



European Centre for Medium-Range Weather Forecasts

## SUMMARY REPORT ON THE MONITORING OF ASAP SHIP DATA

January-December 2011

### 1. Summary

The number of ASAP reports received at ECMWF were slightly increased in 2011 compared to the numbers received in 2010. The percentage of ascents reaching the level of 100 hPa was reduced to values between 75 and 80% in the winter of 2011 and then recovering to normal values in the first half of 2012. Problems related to wrongly located reports still there. The quality of the data has continued to be good and highly valuable.

### 2. Data reception

Figures 1 to 3 show time series from January 1994 to June 2012 with monthly counts of ASAP reports at different levels. In previous years we've been looking to the percentage of launches reaching the lower Stratosphere (namely 100 hPa). This percentage came down to the lowest values since 1994 during the last winter and then recovering to normal values in the spring 2012.

## Monthly counts of ASAP received at ECMWF Temperature 500 hPa - GLOBAL

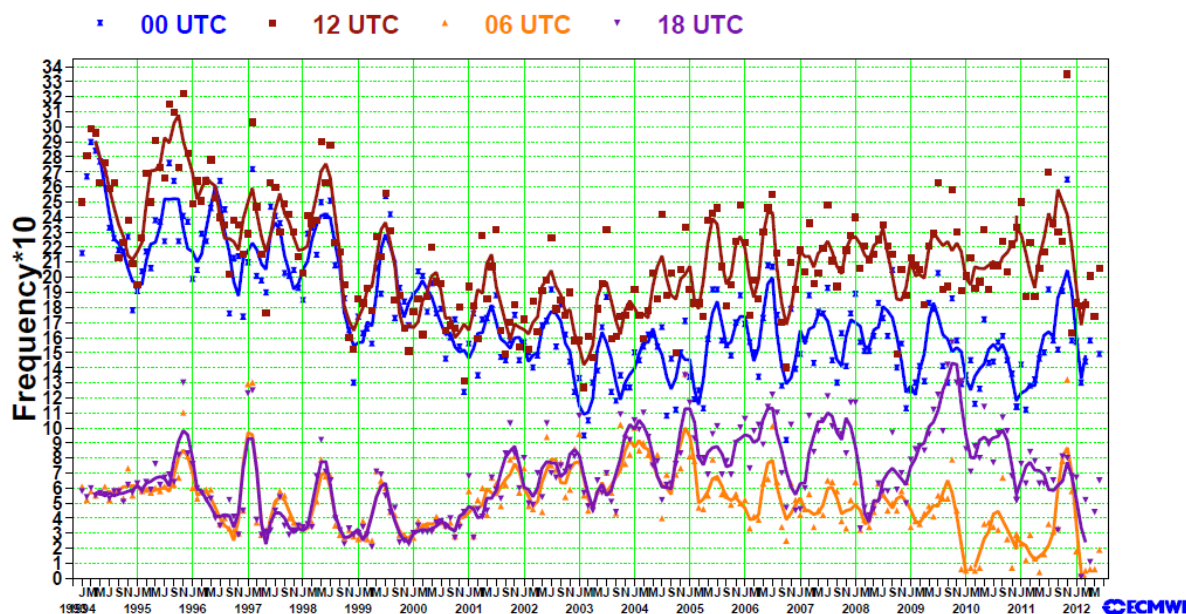


Figure 1

ASAP temperature data received at ECMWF 500 hPa (Jan 1994 to June 2012)

## Monthly counts of ASAP received at ECMWF Temperature reports reaching 100 hPa - GLOBAL

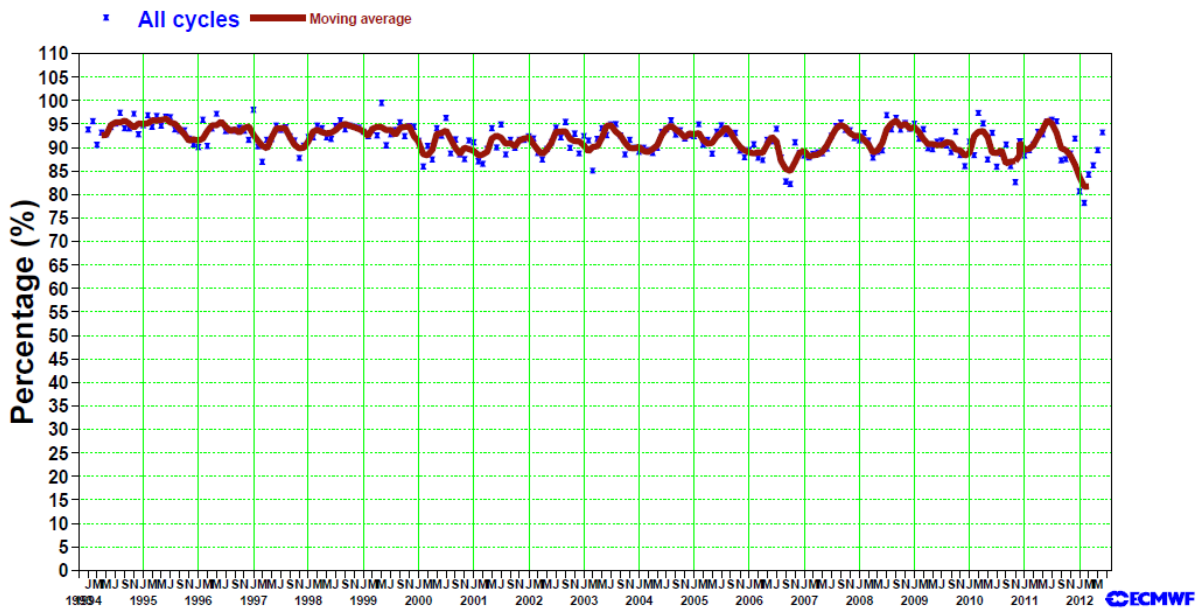


Figure 2

Percentage of ASAP reports reaching the 100 hPa level (Jan 1994 to Jun 2012)

## Monthly counts of ASAP received at ECMWF Wind 250 hPa - GLOBAL

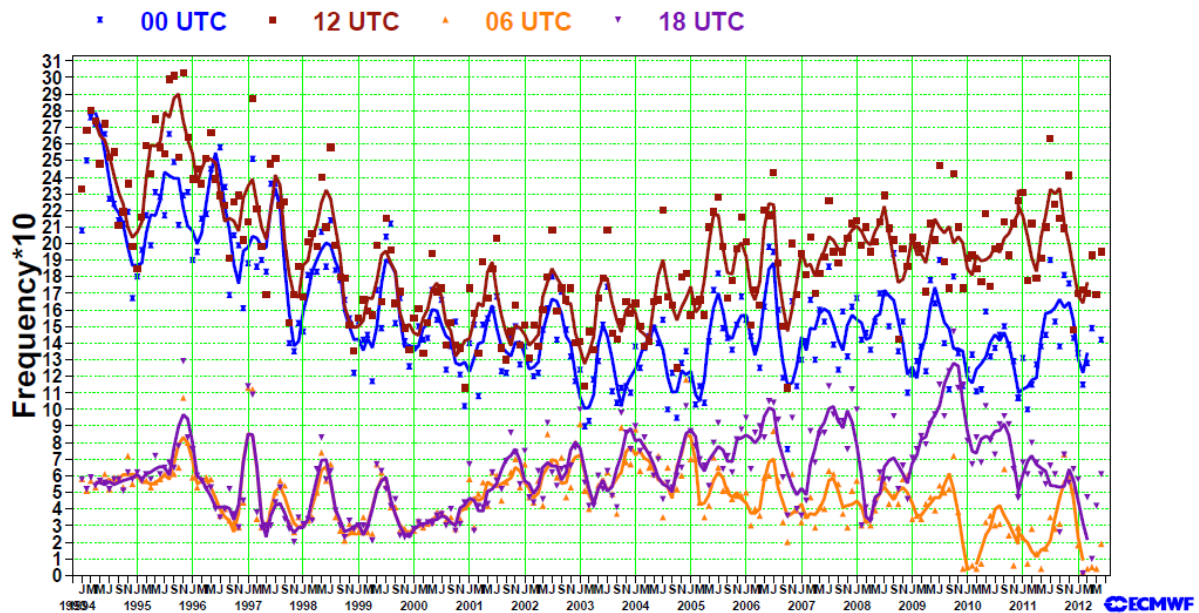


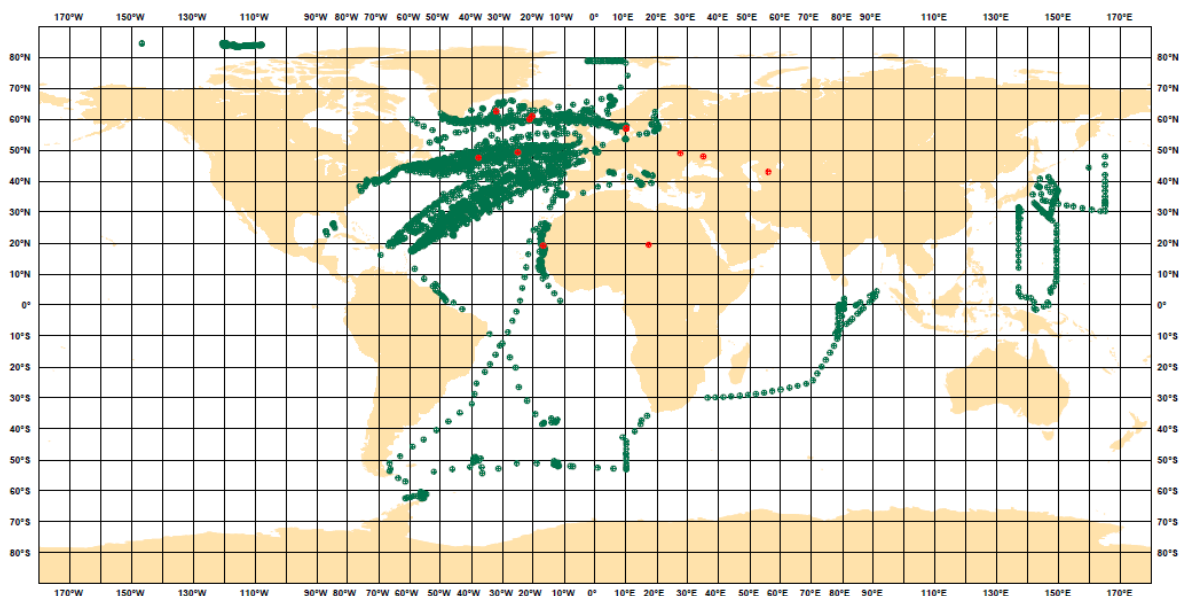
Figure 3

ASAP wind data received at ECMWF 250 hPa (Jan 1994 to June 2012)

As in previous years most of the ASAP units were operating in the North Atlantic and very few on the South Atlantic and Indian Ocean. Apart from that we can see in figure 4 the Japanese ASAP operating close to Japan.

# ASAP tracks

## 1 Jan-30 Jun 2012



CECMWF

Figure 4  
ASAP tracks January to June 2012

### 3. Troubleshooting

Nothing new regarding this. The main problem related to ASAP reports continue to be misplaced reports. Figure 5 shows the tracks of ASAP units January to June 2012. A number of misplaced reports are evident on the chart. The usage of a tracker built-in the monitoring tools can't always trap those wrong positions.

Figures 6 and 7 show one of these cases. The tracker computing the unit speed between two consecutive reports mark as suspicious the report with date 31<sup>st</sup> of August 2011 at 17 UTC when actually the wrongly located is the report with date 31<sup>st</sup> of August 2012 at 11 UTC. Having a look of the tephigrams shown in figure 6 comparing the profiles of the observation and background fields of the model we can see how different both profiles are. The time series shown in figure 7 confirm the suspicious portion mentioned before. In most of the cases the tracker works fine though. Figures 8 and 9 show one of those cases. The tracker correctly pinpoints the wrongly located report. Again the tephigrams and the time series support each other. The question is if those platforms deserve to be blacklisted. To answer this we look to monthly statistics and time series. Only when the bad positions are systematic we proceed to blacklist an ASAP. This was not the case, the time series shown in figure 10 show good performance of ASDK1, so one or two isolated cases is not enough to blacklist this unit.

From time to time we see also reports reporting missing values for latitude/longitude. In those cases the assimilation system assumes a position lat=0/lon=0. This particular position is dynamically blacklisted in the assimilation. Two examples from unit ASDK2 are shown in figure 11. Again this behaviour was not systematic and the monthly averaged time series displayed in figure 12 showed no particular problems.

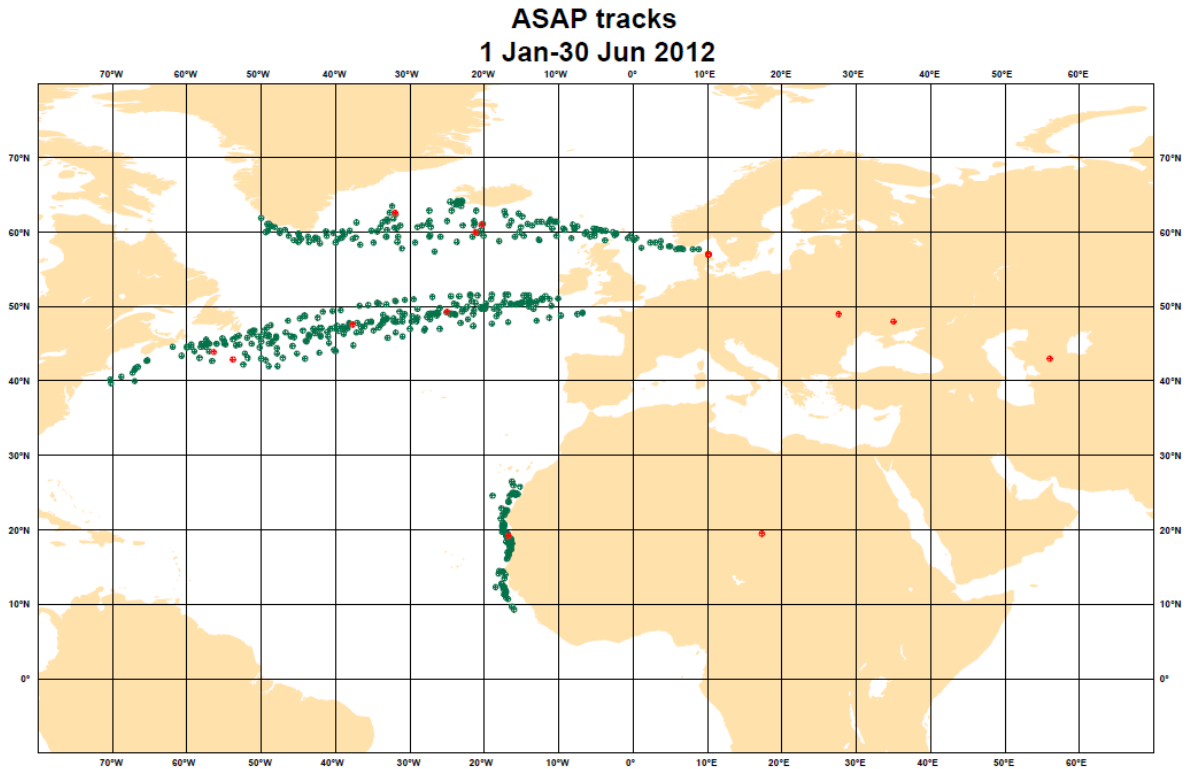


Figure 5  
ASAP ASEU06, ASES01, ASDE03, ASDK01 and ASDK02 tracks Jan to Jun 2012

... a tracker gets confused ...

#####	2011-08-28 05: 0:00	58.3	3.7 -->	23.2 Km/hr
ID:ASDK1	2011-08-31 11: 0:00	57.8	-7.5 -->	8.5 Km/hr
#####	2011-08-31 17: 0:00	58.1	5.1 -->	124.0 Km/hr

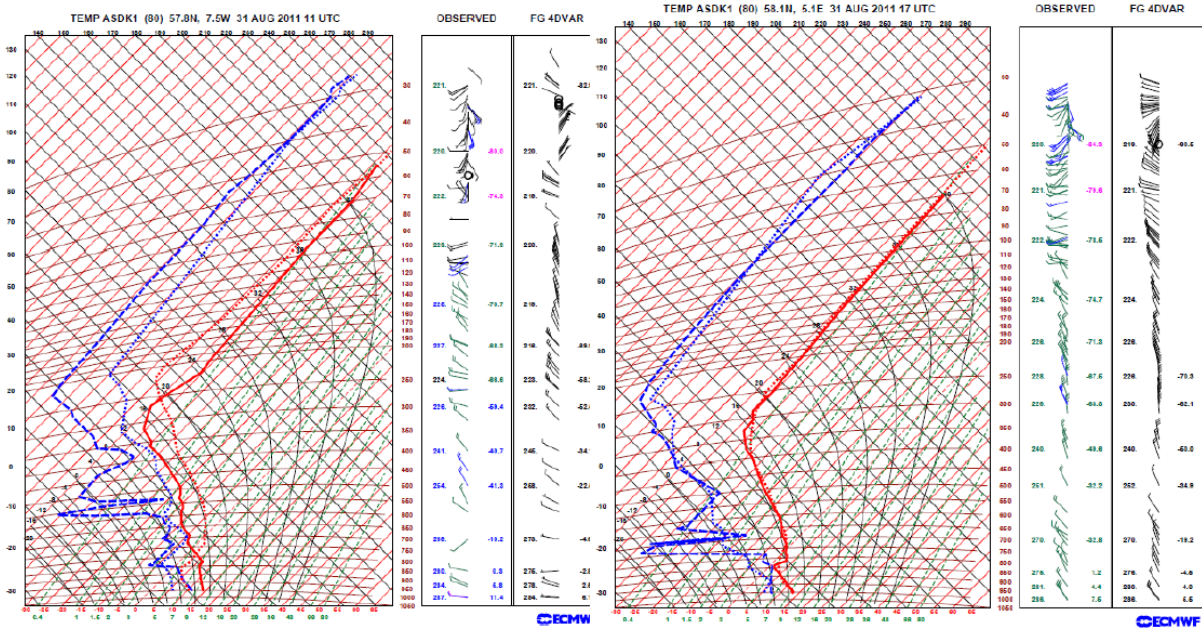


Figure 6

Tephigrams of two consecutive reports ASDK1  
Full red: Observed t, dotted red: FG t, dashed blue: Observed dew point, dotted blue: FG dew point profiles



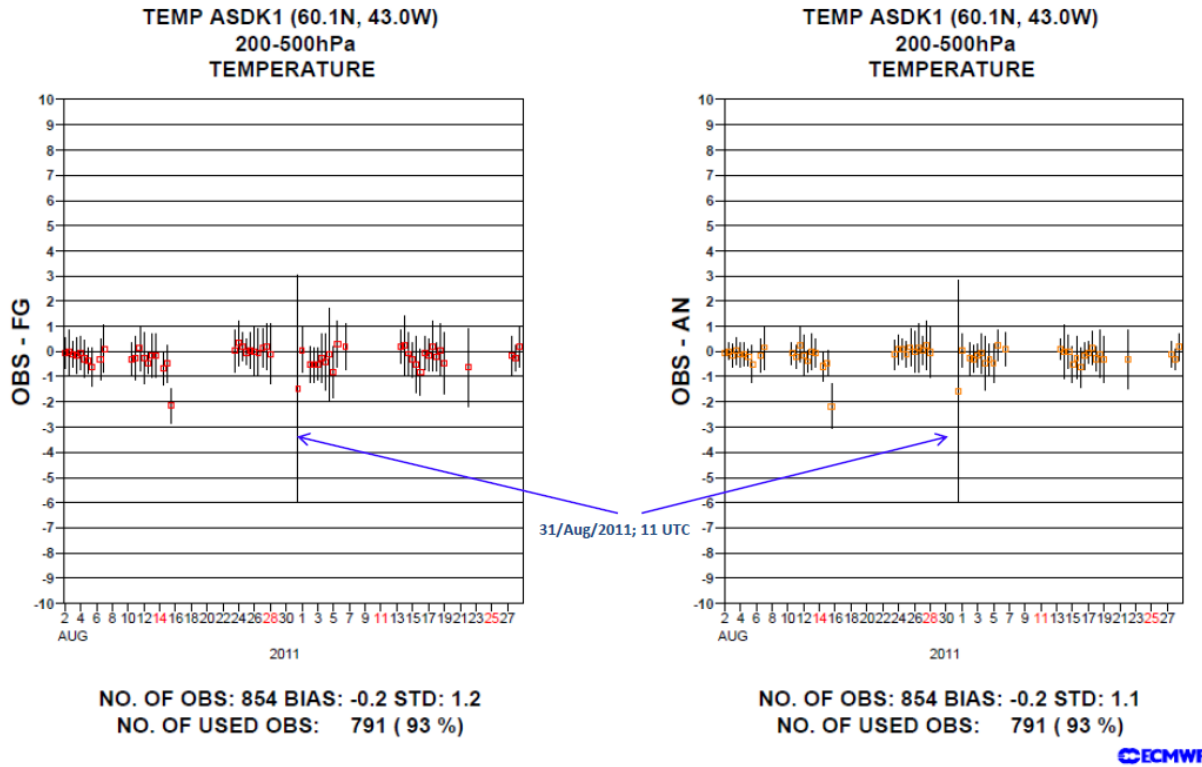


Figure 7  
Time series of ASAP ASDK1: temperature 200-500 hPa (bias and std)

...bad position detected by the tracker ...

#####;	2012-02-06 23:00:00	58.5	-42.1	
ID:ASDK1	2012-02-07 23:00:00	58.7	-31.7	25.1 km/hr
#####;	2012-02-08 11:00:00	57.0	10.1	206.7 km/hr

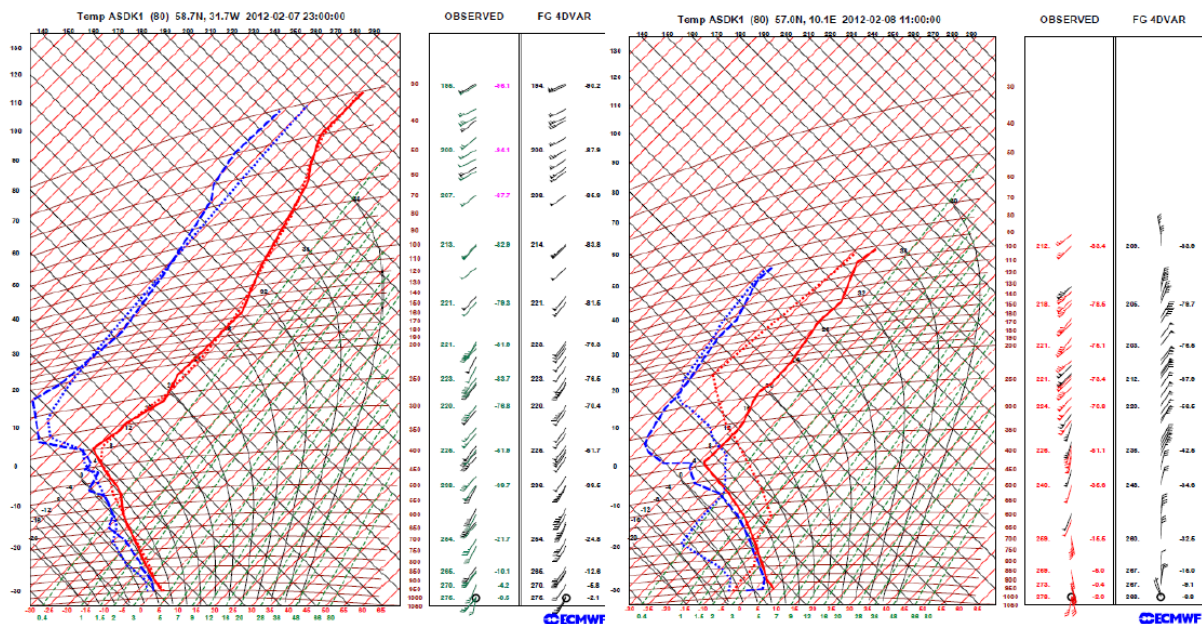


Figure 8

# ASAP ASDK1 temperature

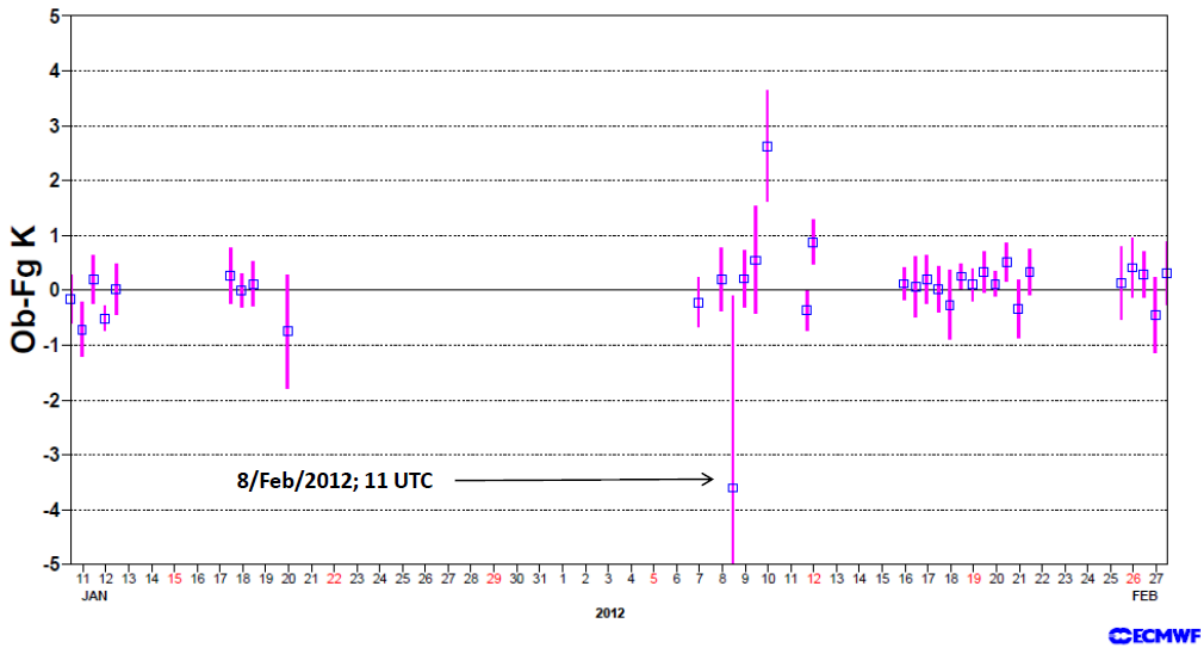
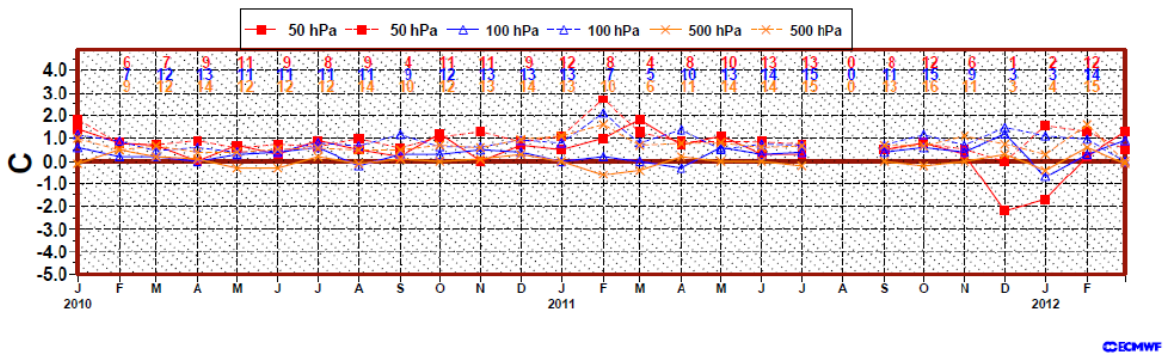


Figure 9  
Time series ASDK1: temperature

Station ASDK1(80) (58N, 0 9E) Elevation: 112 m  
OBS-FG TEMPERATURE: BIAS and STD 0UTC



Station ASDK1(80) (58N, 0 9E) Elevation: 112 m  
OBS-FG TEMPERATURE: BIAS and STD 12UTC

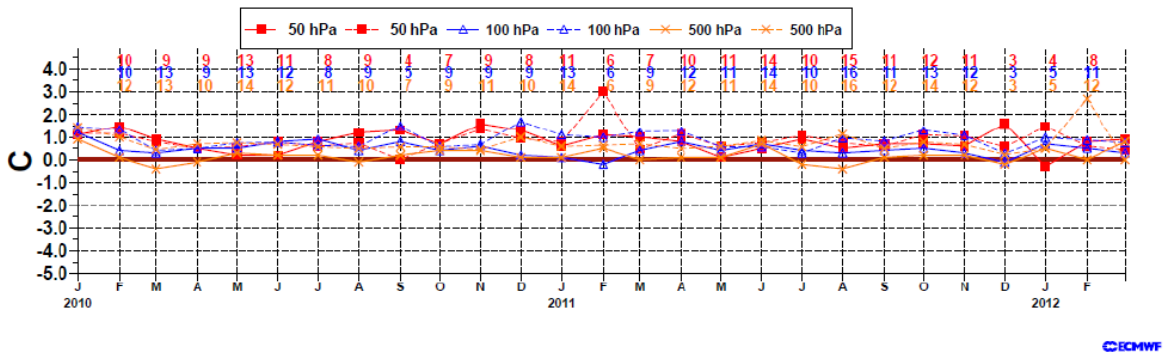


Figure 10  
Time series based on monthly averages January 2010 to March 2012: ASDK1

..no position provided, lat/lon taken as 0/0 → blacklisted

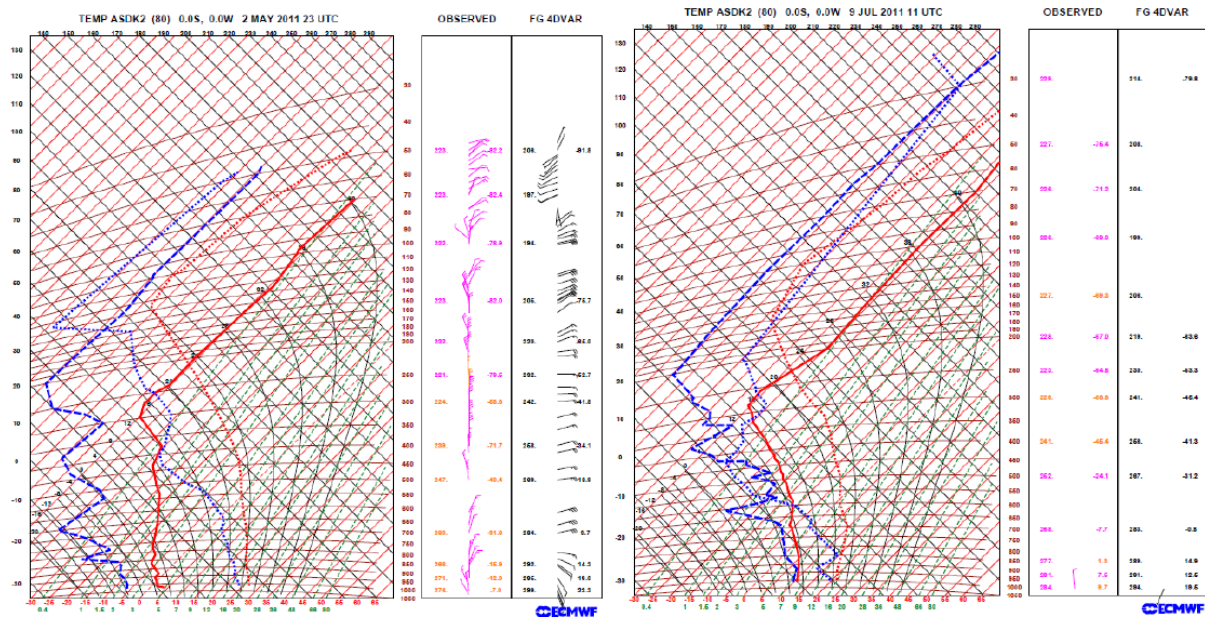


Figure 11

Two tephigrams of ASDK2 reporting as lat/lon 0/0

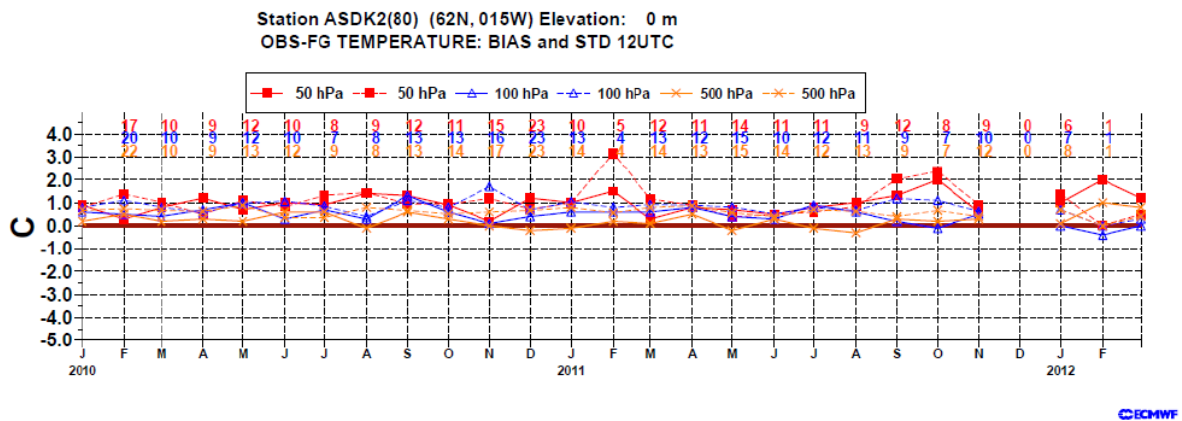
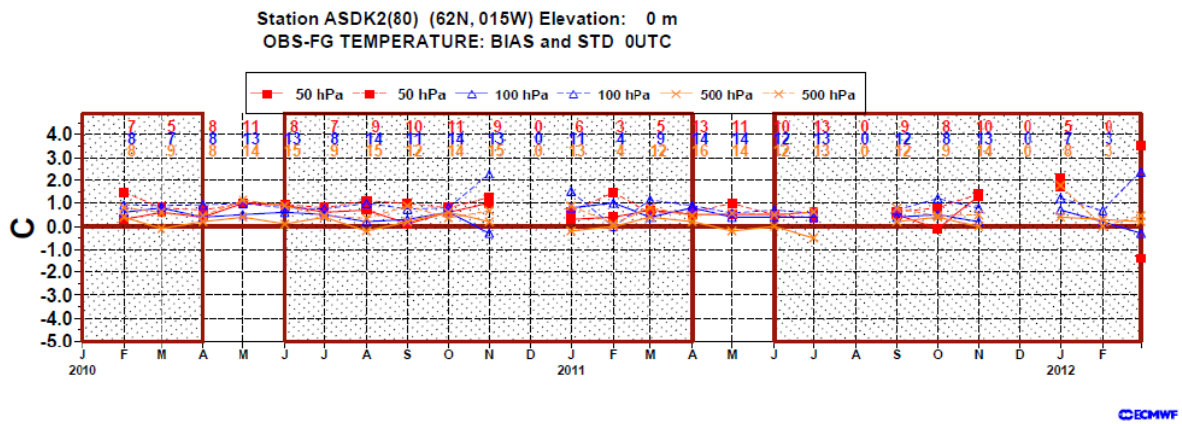


Figure 12

Time series based on monthly averages January 2010 to March 2012: ASDK2

#### **4. Quality Control.**

We run on a monthly basis vertical statistics of all units. The results are included in the ECMWF Monthly Monitoring Report which is freely available in our external web site. Particular problems as those related with wrong positions are detected in the Daily Monitoring carried out by the Met Analyst on duty in the MetOps room.

The quality of the ASAP data has continued to be good and is highly valuable on the oceans where data with high quality and high vertical resolution are needed.

Figures 13 and 14 show composite vertical statistics January to December 2011 of all ASAP data. The profiles show high quality standards fully comparable (if not better in cases) to land-based radiosondes.



# ASAP Global JAN - DEC 2011

## 00/06/12/18 UTC DATA COMBINED

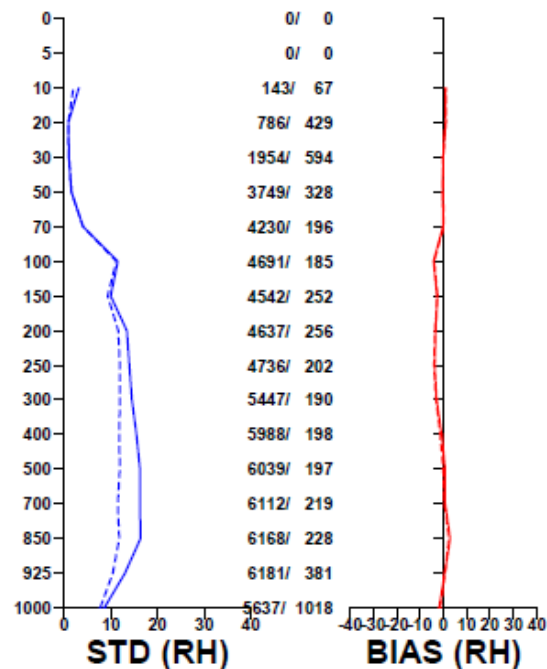
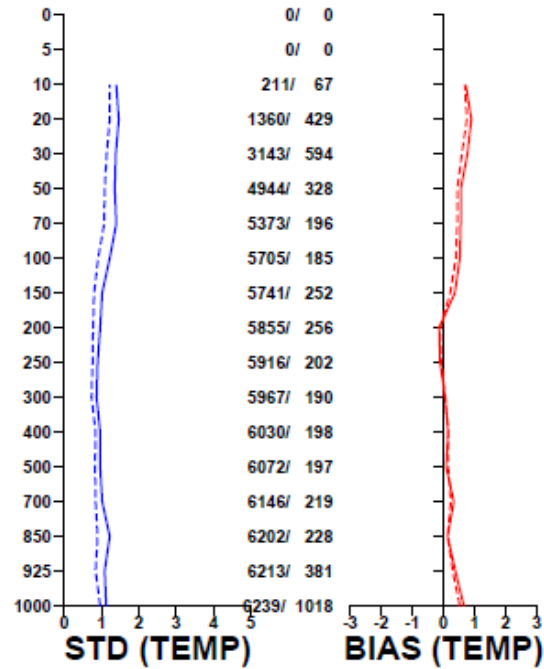


Figure 13

Vertical statistics ASAP Global (temperature and humidity) January to December 2011

# ASAP Global JAN - DEC 2011

## 00/06/12/18 UTC DATA COMBINED

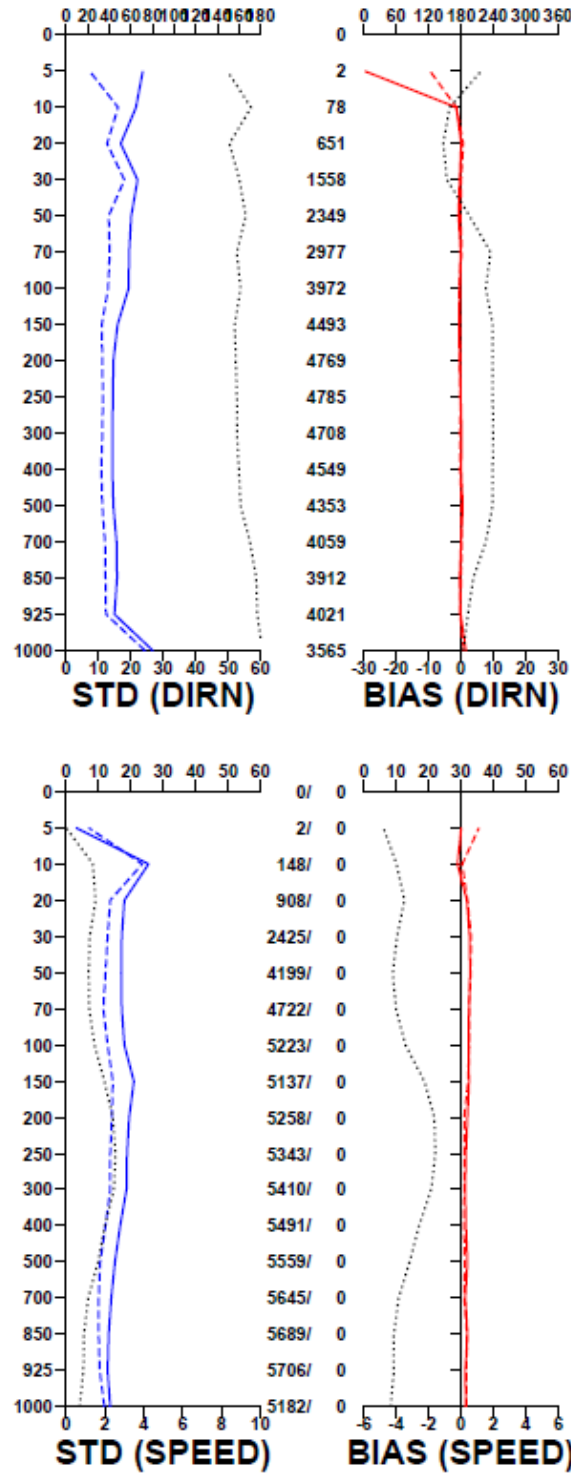


Figure 14

Vertical statistics ASAP Global (wind direction and speed) January to December 2011

TABLE 1: ASAP reports received at ECMWF January-December 2010 at 500 hPa

ID	TEMPERATURE				TOTAL	WIND				TOTAL
	00	06	12	18		00	06	12	18	
ASDE1	118	1	126	116	361	111	1	121	110	343
ASDE2	48	2	240	6	296	48	2	239	6	295
ASDE3	108	0	123	91	322	106	0	122	91	319
ASDE4	91	2	91	96	280	66	2	61	74	203
ASDE9	0	0	4	0	4	0	0	3	0	3
ASDK1	148	41	132	45	366	131	34	117	35	317
ASDK2	120	30	181	34	365	116	26	178	30	350
ASDK3	106	13	115	31	265	104	12	115	31	262
ASES1	0	0	158	2	160	0	0	153	2	155
ASEU1	0	0	149	103	252	0	0	146	103	249
ASEU2	86	3	78	85	252	85	3	75	85	248
ASEU3	60	5	78	63	206	58	5	75	62	200
ASEU4	103	0	95	93	291	102	0	95	93	290
ASEU5	82	0	96	83	261	81	0	94	81	256
ASFR1	108	1	119	0	228	108	1	117	0	226
ASFR2	137	0	141	0	278	137	0	139	0	276
ASFR3	77	0	101	0	178	77	0	101	0	178
ASFR4	67	1	95	0	163	67	1	94	0	162
ASGB1	54	0	70	65	189	44	0	54	53	151
DBLK	55	102	219	31	407	54	102	218	31	405
FQWZ	0	0	1	0	1	0	0	1	0	1
JDWX	2	0	2	0	4	2	0	2	0	4
JGQH	33	0	34	0	67	33	0	34	0	67
JNSR	90	137	88	141	456	88	89	87	88	352
MVKK	0	1	0	0	1	0	1	0	0	1
UFTA	3	0	0	0	3	6	0	0	0	6
WCZ71	0	1	0	0	1	0	1	0	0	1
XXX	0	0	3	0	3	0	0	2	0	2
<hr/>										
	1696	340	2539	1085	5660	1624	280	2443	975	5322

TOTAL NUMBER OF STATION IDENTIFIERS 28

TABLE 2: ASAP reports received at ECMWF January-December 2011 at 500 hPa

ID	TEMPERATURE					WIND				
	00	06	12	18	TOTAL	00	06	12	18	TOTAL
ASDE1	125	0	136	113	374	123	0	136	112	371
ASDE2	62	0	157	78	297	59	0	156	78	293
ASDE3	84	0	85	57	226	84	0	83	57	224
ASDE4	114	0	116	75	305	112	0	113	72	297
ASDE9	0	7	27	0	34	0	7	27	0	34
ASDK1	141	25	134	37	337	133	24	128	32	317
ASDK2	137	39	134	41	351	125	33	114	38	310
ASDK3	134	25	140	30	329	132	25	140	30	327
ASES1	2	0	233	0	235	2	0	221	0	223
ASEU1	1	0	160	10	171	1	0	158	10	169
ASEU2	49	0	46	43	138	47	0	41	38	126
ASEU3	49	3	61	52	165	43	3	58	50	154
ASEU4	38	0	53	39	130	38	0	53	38	129
ASEU5	74	0	93	53	220	71	0	93	52	216
ASEU6	20	1	18	5	44	20	1	18	4	43
ASFR1	134	0	110	0	244	134	0	110	0	244
ASFR2	127	1	134	0	262	127	1	133	0	261
ASFR3	99	0	97	1	197	99	0	97	1	197
ASFR4	137	0	133	0	270	136	0	133	0	269
ASGB1	24	0	26	24	74	24	0	25	24	73
DBLK	0	112	246	1	359	0	112	242	1	355
DRG	25	28	28	29	110	21	24	26	27	98
JGQH	113	0	121	0	234	113	0	121	0	234
JNSR	126	144	117	94	481	67	68	64	51	250
KAOU	106	114	129	84	433	79	69	89	55	292
UFTA	4	0	0	0	4	7	0	0	0	7
VTJR	10	13	11	13	47	9	13	11	13	46
XXX	0	0	1	0	1	0	0	1	0	1
-----										
	1935	512	2746	879	6072	1806	380	2591	783	5560

TOTAL NUMBER OF STATION IDENTIFIERS 28