Australian Government
Bureau of Meteorology

Report on the Quality of Land Surface Observations in Region V

July to December 2005

Report No. 18

WMC Melbourne
Lead Centre for Monitoring of the Quality of Land Surface Observations in RA-V

Data Management Section
Communications & Computing Systems Branch
Bureau of Meteorology, Australia

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Focal Points for Data Quality Monitoring in RA-V

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1. Introduction

Within the Data Management Section of the Bureau of Meteorology lie responsibilities for collecting a full set of meteorological data in real-time from the WMO Global Observing System, and for making such data available to the Analysis-Prognosis models along with some indication as to reliability of report content.

Real-time judgement as to whether a reported element be assimilated by models relies largely on first guess fields, supplemented by observations from any neighbouring stations. Additionally, listings of platforms, which are currently considered suspect, are presented to the Analysis model.

To monitor platform performance, and also to expose likely positional errors, selected reported elements are paired with the
interpolated first-guess value from the global model (6 hour forecast field) and analysed statistically each 6 months in a format which accords with the CBS recommended standards for the exchange of monitoring results. All observations used are unvalidated or "raw" data. This report covers a consolidated list of the suspect stations for the period July to December 2006. The locations of the suspect stations are shown in Figure1 and diagrams of the residuals for each of station are in Figures 2-5.

As part of WMO responsibilities as a WMC, copies of this report are made available to major GDPS Centres participating in data monitoring activities.

2. Monitoring Methods

The decision as to whether a station is 'suspect' is from determination of the deviations of Mean Sea Level Pressure (MSLP) from the GASP first-guess fields (Observation minus Guess), hereafter called O-G. Deviations are accessed relative to the first guess fields.

To achieve more complete reporting profiles for the investigation of suspect stations, observations were not retrieved for statistical analysis until 24 hours after real-time, thus not all values used in such computations may have been available to the assimilation processing.

The selection criteria for deciding whether a station is suspect or not are as follows:

Number of observations (NOBS) >= 120, and one or more of the following:

1. the mean of O-G |BIAS| >= 3.0 hPa
2. the standard deviation of O-G SD >= 5.0 hPa
3. the percentage of gross errors PGE >= 25%

BIAS and SD are calculated excluding gross error data.

The complete criteria for quality control are given on the header page of Table 2. Stations which exhibited 100% gross errors for the 6 months are included, with asterisks substituted for their poorly defined statistical measures.

3. Monitoring Results

Table 1 contains a list of synoptic stations, which are considered to have reported suspect observations of mean sea level pressure (MSLP) during the 6 months.

WMO REGION 5

STN NO.	LAT	LONG	HT(M)	TIME	ELEM	NOBS	NGE	PGE	SD	BIAS	RMS
91329	8.6	151.9	1	ALL	MSLP	137	0	0	1.3	3.1	3.4
91336	6.9	152.7	1	ALL	MSLP	124	0	0	2.6	3.4	4.3
97008	3.6	125.5	38	ALL	MSLP	507	0	0	0.9	3.0	3.2
97378	-10.7	123.1	1	ALL	MSLP	206	159	77	0.5	-14.4	14.4

Table 1. List of land surface stations reporting suspect observations of mean sea level pressure over the period July to December 2005.

Table 2 details a Global coverage of synoptic stations, which are considered to have reported suspect observations of mean sea level pressure (MSLP) during the 6 months.

MONITORING OF SURFACE DATA

SUSPECT LIST

MONITORING CENTRE: MELBOURNE

JULY to DECEMBER 2005
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MONITORING PROCEDURES :-

PERIOD : SIX CALENDAR MONTHS

DATA MONITORED : REPORTS FROM EACH UNIQUE IDENTIFIER FOR SYNOP

AREA : FULL GLOBAL

STANDARD OF COMPARISON : +6H FIRST GUESS FIELD FROM THE AUSTRALIAN GLOBAL ASSIMILATION PREDICTION (GASP) MODEL

OBSERVATION TIMES : 00, 06, 12, 18 UTC

ELEMENT MONITORED : MSLP - MEAN SEA LEVEL PRESSURE (hPa)

PARAMETERS MONITORED :-

NOBS : NUMBER OF OBSERVATIONS RECEIVED (WITH FIRST GUESS AVAILABLE) EXCLUDING DUPLICATES

NGE : NUMBER OF OBSERVATIONS WITH GROSS ERRORS

PGE : PERCENTAGE OF OBSERVATIONS WITH GROSS ERRORS

SD : STANDARD DEVIATION OF DIFFERENCE BETWEEN OBSERVATIONS AND BACKGROUND FIELD EXCLUDING OBSERVATIONS WITH GROSS ERRORS

BIAS : MEAN OF DIFFERENCE BETWEEN OBSERVATIONS AND BACKGROUND FIELD EXCLUDING OBSERVATIONS WITH GROSS ERRORS

RMS : ROOT MEAN SQUARE OF DIFFERENCE BETWEEN OBSERVATIONS AND BACKGROUND FIELD EXCLUDING OBSERVATIONS WITH GROSS ERRORS

GROSS ERROR LIMIT : 15.0 hPa

SELECTION CRITERIA : NOBS >= 120 AND ONE OR MORE OF THE FOLLOWING:
1. |BIAS| >= 3.0hPa
2. SD >= 5.0hPa
3. PGE >= 25%

LIST OF SUSPECT LAND SURFACE STATIONS FOR JUL to DEC 2005

WMO REGION 1

STN NO.	LAT	LONG	HT(M)	TIME	ELEM	NOBS	NGE	PGE	SD	BIAS	RMS
61492	16.1	-13.5	18	ALL	MSLP	205	0	0	1.8	3.6	4.0
63160	10.4	45.0	9	ALL	MSLP	131	8	6	1.2	-3.8	4.0
63210	11.3	49.2	2	ALL	MSLP	147	2	1	1.4	-3.2	3.5
63671	1.8	40.1	244	ALL	MSLP	671	0	0	1.5	-5.1	5.3
68903	-37.0	-12.3	51	ALL	MSLP	164	160	98	7.2	-1.6	6.4

WMO REGION 2

STN NO.	LAT	LONG	HT(M)	TIME	ELEM	NOBS	NGE	PGE	SD	BIAS	RMS
31137	56.3	131.1	850	ALL	MSLP	708	1	0	4.1	3.0	5.1
38933	37.8	68.8	429	ALL	MSLP	276	0	0	2.8	6.4	7.0
40700	39.7	48.1	45	ALL	MSLP	674	1	0	1.4	-4.4	4.6
40740	37.1	58.5	1287	ALL	MSLP	674	0	0	1.9	-3.1	3.6
40754	35.7	51.3	1191	ALL	MSLP	665	0	0	2.7	-4.3	5.1
40757	35.5	53.4	1171	ALL	MSLP	683	0	0	2.8	-3.4	4.4
40789	33.8	55.1	845	ALL	MSLP	683	0	0	2.5	-3.1	4.0
40791	33.6	56.9	711	ALL	MSLP	652	0	0	2.3	-3.5	4.2
40835	30.4	50.8	738	ALL	MSLP	642	0	0	1.9	-3.3	3.8
40854	29.1	58.4	1067	ALL	MSLP	627	0	0	2.3	-5.1	5.6
40859	29.0	53.7	1288	ALL	MSLP	646	1	0	2.5	-3.2	4.0
41396	16.0	49.0	700	ALL	MSLP	293	0	0	1.7	3.8	4.2
44203	51.1	99.7	1583	ALL	MSLP	705	10	1	4.1	4.1	5.8
44214	49.0	90.0	1714	ALL	MSLP	719	24	3	6.1	-0.5	6.1
44218	48.0	91.7	1406	ALL	MSLP	723	27	4	5.3	0.7	5.3
44221	49.7	96.4	1420	ALL	MSLP	718	34	5	5.1	3.1	6.0
44224	48.8	90.1	1928	ALL	MSLP	712	83	12	6.2	1.8	6.4
44225	48.7	98.3	1723	ALL	MSLP	726	69	10	5.0	4.1	6.5
44230	49.6	102.0	1236	ALL	MSLP	722	0	0	2.9	3.5	4.5

44263	46.9	91.1	1951	ALL	MSLP	701	28	4	4.3	5.1	6.6
44266	46.3	93.9	2222	ALL	MSLP	721	2	0	4.0	3.1	5.0
44275	46.8	98.1	2255	ALL	MSLP	724	11	2	5.6	2.4	6.1
44284	46.7	100.1	2117	ALL	MSLP	720	12	2	4.7	4.2	6.3
44329	44.6	98.7	2103	ALL	MSLP	719	7	1	3.6	3.0	4.7
44338	44.7	102.2	1519	ALL	MSLP	704	2	0	3.9	3.0	4.9
48952	15.7	106.4	168	ALL	MSLP	299	0	0	1.4	-3.7	3.9
48957	14.8	106.8	105	ALL	MSLP	212	0	0	1.7	3.2	3.6
52533	39.8	98.5	1478	ALL	MSLP	730	1	0	3.0	3.3	4.4
52652	38.9	100.4	1483	ALL	MSLP	730	2	0	3.9	3.5	5.2
53192	44.0	114.9	1128	ALL	MSLP	730	0	0	2.3	3.1	3.9
56287	30.0	103.0	629	ALL	MSLP	735	0	0	2.4	3.4	4.2

WMO REGION 3

STN NO.	LAT	LONG	HT(M)	TIME	ELEM	NOBS	NGE	PGE	SD	BIAS	RMS
80099	7.1	-70.7	128	ALL	MSLP	163	0	0	1.6	-5.0	5.2
80315	3.0	-75.3	443	ALL	MSLP	354	0	0	2.0	-3.4	3.9
82287	-2.9	-41.6	22	ALL	MSLP	338	0	0	1.3	-3.6	3.9
82353	-3.2	-52.2	74	ALL	MSLP	540	2	0	1.2	-3.8	4.0
82586	-5.2	-39.3	212	ALL	MSLP	543	1	0	1.4	-4.4	4.7
82704	-7.6	-72.7	170	ALL	MSLP	532	1	0	2.3	-3.9	4.6
83264	-12.2	-56.5	415	ALL	MSLP	542	0	0	1.5	3.5	3.8
83388	-15.1	-42.8	604	ALL	MSLP	542	0	0	1.4	-4.6	4.8
83970	-31.3	-50.9	5	ALL	MSLP	366	1	0	2.7	-3.8	4.7
84401	-5.2	-80.6	55	ALL	MSLP	662	0	0	1.7	3.9	4.2
84425	-5.9	-76.1	184	ALL	MSLP	126	0	0	1.9	6.2	6.5
84452	-6.8	-79.8	34	ALL	MSLP	639	0	0	1.6	6.3	6.5
84455	-6.5	-76.4	282	ALL	MSLP	482	2	0	2.7	7.0	7.6
84501	-8.1	-79.0	30	ALL	MSLP	491	0	0	1.7	5.4	5.7
84531	-9.1	-78.5	27	ALL	MSLP	136	0	0	1.3	4.0	4.2
84628	-12.0	-77.1	13	ALL	MSLP	672	0	0	1.5	3.1	3.5
84720	-14.9	-74.9	567	ALL	MSLP	320	1	0	1.5	6.0	6.2
84773	-17.7	-71.3	9	ALL	MSLP	123	0	0	1.3	3.6	3.9
84782	-18.1	-70.3	458	ALL	MSLP	491	0	0	1.9	3.9	4.3
85406	-18.5	-70.2	58	ALL	MSLP	723	0	0	2.2	4.4	4.9
87222	-28.6	-65.8	454	ALL	MSLP	700	0	0	2.6	-3.5	4.3
87418	-32.8	-68.8	704	ALL	MSLP	694	1	0	4.1	-3.2	5.2
88900	-54.0	-38.0	2	ALL	MSLP	340	48	14	6.5	0.9	6.6

WMO REGION 4

STN NO.	LAT	LONG	HT(M)	TIME	ELEM	NOBS	NGE	PGE	SD	BIAS	RMS
71023	65.9	-89.4	18	ALL	MSLP	711	98	14	7.1	1.4	7.3
71684	50.1	-122.9	1628	ALL	MSLP	721	0	0	2.7	-3.3	4.3
71686	50.1	-123.0	903	ALL	MSLP	727	0	0	2.0	-3.6	4.1
71746	82.3	-43.0	181	ALL	MSLP	157	49	31	8.2	-0.4	8.2
71786	51.5	-116.3	1615	ALL	MSLP	726	0	0	2.5	3.4	4.2
71826	66.2	-65.7	32	ALL	MSLP	564	0	0	1.8	-3.2	3.7
72375	35.1	-11.2	2139	ALL	MSLP	721	25	3	5.6	-1.4	5.8
72376	36.2	-111.8	2181	ALL	MSLP	722	1	0	4.6	3.6	5.8
72462	37.4	-105.9	2299	ALL	MSLP	725	5	1	5.9	4.0	7.1
72570	40.5	-107.5	1915	ALL	MSLP	725	2	0	5.2	4.0	6.6
72576	42.8	-108.7	1694	ALL	MSLP	721	0	0	5.3	0.5	5.4
76061	31.3	-113.6	48	ALL	MSLP	205	0	0	1.7	3.7	4.0
76220	29.0	-107.8	1932	ALL	MSLP	315	60	19	2.9	8.9	9.3
76323	26.9	-105.7	1661	ALL	MSLP	458	6	1	4.2	4.6	6.2
76625	20.6	-100.4	1880	ALL	MSLP	198	0	0	2.2	-4.1	4.6
76634	20.1	-98.4	2181	ALL	MSLP	209	0	0	2.7	4.6	5.3

76658	19.2	-103.7	494	ALL	MSLP	144	0	0	1.5	4.9	5.1
76680	19.4	-99.2	2303	ALL	MSLP	361	2	1	2.5	-4.7	5.3
76685	19.0	-98.2	2179	ALL	MSLP	494	0	0	3.0	-3.2	4.4
76762	17.5	-99.5	1265	ALL	MSLP	397	0	0	1.7	3.8	4.2
76848	16.3	-92.1	1646	ALL	MSLP	361	0	0	1.7	-3.7	4.0
78482	18.2	-71.1	12	ALL	MSLP	269	0	0	2.7	3.1	4.1
78588	17.2	-87.5	1	ALL	MSLP	732	732	100	**	**	**
78760	10.0	-84.8	3	ALL	MSLP	170	0	0	1.5	3.1	3.5

WMO REGION 5

STN NO.	LAT	LONG	HT(M)	TIME	ELEM	NOBS	NGE	PGE	SD	BIAS	RMS
91329	8.6	151.9	1	ALL	MSLP	137	0	0	1.3	3.1	3.4
91336	6.9	152.7	1	ALL	MSLP	124	0	0	2.6	3.4	4.3
97008	3.6	125.5	38	ALL	MSLP	507	0	0	0.9	3.0	3.2
97378	-10.7	123.1	1	ALL	MSLP	206	159	77	0.5	-14.4	14.4

WMO REGION 6

STN NO.	LAT	LONG	HT(M)	TIME	ELEM	NOBS	NGE	PGE	SD	BIAS	RMS
11137	47.4	12.9	810	ALL	MSLP	727	0	0	2.0	3.3	3.9
40030	35.1	36.8	303	ALL	MSLP	318	0	0	1.1	-3.3	3.5

WMO REGION ANTARCTICA

STN NO.	LAT	LONG	HT(M)	TIME	ELEM	NOBS	NGE	PGE	SD	BIAS	RMS
89512	-70.8	11.8	102	ALL	MSLP	723	1	0	3.0	-3.9	4.9
89514	-70.8	11.7	117	ALL	MSLP	668	4	1	2.9	-4.2	5.2
89642	-66.7	140.0	41	ALL	MSLP	709	1	0	3.3	-4.8	5.8

Figure 1
SUSPECT STATIONS FOR LAND SURFACE OBSERVATIONS FOR MSLP in RA-V
JULY to DECEMBER 2005

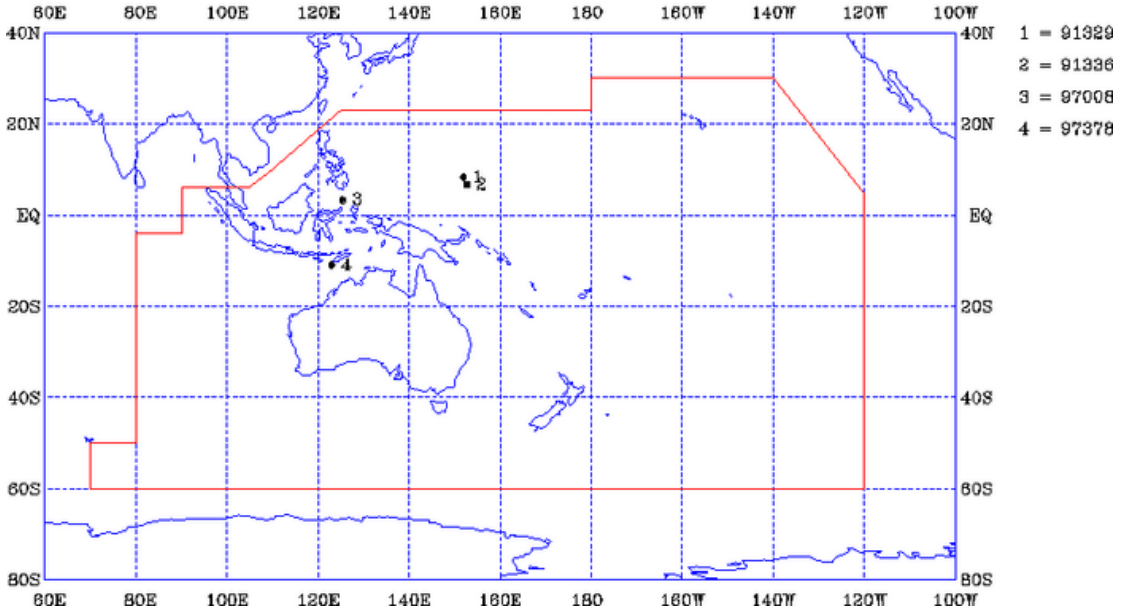

Figure 2
Residuals of MSL Pressure
July – December 2005
STATION: ***91329***

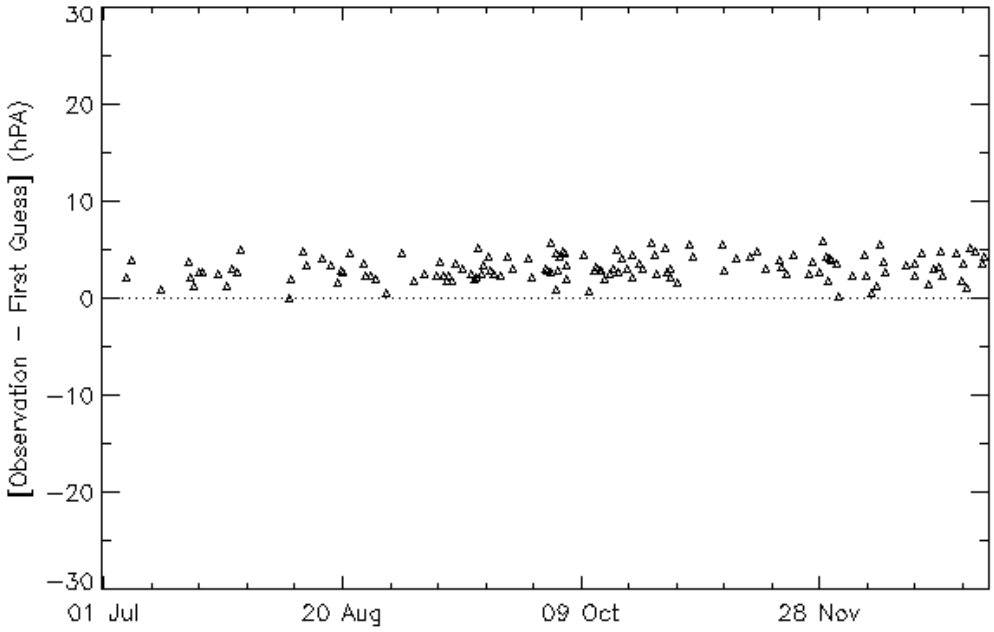

Figure 3
Residuals of MSL Pressure
July – December 2005
STATION: ***91336***

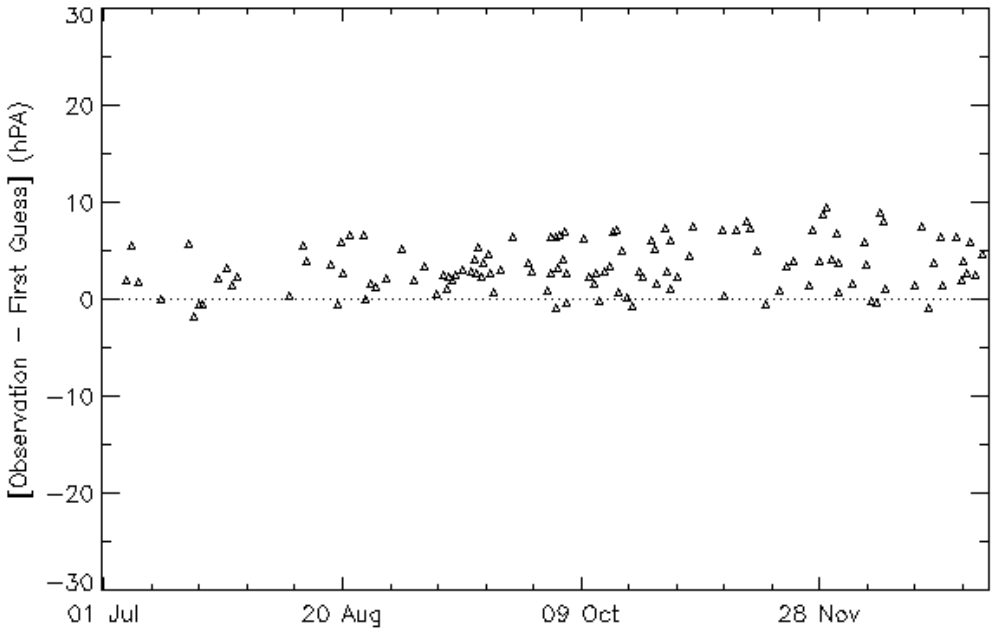

Figure 4
Residuals of MSL Pressure
July – December 2005
STATION: ***97008*** TAHUNA

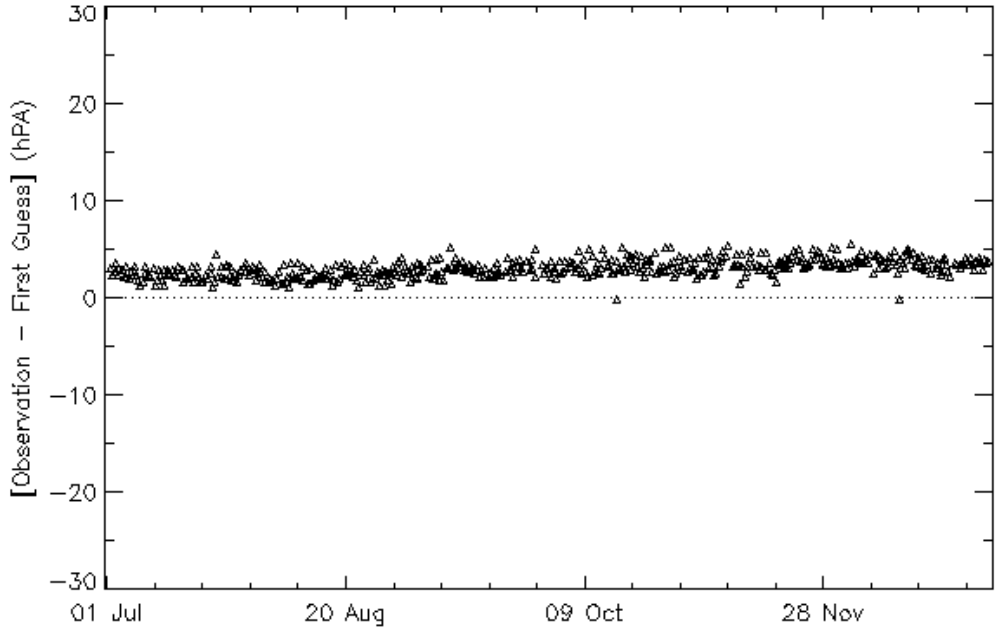

Figure 5
Residuals of MSL Pressure
July – December 2005
STATION: ***97378*** ROTE/BAA