3.5
07110	00	Z	850	30	2.4	-0.7
07110	12	Z	850	30	2.9	-1.5
07510	12	Z	850	29	4.8	4.3
07510	00	Z	850	30	6.1	5.2
07645	00	Z	850	30	3.0	1.5
07645	12	Z	850	30	1.9	0.6
07761	12	Z	850	28	3.8	2.9
07761	00	Z	850	28	4.6	2.8
08001	00	Z	850	28	4.0	3.3
08001	12	Z	850	30	2.9	2.2
08221	12	Z	850	30	4.7	4.4
08221	00	Z	850	31	5.3	5.0
08302	00	Z	850	30	5.0	-4.6
08302	12	Z	850	31	5.0	-4.5
08508	12	Z	850	29	4.0	2.2
08522	12	Z	850	30	4.2	3.7
08579	12	Z	850	30	7.1	6.8
10035	12	Z	850	30	6.4	5.9
10393	00	Z	850	30	3.8	1.9
10393	12	Z	850	31	3.4	2.3
10410	00	Z	850	30	1.9	-0.2
10410	12	Z	850	30	2.3	-0.3
10739	12	Z	850	31	5.6	5.0
10739	00	Z	850	30	5.2	4.7
11035	00	Z	850	30	11.2	10.3
11035	12	Z	850	32	22.2	19.4
12982	12	Z	850	30	7.8	7.5
12982	00	Z	850	30	7.4	6.8
16080	00	Z	850	30	3.6	1.8
16080	12	Z	850	31	2.3	-0.1
16245	12	Z	850	30	2.7	-1.6
16245	00	Z	850	30	16.2	3.2
16320	00	Z	850	29	12.0	8.4
16320	12	Z	850	30	10.1	6.9
16429	00	Z	850	30	4.9	3.8
16429	12	Z	850	31	9.4	4.2
16622	00	Z	850	30	6.0	5.2
16754	00	Z	850	30	5.2	3.3

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	BIAS
17607	12	Z	850	30	3.9	3.3
26435	12	Z	850	15	3.8	3.2
5QPW8X	12	Z	850	11	26.3	26.3
5QPW8X	00	Z	850	12	26.9	26.7
60018	00	Z	850	30	2.7	0.9
60018	12	Z	850	29	3.3	2.0
7JUNA4	00	Z	850	1	3.8	-3.8
7JUNA4	12	Z	850	4	6.1	3.1
ASDE09	12	Z	850	4	5.2	4.9
FHM5UJ	12	Z	850	8	7.0	4.6
FHM5UJ	00	Z	850	7	6.3	5.6
HTXUH4	12	Z	850	10	5.1	3.2
HTXUH4	00	Z	850	13	5.8	3.4
JNKN7J	00	Z	850	8	46.6	46.3
JNKN7J	12	Z	850	9	45.1	44.8
KMPLHP	00	Z	850	6	7.2	5.1
KMPLHP	12	Z	850	6	5.8	5.0
QCY3TG	12	Z	850	3	6.5	6.4
QCY3TG	00	Z	850	4	5.1	4.4
VKB4L5	00	Z	850	6	36.1	36.0
VKB4L5	12	Z	850	6	36.4	36.3
WDK38H	12	Z	850	1	11.9	-11.9
XKQLWQ	12	Z	850	16	24.2	15.8
XQFJRG	00	Z	850	3	13.0	-11.8
XQFJRG	12	Z	850	7	13.2	-12.9
YLV96W	12	Z	850	8	68.2	67.4
YLV96W	00	Z	850	8	67.8	67.4
ZVQEQC	00	Z	850	1	13.0	13.0
ZVQEQC	12	Z	850	13	18.2	18.0

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 : JUN 2019
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
01001	12	V	850	30	2.9	-0.7	0.7
01001	00	V	850	30	3.0	0.4	-0.2
01028	00	V	850	29	2.3	-0.2	-0.1
01028	12	V	850	30	3.0	0.0	0.4
01400	00	V	850	22	2.2	0.2	-0.2
01400	12	V	850	23	2.8	0.7	0.4
01415	00	V	850	27	4.1	0.3	0.5
01415	12	V	850	28	2.7	0.1	-0.4
02365	00	V	850	24	2.9	0.3	0.0
02365	12	V	850	28	3.2	0.3	-0.6
02591	12	V	850	30	2.6	-0.3	-0.8
02591	00	V	850	30	3.3	0.0	-0.4
02836	00	V	850	30	2.3	-0.1	-0.1
02836	12	V	850	30	2.9	0.5	0.1
02963	00	V	850	30	2.8	0.0	0.1
02963	12	V	850	30	2.8	0.1	-0.6
03005	00	V	850	30	2.5	0.6	-0.1
03005	12	V	850	30	2.5	0.7	-0.3
03238	00	V	850	29	3.0	0.5	0.7
03238	12	V	850	2	3.7	0.1	-0.4
03808	00	V	850	30	2.6	0.0	0.2
03808	12	V	850	30	2.9	0.2	-0.1
03918	12	V	850	4	2.7	1.5	-0.7
03918	00	V	850	20	2.0	0.0	0.8
03953	00	V	850	30	2.1	0.1	0.6
03953	12	V	850	30	2.1	0.0	0.0
04018	00	V	850	30	2.7	-0.1	0.5
04018	12	V	850	28	2.9	0.0	0.0
04220	00	V	850	30	2.9	-0.3	-0.8
04220	12	V	850	30	3.0	-0.5	-0.4
04270	00	V	850	30	3.4	0.6	-0.2
04270	12	V	850	29	4.1	0.8	0.0
04320	00	V	850	30	3.3	0.2	-0.3
04320	12	V	850	30	3.0	-1.0	0.5
04339	12	V	850	30	2.5	0.0	-0.4
04339	00	V	850	30	3.0	-1.1	-0.6
04360	00	V	850	27	3.8	-1.0	0.2
04360	12	V	850	27	3.2	-0.1	0.4
06011	12	V	850	30	2.8	0.0	0.4

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
06011	00	V	850	30	2.5	0.1	0.1
06260	00	V	850	30	4.4	1.1	0.1
06260	12	V	850	5	3.4	-0.5	0.5
06610	00	V	850	30	3.1	0.9	0.1
06610	12	V	850	30	3.3	1.5	0.4
07110	00	V	850	30	2.1	0.4	0.1
07110	12	V	850	30	2.9	-0.3	0.3
07510	12	V	850	29	2.8	-0.7	0.0
07510	00	V	850	30	3.5	0.7	0.4
07645	00	V	850	30	2.8	-0.3	0.6
07645	12	V	850	30	3.0	0.2	-0.8
07761	12	V	850	28	2.3	-0.3	0.1
07761	00	V	850	27	2.9	0.4	0.0
08001	00	V	850	28	3.7	1.1	0.5
08001	12	V	850	30	2.8	0.2	0.5
08221	12	V	850	30	2.3	-0.3	0.4
08221	00	V	850	30	3.6	0.0	1.2
08302	00	V	850	29	3.0	-0.4	-0.2
08302	12	V	850	30	2.5	0.6	0.8
08508	12	V	850	29	2.8	0.1	-0.4
08522	12	V	850	30	3.3	0.3	0.7
08579	12	V	850	30	2.2	-0.3	0.3
10035	12	V	850	30	2.6	0.2	-0.4
10393	00	V	850	30	3.7	0.5	-0.4
10393	12	V	850	30	2.5	0.3	0.3
10410	00	V	850	30	2.6	0.4	0.1
10410	12	V	850	30	3.1	0.3	0.0
10739	12	V	850	30	2.5	0.1	0.9
10739	00	V	850	30	3.5	1.3	0.5
11035	00	V	850	30	2.5	0.1	0.4
11035	12	V	850	30	2.7	1.0	-0.4
12982	12	V	850	30	2.9	-0.4	-0.1
12982	00	V	850	29	3.3	0.2	-0.8
16080	00	V	850	30	3.2	0.0	-0.1
16080	12	V	850	30	3.0	-0.6	-0.7
16245	12	V	850	30	2.8	-0.1	0.7
16245	00	V	850	30	3.1	-0.2	-0.6
16320	00	V	850	29	2.2	0.0	-0.5
16320	12	V	850	30	2.4	0.4	-0.7
16429	00	V	850	30	2.7	-0.3	0.4
16429	12	V	850	30	2.6	0.1	0.1
16622	00	V	850	30	2.9	0.6	-0.8
16754	00	V	850	25	2.5	0.2	0.8

RADIOSONDE MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	OBS RECD	RMS	UBIAS	VBIAS
17607	12	V	850	29	3.3	0.0	0.1
26435	12	V	850	15	3.0	1.0	0.5
5QPW8X	12	V	850	11	2.8	-0.3	0.3
5QPW8X	00	V	850	12	2.5	-0.1	0.1
60018	00	V	850	30	4.2	-1.4	1.3
60018	12	V	850	29	4.2	-1.6	0.5
7JUNA4	00	V	850	1	0.8	0.2	-0.8
7JUNA4	12	V	850	4	4.2	-0.7	-1.5
ASDE09	12	V	850	4	3.7	-1.0	-2.1
FHM5UJ	12	V	850	8	2.5	0.4	0.0
FHM5UJ	00	V	850	7	3.7	-0.8	1.9
HTXUH4	12	V	850	9	3.1	-0.3	-2.3
HTXUH4	00	V	850	13	2.1	-0.3	0.1
JNKN7J	00	V	850	8	1.7	-0.1	-0.3
JNKN7J	12	V	850	9	2.5	-0.3	0.0
KMPLHP	00	V	850	6	1.6	0.5	0.7
KMPLHP	12	V	850	6	2.4	-1.3	1.4
QCY3TG	12	V	850	3	1.8	0.5	1.0
QCY3TG	00	V	850	4	2.5	0.6	-1.0
VKB4L5	00	V	850	6	2.2	0.3	-1.1
VKB4L5	12	V	850	6	2.2	0.0	0.2
WDK38H	12	V	850	1	5.9	4.8	3.4
XKQLWQ	12	V	850	16	3.2	0.7	0.5
XQFJRG	00	V	850	3	1.0	0.4	-0.2
XQFJRG	12	V	850	7	1.8	0.0	0.8
YLV96W	12	V	850	8	1.8	-0.2	-0.1
YLV96W	00	V	850	8	2.5	-0.4	0.4
ZVQEQC	00	V	850	1	0.3	0.3	0.0
ZVQEQC	12	V	850	13	2.0	0.4	-0.1

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 : JUN 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
0000000	99	P	SUR	17	-43	93	0	0.2	0.3	0.3
03380	99	P	SUR	54	0	755	0	0.3	0.0	0.3
1300001	99	P	SUR	11	-23	602	0	0.4	0.1	0.4
1300008	99	P	SUR	15	-38	618	0	0.3	-0.0	0.3
1300130	99	P	SUR	28	-16	720	0	0.3	0.2	0.3
1301569	99	P	SUR	24	-35	669	0	0.2	0.0	0.2
1301603	99	P	SUR	30	-59	700	0	0.3	-0.1	0.3
1301605	99	P	SUR	23	-58	694	0	0.3	0.2	0.4
1301607	99	P	SUR	20	-49	696	0	0.3	0.6	0.7
1301608	99	P	SUR	29	-44	701	0	0.2	0.6	0.7
1301609	99	P	SUR	21	-66	697	0	0.3	0.5	0.6
1301610	99	P	SUR	23	-51	700	0	0.2	0.3	0.4
1301612	99	P	SUR	25	-44	704	0	0.2	0.1	0.2
1301618	99	P	SUR	17	-30	706	0	0.4	1.0	1.1
1301619	99	P	SUR	37	-22	701	0	0.7	0.5	0.9
1402554	99	P	SUR	24	-66	712	0	0.3	0.4	0.5
1402559	99	P	SUR	31	-46	719	0	0.4	0.3	0.5
1501529	99	P	SUR	20	-39	563	0	0.3	0.4	0.4
1501531	99	P	SUR	25	-56	666	0	0.3	-0.2	0.4
1501534	99	P	SUR	25	-67	666	0	0.3	-1.0	1.1
1501581	99	P	SUR	13	-56	668	0	0.3	0.3	0.5
2501661	99	P	SUR	86	35	722	0	0.4	-0.1	0.4
2601623	99	P	SUR	78	29	720	1	0.4	-0.1	0.4
2601624	99	P	SUR	82	16	721	0	0.4	0.0	0.4
2601625	99	P	SUR	82	25	720	0	0.4	0.1	0.4
2601626	99	P	SUR	80	33	11	11	0.0	0.0	0.0
3100735	99	P	SUR	32	-62	692	0	0.8	0.1	0.8
3101532	99	P	SUR	12	-68	667	0	0.5	0.1	0.5
31735	99	P	SUR	32	-62	692	0	0.8	0.1	0.8
4100040	99	P	SUR	15	-53	3902	0	0.3	-0.7	0.8
4100043	99	P	SUR	21	-65	3866	0	0.3	0.2	0.4
4100044	99	P	SUR	22	-59	3867	0	0.3	0.3	0.4
4100046	99	P	SUR	24	-68	3827	0	0.4	-0.4	0.5
4100048	99	P	SUR	32	-70	3749	0	0.4	-0.7	0.8
4100049	99	P	SUR	27	-63	3898	0	0.7	-0.1	0.7
4100052	99	P	SUR	18	-65	4302	0	0.3	-1.2	1.2

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4100053	99	P	SUR	18	-66	4312	0	0.4	-0.6	0.7
4100056	99	P	SUR	18	-65	4249	0	0.3	-0.7	0.8
4100139	99	P	SUR	20	-38	606	0	0.2	-0.1	0.3
4100300	99	P	SUR	16	-57	688	0	0.3	0.1	0.3
4100597	99	P	SUR	34	-30	696	0	0.3	0.4	0.5
4100729	99	P	SUR	37	-25	701	0	0.3	0.3	0.5
4100730	99	P	SUR	37	-21	696	0	0.3	0.5	0.5
4101529	99	P	SUR	26	-63	677	0	0.3	-0.6	0.7
4101530	99	P	SUR	33	-29	683	0	0.3	0.6	0.6
4101531	99	P	SUR	37	-18	637	0	0.3	0.8	0.8
4101533	99	P	SUR	53	-26	470	0	0.5	0.7	0.8
4101534	99	P	SUR	53	-26	294	0	0.4	0.5	0.7
4101535	99	P	SUR	45	-31	103	0	0.4	0.0	0.4
4101536	99	P	SUR	43	-24	344	0	0.4	0.6	0.7
4101537	99	P	SUR	39	-14	639	0	0.5	0.5	0.7
4101539	99	P	SUR	37	-60	703	0	0.4	0.0	0.4
4101554	99	P	SUR	26	-58	699	0	0.3	0.5	0.5
4101556	99	P	SUR	41	-15	703	0	0.3	0.5	0.6
4101557	99	P	SUR	36	-25	703	0	0.3	0.4	0.5
4101558	99	P	SUR	22	-43	704	0	0.2	0.6	0.6
4101560	99	P	SUR	37	-36	703	0	0.3	0.7	0.8
4101562	99	P	SUR	33	-50	662	0	0.2	0.6	0.6
4101564	99	P	SUR	29	-45	696	0	0.2	0.1	0.2
4101565	99	P	SUR	29	-32	624	0	0.2	0.6	0.7
4101567	99	P	SUR	35	-49	698	0	0.3	0.4	0.5
4101568	99	P	SUR	38	-49	301	61	0.3	0.5	0.5
4101570	99	P	SUR	27	-60	703	0	0.3	0.4	0.5
4101572	99	P	SUR	51	-17	299	0	0.3	0.6	0.7
4101573	99	P	SUR	31	-44	703	0	0.3	0.3	0.5
4101575	99	P	SUR	42	-42	368	0	0.3	0.2	0.4
4101596	99	P	SUR	60	-5	703	0	0.3	0.8	0.8
4101598	99	P	SUR	16	-61	704	0	0.4	-0.2	0.4
4101604	99	P	SUR	10	-62	641	0	0.5	-0.1	0.5
4101606	99	P	SUR	43	-9	82	0	2.1	-1.1	2.3
4101607	99	P	SUR	43	-16	703	0	0.3	0.3	0.4
4101608	99	P	SUR	62	-5	704	0	0.3	0.3	0.5
4101609	99	P	SUR	36	-25	703	0	0.3	0.4	0.5
4101610	99	P	SUR	65	-10	703	0	0.4	0.4	0.5
4101613	99	P	SUR	35	-23	704	0	0.3	0.6	0.7
4101614	99	P	SUR	33	-33	703	0	0.2	0.1	0.3
4101616	99	P	SUR	35	-22	703	0	0.2	0.2	0.3
4101617	99	P	SUR	34	-26	704	0	0.2	0.5	0.5
4101618	99	P	SUR	34	-28	704	0	0.2	0.4	0.5

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4101619	99	P	SUR	52	-12	703	0	0.4	0.2	0.4
4101620	99	P	SUR	51	-7	704	0	0.4	0.4	0.5
4101621	99	P	SUR	36	-34	704	0	0.4	0.3	0.5
4101622	99	P	SUR	71	-10	704	0	0.3	0.3	0.4
4101623	99	P	SUR	56	-50	703	0	0.5	0.0	0.5
4101625	99	P	SUR	65	-56	704	0	0.4	0.4	0.5
4101627	99	P	SUR	58	-29	704	0	0.3	-0.0	0.3
4101662	99	P	SUR	61	-12	326	0	0.3	0.1	0.3
4101663	99	P	SUR	63	-17	326	0	0.3	0.0	0.3
4101664	99	P	SUR	62	-21	703	0	0.3	0.2	0.3
4101666	99	P	SUR	62	-11	704	0	0.4	0.1	0.4
4101690	99	P	SUR	54	-55	638	0	0.5	0.2	0.5
4101700	99	P	SUR	28	-58	694	0	0.3	-0.0	0.3
4101702	99	P	SUR	33	-66	695	1	1.8	-0.3	1.8
4101705	99	P	SUR	32	-26	698	0	0.2	0.1	0.2
4101706	99	P	SUR	34	-31	703	0	0.3	-0.6	0.6
4101708	99	P	SUR	27	-48	697	0	0.2	-0.3	0.4
4101712	99	P	SUR	36	-28	700	0	0.3	0.2	0.3
4101713	99	P	SUR	35	-68	695	0	0.4	-0.3	0.5
4101714	99	P	SUR	32	-29	703	0	0.2	0.0	0.2
4101715	99	P	SUR	30	-47	699	0	0.6	-0.5	0.8
4101716	99	P	SUR	25	-54	701	0	0.3	-0.8	0.9
4101717	99	P	SUR	29	-56	704	0	0.3	-0.1	0.3
4101718	99	P	SUR	34	-31	703	0	0.3	0.2	0.3
4101719	99	P	SUR	35	-53	701	0	0.3	-0.0	0.3
4101720	99	P	SUR	45	-56	702	0	0.4	0.6	0.7
4101721	99	P	SUR	32	-51	699	0	0.3	0.5	0.5
4101742	99	P	SUR	36	-39	696	0	0.4	0.1	0.4
4101743	99	P	SUR	30	-59	699	0	0.3	0.6	0.7
4101760	99	P	SUR	29	-54	719	0	0.4	0.2	0.5
4101762	99	P	SUR	24	-67	717	0	0.3	0.4	0.5
4101764	99	P	SUR	76	15	712	0	0.8	0.4	0.9
4101765	99	P	SUR	61	-9	697	0	0.7	0.3	0.8
4101767	99	P	SUR	13	-27	719	0	0.4	0.5	0.6
41040	99	P	SUR	15	-53	1243	0	0.3	-0.3	0.5
41043	99	P	SUR	21	-65	1236	0	0.3	0.6	0.7
41044	99	P	SUR	22	-59	1231	0	0.3	0.7	0.8
41046	99	P	SUR	24	-68	1296	0	0.4	0.1	0.4
41048	99	P	SUR	32	-70	1314	0	0.4	-0.3	0.5
41049	99	P	SUR	28	-63	884	0	0.4	0.6	0.7
41052	99	P	SUR	18	-65	1797	0	0.3	-1.1	1.2
41053	99	P	SUR	19	-66	1842	0	0.4	-0.7	0.8
41056	99	P	SUR	18	-66	1774	0	0.4	-0.8	0.8

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
41300	99	P	SUR	16	-57	688	0	0.3	0.1	0.3
41597	99	P	SUR	34	-30	696	0	0.3	0.4	0.5
41729	99	P	SUR	37	-25	701	0	0.3	0.3	0.5
41730	99	P	SUR	37	-21	696	0	0.3	0.5	0.5
4200059	99	P	SUR	15	-67	3915	0	0.4	0.0	0.4
4200060	99	P	SUR	16	-63	3931	0	0.3	-0.0	0.3
4200085	99	P	SUR	18	-67	922	0	0.3	-0.8	0.8
42059	99	P	SUR	15	-68	1295	0	0.4	0.4	0.6
42060	99	P	SUR	16	-63	1272	0	0.4	0.4	0.5
42085	99	P	SUR	18	-67	903	0	0.3	-0.8	0.9
4400005	99	P	SUR	43	-69	630	0	0.5	0.2	0.5
4400008	99	P	SUR	41	-69	3993	0	0.4	0.1	0.4
4400011	99	P	SUR	41	-67	3996	0	0.4	-0.2	0.4
4400027	99	P	SUR	44	-67	641	0	0.5	-0.3	0.5
4400032	99	P	SUR	44	-69	703	0	0.4	-0.9	1.0
4400033	99	P	SUR	44	-69	712	0	0.6	-0.1	0.6
4400034	99	P	SUR	44	-68	710	0	0.5	-0.1	0.5
4400037	99	P	SUR	43	-68	710	0	0.4	-0.7	0.8
44005	99	P	SUR	43	-69	696	0	0.5	0.2	0.5
4400513	99	P	SUR	54	-10	624	0	0.3	-0.3	0.5
4400521	99	P	SUR	28	-32	660	0	0.2	-0.8	0.9
4400746	99	P	SUR	34	-32	699	0	0.2	0.3	0.4
4400777	99	P	SUR	28	-51	695	0	0.2	0.3	0.4
4400778	99	P	SUR	27	-59	703	0	0.3	0.1	0.3
44008	99	P	SUR	41	-69	1769	0	0.5	0.5	0.7
4400857	99	P	SUR	33	-33	697	0	0.5	0.5	0.7
4400874	99	P	SUR	37	-32	700	0	0.3	-0.4	0.5
44011	99	P	SUR	41	-67	1814	0	0.4	0.2	0.5
4401531	99	P	SUR	39	-38	703	0	0.3	0.3	0.4
4401536	99	P	SUR	32	-15	665	0	0.2	0.7	0.8
4401537	99	P	SUR	29	-43	662	0	0.6	-0.8	1.0
4401540	99	P	SUR	33	-41	703	0	0.2	0.3	0.4
4401541	99	P	SUR	31	-26	704	0	0.2	-0.1	0.2
4401549	99	P	SUR	63	4	633	0	0.4	0.2	0.5
4401551	99	P	SUR	38	-21	684	0	0.3	0.3	0.4
4401556	99	P	SUR	28	-26	701	0	0.2	0.2	0.3
4401557	99	P	SUR	33	-25	695	0	0.2	0.2	0.3
4401558	99	P	SUR	66	12	696	0	0.4	-0.1	0.4
4401559	99	P	SUR	47	-10	698	0	0.4	0.4	0.6
4401561	99	P	SUR	29	-43	692	0	0.2	0.0	0.2
4401562	99	P	SUR	30	-21	695	0	0.2	-0.2	0.3
4401563	99	P	SUR	28	-48	698	0	0.2	-0.4	0.4
4401564	99	P	SUR	38	-26	701	0	0.5	0.6	0.8

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4401565	99	P	SUR	62	-16	699	0	0.6	0.3	0.7
4401567	99	P	SUR	51	-26	702	0	0.4	0.4	0.6
4401568	99	P	SUR	52	-23	701	0	0.4	0.3	0.5
4401569	99	P	SUR	52	-40	700	0	0.4	-0.1	0.4
4401570	99	P	SUR	46	-16	704	0	0.3	0.1	0.3
4401572	99	P	SUR	43	-40	704	0	0.4	0.2	0.5
4401573	99	P	SUR	51	-30	701	0	0.6	0.1	0.6
4401574	99	P	SUR	55	-33	701	0	0.5	0.5	0.8
4401575	99	P	SUR	50	-48	698	0	0.5	0.3	0.6
4401576	99	P	SUR	41	-34	642	0	0.4	0.5	0.6
4401577	99	P	SUR	42	-45	643	0	0.5	0.0	0.5
4401578	99	P	SUR	40	-47	642	0	0.4	-0.1	0.5
4401579	99	P	SUR	42	-37	640	0	0.4	0.2	0.4
4401611	99	P	SUR	42	-48	667	0	0.6	0.5	0.7
4401613	99	P	SUR	33	-13	666	0	0.2	0.7	0.7
4401616	99	P	SUR	37	-32	195	0	0.2	0.2	0.3
4401633	99	P	SUR	31	-20	665	0	0.3	-0.1	0.3
4401750	99	P	SUR	66	4	648	0	0.4	-1.3	1.3
4401751	99	P	SUR	64	-2	625	0	0.3	0.3	0.5
4401753	99	P	SUR	62	-2	608	0	0.4	0.6	0.7
4401799	99	P	SUR	21	-56	675	0	0.3	0.4	0.5
4401802	99	P	SUR	39	-17	665	0	0.3	0.1	0.3
4401893	99	P	SUR	55	-53	668	0	0.4	0.3	0.5
4401894	99	P	SUR	54	-54	651	0	0.5	0.4	0.6
44027	99	P	SUR	44	-67	725	0	0.5	-0.2	0.5
44032	99	P	SUR	44	-69	707	0	0.5	-0.9	1.0
44033	99	P	SUR	44	-69	716	0	0.6	-0.1	0.6
44034	99	P	SUR	44	-68	714	0	0.5	-0.1	0.5
44037	99	P	SUR	44	-68	715	0	0.4	-0.7	0.8
44137	99	P	SUR	42	-62	711	0	0.5	-0.3	0.6
44139	99	P	SUR	44	-57	718	0	0.5	-0.1	0.5
44150	99	P	SUR	43	-64	718	0	0.4	0.0	0.4
44258	99	P	SUR	45	-63	710	0	0.4	-0.2	0.5
44513	99	P	SUR	54	-10	624	0	0.3	-0.3	0.5
44521	99	P	SUR	28	-32	657	0	0.2	-0.8	0.9
44746	99	P	SUR	34	-32	699	0	0.2	0.3	0.4
44777	99	P	SUR	28	-51	695	0	0.2	0.3	0.4
44778	99	P	SUR	27	-59	703	0	0.3	0.1	0.3
44857	99	P	SUR	33	-33	697	0	0.5	0.5	0.7
44874	99	P	SUR	37	-32	700	0	0.3	-0.4	0.5
45138	99	P	SUR	50	-66	713	0	0.5	-0.2	0.6
4700546	99	P	SUR	29	-58	648	0	0.5	0.0	0.5
4701669	99	P	SUR	48	-28	665	0	0.3	0.3	0.5

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
4800770	99	P	SUR	67	-31	646	646	0.0	0.0	0.0
4802505	99	P	SUR	84	-57	667	0	0.5	0.1	0.5
4802512	99	P	SUR	85	-68	667	0	0.4	-0.9	1.0
5301764	99	P	SUR	62	-13	717	0	0.5	0.5	0.7
5301765	99	P	SUR	62	-11	719	0	0.5	0.4	0.7
6100001	99	P	SUR	43	8	678	0	0.4	0.5	0.6
6100002	99	P	SUR	42	5	690	0	0.3	0.1	0.4
61001	99	P	SUR	43	8	678	0	0.4	0.5	0.6
6100196	99	P	SUR	42	4	719	0	0.5	0.3	0.6
6100197	99	P	SUR	40	4	720	0	0.3	0.5	0.6
6100198	99	P	SUR	37	-2	720	0	0.4	0.4	0.5
61002	99	P	SUR	42	5	690	0	0.3	0.1	0.4
6100280	99	P	SUR	41	1	720	0	0.4	0.3	0.5
6100281	99	P	SUR	40	0	720	0	0.4	0.4	0.6
6100417	99	P	SUR	38	0	720	0	0.3	0.5	0.6
6100430	99	P	SUR	40	2	720	0	0.3	0.2	0.4
6101005	99	P	SUR	38	26	174	0	0.6	0.8	1.0
6102505	99	P	SUR	44	9	703	0	0.5	-0.2	0.5
6200024	99	P	SUR	44	-3	720	0	0.4	0.2	0.5
6200025	99	P	SUR	44	-6	720	0	0.4	0.1	0.4
6200082	99	P	SUR	44	-8	717	0	0.4	0.1	0.4
6200083	99	P	SUR	43	-9	720	0	0.4	0.0	0.4
6200084	99	P	SUR	42	-9	719	0	0.3	0.2	0.4
6200085	99	P	SUR	36	-7	719	0	0.3	0.3	0.4
6200092	99	P	SUR	51	-11	720	0	0.4	-0.1	0.4
6200093	99	P	SUR	55	-10	720	0	0.3	-0.1	0.3
6200094	99	P	SUR	52	-7	718	2	0.4	0.1	0.4
6200095	99	P	SUR	53	-16	720	0	0.4	-0.2	0.5
62001	99	P	SUR	45	-5	735	0	0.4	0.2	0.5
6200191	99	P	SUR	41	-10	512	0	0.4	0.2	0.4
6200192	99	P	SUR	40	-10	547	0	0.3	0.2	0.3
6200199	99	P	SUR	40	-9	552	0	0.3	0.1	0.3
6200200	99	P	SUR	36	-8	420	0	0.3	-0.2	0.4
6201030	99	P	SUR	44	-4	671	0	0.4	0.2	0.4
6202640	99	P	SUR	20	-41	567	0	0.2	0.3	0.4
6202641	99	P	SUR	11	-48	471	0	0.3	0.3	0.5
6202642	99	P	SUR	14	-46	560	0	0.3	0.2	0.4
6202643	99	P	SUR	17	-43	471	0	0.2	0.3	0.4
6202644	99	P	SUR	23	-38	573	0	0.2	0.3	0.4
6202675	99	P	SUR	58	-23	2131	0	0.3	0.2	0.3
6202676	99	P	SUR	58	-23	2139	0	0.3	0.2	0.3
6202677	99	P	SUR	58	-23	1305	0	0.3	0.1	0.3
6202678	99	P	SUR	59	-26	2132	0	0.3	0.2	0.4

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
6202679	99	P	SUR	61	-25	2137	0	0.3	0.3	0.4
6202680	99	P	SUR	58	-22	911	0	0.3	0.2	0.3
6202681	99	P	SUR	58	-21	924	0	0.3	0.1	0.3
6202682	99	P	SUR	58	-21	918	0	0.3	0.0	0.3
6202683	99	P	SUR	58	-22	1016	0	0.3	0.2	0.4
6202684	99	P	SUR	59	-22	1007	0	0.3	0.3	0.4
62029	99	P	SUR	49	-12	1375	0	0.3	0.1	0.3
62030	99	P	SUR	50	-4	1279	0	0.5	-0.3	0.6
6203503	99	P	SUR	46	-9	703	0	0.3	-0.0	0.3
6203523	99	P	SUR	68	4	554	0	0.3	-0.4	0.5
6203525	99	P	SUR	72	12	429	0	0.3	-0.7	0.7
6203527	99	P	SUR	61	-8	620	0	0.4	-2.4	2.5
6203528	99	P	SUR	28	-23	672	0	0.3	-0.1	0.3
6203574	99	P	SUR	64	-26	664	0	0.3	0.4	0.5
6203576	99	P	SUR	59	-47	636	0	0.3	0.4	0.5
6203577	99	P	SUR	67	-23	654	0	0.3	0.4	0.5
6203579	99	P	SUR	66	-29	664	0	0.3	0.3	0.4
6203580	99	P	SUR	68	-13	648	0	0.3	0.5	0.6
6203581	99	P	SUR	64	-14	658	0	0.3	0.0	0.3
6203582	99	P	SUR	63	-22	664	0	0.4	0.3	0.5
6203583	99	P	SUR	63	-22	652	0	0.3	0.1	0.3
6203601	99	P	SUR	43	-11	693	0	0.3	0.5	0.6
6203607	99	P	SUR	29	-36	702	0	0.3	0.2	0.3
6203608	99	P	SUR	50	-8	692	0	0.5	0.1	0.5
6203609	99	P	SUR	46	-14	702	0	0.3	-0.1	0.3
6203610	99	P	SUR	50	-7	665	0	0.3	0.3	0.5
6203706	99	P	SUR	27	-62	719	0	0.6	0.1	0.6
6203707	99	P	SUR	30	-33	719	0	0.3	0.5	0.5
6203708	99	P	SUR	28	-38	719	0	0.5	0.3	0.6
6203710	99	P	SUR	62	-14	718	0	0.3	0.2	0.4
6203711	99	P	SUR	63	-14	706	0	0.4	0.3	0.5
6203715	99	P	SUR	73	16	718	0	0.4	0.2	0.5
62050	99	P	SUR	50	-4	738	0	0.4	0.3	0.5
62102	99	P	SUR	58	2	751	0	0.3	0.4	0.5
62103	99	P	SUR	50	-3	751	0	0.4	0.6	0.7
62104	99	P	SUR	57	1	755	0	0.3	0.2	0.4
62107	99	P	SUR	50	-6	1381	0	0.4	0.5	0.6
62112	99	P	SUR	58	0	747	0	0.3	0.6	0.7
62113	99	P	SUR	58	0	751	0	0.4	0.2	0.5
62114	99	P	SUR	58	0	1378	0	0.4	0.5	0.7
62115	99	P	SUR	58	-3	750	0	0.3	0.2	0.4
62116	99	P	SUR	58	1	755	0	0.3	0.3	0.5
62118	99	P	SUR	58	1	753	0	0.3	0.6	0.7

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62119	99	P	SUR	57	2	755	0	0.4	0.3	0.5
62120	99	P	SUR	56	2	8	0	0.4	0.4	0.6
62121	99	P	SUR	54	3	746	0	0.4	0.5	0.7
62122	99	P	SUR	57	2	1384	0	0.4	0.3	0.5
62124	99	P	SUR	54	-4	750	0	0.3	0.2	0.3
62127	99	P	SUR	54	1	750	0	0.4	0.9	0.9
62129	99	P	SUR	58	0	751	0	0.4	0.3	0.5
62130	99	P	SUR	59	1	751	0	0.4	0.2	0.4
62131	99	P	SUR	54	1	755	0	0.4	0.8	0.8
62132	99	P	SUR	56	2	590	0	0.4	0.6	0.7
62133	99	P	SUR	57	1	755	0	0.4	0.4	0.5
62134	99	P	SUR	58	1	750	0	0.3	0.8	0.9
62135	99	P	SUR	54	2	754	0	0.5	0.7	0.8
62136	99	P	SUR	54	3	444	0	0.3	0.8	0.9
62138	99	P	SUR	54	0	1377	0	0.4	1.0	1.0
62139	99	P	SUR	53	2	830	0	0.3	0.6	0.7
62140	99	P	SUR	57	1	1383	0	0.4	0.5	0.6
62141	99	P	SUR	58	-4	653	0	0.4	-2.0	2.0
62143	99	P	SUR	58	2	752	0	0.4	0.9	1.0
62144	99	P	SUR	53	2	755	0	0.4	0.5	0.6
62145	99	P	SUR	53	3	1381	0	0.4	0.6	0.7
62146	99	P	SUR	57	2	755	0	0.4	0.1	0.4
62148	99	P	SUR	54	2	755	0	0.4	0.6	0.7
62149	99	P	SUR	54	1	755	0	0.3	1.0	1.0
62150	99	P	SUR	54	1	516	0	0.4	1.5	1.6
62151	99	P	SUR	57	2	1329	0	0.3	0.5	0.6
62152	99	P	SUR	57	2	755	0	0.4	0.6	0.7
62153	99	P	SUR	57	2	1383	0	0.4	0.5	0.7
62154	99	P	SUR	56	2	754	0	0.4	0.3	0.5
62155	99	P	SUR	58	1	734	0	0.3	0.6	0.7
62157	99	P	SUR	58	0	751	0	0.4	0.3	0.5
62160	99	P	SUR	57	2	1378	0	0.4	0.6	0.8
62161	99	P	SUR	58	1	751	0	0.4	0.2	0.5
62162	99	P	SUR	57	1	752	0	0.3	0.4	0.5
62163	99	P	SUR	48	-8	736	0	0.4	0.4	0.6
62165	99	P	SUR	54	1	752	0	0.4	0.8	0.8
62168	99	P	SUR	58	1	751	0	0.3	0.3	0.5
62170	99	P	SUR	51	2	466	0	0.9	0.2	0.9
62296	99	P	SUR	53	2	752	0	0.3	0.4	0.5
62297	99	P	SUR	59	2	1372	0	0.4	0.3	0.5
62302	99	P	SUR	61	-2	750	0	0.4	0.1	0.4
62304	99	P	SUR	51	2	459	0	0.5	0.8	1.0
62305	99	P	SUR	50	0	751	0	0.4	0.4	0.5

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
62442	99	P	SUR	49	-16	646	0	1.0	0.2	1.0
6301501	99	P	SUR	84	15	666	0	0.4	0.3	0.5
6301505	99	P	SUR	85	13	664	0	0.4	0.1	0.5
6301558	99	P	SUR	68	-14	700	0	0.4	0.8	0.9
6301560	99	P	SUR	69	15	648	0	0.4	0.6	0.7
6301562	99	P	SUR	61	-41	692	0	0.4	0.1	0.4
6301563	99	P	SUR	59	-49	695	0	0.5	0.6	0.8
6301564	99	P	SUR	68	-5	697	0	0.5	0.5	0.7
6301600	99	P	SUR	70	-21	20	0	0.3	0.1	0.3
63055	99	P	SUR	61	2	753	0	0.4	0.0	0.4
63056	99	P	SUR	60	2	729	0	0.4	0.5	0.6
63057	99	P	SUR	59	2	753	0	0.3	0.1	0.4
63058	99	P	SUR	53	2	1306	0	0.3	0.5	0.6
63059	99	P	SUR	58	-1	751	0	0.4	0.8	0.8
63101	99	P	SUR	61	1	739	0	0.4	0.2	0.5
63102	99	P	SUR	61	1	410	0	0.3	0.2	0.4
63103	99	P	SUR	61	1	753	0	0.3	0.2	0.4
63104	99	P	SUR	61	2	753	0	0.3	0.1	0.3
63108	99	P	SUR	61	2	753	0	0.4	-0.0	0.4
63109	99	P	SUR	60	2	753	0	0.4	-0.1	0.4
63110	99	P	SUR	60	2	753	0	0.4	0.0	0.4
63111	99	P	SUR	61	2	1373	0	0.3	-0.1	0.4
63112	99	P	SUR	61	1	753	0	0.4	-0.2	0.4
63115	99	P	SUR	62	1	753	0	0.3	0.0	0.3
63117	99	P	SUR	61	1	1377	0	0.4	0.5	0.7
63118	99	P	SUR	58	-4	997	0	1.0	-0.3	1.0
63120	99	P	SUR	54	2	753	0	0.3	0.7	0.8
6401502	99	P	SUR	72	10	630	0	0.3	0.3	0.4
6401503	99	P	SUR	64	5	619	0	0.4	0.5	0.7
6401506	99	P	SUR	61	-4	616	0	0.4	0.3	0.5
6401531	99	P	SUR	58	-37	668	0	0.3	0.2	0.4
6401539	99	P	SUR	57	-54	631	0	0.3	0.5	0.6
6401550	99	P	SUR	68	12	701	0	0.3	0.0	0.3
6401555	99	P	SUR	69	35	56	0	0.3	0.0	0.3
6401556	99	P	SUR	71	12	704	0	0.4	0.2	0.4
6401561	99	P	SUR	65	-1	702	0	0.5	0.1	0.5
6401565	99	P	SUR	71	30	28	3	7.2	3.6	8.1
6401568	99	P	SUR	62	-5	703	0	0.4	0.3	0.5
6401569	99	P	SUR	62	-2	701	0	0.4	0.3	0.5
6401570	99	P	SUR	69	11	702	0	0.4	0.1	0.4
6401571	99	P	SUR	67	4	701	0	0.3	0.3	0.5
64041	99	P	SUR	61	-3	750	0	0.4	0.2	0.5
64045	99	P	SUR	59	-12	787	3	0.5	-0.1	0.6

DRIFTER MONITORING STATISTICS (EUCOS)
(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS
64046	99	P	SUR	61	-4	730	0	0.4	-0.0	0.4
6501556	99	P	SUR	73	12	694	0	0.3	0.4	0.5
66023	99	P	SUR	55	11	729	0	0.5	0.2	0.6

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 : JUN 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
1300001	99	SPEED	SUR	11	-23	602	0	0	0.9	0.4	1.0
1300002	99	SPEED	SUR	20	-23	606	0	0	0.8	0.0	0.8
1300008	99	SPEED	SUR	15	-38	618	0	0	1.3	0.5	1.4
4100026	99	SPEED	SUR	12	-38	267	0	0	0.9	-0.0	0.9
4100040	99	SPEED	SUR	15	-53	3901	0	0	0.8	0.0	0.8
4100043	99	SPEED	SUR	21	-65	3866	0	0	0.9	0.0	0.9
4100044	99	SPEED	SUR	22	-59	3867	0	0	1.0	0.0	1.0
4100046	99	SPEED	SUR	24	-68	3825	0	0	0.9	-0.2	0.9
4100048	99	SPEED	SUR	32	-70	3749	0	0	1.1	0.0	1.2
4100049	99	SPEED	SUR	27	-63	3952	0	0	1.1	-0.2	1.1
4100052	99	SPEED	SUR	18	-65	4302	0	0	0.8	-0.5	0.9
4100053	99	SPEED	SUR	18	-66	4312	0	0	1.2	1.4	1.8
4100056	99	SPEED	SUR	18	-65	4249	0	0	1.1	-0.8	1.3
4100139	99	SPEED	SUR	20	-38	606	0	0	0.7	-0.1	0.7
4100300	99	SPEED	SUR	16	-57	688	0	0	0.7	-0.4	0.8
41026	99	SPEED	SUR	12	-38	267	0	0	0.9	0.1	0.9
41040	99	SPEED	SUR	15	-53	1243	0	0	0.8	-0.4	0.9
41043	99	SPEED	SUR	21	-65	1280	0	0	1.0	-0.0	1.0
41044	99	SPEED	SUR	22	-59	1275	0	0	1.0	-0.2	1.0
41046	99	SPEED	SUR	24	-68	1296	0	0	0.9	-0.3	0.9
41048	99	SPEED	SUR	32	-70	1338	0	0	1.2	-0.2	1.2
41049	99	SPEED	SUR	28	-63	1561	0	0	1.1	-0.2	1.1
41052	99	SPEED	SUR	18	-65	1797	0	0	0.8	-0.4	0.9
41053	99	SPEED	SUR	19	-66	1842	0	0	1.2	0.7	1.3
41056	99	SPEED	SUR	18	-66	1774	0	0	1.1	-0.6	1.2
41300	99	SPEED	SUR	16	-57	688	0	0	0.8	-0.3	0.8
4200059	99	SPEED	SUR	15	-67	3914	0	0	0.8	0.2	0.8
4200060	99	SPEED	SUR	16	-63	3929	0	0	1.1	0.2	1.1
4200085	99	SPEED	SUR	18	-67	922	0	0	0.9	-0.2	1.0
42059	99	SPEED	SUR	15	-68	1294	0	0	0.9	-0.0	0.9
42060	99	SPEED	SUR	16	-63	1295	0	0	1.1	-0.1	1.1
42085	99	SPEED	SUR	18	-67	903	0	0	1.0	0.1	1.0
4400005	99	SPEED	SUR	43	-69	595	0	0	1.4	-0.8	1.6
4400008	99	SPEED	SUR	41	-69	3991	0	0	1.4	-0.6	1.5

DRIFTER MONITORING STATISTICS (EUCOS)

MONITORING CENTRE : ECMWF

ELEMENT MONITORED : WIND SPEED (M/S)

(CONTINU

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
4400011	99	SPEED	SUR	41	-67	3996	0	0	1.3	-0.6	1.5
4400027	99	SPEED	SUR	44	-67	669	0	0	1.5	-0.6	1.7
4400032	99	SPEED	SUR	44	-69	703	0	0	1.5	-0.8	1.7
4400033	99	SPEED	SUR	44	-69	712	0	0	1.5	-0.6	1.6
4400034	99	SPEED	SUR	44	-68	710	0	0	1.5	-1.3	2.0
4400037	99	SPEED	SUR	43	-68	710	0	0	1.3	-0.6	1.4
44005	99	SPEED	SUR	43	-69	657	0	0	1.5	-0.8	1.7
44008	99	SPEED	SUR	41	-69	1796	0	0	1.4	-1.1	1.8
44011	99	SPEED	SUR	41	-67	1814	0	0	1.4	-1.0	1.7
44027	99	SPEED	SUR	44	-67	756	0	0	1.5	-0.6	1.6
44032	99	SPEED	SUR	44	-69	707	0	0	1.5	-0.8	1.7
44033	99	SPEED	SUR	44	-69	716	0	0	1.5	-0.3	1.5
44034	99	SPEED	SUR	44	-68	714	0	0	1.6	-1.2	2.0
44037	99	SPEED	SUR	44	-68	715	0	0	1.3	-0.5	1.4
44137	99	SPEED	SUR	42	-62	318	0	0	2.7	0.7	2.8
44139	99	SPEED	SUR	44	-57	718	0	0	1.3	-0.5	1.4
44150	99	SPEED	SUR	43	-64	718	0	0	1.4	-0.6	1.6
44258	99	SPEED	SUR	45	-63	710	0	0	1.7	-0.1	1.7
45138	99	SPEED	SUR	50	-66	713	0	0	1.7	-0.3	1.7
6100001	99	SPEED	SUR	43	8	660	0	0	1.4	-0.2	1.4
6100002	99	SPEED	SUR	42	5	690	0	0	1.3	-0.1	1.3
61001	99	SPEED	SUR	43	8	660	0	0	1.5	-0.6	1.6
6100196	99	SPEED	SUR	42	4	706	0	0	1.3	-0.8	1.5
6100197	99	SPEED	SUR	40	4	706	0	0	1.1	-0.2	1.1
6100198	99	SPEED	SUR	37	-2	705	0	0	1.6	-1.1	1.9
61002	99	SPEED	SUR	42	5	690	0	0	1.4	-0.6	1.5
6100280	99	SPEED	SUR	41	1	697	0	0	1.2	-0.8	1.5
6100281	99	SPEED	SUR	40	0	706	0	0	1.7	0.2	1.7
6100417	99	SPEED	SUR	38	0	716	0	0	1.1	-0.1	1.1
6100430	99	SPEED	SUR	40	2	700	0	0	1.4	0.1	1.4
6101005	99	SPEED	SUR	38	26	174	0	0	1.3	-1.0	1.6
6101008	99	SPEED	SUR	37	22	118	0	0	2.0	-3.8	4.3
6200024	99	SPEED	SUR	44	-3	709	0	0	1.3	-0.2	1.3
6200025	99	SPEED	SUR	44	-6	707	0	0	1.3	-0.2	1.3
6200082	99	SPEED	SUR	44	-8	710	0	0	1.1	-0.6	1.2
6200083	99	SPEED	SUR	43	-9	710	0	0	1.0	-0.5	1.2
6200084	99	SPEED	SUR	42	-9	715	0	0	1.1	-0.2	1.1
6200085	99	SPEED	SUR	36	-7	717	0	0	1.2	-0.5	1.3
6200092	99	SPEED	SUR	51	-11	720	0	0	0.9	-0.1	0.9
6200093	99	SPEED	SUR	55	-10	720	0	0	1.0	-0.2	1.0
6200094	99	SPEED	SUR	52	-7	718	0	0	1.2	0.2	1.2

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	-16	720	0	0	0.9	-0.4	1.0
62001	99	SPEED	SUR	45	-5	735	0	0	1.2	0.6	1.3
6200192	99	SPEED	SUR	40	-10	549	0	0	0.8	0.0	0.8
6200199	99	SPEED	SUR	40	-9	553	0	0	1.0	-0.2	1.0
6200200	99	SPEED	SUR	36	-8	561	0	0	1.1	0.3	1.2
6201030	99	SPEED	SUR	44	-4	660	0	0	1.2	-0.2	1.3
62029	99	SPEED	SUR	49	-12	1375	0	0	1.0	0.3	1.0
62050	99	SPEED	SUR	50	-4	738	0	0	1.2	0.5	1.3
62102	99	SPEED	SUR	58	2	751	0	0	1.6	-0.6	1.7
62103	99	SPEED	SUR	50	-3	734	0	0	1.5	1.1	1.9
62104	99	SPEED	SUR	57	1	755	0	0	1.1	-0.0	1.1
62107	99	SPEED	SUR	50	-6	1381	0	0	1.4	0.9	1.7
62112	99	SPEED	SUR	58	0	747	0	0	1.5	0.0	1.5
62113	99	SPEED	SUR	58	0	751	0	0	1.5	0.6	1.6
62114	99	SPEED	SUR	58	0	1378	0	0	1.4	0.9	1.7
62118	99	SPEED	SUR	58	1	753	0	0	1.2	0.7	1.4
62119	99	SPEED	SUR	57	2	755	0	0	1.3	-0.2	1.3
62120	99	SPEED	SUR	56	2	753	0	0	1.3	0.4	1.4
62121	99	SPEED	SUR	54	3	746	0	0	1.3	0.1	1.3
62122	99	SPEED	SUR	57	2	1384	0	0	1.4	-0.1	1.5
62129	99	SPEED	SUR	58	0	751	0	0	1.4	0.2	1.4
62131	99	SPEED	SUR	54	1	755	0	0	1.8	-0.3	1.8
62132	99	SPEED	SUR	56	2	589	0	0	2.9	-2.7	4.0
62133	99	SPEED	SUR	57	1	755	0	0	1.2	0.4	1.3
62134	99	SPEED	SUR	58	1	750	0	0	1.2	0.4	1.3
62140	99	SPEED	SUR	57	1	1383	0	0	1.1	0.1	1.1
62143	99	SPEED	SUR	58	2	752	0	0	1.6	-0.3	1.6
62144	99	SPEED	SUR	53	2	755	0	0	1.8	-0.5	1.9
62145	99	SPEED	SUR	53	3	1381	0	0	1.8	1.4	2.2
62146	99	SPEED	SUR	57	2	755	0	0	1.5	-0.0	1.5
62148	99	SPEED	SUR	54	2	755	0	0	1.5	0.0	1.5
62149	99	SPEED	SUR	54	1	755	0	0	1.6	0.0	1.6
62150	99	SPEED	SUR	54	1	516	0	0	1.4	-0.3	1.4
62152	99	SPEED	SUR	57	2	755	0	0	1.6	-0.5	1.7
62153	99	SPEED	SUR	57	2	1383	0	0	2.2	-1.1	2.5
62154	99	SPEED	SUR	56	2	753	0	0	1.6	0.2	1.6
62155	99	SPEED	SUR	58	1	732	0	0	1.4	-0.4	1.4
62163	99	SPEED	SUR	48	-8	736	0	0	1.1	0.1	1.1
62165	99	SPEED	SUR	54	1	752	0	0	1.3	-0.2	1.3
62170	99	SPEED	SUR	51	2	465	0	0	1.7	0.4	1.8
62304	99	SPEED	SUR	51	2	96	0	0	1.4	1.0	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
62305	99	SPEED	SUR	50	0	751	0	0	1.7	0.8	1.8
62442	99	SPEED	SUR	49	-16	623	0	0	2.3	-0.4	2.3
63055	99	SPEED	SUR	61	2	753	0	0	1.1	-0.4	1.2
63056	99	SPEED	SUR	60	2	729	0	0	1.3	0.3	1.3
63057	99	SPEED	SUR	59	2	753	0	0	1.8	0.6	1.9
63058	99	SPEED	SUR	53	2	1306	0	0	1.7	0.3	1.7
63101	99	SPEED	SUR	61	1	739	0	0	1.3	0.0	1.3
63103	99	SPEED	SUR	61	1	753	0	0	1.3	0.0	1.3
63104	99	SPEED	SUR	61	2	753	0	0	1.1	0.1	1.2
63106	99	SPEED	SUR	61	2	504	0	0	1.3	0.2	1.3
63108	99	SPEED	SUR	61	2	753	0	0	1.7	-0.0	1.7
63109	99	SPEED	SUR	60	2	739	0	0	1.3	0.6	1.4
63110	99	SPEED	SUR	60	2	753	0	0	1.4	0.0	1.4
63112	99	SPEED	SUR	61	1	753	0	0	1.1	-0.2	1.1
63113	99	SPEED	SUR	61	2	751	0	0	1.1	-0.1	1.1
63115	99	SPEED	SUR	62	1	753	0	0	1.2	-0.0	1.2
63117	99	SPEED	SUR	61	1	1377	0	0	1.2	0.2	1.2
64041	99	SPEED	SUR	61	-3	750	0	0	1.3	0.0	1.3
64045	99	SPEED	SUR	59	-12	786	0	0	1.2	0.3	1.2
64046	99	SPEED	SUR	61	-4	730	0	0	1.1	0.7	1.3
66021	99	SPEED	SUR	55	14	717	0	0	2.1	0.2	2.1
66022	99	SPEED	SUR	54	14	578	0	0	1.4	0.1	1.4
66023	99	SPEED	SUR	55	11	729	0	0	1.8	0.6	1.9
66024	99	SPEED	SUR	55	13	705	0	0	1.5	0.2	1.5

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 : JUN 2019
 STANDARD OF COMPARISON: FIRST-GUESS FIELD

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
1300001	99	DIRN	SUR	11	-23	495	0	0	12.2	-2.1	12.3
1300002	99	DIRN	SUR	20	-23	601	0	0	7.8	-1.4	7.9
1300008	99	DIRN	SUR	15	-38	618	0	0	8.0	4.6	9.2
4100001	99	DIRN	SUR	35	-73	3191	0	0	21.4	11.0	24.1
4100002	99	DIRN	SUR	32	-75	3290	0	0	17.7	6.4	18.8
4100004	99	DIRN	SUR	33	-79	3230	0	0	20.4	5.8	21.2
4100008	99	DIRN	SUR	31	-81	571	0	0	23.0	-4.6	23.5
4100009	99	DIRN	SUR	29	-80	2949	0	0	25.3	9.2	26.9
4100010	99	DIRN	SUR	29	-78	2565	0	0	26.4	10.5	28.4
4100013	99	DIRN	SUR	33	-78	3055	0	0	21.1	3.6	21.4
4100024	99	DIRN	SUR	34	-78	542	0	0	31.4	-5.8	31.9
4100025	99	DIRN	SUR	35	-75	887	0	0	14.9	3.8	15.4
4100026	99	DIRN	SUR	12	-38	266	0	0	10.5	8.1	13.2
4100029	99	DIRN	SUR	33	-80	582	0	0	30.0	-12.0	32.3
4100033	99	DIRN	SUR	32	-80	589	0	0	30.3	-13.1	33.0
4100037	99	DIRN	SUR	34	-77	534	0	0	23.7	-15.4	28.3
4100038	99	DIRN	SUR	34	-78	510	0	0	28.6	-5.4	29.1
4100040	99	DIRN	SUR	15	-53	3901	0	0	8.0	3.8	8.8
4100043	99	DIRN	SUR	21	-65	3698	0	0	11.3	-13.5	17.6
4100044	99	DIRN	SUR	22	-59	3766	0	0	12.9	2.4	13.1
4100046	99	DIRN	SUR	24	-68	3180	0	0	12.0	7.5	14.2
4100047	99	DIRN	SUR	28	-71	2912	0	0	15.1	-7.7	17.0
4100048	99	DIRN	SUR	32	-70	2605	0	0	26.5	13.8	29.9
4100049	99	DIRN	SUR	27	-63	2188	0	0	13.8	0.5	13.8
4100052	99	DIRN	SUR	18	-65	4180	0	0	10.2	4.1	10.9
4100053	99	DIRN	SUR	18	-66	3132	0	0	14.6	6.0	15.8
4100056	99	DIRN	SUR	18	-65	4003	0	0	12.5	2.8	12.8
4100064	99	DIRN	SUR	34	-77	507	0	0	22.8	-23.5	32.8
41001	99	DIRN	SUR	35	-73	1098	0	0	22.1	9.9	24.2
4100139	99	DIRN	SUR	20	-38	591	0	0	7.8	0.8	7.8
41002	99	DIRN	SUR	32	-75	1125	0	0	18.4	8.2	20.2
4100300	99	DIRN	SUR	16	-57	687	0	0	10.4	2.7	10.8

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
41004	99	DIRN	SUR	33	-79	1021	0	0	23.3	4.3	23.7
41008	99	DIRN	SUR	31	-81	642	0	0	22.5	-4.9	23.1
41009	99	DIRN	SUR	29	-80	914	0	0	25.7	6.5	26.5
41010	99	DIRN	SUR	29	-79	716	0	0	28.9	9.0	30.3
41013	99	DIRN	SUR	33	-78	987	0	0	21.7	3.3	22.0
41024	99	DIRN	SUR	34	-79	545	0	0	31.9	-5.9	32.4
41025	99	DIRN	SUR	35	-75	282	0	0	15.7	3.1	16.0
41026	99	DIRN	SUR	12	-38	266	0	0	10.6	7.5	13.0
41029	99	DIRN	SUR	33	-80	823	0	0	28.8	-14.4	32.2
41033	99	DIRN	SUR	32	-80	573	0	0	31.0	-13.5	33.8
41037	99	DIRN	SUR	34	-77	537	0	0	23.2	-17.0	28.8
41038	99	DIRN	SUR	34	-78	503	0	0	28.6	-5.4	29.2
41040	99	DIRN	SUR	15	-53	1243	0	0	8.8	5.8	10.6
41043	99	DIRN	SUR	21	-65	1199	0	0	10.5	-14.9	18.2
41044	99	DIRN	SUR	22	-59	1208	0	0	12.7	1.1	12.8
41046	99	DIRN	SUR	24	-68	1067	0	0	11.6	6.8	13.5
41047	99	DIRN	SUR	28	-72	976	0	0	14.1	-9.2	16.8
41048	99	DIRN	SUR	32	-70	911	0	0	28.7	12.6	31.3
41049	99	DIRN	SUR	28	-63	799	0	0	13.2	-1.2	13.3
41052	99	DIRN	SUR	18	-65	1728	0	0	10.4	3.0	10.8
41053	99	DIRN	SUR	19	-66	1439	0	0	15.0	4.2	15.6
41056	99	DIRN	SUR	18	-66	1645	0	0	12.8	3.7	13.3
41064	99	DIRN	SUR	34	-77	495	0	0	22.7	-25.0	33.8
41300	99	DIRN	SUR	16	-57	687	0	0	10.4	2.7	10.8
4200013	99	DIRN	SUR	27	-83	695	0	0	26.0	-4.4	26.3
4200022	99	DIRN	SUR	28	-84	742	0	0	24.4	9.7	26.3
4200023	99	DIRN	SUR	26	-83	644	0	0	27.9	0.3	27.9
4200036	99	DIRN	SUR	29	-85	222	0	0	17.3	-9.9	19.9
4200056	99	DIRN	SUR	20	-85	3064	0	0	16.5	3.1	16.8
4200057	99	DIRN	SUR	17	-81	3777	0	0	6.6	0.1	6.6
4200058	99	DIRN	SUR	15	-75	3780	0	0	4.9	4.0	6.3
4200059	99	DIRN	SUR	15	-67	3914	0	0	8.9	-5.3	10.4
4200060	99	DIRN	SUR	16	-63	3850	0	0	11.2	4.7	12.1
4200085	99	DIRN	SUR	18	-67	913	0	0	14.3	8.8	16.8
42013	99	DIRN	SUR	27	-83	657	0	0	24.8	-4.1	25.1
42022	99	DIRN	SUR	28	-84	685	0	0	22.2	9.3	24.1
42023	99	DIRN	SUR	26	-83	497	0	0	29.2	1.3	29.2
42036	99	DIRN	SUR	29	-85	74	0	0	18.1	-11.7	21.5
42056	99	DIRN	SUR	20	-85	1011	0	0	13.8	2.2	14.0
42057	99	DIRN	SUR	17	-81	1277	0	0	7.4	2.6	7.8
42058	99	DIRN	SUR	15	-75	1300	0	0	5.5	3.2	6.4

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
42059	99	DIRN	SUR	15	-68	1294	0	0	9.4	-6.9	11.7
42060	99	DIRN	SUR	16	-63	1242	0	0	11.5	-0.0	11.5
42085	99	DIRN	SUR	18	-67	880	0	0	12.8	8.2	15.2
4400005	99	DIRN	SUR	43	-69	402	0	0	17.5	9.1	19.8
4400007	99	DIRN	SUR	44	-70	382	0	0	23.7	4.2	24.0
4400008	99	DIRN	SUR	41	-69	2684	0	0	16.7	18.5	25.0
4400009	99	DIRN	SUR	38	-75	541	0	0	25.8	14.7	29.7
4400011	99	DIRN	SUR	41	-67	2686	0	0	17.9	12.4	21.8
4400013	99	DIRN	SUR	42	-71	453	0	0	28.4	20.9	35.3
4400014	99	DIRN	SUR	37	-75	489	0	0	20.0	6.7	21.0
4400017	99	DIRN	SUR	41	-72	2868	0	0	16.1	9.6	18.8
4400018	99	DIRN	SUR	42	-70	462	0	0	17.7	14.0	22.6
4400020	99	DIRN	SUR	41	-70	2336	0	0	18.9	3.0	19.1
4400022	99	DIRN	SUR	41	-74	41	0	0	26.3	3.6	26.6
4400025	99	DIRN	SUR	40	-73	494	0	0	17.9	4.3	18.4
4400027	99	DIRN	SUR	44	-67	442	0	0	18.7	12.4	22.4
4400029	99	DIRN	SUR	43	-71	443	0	0	24.1	8.7	25.6
4400030	99	DIRN	SUR	43	-70	461	0	0	30.0	7.9	31.0
4400032	99	DIRN	SUR	44	-69	416	0	0	22.9	11.9	25.8
4400033	99	DIRN	SUR	44	-69	361	0	0	25.3	9.3	26.9
4400034	99	DIRN	SUR	44	-68	367	0	0	19.3	14.9	24.4
4400037	99	DIRN	SUR	43	-68	480	0	0	17.5	10.2	20.2
4400039	99	DIRN	SUR	41	-73	4	0	0	4.2	13.1	13.7
4400040	99	DIRN	SUR	41	-74	31	0	0	30.5	1.0	30.5
4400042	99	DIRN	SUR	38	-76	2374	0	0	37.1	-3.6	37.2
4400058	99	DIRN	SUR	38	-76	236	0	0	35.5	-17.9	39.8
4400062	99	DIRN	SUR	39	-76	112	0	0	44.6	-12.8	46.4
4400063	99	DIRN	SUR	39	-76	2084	0	0	30.6	-20.3	36.8
4400064	99	DIRN	SUR	37	-76	1948	0	0	24.2	-17.5	29.8
4400065	99	DIRN	SUR	40	-74	2730	0	0	19.5	10.6	22.2
4400066	99	DIRN	SUR	40	-73	2847	0	0	16.0	11.5	19.7
44005	99	DIRN	SUR	43	-69	419	0	0	16.0	8.7	18.2
44007	99	DIRN	SUR	44	-70	414	0	0	24.9	5.5	25.5
44008	99	DIRN	SUR	41	-69	1104	0	0	16.5	16.3	23.2
44009	99	DIRN	SUR	39	-75	527	0	0	25.1	13.5	28.6
44011	99	DIRN	SUR	41	-67	1172	0	0	18.4	14.6	23.5
44013	99	DIRN	SUR	42	-71	472	0	0	29.0	18.9	34.6
44014	99	DIRN	SUR	37	-75	483	0	0	19.4	6.8	20.5
44017	99	DIRN	SUR	41	-72	1222	0	0	16.0	9.5	18.6
44018	99	DIRN	SUR	42	-70	500	0	0	18.1	13.2	22.4
44020	99	DIRN	SUR	42	-70	916	0	0	19.6	3.1	19.8

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
44022	99	DIRN	SUR	41	-74	14	0	0	28.1	3.6	28.3
44025	99	DIRN	SUR	40	-73	546	0	0	17.8	4.5	18.4
44027	99	DIRN	SUR	44	-67	468	0	0	20.6	12.7	24.2
44029	99	DIRN	SUR	43	-71	645	0	0	29.2	8.0	30.2
44030	99	DIRN	SUR	43	-70	443	0	0	30.0	7.7	31.0
44032	99	DIRN	SUR	44	-69	388	0	0	21.2	11.4	24.1
44033	99	DIRN	SUR	44	-69	333	0	0	24.6	7.7	25.8
44034	99	DIRN	SUR	44	-68	348	0	0	21.1	15.8	26.3
44037	99	DIRN	SUR	44	-68	465	0	0	15.7	10.3	18.8
44039	99	DIRN	SUR	41	-73	1	0	0	0.0	11.4	11.4
44040	99	DIRN	SUR	41	-74	13	0	0	37.0	-2.2	37.1
44042	99	DIRN	SUR	38	-76	557	0	0	36.0	-6.7	36.7
44058	99	DIRN	SUR	38	-76	105	0	0	29.0	-23.1	37.1
44062	99	DIRN	SUR	39	-76	66	0	0	45.1	-18.3	48.7
44063	99	DIRN	SUR	39	-76	452	0	0	32.5	-20.2	38.3
44064	99	DIRN	SUR	37	-76	536	0	0	24.2	-18.7	30.6
44065	99	DIRN	SUR	40	-74	861	0	0	18.9	8.0	20.5
44066	99	DIRN	SUR	40	-73	1187	0	0	15.9	7.3	17.5
44069	99	DIRN	SUR	41	-73	559	0	0	18.6	-0.1	18.6
44137	99	DIRN	SUR	42	-62	244	0	0	14.4	2.3	14.6
44139	99	DIRN	SUR	44	-57	452	0	0	15.4	-18.9	24.4
44150	99	DIRN	SUR	43	-64	503	0	0	14.7	4.8	15.5
44258	99	DIRN	SUR	45	-63	412	0	0	20.7	8.8	22.5
4500003	99	DIRN	SUR	45	-83	390	0	0	32.4	15.8	36.0
4500005	99	DIRN	SUR	42	-82	2526	0	0	26.5	12.7	29.4
4500008	99	DIRN	SUR	44	-82	2314	0	0	25.1	17.7	30.7
4500012	99	DIRN	SUR	44	-77	2222	0	0	22.2	18.2	28.8
4500162	99	DIRN	SUR	45	-83	947	0	0	23.7	6.4	24.5
4500163	99	DIRN	SUR	44	-84	1497	0	0	34.2	4.3	34.5
4500165	99	DIRN	SUR	42	-83	1966	0	0	31.5	12.7	34.0
4500169	99	DIRN	SUR	42	-82	2358	0	0	39.1	-12.6	41.1
4500175	99	DIRN	SUR	46	-85	1997	0	0	72.7	-24.7	76.7
4500176	99	DIRN	SUR	42	-82	1004	0	0	96.3	-38.0	103.6
4500178	99	DIRN	SUR	45	-73	589	0	0	22.7	-4.1	23.1
4500188	99	DIRN	SUR	44	-73	28	0	0	18.8	-6.1	19.8
45003	99	DIRN	SUR	45	-83	345	0	0	30.0	13.5	32.9
45005	99	DIRN	SUR	42	-82	809	0	0	26.5	12.6	29.4
45008	99	DIRN	SUR	44	-82	939	0	0	24.1	17.3	29.6
45012	99	DIRN	SUR	44	-77	972	0	0	21.4	13.8	25.5
45132	99	DIRN	SUR	43	-81	450	0	0	19.3	4.4	19.8
45135	99	DIRN	SUR	44	-77	422	0	0	19.9	8.6	21.7

DRIFTER MONITORING STATISTICS (EUCOS)

MONITORING CENTRE : ECMWF

ELEMENT MONITORED : WIND DIRECTION (DEGREES)

(CONTINUED)

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
45137	99	DIRN	SUR	46	-81	450	0	0	17.3	7.9	19.0
45138	99	DIRN	SUR	50	-66	488	0	0	21.8	4.0	22.2
45139	99	DIRN	SUR	43	-80	237	0	0	26.6	7.4	27.6
45142	99	DIRN	SUR	43	-79	398	0	0	23.0	2.6	23.2
45143	99	DIRN	SUR	45	-81	401	0	0	21.2	11.6	24.2
45147	99	DIRN	SUR	42	-83	380	0	0	21.1	5.3	21.8
45149	99	DIRN	SUR	44	-82	382	0	0	21.3	29.2	36.1
45151	99	DIRN	SUR	45	-79	313	0	0	19.5	6.1	20.4
45152	99	DIRN	SUR	46	-80	347	0	0	17.5	2.8	17.7
45154	99	DIRN	SUR	46	-83	316	0	0	17.7	5.1	18.4
45159	99	DIRN	SUR	44	-79	292	0	0	23.1	7.2	24.1
45162	99	DIRN	SUR	45	-83	347	0	0	22.2	5.7	22.9
45163	99	DIRN	SUR	44	-84	573	0	0	33.4	1.2	33.5
45165	99	DIRN	SUR	42	-83	410	0	0	31.0	8.3	32.1
45169	99	DIRN	SUR	42	-82	530	0	0	42.0	-11.9	43.7
45175	99	DIRN	SUR	46	-85	481	0	0	73.0	-27.2	78.0
45176	99	DIRN	SUR	42	-82	267	0	0	97.4	-29.8	101.8
45178	99	DIRN	SUR	45	-73	474	0	0	27.1	-3.9	27.4
45188	99	DIRN	SUR	44	-73	57	0	0	19.8	-7.9	21.3
6100198	99	DIRN	SUR	37	-2	438	0	0	14.4	1.5	14.5
6100281	99	DIRN	SUR	40	0	349	0	0	36.4	-7.7	37.2
6100417	99	DIRN	SUR	38	0	522	0	0	13.7	2.5	13.9
6200024	99	DIRN	SUR	44	-3	393	0	0	20.3	11.3	23.2
6200025	99	DIRN	SUR	44	-6	370	0	0	15.6	-0.5	15.6
6200082	99	DIRN	SUR	44	-8	404	0	0	13.2	7.7	15.3
6200083	99	DIRN	SUR	43	-9	421	0	0	14.3	1.6	14.4
6200084	99	DIRN	SUR	42	-9	463	0	0	12.9	-1.1	12.9
6200085	99	DIRN	SUR	36	-7	464	0	0	12.1	1.1	12.2
6200092	99	DIRN	SUR	51	-11	635	0	0	11.6	6.9	13.5
6200093	99	DIRN	SUR	55	-10	668	0	0	13.1	1.8	13.2
6200094	99	DIRN	SUR	52	-7	589	0	0	12.5	-0.5	12.6
6200095	99	DIRN	SUR	53	-16	708	0	0	13.3	-5.1	14.2
62001	99	DIRN	SUR	45	-5	529	0	0	15.3	5.2	16.1
6200192	99	DIRN	SUR	40	-10	424	0	0	11.5	-3.5	12.0
6200199	99	DIRN	SUR	40	-9	368	0	0	11.8	-3.1	12.2
6200200	99	DIRN	SUR	36	-8	467	0	0	11.4	3.6	11.9
6201030	99	DIRN	SUR	44	-4	370	0	0	16.9	0.8	16.9
62029	99	DIRN	SUR	49	-12	1257	0	0	13.0	11.2	17.1
62050	99	DIRN	SUR	50	-4	612	0	0	16.9	4.8	17.5
62103	99	DIRN	SUR	50	-3	640	0	0	20.4	7.3	21.7
62107	99	DIRN	SUR	50	-6	1208	0	0	16.6	6.4	17.8

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

WMO IDENT	OBS TIME	ELM	LEVEL	MEAN LAT	MEAN LONG	NUM OBS	NUM GROSS	% GROSS	SD	BIAS	RMS
62112	99	DIRN	SUR	58	0	646	0	0	13.9	-4.3	14.5
62114	99	DIRN	SUR	58	0	1253	0	0	13.5	-3.5	14.0
62163	99	DIRN	SUR	48	-8	594	0	0	14.8	-1.4	14.9
62305	99	DIRN	SUR	50	0	619	0	0	21.2	8.3	22.8
62442	99	DIRN	SUR	49	-16	486	0	0	14.0	-6.7	15.5
64041	99	DIRN	SUR	61	-3	665	0	0	14.6	6.0	15.8
64045	99	DIRN	SUR	59	-12	663	0	0	12.3	7.6	14.4
64046	99	DIRN	SUR	61	-4	620	0	0	12.2	-2.0	12.4

4.12 Table 24 - List of Assimilated BUFR Encoded Radiosonde Stations

ASDE09	DBLK	FHM5UJH	HTXUH4H	JNKN7JF	KMPLHPW	QCY3TGN	VKB4L5Q	WDK38HS
XKQLWQB	XQFJRGX	YLV96WM	ZVQEQCM	5QPW8XG	7JUNA4N	01001	01004	01010
01028	01241	01400	01415	01492	02185	02365	02527	02591
02836	02963	03005	03238	03354	03502	03743	03808	03882
03918	03953	04018	04220	04270	04320	04339	04360	04417
06011	06260	06458	06610	07110	07145	07510	07645	07761
08001	08023	08190	08221	08302	08383	08430	08508	08522
08579	10035	10113	10184	10238	10304	10393	10410	10548
10618	10739	10771	10868	10954	10962	11010	11035	11120
11240	11520	11747	11952	12120	12374	12425	12843	12982
13275	13388	14015	14240	14430	15420	15614	16045	16080
16113	16144	16245	16320	16429	16546	16622	16716	16754
17030	17064	17095	17130	17220	17240	17281	17516	17607
22008	23205	23472	26038	26435	27707	27713	29612	33008
33041	37789	40179	40186	43599	45004	47102	47104	47138
47155	47169	47186	47401	47412	47418	47582	47600	47646
47678	47741	47778	47807	47827	47909	47918	47945	47971
47991	48698	60018	60155	61901	61980	61998	68263	68424
68442	68538	68816	68842	70133	70200	70231	70316	71043
71081	71082	71109	71117	71119	71600	71603	71722	71802
71811	71815	71816	71823	71836	71845	71867	71906	71907
71908	71909	71913	71917	71924	71925	71926	71934	71945
71957	71964	72201	72206	72208	72210	72214	72215	72230
72233	72235	72240	72248	72249	72250	72251	72261	72265
72274	72293	72317	72327	72340	72363	72364	72365	72376
72388	72426	72440	72451	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	74389	74494	74560	76225	76405
76458	76526	76612	76679	76692	76805	76903	78897	78954
81405	82983	85442	85469	85586	85799	85934	87155	87344
87418	87576	87623	87715	87860	88889	89002	89062	89564
89571	89611	89625	89642	89859	91212	91285	91592	91765
91925	91938	91948	91958	93112	93417	93817	93844	93997
94120	94150	94170	94203	94294	94299	94302	94326	94332
94374	94403	94430	94461	94510	94578	94610	94637	94638
94653	94659	94672	94711	94767	94776	94802	94821	94866
94910	94975	94995	94996	94998	95527	96996		

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

ASDE09	DBLK	FHM5UJH	HTXUH4H	JNKN7JF	KMPLHPW	QCY3TGN	VKB4L5Q	WDK38HS
XKQLWQB	XQFJRGX	YLV96WM	ZVQEQCM	5QPW8XG	7JUNA4N	01001	01010	01028
01241	01400	01415	01492	02836	02963	06610	07110	07145
07510	07645	07761	17607	40186	47155	61998	71117	73033
76903	89642	94653	94767					

5 Annex - Explanations of figures and tables

5.1 General

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

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

5.2 Data Availability

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

5.3 Data Quality

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

It should be noted that:

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

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

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

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

The corresponding limits for wind (table 8) are:

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

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

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

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

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

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

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

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

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