GCOS, SCAR and EC-PORS update

Steve Colwell

British Antarctic Survey

Acronyms

- Global Climate Observing System (GCOS).
  - BAS acts as the monitoring centre for Antarctica.
- Scientific Committee on Antarctic Research (SCAR).
  - I chair the expert group on operational meteorology.
  - I am the secretary of the SSG/PS.
  - David Bromwich is the Chief Officer of the SSG/PS.
- Executive Council Panel of Experts on Polar Observations, Research and Services (EC-PORS).
  - I represent the UK and SCAR at EC-PORS.
  - I chair the Antarctic Task Team (ATT).

Colwell (S.Colwell@bas.ac.uk). If you would like to join the Group please contact him. Jon Shanklin (J.Shanklin@bas.ac.uk), former chair of the Group, currently maintains these pages.

Latest news:

1. 2013 February 4 - SYNOP reports from Aquiles (CCAQ) now on the GTS
2. 2013 January 14 - Congratulations to Le Boreal (FLSY) for commencing transmission of SYNOP reports.
3. 2012 December 3 - Monitoring shows that only 8 out of 23 ships visiting Antarctic waters so far this season have reported weather observations. Ships not reporting include two supply vessels.
4. 2012 September 23 - The 2012/13 Antarctic season has begun with the arrival of the Laurence M Gould and Aurora Australis in Antarctic waters

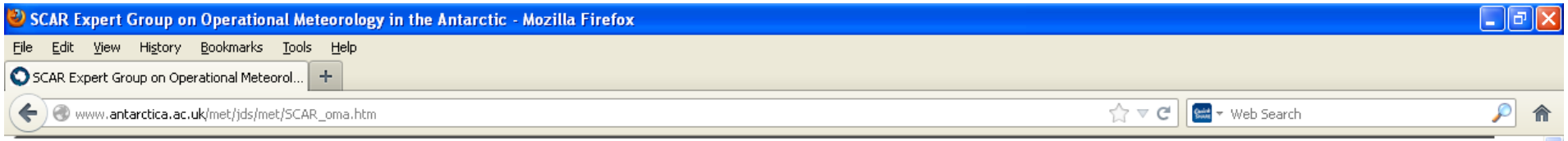
General

Old News	Members
Details of how to register for the .aq (Antarctic) domain.	Antarctic Station details (Updated 2013 February - changes are highlighted)

Monitoring

UK Met Office global monitoring	Australian BoM global monitoring
ECMWF global monitoring	NCDC data list
Operational GSN stations with recent missing CLIMAT messages in the last 12 months are: 88889 (May, September), 89272 (July), 89327 (May, June, July), 89573 (March, June), 89625 (June, September, October, November, January), 89662 (February, October, November, December, January), 89879 (July). Non operational GSN stations are: 68992, 89377. Summer only GSN stations are 89327. **Please check our GCOS AntON CLIMAT monitoring results if your station is listed here and resend the data for the missing month(s).** See the latest CLIMATs to check if your report has been received at BAS. See CLIMAT data for Antarctic AWS for all the University of Wisconsin AWS.	The first stations to submit CLIMAT reports for January were McMurdo, Bellingshausen, Novolazarevskaya, Progress, Mirnyj and Vostok. WMO no longer require distribution of the CLIMAT TEMP message and monitoring of these has ceased.
BAS GTS monitoring	
BAS GCOS monitoring results for SYNOP and TEMP messages from the Antarctic and Oceanic Islands (AntON) (Updated 2013 February). Several AWS experience problems with low battery voltages restricting real-time transmissions during the winter. **If your SYNOP or TEMP message percentage is lower than you think it should be, please check your GTS routing.**	All GUAN stations are now carrying out at least some radiosonde flights each month. Several stations experience problems with balloons bursting early during the winter due to low stratospheric temperatures.
• AntON CLIMAT monitoring in 2013 • AntON CLIMAT monitoring in 2012 • AntON CLIMAT monitoring in 2011 • ABCN CLIMAT monitoring in 2010 • ABCN CLIMAT monitoring in 2009 • ABCN CLIMAT monitoring in 2008 • ABCN CLIMAT monitoring in 2007 • ABCN CLIMAT monitoring in 2006	• AntON SYNOP monitoring in 2013 • AntON SYNOP monitoring in 2012 • AntON SYNOP monitoring in 2011 • ABCN SYNOP monitoring in 2010

Ships



Ships

Ships reporting in 2004/05	Ships reporting in 2005/06
Ships reporting in 2006/07	Ships reporting in 2007/08
Ships reporting in 2008/09	Ships reporting in 2009/10
Ships reporting in 2010/11	Ships reporting in 2011/12
Ships reporting in 2012/13 [Updated 2013 Febuary 25]	Ships reporting in 2013/14 [No data yet]
Sign up to send met reports through Yotreps	Latest list of ships with significant errors/biases in their reports
Download electronic met logbook software from the VOS website	Download Turbowin
Oceanogrphic ship locations (Sailwx)	Ship locations (Sailwx)
Live ships map (Marine Traffic)	Palmer AIS (APRS.fi)

Planes

Coding aircraft observations (Draft)	

Overland traverses

Reporting traverse observations (Draft)	

Forecasting and Forecasts

BAS Antarctic Weather Forecasting Manual	International Antarctic Weather Forecasting Manual [updated 2009 June]
Antarctic Mesoscale Prediction System Forecast products from Byrd Polar Research Center of Ohio State University	UV forecasts from SCIAMACHY
Antarctic ensemble plots from the Australian BoM & CSIRO	Forecasts for Norwegian Antarctic sites
TAFs and Forecast charts generated at Rothera for BAS operations	

Information

University of Wisconsin Real time weather data and displays	WMO Polar Observations, Research and Services
Argentinian Antarctic weather information	Australian Antarctic weather information
Brazilian Antarctic weather information	Chilean weather information
	Italian Antarctic weather information
Russian Antarctic weather information	Russian weather server for Antarctica and sub Antarctic islands
Polar View Antarctic portal	UK Antarctic weather information
SCAR READER database	

Other Programmes

International Polar Year	International Programme for Antarctic Buoys

AntON CLIMAT monitoring

- http://www.antarctica.ac.uk/met/jds/met/AntON_CLM_2013.pdf

Performance of the Antarctic Observing Network (AntON)
2013 CLIMAT MESSAGES

Surface stations
This chart shows the status of CLIMAT messages during 2013 for stations in the EC-PORS zone of interest, M = message on GTS, B = message generated from SYNOP by BAS, S = message received at a centre, but not on GTS, NIL = Insufficient SYNOP messages to generate a CLIMAT. Off green = Message on the GTS contains errors (GSN station, many are not significant), Pale green = 80% or more SYNOP messages available, Yellow = NIL message received, Pale yellow = Less than 80% SYNOP messages available, Amber = Silent non GSN station, Red = Silent GSN station. NOTE monitoring does not distinguish between problems with generation and transmission of messages. Monitoring is manual and may have errors.

WMO no	Station	GSN	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Sub Antarctic stations (in Region I, III or V)													
61997	Isle Crozet	X	M	M	M	M								
61998	Isle Kerguelen	X	M	M	M	M								
68906	Gough Island	X	M	M	M	92 N								
68992	Bouvetoya	X												
68994	Marion Island	X	M	M	M	92 N								
88878	Pebble Island		NIL	NIL	NIL	NIL								
88883	Weddell Island		NIL	NIL	NIL	NIL								
88889	Mount Pleasant Airport	X	M	100	M	M								
88892	Sapper Hill			18	26	0								
88897	Sea Lion Island		NIL			0								
88900	Bird Island		M	M	M	M								
88903	Grytviken	X	M	M	M	M								
88986	South Thule Island		B	B	B	B								
93929	Enderby Island AWS		B	B	B	B								
93947	Campbell Island AWS	X	M	M	M	M								
94997	Heard Island (The Spit)		B	B	B	B								
94998	Macquarie Island	X	M	M	M	M								
95997	Heard Island (Atlas Cove)					0								
	Antarctic stations													
WMO no	Station													
88963	Esperanza	X	M	M	M	M								
88968	Orcadas	X	M	M	M	M								
89002	Neumayer	X	M	M	M	M								
89003	Halvfarryggen EP11		NIL	B	B	B								

AntON SYNOP and TEMP monitoring

- http://www.antarctica.ac.uk/met/jds/met/AntON_SYN_2013.pdf

Performance of the Antarctic Observing Network (AntON)
SYNOP

Surface stations

This chart shows the status of SYNOP messages on the GTS during 2013, with green representing good performance, off green representing less than 90% of expected messages (acceptable, but not adequate for CLIMAT), yellow less than 80%, amber less than 50% and red less than 10%. Stations shown as white did not transmit in 2011. Note that for AWS transmitting via Argos a normal percentage for real-time transmission is around 70% and the non-real time data is recovered later for use in the CLIMAT message.

WMO no	Station	GSN	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Sub Antarctic stations (in Region I, III or V)													
61997	Isle Crozet	X		91	95									
61998	Isle Kerguelen	X		94	90									
68906	Gough Island	X	92	83		92								
68992	Bouvetoya	X	0	0	0	0								
68994	Marion Island	X	81	93		92								
88878	Pebble Island		77	71	87	73								
88883	Weddell Island		80	77	79	77								
88889	Mount Pleasant Airport	X												
88897	Sea Lion Island		73	0	0	0								
88892	Sapper Hill		0	18	26	0								
88900	Bird Island			82	93	85								
88903	Grytviken	X		85		95								
88986	South Thule Island		94	95		93								
93929	Enderby Island AWS													
93947	Campbell Island AWS	X												
94997	Heard Island (The Spit)													
94998	Macquarie Island	X												
95997	Heard Island (Atlas Cove)		0	0	0	0								
	Antarctic stations													
WMO no	Station													
88963	Esperanza	X	87	90	84	90								
88968	Orcadas	X	95	91	87	88								
89002	Neumayer	X												
89003	Halvfarryggen EP11		83											
89004	SANAE	X	82	88	95	86								
89009	Amundsen-Scott	X												

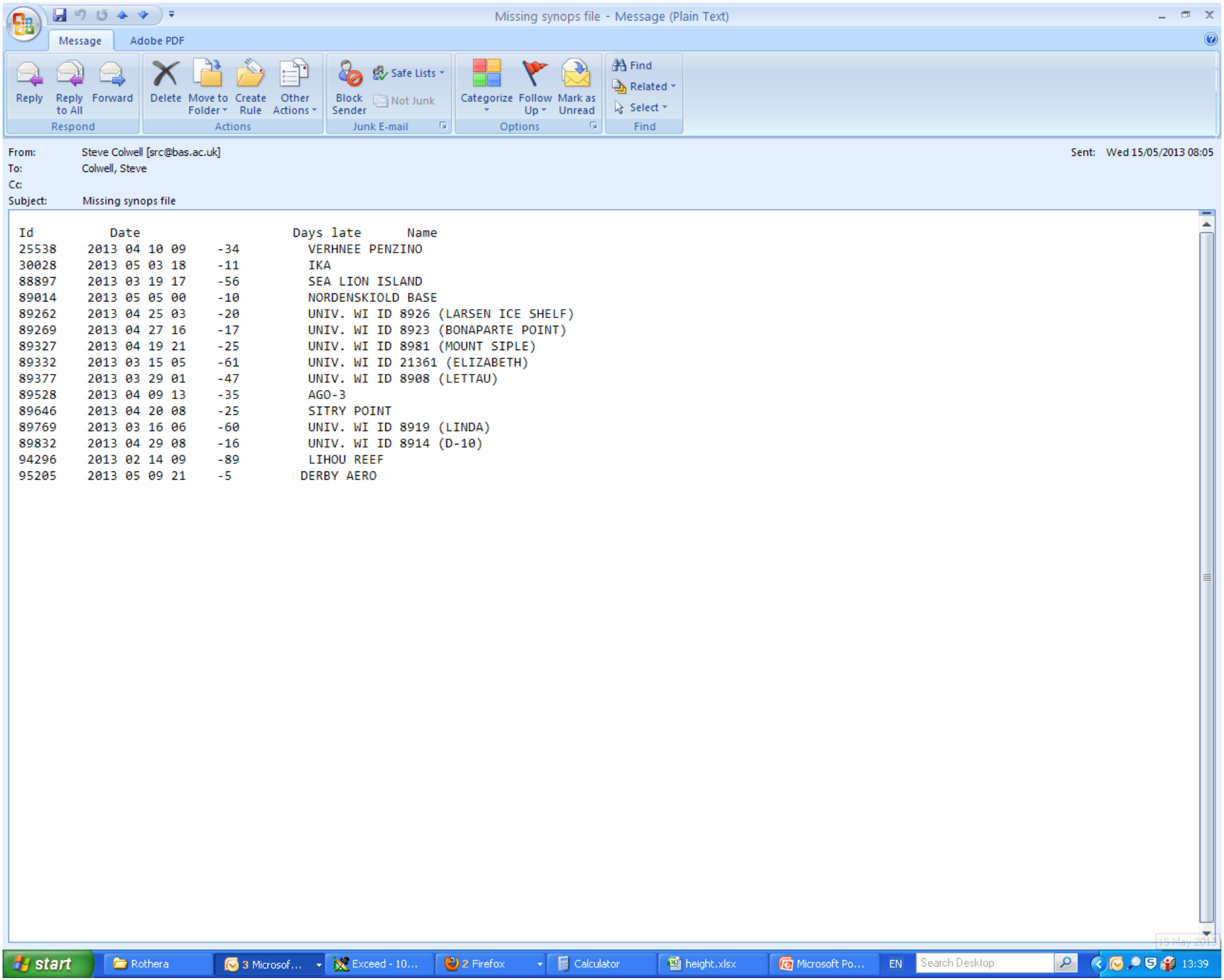
Upper air stations

The monthly columns show the status of TEMP messages with data to 100 hPa (after quality control) on the GTS, with yellow representing less than 70% of expected messages, amber representing less than 40% and red less than 10% of messages. Figures in bold include flights that did not appear on the GTS. Stations are assessed against their published programme in WMO No 9, Vol A at the beginning of the year.

NOTE monitoring does not distinguish between problems with generation and transmission of messages. Monitoring is manual and may have errors and there are occasional breaks in the BAS GTS feed. The 100 hPa level is chosen as the minimum target level for GUAN stations, but balloon performance often degrades during the polar winter and not all flights reach this level.

INDEX	STATION NAME		GUAN	1	2	3	4	5	6	7	8	9	10	11	12
61998	ILES KERGUELEN	12	X	74	53	70	66								
68906	GOUGH ISLAND	00	X	0	0	74	86								
68906	GOUGH ISLAND	12	X	0	0	64	76								
68994	MARION ISLAND	00	X	83	85	48	0								
68994	MARION ISLAND	12	X	77	71	41	0								
88889	MOUNT PLEASANT AIRPORT	00	X	83	96	90	96								
88889	MOUNT PLEASANT AIRPORT	12	X	0	10	0	0								
94998	MACQUARIE ISLAND	00	X	96	100	100	96								
94998	MACQUARIE ISLAND	12	X	100	100	96	96								
89002	NEUMAYER	12	X	93	96	93	76								
89009	AMUNDSEN-SCOTT	00	X	96	96	100	100								
89009	AMUNDSEN-SCOTT	12	X	96	85	22	0								
89022	HALLEY	12	X	96	100	96	100								
89055	BASE MARAMBIO (CENTRO MET. ANTARTICO)	12	X	42	43	**26**	37								
89062	ROTHERA	12		58	57	**54**	**53**								
89512	NOVOLAZAREVSKAJA	00	X	93	89	93	86								
89512	NOVOLAZAREVSKAJA	12	X	0	35	0	0								
89532	SYOWA	00	X	87	92	93	83								
89532	SYOWA	12	X	83	85	80	90								
89564	MAWSON	12	X	100	96	100	93								
89571	DAVIS	00	X	96	96	96	96								
89571	DAVIS	12	X	96	0	0	0								
89592	MIRNYJ	00	X	96	100	93	100								
89592	MIRNYJ	12	X	0	39	0	0								
89611	CASEY	00	X	100	96	90	93								
89611	CASEY	12	X	100	96	100	93								
89625	CONCORDIA	12		58	0	0	0								
89642	DUMONT D'URVILLE	00	X	83	92	80	83								
89662	MARIO ZUCCELLI STATION	00		77	0	0	0								
89662	MARIO ZUCCELLI STATION	12		74	0	0	0								
89664	MCMURDO	00	X	100	100	93	80								
89664	MCMURDO	12	X	100	96	22	0								

Notes: Balloons at 89009, 89022, 89625, 89642 and 89664 and to a lesser extent at other Antarctic stations, burst early in the winter months due to the low stratospheric temperature. .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25538 2013 04 10 09 -34 VERHNEE PENZINO
30028 2013 05 03 18 -11 IKA
88897 2013 03 19 17 -56 SEA LION ISLAND
89014 2013 05 05 00 -10 NORDENSKIOLD BASE
89262 2013 04 25 03 -20 UNIV. WI ID 8926 (LARSEN ICE SHELF)
89269 2013 04 27 16 -17 UNIV. WI ID 8923 (BONAPARTE POINT)
89327 2013 04 19 21 -25 UNIV. WI ID 8981 (MOUNT SIPLE)
89332 2013 03 15 05 -61 UNIV. WI ID 21361 (ELIZABETH)
89377 2013 03 29 01 -47 UNIV. WI ID 8908 (LETTAU)
89528 2013 04 09 13 -35 AGO-3
89646 2013 04 20 08 -25 SITRY POINT
89769 2013 03 16 06 -60 UNIV. WI ID 8919 (LINDA)
89832 2013 04 29 08 -16 UNIV. WI ID 8914 (D-10)
94296 2013 02 14 09 -89 LIHOU REEF
95205 2013 05 09 21 -5 DERBY AERO
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AntON Ship monitoring

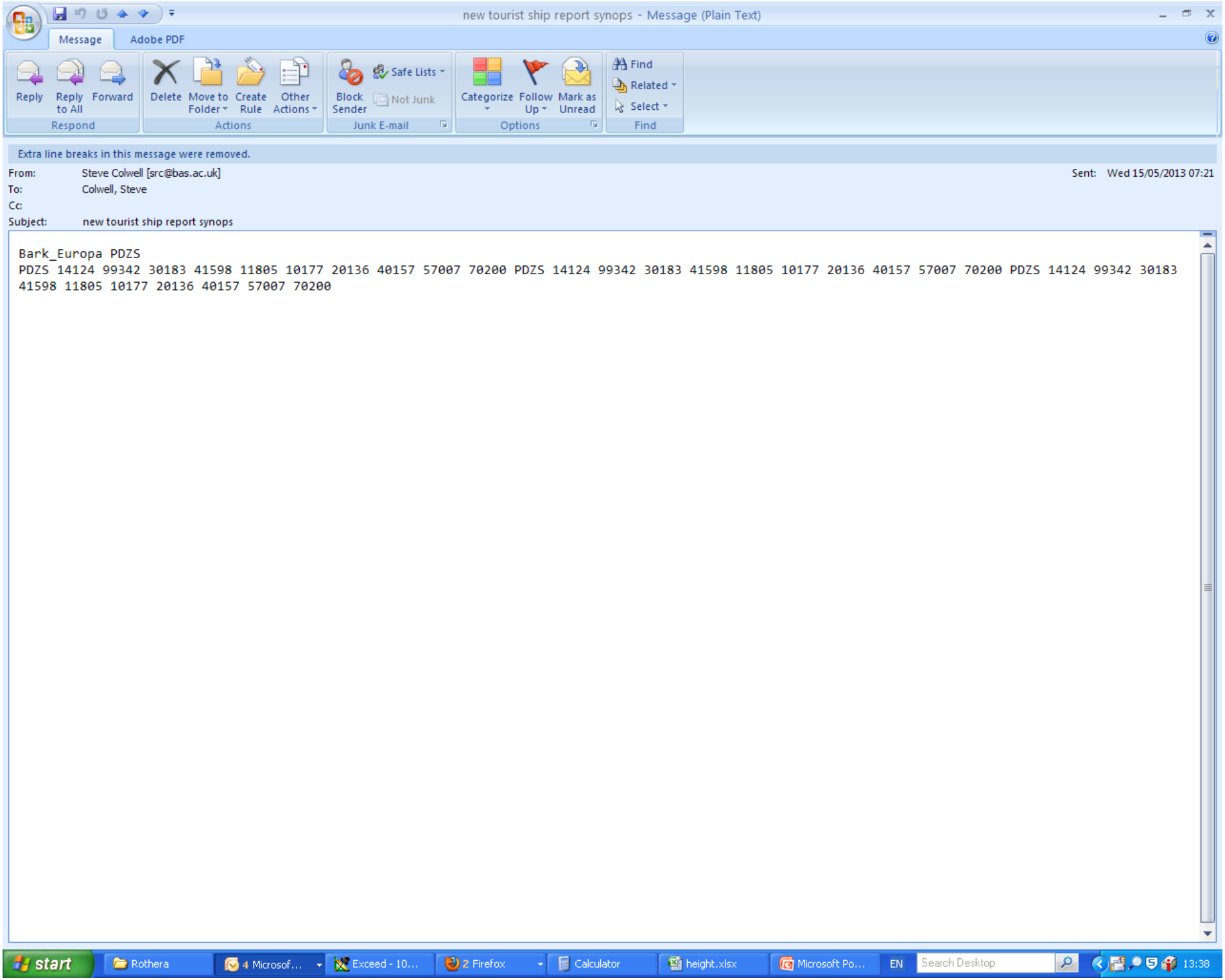
- http://www.antarctica.ac.uk/met/jds/met/Antarctic%20ships%202012.pdf

List of ships that operated in Antarctica during the 2012/13 season, with call signs and names.

The SCAR and WMO request that all ships operating in Antarctic waters should make meteorological observations and report them on the GTS.

The following ships, which entered Antarctic waters in 2012/2013, made meteorological reports, they may have reported from outside Antarctic waters after the date given here. For most ships the 2012 season begins in November or December and ends in March. Country is the country of recruitment to the VOS, or where not known of registration. Monitoring is manual and may miss some ships.

Call sign	Name	Country	Arrive	Depart	latest obs	
9HJD9	Celebrity Infinity (Tourist)	USA	2013 February	2013 February		
C6JC3	Bremen (Tourist)	Germany	2012 November	2013 February	2012 December	
C6TE3	Orion (Tourist)	Bahamas	2013 January	2013 February		
CCAQ	Aquiles (Supply)	Chile	2013 February	2013 February		
CCOV	Oscar Viel (Supply)	Chile	2013 January	2013 February		
DBLK	RV Polarstern (Research)	Germany	2012 December	2013 March	2013 April	
FHZI	L'Astrolabe (Supply)	France	2012 October	2013 February	2013 April	
FLSY	Le Boreal (Tourist)	France	2012 December	2013 February		
GXRK	HMS Protector (Hydrographic)	UK	2012 November	2013 March		(5)
JPAT	Umitaka Maru (Fisheries research)	Japan	2013 January	2013 January	2013 April	
OXGN2	Mary Arctica (Containership)	Denmark	2012 December	2013 January		
PBGH	Prinsendam (Tourist)	Netherlands	2013 February	2013 February		
PBQK	Plancius (Tourist)	Netherlands	2012 November	2013 April	2013 April	
PDZS	Europa (Ice strengthened tall ship)	Netherlands	2012 December	2013 March		(8)
PHEO	Veendam (Tourist)	Netherlands	2013 January	2013 February		
UCKZ	Akademik Fedorov (Research)	Russia	2012 December	2013 March	2013 April	
VNAA	RV Aurora Australis (Supply)	Australia	2012 September	2013 February	2013 March	
WBP3210	Nathaniel B Palmer (Oceanographic)	USA	2012 August	2013 March	2013 April	
WCX7445	Laurence M Gould (Oceanographic)	USA	2012 June	2013 April	2013 April	
WDG4379	Ocean Giant (Cargo)	USA	2013 February	2013 March		
WHKM	Maersk Peary (Oil Tanker)	USA	2013 February	2013 February	2013 February	
ZDLP	RRS James Clark Ross (Research)	UK	2012 November	2013 April	2013 April	(7)
ZDLS1	RRS Ernest Shackleton (Supply)	UK	2012 December	2013 April	2013 April	(4)
ZMFR	RV Tangaroa (Research)	New Zealand	2013 February	2013 March	2013 April	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Sent: Wed 15/05/2013 07:21
To: Colwell, Steve
Cc:
Subject: new tourist ship report synops
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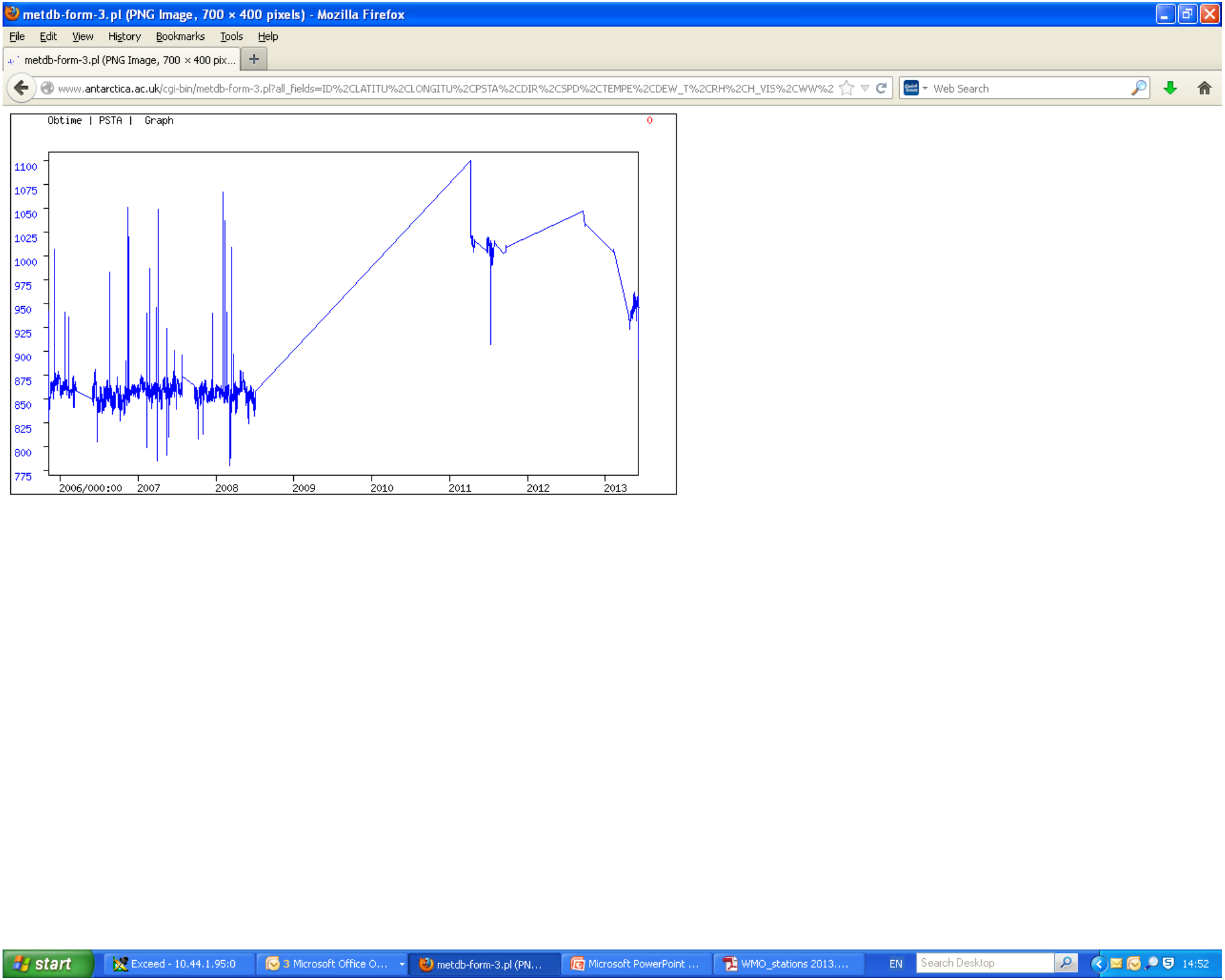
AntON successes

- We noticed that the synoptic observations from the Dumont d'Urville (89642) stopped on the 18th July 2012. I contacted the Meteo-France people in charge and the problem was resolved.
- We noticed that the synoptic observation from Concordia (89625) and Mario Zuchelli Station (89662) stopped in October 2012 and contacted the Italians and they resolved the problem
- We have noticed that the pressure values in the CLIMAT message sent out from Marion Island (68994) didn't seem to be correct for September so I contacted the South Africans and they resent the message.

89018 Svea EP6

- This is one of the Dutch AWS and had stopped sending out data but started again on the 19th April 2013.
- The data looks valid but the pressure looked to high for this station which is at 1160m.
- After some investigation it has been found that the ARGOS transmitter has now been instead on an AWS on Svalbard in the Arctic.
- We have asked them to notify ARGOS about this change.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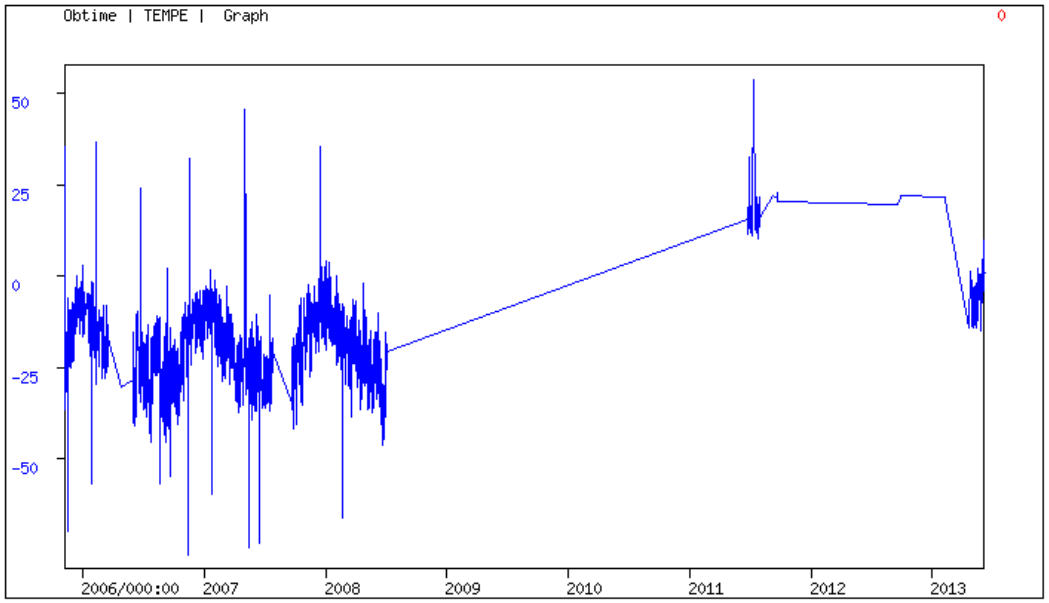

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Feedback from ATT (Antarctic Task Team)

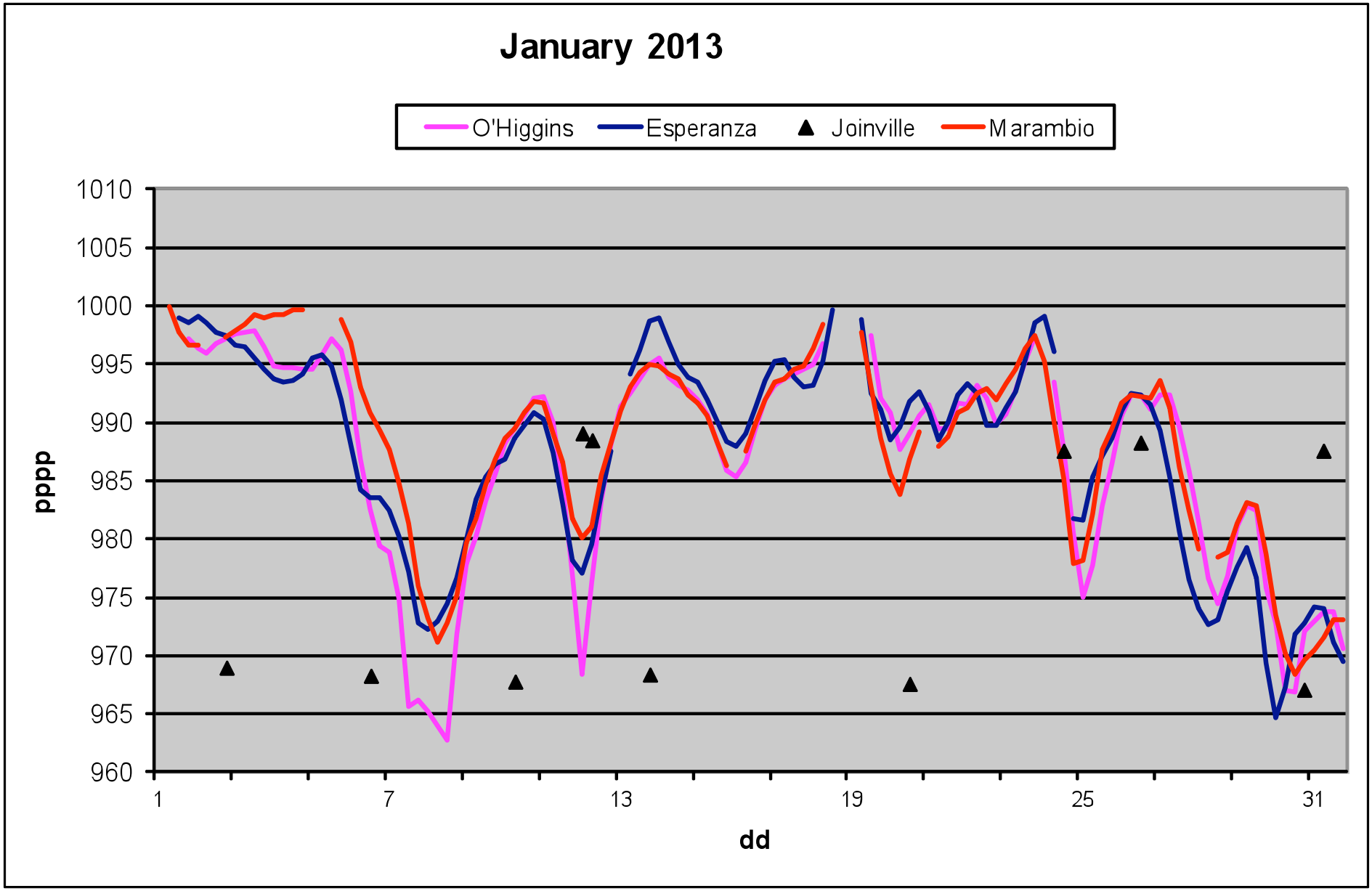
- How to expand AntON
- How to improve the number of ship report
- Ask Antarctic operators to update the list of how their observations get from Antarctica
- How to deal with blacklisted stations

- How to expand AntON
  - Link to marine and remote sensing websites (SOOS, IPAB, POLARVIEW)
  - Link to other online resources (BEDMAP, POLENET)
  - Send any other resources to Steve Colwell src@bas.ac.uk
  - Add aircraft monitoring
    - AMDAR (Aircraft Meteorological Data Relay) and AIREPS
      - Check what went out on the GTS this last Antarctic season.
      - Compile a list of aircraft that fly to Antarctic and find out if they have AMDAR capability.
- How to improve the number of ship report
  - Produce a one page document for sending to IAATO (International Association of Antarctica Tour Operators).
    - This should include what parameters we would like reporting and highlight the importance of the observations for forecast models and their verification,.
    - Include examples of when observations have made a difference specifically for SOLAS (Safety Of Life At Sea) purposes.
  - JCOMMOPS (Joint Commission for Oceanography and Marine Meteorology) has appointed a person with direct responsibility for ship observations so they need to be put in contact with IAATO.

- Ask Antarctic operators to update the list of how their observations get from Antarctica.
  - A meeting of the International forum of Users of Satellite Data Telecommunication was held in April 2012 to see about reducing the costs of meteorological data transmission via satellites.
  - The information currently held by the WMO on how observations get from Antarctica and onto the GTS is very out of date so this information needs to be updated ASAP
    - EC-PORS representatives with links to Antarctica to check entries for their stations.
    - Contact people in SCAR to ask them to update information.
- How to deal with blacklisted stations.
  - The issue was raised that some Antarctic stations are listed on a blacklist for both surface and upper air observations.
    - Some where stations that were no longer operational and others had valid looking data (buddy checking against other local stations).
    - Contacting ECMWF to find out why stations are being blacklisted and make this information available to stakeholders.
    - This has an impact for GFCS (Glogal Framework for Climate Services) as it may be the case the valid observations are being excluded from model input and verification and also may not get into international databases.

ECMWF Blacklist of Antarctic stations

				DWD			WMO	
KENN	STATIONSNAME	HH	I	LAT	LON		Latitude	Longitude
				hh.mm.ss	hh.mm.ss			
88902	Grytviken Flat Bluff (replaced 89003)							
89059	BASE_BERNARDO_O'HIGGINS_(85988)	10	J	-63° 19' 15,6"	-57° 53' 00,0"		63 19 00S	56 41 00W
89253	JOINVILLE_ISL._AWS	75	N	-63° 10' 59,9"	-55° 23' 00,0"		63 11 00S	55 24 00W
89269	UNIV.WISC.#8923_(BONAPARTE_POINT)	8	N	-64° 46' 48,0"	-64° 04' 12,0"		64 47 00S	64 04 00W
89327	UNIV.WISC.#8981_(MOUNT_Siple)	230	N	-73° 12' 00,0"	-127° 02' 00,0"		73 12 00S	127 03 00W
89542	MOLODEZNAJA	48	N	-67° 40' 00,1"	45° 51' 00,0"		67 39 58S	45 51 07E
89544	MIZUHO	2230	N	-70° 42' 00,0"	44° 19' 48,0"			
89648	MID_POINT	2509	N	-72° 32' 10,0"	145° 51' 32,0"		72 32 10S	145 51 32E
89661	CAPE_PHILLIPS	568	N	-73° 31' 00,1"	169° 45' 00,0"		73 31 06S	169 44 55E
89847	UNIV.WI_ID8929_(PENGUIN_POINT)	30	N	-67° 37' 00,1"	146° 10' 59,9"		67 37 00S	146 11 00E
89864	UNIV.WISC.#8905_(MANUELA)	80	N	-74° 57' 00,0"	163° 40' 48,0"		74 57 00S	163 41 00E
89865	UNIV.WISC.#8921_(WHITLOCK)	275	N	-76° 07' 48,0"	168° 22' 48,0"		76 08 00S	168 23 00E
89664	MCMURDO	24	N	-77° 50' 00,0"	166° 40' 12,0"		77 51 00S	166 40 00E
89050	BELLINGSHAUSEN	14,3	N	-62° 11' 58,9"	-58° 53' 37,0"		62 11 59S	58 53 37W


January 2013
O'Higgins
Esperanza
Joinville
Marambio
1010
1005
1000
995
990
985
980
975
970
965
960
dddd
1
7
13
19
25
31
dd

Issues

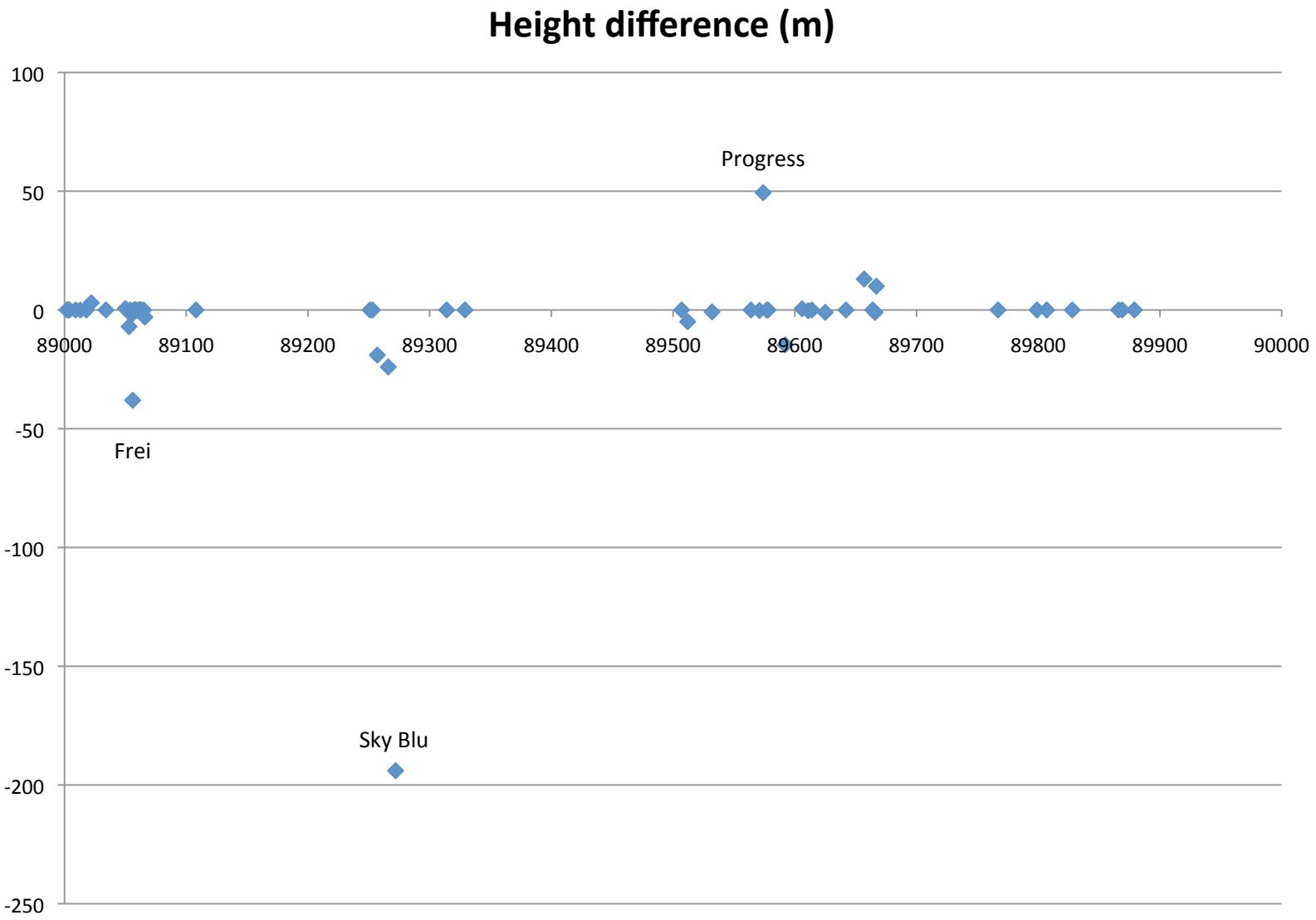
- 88902 is not listed in the WMO flat file of current operational stations.
- Molodeznaja (89542) closed in 1999 but there is an AWS there but it does not seem to transmit data.
- The WMO list the position of Bernado O'Higgins (89059) as 05641W rather than 05754W.
- Bellingshausen stopped doing radiosonde ascents in 1999.

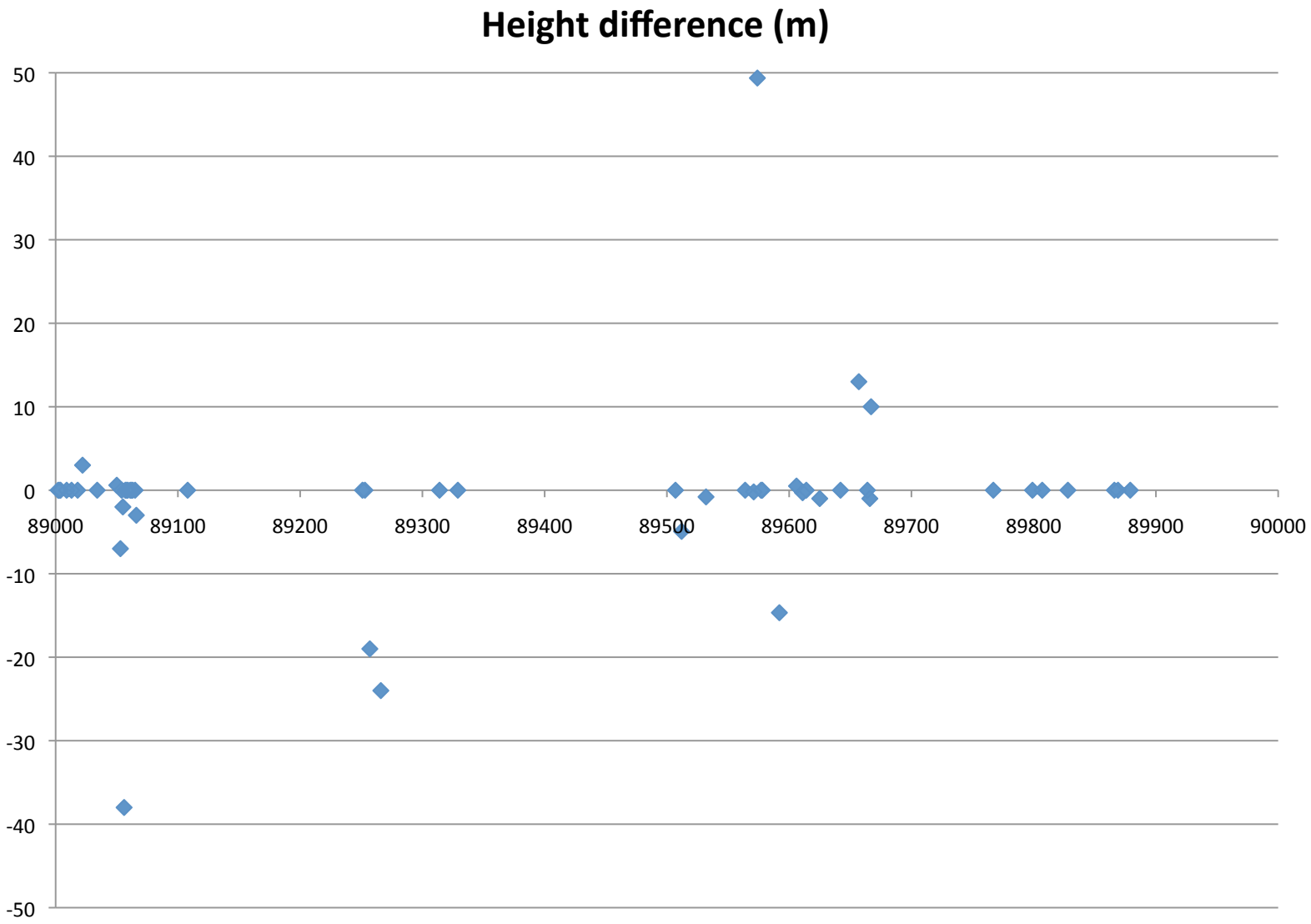
Actions

- ECMWF have been contacted and they have updated their list to remove non operational stations
- They have corrected the position for Bernado O'Higgins but not removed it from the blacklist.
- They will be sending me the updated blacklist whenever it changes for Antarctic stations so that we can see if any others have been added and then try to find out why.

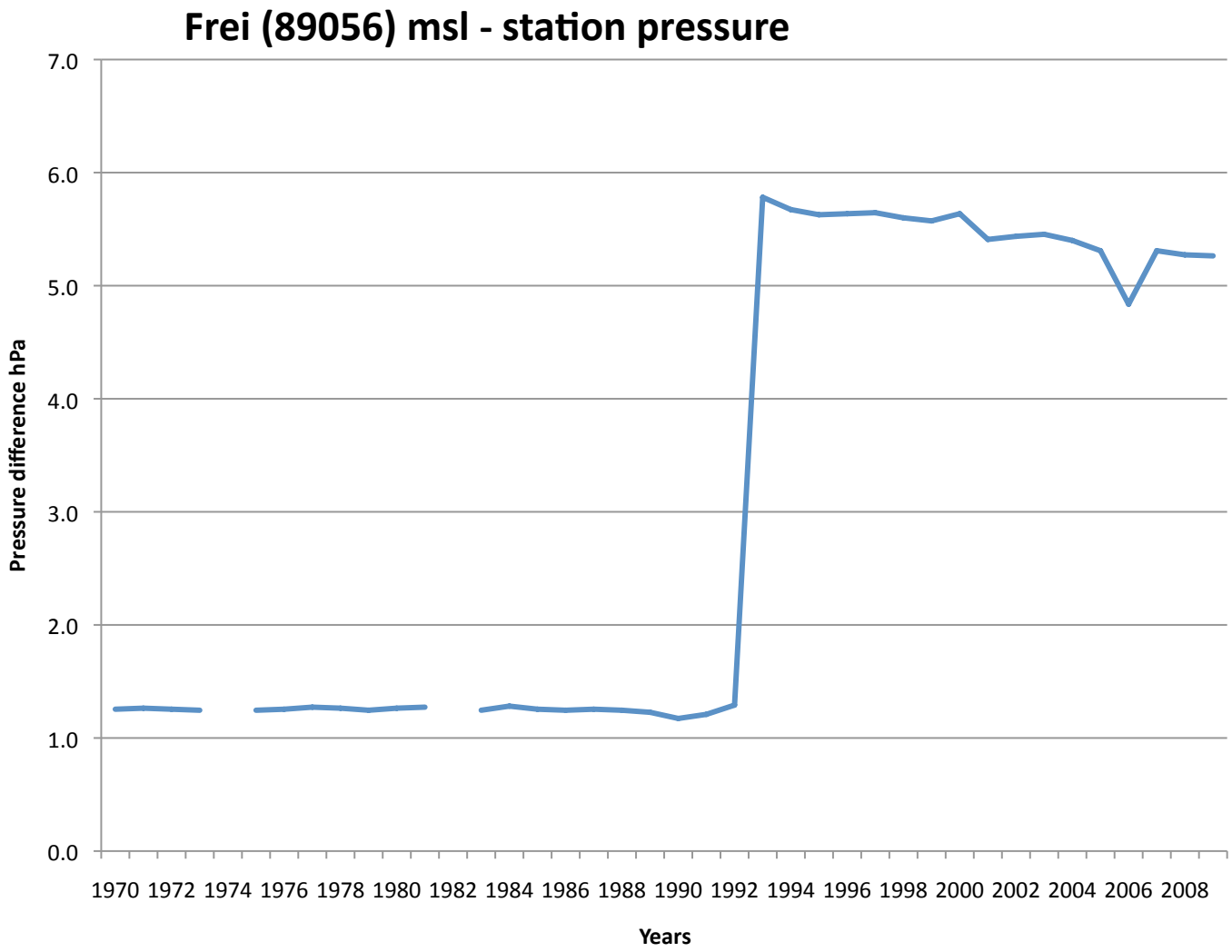
Observations used for AMPS

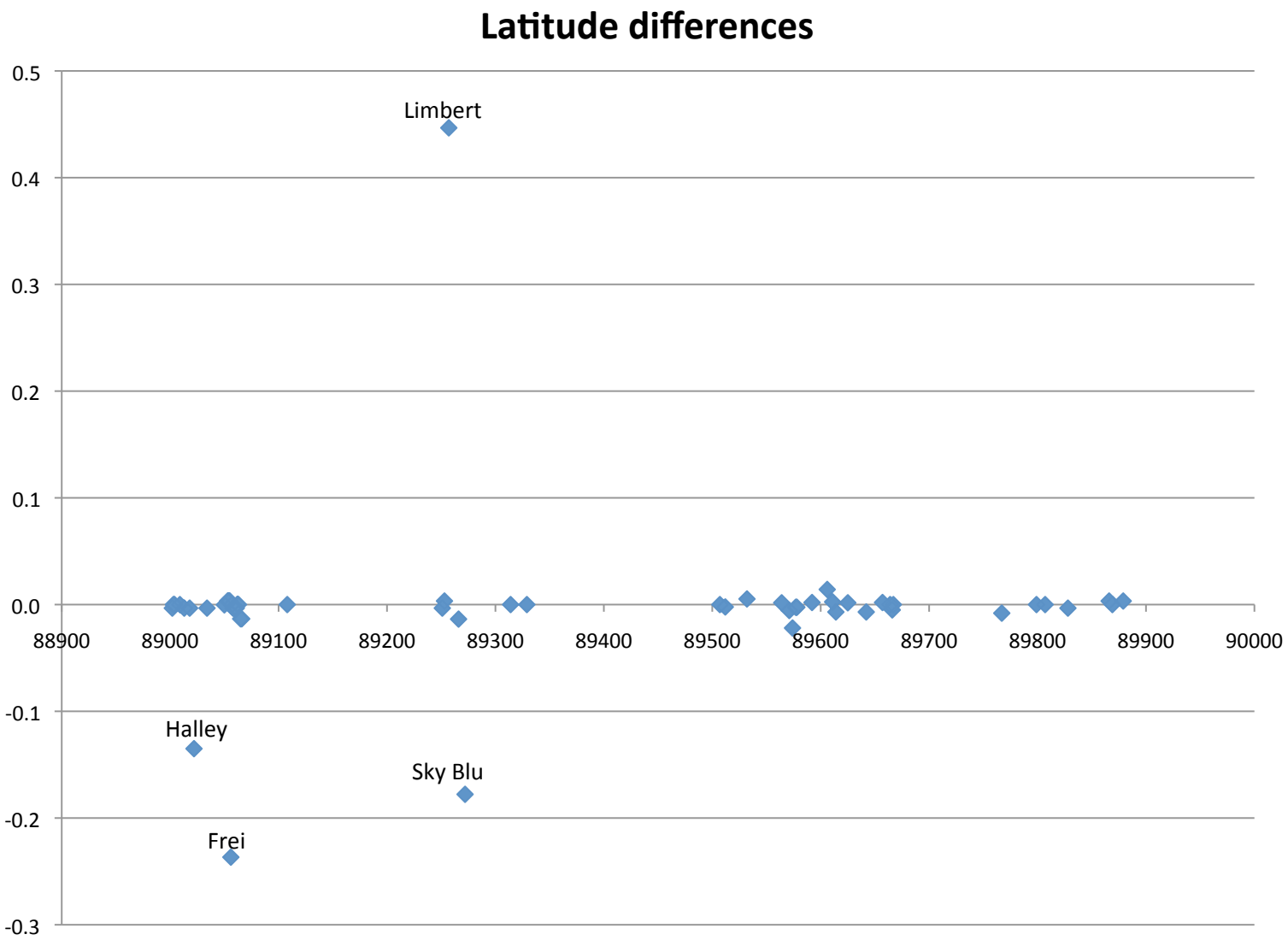
- A few years ago I looked at the observations file that were being used for AMPS and found that many of them had incorrect height and positions.
- I contacted Kevin Manning and asked for a copy of the latest one to which he replied.
  - Uh-oh. I can see where this is going....
- The situation has improved.

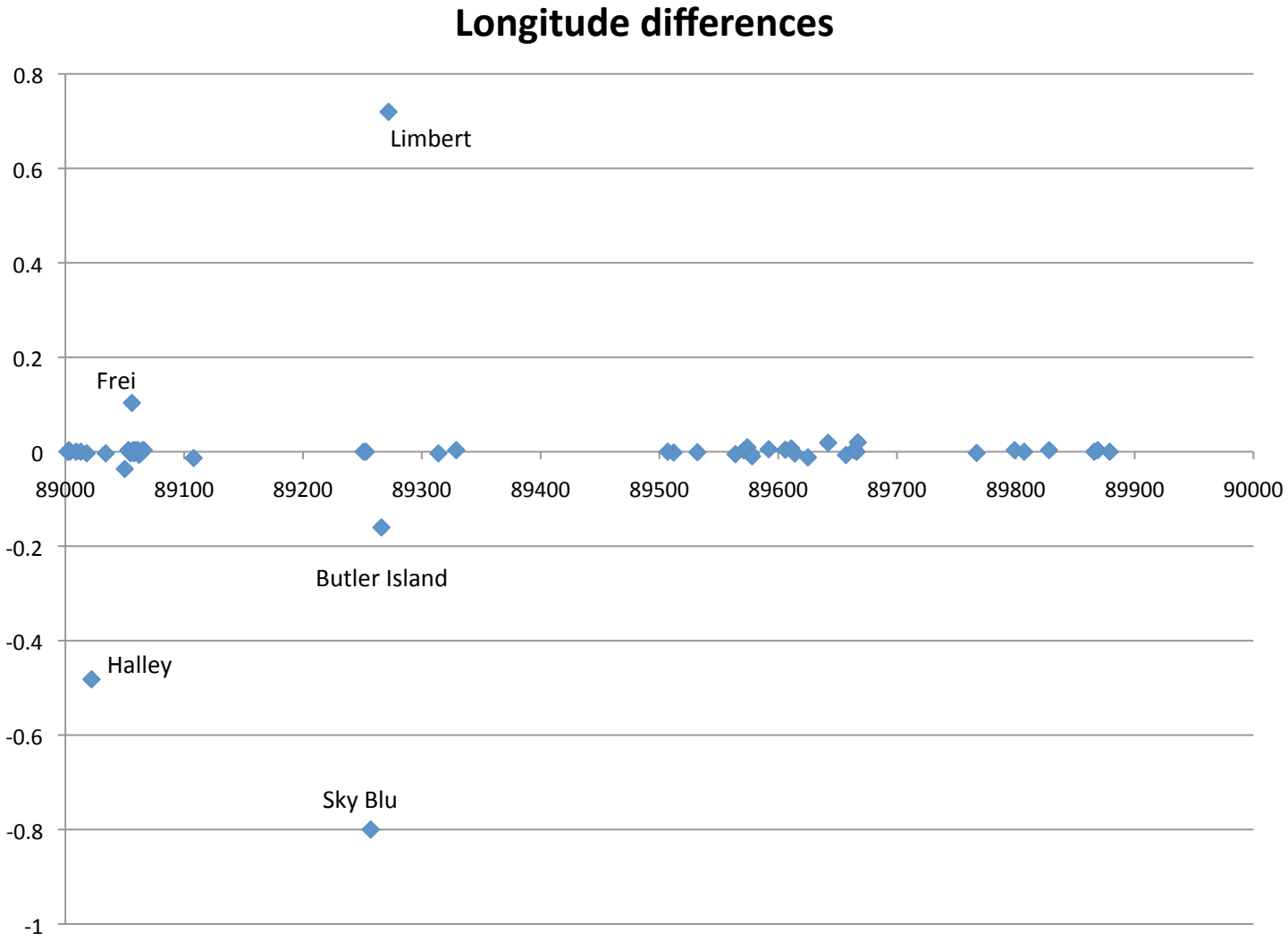

Height difference (m)
100
50
0
-50
-100
-150
-200
-250
89000
89100
89200
89300
89400
89500
89600
89700
89800
89900
90000
Progress
Frei
Sky Blu


Height difference (m)
50
40
30
20
10
0
-10
-20
-30
-40
-50
89000
89100
89200
89300
89400
89500
89600
89700
89800
89900
90000

WMO number	AMPS	WMO	Difference
89022	33	30	3
89053	4	11	-7
89055	198	200	-2
89056	10	48	-38
89066	4	7	-3
89257	40	59	-19
89266	91	115	-24
89272	1395	1589	-194
89512	119	124	-5
89574	64	15	49
89592	30	45	-15
89606	3490	3490	1
89625	3233	3234	-1
89657	304	291	13
89666	150	151	-1
89667	20	10	10


Frei (89056) msl - station pressure
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Pressure difference hPa
1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008
Years


Latitude differences
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
88900
89000
89100
89200
89300
89400
89500
89600
89700
89800
89900
90000
Limbert
Halley
Sky Blu
Frei


Longitude differences
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
89000
89100
89200
89300
89400
89500
89600
89700
89800
89900
90000
Limbert
Frei
Butler Island
Halley
Sky Blu

Actual differences

Frei	35 km
Halley	20 km
Limbert	54 km
Sky Blu	94 km
Butler Island	6 km

Summary

- The situation is better than a few years ago.
- There is a lag in getting the positions and height updated once they are on the WMO site.
- It should be possible to take the height and positions of Antarctic stations directly from the WMO flatfile.
- SYNOP MOBIL (WMO code FM-14) observations are not being used, this would currently give an extra 20 observation locations.

SCAR

- The next SCAR biennial meeting and open science conference will be held in late August 2014 in Auckland, New Zealand.
  - http://www.scar2014.com/about-2014-scar-biennial-meetings/
- SCAR has initiated the first ever Antarctic and Southern Ocean Science Horizon Scan.
  - This community-based effort has begun with a wide call for opinions and views of the most important and compelling questions in Antarctic and Southern Ocean science over the next two decades.
  - http://www.scar.org/horizonscanning/submitquestions.html
  - http://www.scar.org/horizonscanning/questions.html

The database of submissions is available to view and will be updated in real time as new submissions are received. All submissions contain 'raw' data (ie they are unedited) so any mistakes made in the submission will appear in the database. The questions will be edited after the final date for submissions has passed.

Each row in the database is one complete submission so you will need to use the scroll bar to view all fields and multiple questions. A search box is provided at the foot of the database window to help you navigate around the database and find the topics of interest to you. In addition, each column can be sorted by clicking on the column title.

Submission Date	Scientific Question 1	Description
2013-06-04 14:53:35	How does the changes on land impact the coastal ecosystems in trems of food web interactions and productivity? We need to understand the interaction between land and ocean based processes by looking at interaction between both systems. How is transport of meltwater, minerals and other suspende matter effecting coastal systems?	
2013-06-04 13:19:15	What is the current status of the active layer in the Antarctic?	Monitoring the thermal conditio investigations into climate chai of inventories of periglacial lar is supported by the IPA.
2013-06-04 11:20:04	How will Southern Ocean carbon uptake change in the future?	The Southern Ocean is a signi but uncertainties remain how t
2013-06-04 10:32:48	Does the changing climate and circulation regime force Southern Ocean to take up more CO2?	Warming ocean can induce sp regimes can have negative or to the utilisation of more CO2. temperature increase reduces
2013-06-04 10:28:02	Whether the Antarctic Circumpolar Current enhance or reduce the Oceanic transport of anthropogenic pollutants to the otherwise pristine South pole?	The role played by this dynam the oceanic transport of Anthr warming can change the prev transport.
2013-06-04 09:41:10	What observations and networks (in-situ, satellite, airborne etc) will be needed to answer the questions submitted to the horizon scan	When considering the questio existing data that are collectec this could be done.
2013-06-04 04:24:12	Will the Southern Ocean take up less carbon dioxide in the future, leading to higher radiative forcing?	The Southern Ocean's uptake changing wind patterns assoc increasing future atmospheric models and atmospheric analy
2013-06-03 20:58:09	How Marine antarctic fauna endured the recurrent and periodic Quaternary glacial cycles	model of Quaternary Biogeogr
2013-06-03 16:50:11	What is the role of Antarctic regions to invoke and shape warmer/higher sea level than present conditions (Quaternary)?	Southern Ocean and Antarctic and sea level.
2013-06-03 16:41:44	Which is limiting terrestrial life: cold temperature or water availability?	With temperatures largely belc altering precipitation frequenc will have huge impacts on col
2013-06-03 05:21:38	How can the light from the first stars to exist in the Universe be seen?	The first stars likely ended the gamma-rays. The cosmologic wavebands. Antarctica's extr search for these transient, en
2013-06-03 05:20:35	How can other solar systems be discovered in the cosmos?	The long duration of winter da atmosphere, permit the precis

Page 1 of 4 Search In Submissions Submission 1 - 29 of 99


ELIZABETH II D:G: REGINA F:D:

Questions