

GSN, GUAN and Interactions with CBS – Update from Secretariat

(Submitted by the GCOS Secretariat)

Summary and Purpose of Document

This document summarizes the latest status and developments relevant to the GSN and GUAN, including an assessment of the adequacy of water vapour observations, and a description of interactions with the WMO Commission for Basic Systems (CBS) since the last session of AOPC. It is intended to provide recent results and background information that will be beneficial for discussions to take place during the session.

ACTION PROPOSED

The meeting is invited to note the information contained in this document for discussions under Agenda Item 4.1.

Annexes:

1. Change Log GSN and GUAN Lists
2. GSN and GUAN Centres and Archives
3. List of National Focal Points for GCOS and Related Climatological Data

GSN, GUAN and Interactions with CBS – Update from the Secretariat

Network Composition

1. The GSN and GUAN station lists were updated as of 1 February 2008 in line with normal procedures. This has resulted in a total number of 1023 stations in the GSN and 165 stations in the GUAN. The current lists are available through the GCOS Web site (<http://gcos.wmo.int>), where new network maps have also been posted. The change log for GSN and GUAN from the previous composition (1 January 2007) is included as Annex I to this report, for information. Efforts went into harmonizing these lists with the Regional Basic Climatological Network (RBCN) list maintained by World Weather Watch (cf. doc. 9). By default, GSN and GUAN are subsets of the RBCN. Only one GSN station is currently not in WMO Pub. 9, Vol. A (94275 GEORGETOWN POST OFFICE, Australia); it has ceased operations in October 2007, and 94274 GEORGETOWN AIRPORT has been suggested as a replacement, but formal notification of this transition is still pending.

Network Monitoring and Performance

2. The GCOS Monitoring, Analysis and Archive Centres and the CBS Lead Centres for GCOS Data have continued their activities and will report on details at this session. Annex II provides a list of all GCOS centres and their latest contacts, for information.

Water Vapour Observations

3. On the topic of systematic measurements of water vapour (humidity) from in-situ observing networks, the GCOS Implementation Plan stated that homogeneous data were essential for assessment of the impact of changes of surface water vapour on natural and human systems (cf. p. 39 of GCOS-92, and Action A12). Unfortunately, according to the Plan, poor observational practices hampered the usefulness of the data from most sources (e.g., the WWW/GOS synoptic observing networks over land, VOS, VOSclim etc.), and additional research was needed to address these issues. In response to this perceived deficiency, the Secretariat sought the opinion from the WCRP GEWEX community on the situation.

The GEWEX Radiation Panel, through Chris Kummerow (Colorado State University, USA), responded that, “for climate research purposes, status and variability of lower-tropospheric water vapour is more or less understood, the argument being that forecast models, such as from ECMWF, now do as well in the southern hemisphere where vapour information is almost exclusively from satellites as they do in the northern hemisphere where rawinsonde data is more abundant. The biggest issue today is upper-tropospheric water vapour, since radiosondes historically had very difficult times making accurate measurements. Some of the GPS occultation measurements seems to have great potential offering reliable estimates in this region. Verification by very high quality ground-based systems is still necessary, but perhaps done as easily with lidar systems as with rawinsondes. From a GRP perspective, it is thus difficult to justify a significant effort to improve and homogenize global rawinsonde data. Satellites have become increasingly sophisticated and now rival the quality of sondes while having homogeneous coverage. This is not to say that improved synoptic observations may not be useful for a number of weather related applications - they simply are not homogeneous enough - never have been and probably never will be - for use in climate monitoring.”

Implementation Activities

4. Dick Thigpen has continued his activities as implementation manager for GSN and GUAN on revitalization of high-priority GUAN and GSN stations, in cooperation with the WMO Technical Cooperation Department and under the guidance of the Advisory Group on GSN and GUAN (AGG). Details are reported in doc. 10 and will be presented under Agenda Item 4.8.

National Points of Contact for GCOS and Related Climatological Data

5. The list of National Focal Points for GSN and GUAN data was updated as of 1 April 2008 and now has 140 names. It is attached for information as Annex III and can also be found via the GCOS website:

<http://www.wmo.int/pages/prog/gcos/index.php?name=nationalactivities> .

GCOS Interactions with the WMO Commission for Basic Systems (CBS)

6. GCOS representatives participated in a number of meetings of Expert Teams (ET) to discuss relevant items, including the third session of the OPAG-IOE ET on Evolution of the Global Observing System (9-13 July 2007), and the joint third session of the ET on Satellite Systems and the ET on Satellite Utilization and Products (3-7 September 2007). GCOS was also represented in the Workshop on the Re-design and Optimization of the Space-based Global Observing System (OPT-2, 21-22 June 2007). The objective is to further ensure that GCOS needs are fully taken into account in the evolution of the GOS, including the space-based component.

OPT-2 made recommendations and identified challenges related to addressing space-based requirements of climate monitoring alongside with those of operational meteorology in a new vision of the GOS, with 2025 as the time horizon.

In response to a briefing by the CBS Rapporteur on GCOS Matters (Matthew Menne), ET-EGOS:

- "... reaffirmed the need for the reliable operation of GUAN stations on the Indian subcontinent [and] supported the ongoing efforts by the GCOS programme to secure an agreement with India related to the full establishment of GUAN candidate stations..."
- "...[recommended and] GCOS Secretariat agreed to draft, with help from CBS Rapporteur on GCOS matters and in collaboration with WMO WWW, a letter to Members announcing that the calculation and transmission of CLIMAT TEMP messages is no longer required for GCOS purposes and inquiring on possible consequence for other user communities." (ACTION)
- "...supported the development of the proposal for the GRUAN [and] welcomed the offer by German Meteorological Service to serve, at its Lindenberg Observatory, as a Lead Centre for GRUAN for an initial 'pilot phase'."

ET-EGOS also noted the July 2007 update of GCOS/WCRP observation requirements (as being part of the regular Rolling Review of Requirements process), including proposed modifications and additions to the CEOS/WMO database set of parameters, that more accurately reflect the nature of Essential Climate Variables.

The joint session of ET-SAT and ET-SUP extensively discussed the concept for Regional/Specialized Centres for Climate Monitoring (R/SSC-CM) which are intended to comprehensively address GCOS satellite-related needs. In response to the need for facilitated access to satellite-derived datasets and products, the Chair of the session (Michael King) interacted with the NASA Global Change Master Directory to establish a special GCOS query on its site (see http://gcmd.nasa.gov/Data/portal_index.html?leftnav=services > GCOS).

7. GCOS staff have continued to worked closely with Observations Department/Observing Systems Division (OBS/OSD) staff in carrying out revitalization activities on a number of GSN and GUAN stations, and with WMO Space Programme staff in addressing space-based requirements.

ANNEX I: CHANGE LOG GSN AND GUAN STATION LISTS

GSN STATION LIST – FEBRUARY 2008 UPDATE

Total Number of Stations:

1-Jan-2007: 1016

1-Feb-2008: 1023

Date: 1-Feb-2008
Number: 29
Country: UK (South Georgia Islands)
Change(s):

Add (1): 88903 GRYTVIKEN

Net Change: +1

Status: COMPLETED

Comments:

Date: 1-Feb-2008
Number: 30
Country: Morocco
Change(s):

Add (1): 60120 KENITRA

Delete (1): 60156 NOUASSEUR

Net Change: 0

Status: COMPLETED

Comments:

Date: 1-Feb-2008
Number: 31
Country: Lithuania
Change(s):

Add (1): 26730 VILNIUS

Net Change: +1

Status: COMPLETED

Comments:

Date: 1-Feb-2008
Number: 32

Country: Sweden
Change(s):

Add (1): 02287 HOLMON
Delete (1): 02288 HOLMOGADD

Net Change: 0

Status: COMPLETED
Comments:

Date: 1-Feb-2008
Number: 33
Country: Sweden
Change(s):

Add (1): 02589 GOTSKA SANDON
Delete (1): 02584 GOTSKA SANDON

Net Change: 0

Status: COMPLETED
Comments: Closure of station, transition to AWS

Date: 1-Feb-2008
Number: 34
Country: Australia
Change(s):

Add (1): 95625 CUNDERDIN AIRFIELD
Delete (1): 94626 CUNDERDIN

Net Change: 0

Status: COMPLETED
Comments: 94626 no longer in Vol A; Transition to AWS

Date: 1-Feb-2008
Number: 35
Country: Australia
Change(s):

Add (1): 95805 CAPE BORDA AWS
Delete (1): 94805 CAPE BORDA (COMPARISON)

Net Change: 0

Status: COMPLETED
Comments: Transition to AWS according to GCMPs

Date: 1-Feb-2008
Number: 36
Country: South Africa
Change(s):

Add (11): 68242 MAKIFENG
68262 PRETORIA
68442 BLOEMFONTEIN
68461 BETHLEHEM
68512 SPRINGBOK
68538 DE AAR
68588 DURBAN
68816 CAPE TOWN
68828 GEORGE
68842 PORT ELIZABETH
89004 SANAE

Delete (7): 68296 SKUKUZA
68370 BETHAL
68496 CAPE ST. LUCIA
68580 CEDARA
68712 CAPE COLUMBINE
68920 CAPE AGULHAS
68938 CAPE ST. FRANCIS

Net Change: +4

Status: COMPLETED

Comments:

Date: 1-Feb-2008
Number: 37
Country: Moldova
Change(s):

Add (1): 33815 CHISINAU

Net Change: +1

Status: COMPLETED

Comments:

Date: 1-Feb-2008
Number: 38
Country: China
Change(s):

Add (1): 56187 WENJIANG
Delete (1): 56294 CHENGDU

Net Change: 0

Status: COMPLETED

CHANGE LOG: GUAN STATION LIST – FEBRUARY 2008 UPDATE

Total Number of Stations:

1-Jan-2007: 164

1-Feb-2008: 165

Date: 1-Feb-2008
Number: 14
Country: Switzerland
Change(s):

Add (1): 06610 PAYERNE

Net Change: +1

Status: COMPLETED
Comments:

Date: 1-Feb-2008
Number: 15
Country: Japan
Change(s):

Add (1): 47918 ISHIGAKIJIMA

Delete (1): 47936 NAHA

Net Change: 0

Status: COMPLETED
Comments:

ANNEX II: GSN and GUAN Centres and Archives

	MONITORING CENTRE	ANALYSIS CENTRE	ARCHIVE	CBS LEAD CENTRES
GSN	DWD (Precip), JMA (Temp)	NCDC	NCDC	BOM, BAS, DMC, DMN, DWD, IMN, IRIMO, JMA, NCDC
GUAN	ECMWF	NCDC	NCDC	

Overview page for all networks:

GCOS Secretariat: <http://www.wmo.int/pages/prog/gcos/index.php?name=networks>

CBS Lead Centres for GCOS Data:

- AUSTRALIA (BOM): K.C.Smith@bom.gov.au, [GCOS Lead Centre RAV@bom.gov.au](mailto:GCOS_Lead_Centre_RAV@bom.gov.au)
- CHILE (DMC): gtorres@meteochile.cl
- GERMANY (DWD): Tobias.Fuchs@dwd.de
- IRAN (IRIMO): jabbari@irimet.net
- JAPAN (JMA): h_isobe@met.kishou.go.jp, climatemonitor@met.kishou.go.jp
- MOROCCO (DMN): sebbari@marocmeteo.ma
- MOZAMBIQUE (INM): domingos_p@inam.gov.mz
- UK (for BAS): j.shanklin@bas.ac.uk
- US (NCDC): matthew.menne@noaa.gov, <http://www.ncdc.noaa.gov/oa/hofn/global-insitu.html>

A. GSN

GSN Monitoring Centre:

- Deutscher Wetterdienst (DWD, JMA): <http://www.gsnmc.dwd.de>

GSN Analysis Centre :

- National Climatic Data Center (NCDC): <http://www.ncdc.noaa.gov/oa/hofn/global-insitu.html>

GSN Archive:

- World Data Center for Meteorology – Asheville: <http://gosis.org/ios/GCOS-main-page.htm>

B. GUAN

GUAN Monitoring Centre:

- ECMWF (TEMPs): <http://www.ecmwf.int/products/forecasts/d/charts/monitoring/guan>

GUAN Analysis Centre:

- National Climatic Data Center (NCDC): <http://www.ncdc.noaa.gov/oa/hofn/global-insitu.html>

GUAN Archive:

- World Data Center for Meteorology - Asheville: <http://gosis.org/ios/GCOS-main-page.htm>

NATIONAL FOCAL POINTS FOR GCOS AND RELATED CLIMATOLOGICAL DATA (RBCN)

(UPDATED 1 APRIL 2008)

Please verify the exactitude of the information in this list and kindly report any changes to WMO, World Weather Watch e-mail box: wwwmail@wmo.int to the attention of Dr. Miroslav Ondras

	COUNTRY LOCATION MET OFFICE	LAST NAME FIRST NAME	LANG. E-F-S-R	E-MAIL	TELEPHONE	FAX
1.	Afghanistan Kabul	Qadeer Abdul Q	En	afghanistan_met_authority@hotmail.com	+(93) 7931 5843	Not available
2.	Algeria Dar El Beida	Saci Azzedine	Fr	a.saci@meteo.dz	+(213 21) 50 89 57	+(213 21) 50 88 49
3.	Albania Tirana	Bruçi Eglantina Demiraj	En	eglantinab@yahoo.com	+(355 4) 22 35 18	+(355 4) 22 35 18
4.	Antigua & Barbuda St. John's Antigua	Meade Keithley	En	metoff@candw.ag keithleym@yahoo.com	+(268) 462 4606 +(268) 462 3229	+(268) 462 4606
5.	Argentina Buenos Aires	Garcia Mario Jorge	Sp	garcia@meteofa.mil.ar	+(54 11) 4514 1525	+(54 11) 5167 6709
6.	Armenia Yerevan	Grigoryan Valentina	Ru	valent_g2000@yahoo.com agency@hydromet.am	+(374 1) 533 575	+(374 1) 533 575
7.	Australia Melbourne	Coughlon Michael James	En	m.coughlan@bom.gov.au	+(61 3) 9669 4086	+(61 3) 9669 4881
8.	Austria Vienna	Potzmann Roland	En	r.potzmann@zamg.ac.at	+(43 1) 360 26 2208	+(43 1) 360 26 72... Missing digits!
9.	Azerbaijan	Khalilov Sahib	Ru	S_khalilov@yahoo.com Meteo@azdata.net	+(99 412) 441 5138	+(99 412) 441 5685
10.	Bahamas Nassau	Burnside Godfrey Lionel	En	glb.met@batelnet.bs	+(1 242) 356 3734 / 6 / 8	+(1 242) 356 3739
11.	Bahrain Muharraq	Mohammed Abdul Rahman	En	arahman@caa.gov.bh	+(97 3) 1732 9044	+(97 3) 1732 0630
12.	Belarus Minsk	Ludmila (Mrs) Ganchina	Ru	info@by.mecom.ru	+(375 17) 264 26 10	+(375 17) 264 02 43
13.	Belgium Brussels	Vandiepenbeeck Marc	Fr	Marc.vandiepenbeeck@oma.be	+(32 2) 373 05 23	+(32 2) 373 05 28
14.	Belize Belize City	Gordon (Mrs) Ann	En	Anngordon56@hotmail.com climat@hydromet.gov.bz	+(501) 225 2011	+(501) 225 2101
15.	Bolivia La Paz	Trujillo Felix	Sp	ftujillo@senamhi.gov.bo	Not available	Not available
16.	Bosnia &	Sehbajraktarevic	En	kemo_seh@yahoo.com	+(387 33) 276 709	+(387 33) 276 701

	COUNTRY LOCATION MET OFFICE	LAST NAME FIRST NAME	LANG. E-F-S-R	E-MAIL	TELEPHONE	Fax
	Herzegovina Sarajevo	Kemal				
17.	Brazil Brasília	Manhães Francisco de Paula	En	manhaes@inmet.gov.br	+(55 61) 343 2192	+(55 61) 343 2167
18.	Botswana Gaborone	Masisi (Ms) Doreas	En	Not indicated	+(267) 3956 281	+(267) 3956 282
19.	Bulgaria Sofia	Alexandrov Vesselin	En	vesselin.alexandrov@meteo.bg	+(359 2) 975 3986 ext 455	+(359 2) 988 4494
20.	Burkina Faso Ouagadougou	Garane Ali Jacques	Fr	aigarane@yahoo.fr	+(226) 35 60 32	+(226) 35 60 39
21.	Burundi Bujumbura	Ntibasharira Balthazar	Fr	Not indicated	+(257) 22 3150	+(257) 27 6025
22.	Canada Downsview, Ontario	Manore Mike	En		+(1 902) 426 1241	+(1 902) 426 1595
23.	Cape Verde Ilha do Sal	Moniz Carlos Alberto	En	institutometeo@cvtelecom.cv camoniz@yahoo.com(unclear)	+(238) 411 276	+(238) 411 294
24.	Chile Santiago	Carrasco Cerda Jorge	Sp	jorge.carrasco@meteochile.cl	+(56 2) 436 4519	+(56 2) 437 8512
25.	China Beijing	Xiong Anyuan	En	xay@cma.gov.cn	+(86 10) 6840 7447	+(86 10) 6217 5930
26.	Colombia Bogota D.C	Rancel-Mantilla Ernesto	Sp	erangel@ideam.gov.co	+(57 1) 350 0195	+(57 1) 350 0131
27.	Costa Rica San Jose	Herrera Soto Hugo	Sp	hherrera@imn.ac.cr	+(506) 222 5616 ext. 104	+(506) 223 1837
28.	Côte D'Ivoire Abidjan	Abolé N'GBÉ	Fr	abole@sodexam-ci.com (Incorrect – awaiting update)	+(225 21) 58 30 06	+(225 21) 27 73 44
29.	Croatia Zagreb	Katušín Zvonimir	En	katusin@cirus.dhz.hr	+(385 1) 4565706	+385 1 4851903
30.	Cyprus Nicosia	Pashiardis Stelios	En	spashiadis@ms.moa.gov.cy (Incorrect – awaiting update)	+(357 22) 802 911	+(357 22) 305 500
31.	Czech Republic Prague	Kveton Vit	En	vit.kveton@chmi.cz	+(420) 24403 2204	+(420) 24403 2276
32.	Denmark Copenhagen	Kern-Hansen Claus (updated 3/372007)	En	ckh@dmi.dk	+(45 39) 15 73 50	+(45 39) 15 73 90
33.	Dominican Rep. Santo Domingo	Villegas Elba	Sp	dir.met@codetel.net.do (Incorrect – awaiting update)	+(809) 788 1122	+(809) 594 8844
34.	Ecuador Quito	Enríquez Dávila Humberto	Sp	enriquez@inamhi.gov.ec	+(59 322) 456 728	+(59 322) 433 934
35.	El Salvador San Salvador	Zimmermann Mejla Ricardo	Sp	rzimmermann@snet.gob.sv	+(503) 283 2268 / 9	+(503) 283 2269
36.	Egypt Cairo	Youssef M. Yehia A. M	En	ma@idsc.gov.eg (Incorrect – awaiting update)	+(202) 684 9860	+(202) 684 9857
37.	Estonia Tallinn	Tillmann (Ms) Ene	En	ene@emhi.ee	+(372 6) 461 559	+(372 6) 454 277

	COUNTRY LOCATION MET OFFICE	LAST NAME FIRST NAME	LANG. E-F-S-R	E-MAIL	TELEPHONE	Fax
38.	Ethiopia Addis Ababa	Bekele Endalkachew	En	nmsa@telecom.net.et endbek2002@yahoo.com	+(251 1) 51 22 99	+(251 1) 51 70 66
39.	Fiji Nadi	Mani Sukamanu Kafoa	En	fms@met.gov.fj	+(679) 672 4888	+(679) 672 0430
40.	Finland Helsinki	Heino Raino	En	Raino.heino@fmi.fi	+(358 9) 1929 2200	+(358 9) 1929 2203
41.	France Toulouse	Céron (Ms) Madeleine (New)	Fr	Madeleine.ceron@meteo.fr	+(33) 5 61 07 8354	+(33) 5 61 07 8309
42.	Gambia Banjul	Sima Fatou	En	sima_fatou@yahoo.com	+(220) 201 559	+(220) 225 009
43.	Georgia Agmashenebeli	Kartvelishvili (Ms) Liana	Ru	lianakartvelishvili@yahoo.com l_megrelidze@yahoo.com	+(995 32) 950 255	+(995 32) 955 006
44.	Germany Offenbach	Schneider Udo	En	Udo.schneider@dwd.de	+(49 69) 8062 2766	+(49 69) 8062 3759
45.	Ghana Accra	Narh Amos Thomas	En	meteokia@africaonline.com.gh meteo@africaonline.com.gh	+(233 21) 777 172	+(233 21) 764 926
46.	Greece Hellinikon	Karatarakis Nikolaos	En	nkhydro@hnms.gr	+(30 210) 969 9032	+(30 210) 962 8952
47.	Guatemala Guatemala	Garavito Fulgencio	Sp	fgaravito@insivumeh.gob.gt	+(502) 331 4967	+(502) 331 5005
48.	Guinea Conakry	Barry Alpha Boubacar	Fr	barry_ab@yahoo.fr	+(224) 45 48 15	+(224) 41 35 77
49.	Guinea Bissau Bissau	Mendonça (Ms) Feliciana	Fr, Sp	felicianapt@yahoo.fr	+(245) 212332	+(245) 201753
50.	Guyana Georgetown	Seulall (Ms) Bhaleka Devi	En	b.d.seulall@hydromet.gov.gy	+(592) 225 4247	+(592) 226 1460
51.	Hong Kong, China Hong Kong	Leung Wing-mo	En	wleung@hko.gov.hk	+(852) 2926 8441	+(852) 2311 9448
52.	Hungary Budapest	Wantuch Dobi (Mrs) Ildikó	En	dobi.i@met.hu	+(36 1) 346 4614	+(36 1) 346 4659
53.	India New Delhi	Srinivasan Govindarajan	En	srinidst@nic.in	+(91 11) 2686 4642	+(91 11) 2461 1792
54.	Indonesia Jakarta	Siwamura Djojo	En	djojo_s@yahoo.com	+(62 21) 654 5626	+(62 21) 424 6703
55.	Iran Tehran	Jabbari Mina	En	jabbari@irimet.net mina747@yahoo.com	+(98 21) 602 47 40	+(98 21) 600 04 17
56.	Iraq	Hantosh Dr. T	En	imodania@yahoo.com	+(96 41) 7788927	Not indicated
57.	Ireland Dublin	Sheridan Thomas	En	tom.sheridan@met.ie	+(353 1) 806 4207	+(353 1) 806 4216
58.	Israel	Furshpan	En	avnerf@ims.gov.il	+(972 3) 968 2162	+(972 3) 960 4063

	COUNTRY LOCATION MET OFFICE	LAST NAME FIRST NAME	LANG. E-F-S-R	E-MAIL	TELEPHONE	Fax
	Bet Dagan	Avner				
59.	Italy Rome	Colombo Tiziano	En	t.colombo@meteoam.it	+(39 06) 9129 3232	+(39 06) 9129 2457
60.	Japan Tokyo	Hashida Toshihiko	En	iao-jma@met.kishou.go.jp	+(81 3) 3211 4096	+(81 3) 3211 2032
61.	Jordan Amman	Samawi Mohammad	En	climate@jometeo.gov.jo	+(962 6) 489 2408	+(962 6) 489 4409
62.	Kazakhstan Almaty	Aliyakbarova (Ms) Noelya	Ru	abramenko@meteo.kz andreadi@meteo.kz	+(732 72) 67 52 83	+(732 72) 67 64 64
63.	Kenya Nairobi	Machua Samuel M.	En	machua@meteo.go.ke	+(254 020) 567 880	+(254 020) 576 955
64.	Kiribati Bikenibeu	Tibiriano Moreti	En	kiri_met@tskl.net.ki (Incorrect – awaiting update)	+(686) 26 209	+(686) 26 089
65.	Korea, Rep. Seoul	Choi Jae-Cheon	En	icchoi@kma.go.kr	+(82 2) 841 9157	+(82 2) 841 9258
66.	Kyrgyzstan Bishkek	Vandasheva (Ms) Svetlana S	Ru	climate@meteo.ktnet.kg	+(996 312) 21 38 62	+(996 312) 21 44 22
67.	Latvia Riga	Pirozenoka Lubova	En	Meteo.climat@meteo.lv	+(371) 703 2634	+(371) 714 5154
68.	Lebanon Beirut	Al Khodari Riad Assolh	Fr	meteolb@meteolb.org	+(96 11) 628 187 ext 2214	+(96 11) 629 046
69.	Libya Tripoli	El Fadli Kalid Ibrahim	En	K_elfadli_met@mail.lttntnet.net	+(218 21) 360 6644	+(218 21) 360 6655
70.	Lithuania Vilnius	Galvonaite Audrone	En	audrone@meteo.lt	+(370 5) 275 04 18	+(370 5) 272 88 74
71.	Luxemburg Luxembourg	Alesch Claude	Fr	claud.alesch@airport.etat.lu	+(352) 4798 2029
72.	Macao Taipa	Tong Si Man	En	smtong@smg.gov.mo	+(853) 898 9250	+(853) 850 557
73.	Macedonia, Rep. Skopje	Pavlovska (Mrs) Vesna	En	vpavlovska@meteo.gov.mk	+(389 2) 3097 004	+(389 2) 3097 118
74.	Madagascar	Ms Ranivoarisoa Sahondra Vololoniaina	Fr	sahondra_ranivoarisoa@yahoo.fr	+032 04 111 58 (Mobile)	Not available
75.	Malaysia Petaling Jaya	Chan Ah Kee	En	cak@kjc.gov.my	+(603) 7967 8162	+(603) 7955 0964
76.	Malawi Chileka	Nkhokwe Jolam	En	metdept@metmalawi.com	+(265 1) 692 333	+(265 1) 692 329
77.	Maldives Male	Yazeed Ahmed	En	admin@meteorology.gov.mv	+(960) 324 524	+(960) 320 021
78.	Mali Bamako	Gueye (Ms) Sissoko Yaye	Fr	Not indicated	+(223) 229 6203	+(223) 229 2101
79.	Malta Luqa	Giordmania Lawrence	En	lawrence.giordmania@maltairport.com (Incorrect – awaiting update)	+(356) 9210 6689	+(356) 2124 6694

	COUNTRY LOCATION MET OFFICE	LAST NAME FIRST NAME	LANG. E-F-S-R	E-MAIL	TELEPHONE	Fax
80.	Marocco Casablanca	Sebbari Rachid	Fr	sebbari@marocmeteo.ma	+(212 22) 913 805	+(212 22) 913 797
81.	Mauritius Vacoas	Dunputh Balraj	En	meteo@intnet.mu	+(230) 686 1031	+(230) 686 1033
82.	Mexico Mexico City	Davydova Belitskaya Valentina	Sp	vdavydova@mailsmn.cna.gob.mx (Incorrect – awaiting update)	+(???) 9159 8757	+(???) 9159 8695
83.	Moldova, Rep Chisinau	Trescilo Lidia	Ru/En	lidiat@meteo.md	+(373 22) 773 644	+(373 22) 773 636
84.	Mongolia Ulanbnbaatar	Dolgorsuren Azzaya	En	azzaya23@yahoo.com	+(976 11) 326 614	+(976 11) 326 614
85.	Mozambique Maputo	Patricio Domingos Mosquito	En	domingos_p@inam.gov.mz	+(258 21) 491 150	+(258 21) 491 150
86.	Myanmar Yangon	Khin Cho Cho Shein (Ms) Khin	En	dg.dmh@mptmail.net.mm	+(95 1) 665 669	+(95 1) 665 944
87.	Namibia Windhoek	Mwangala Sepiso	En	smwangala@yahoo.co.uk	+(264 61) 287 7000	+(264 61) 287 7009
88.	Nepal Kathmandu	Rajbhandari Nirmal (or) Baidya Saraju Kumar	En En	sarju@dhm.gov.np (Tentative, awaiting confirmation) meteo@wlink.com.np (Incorrect – awaiting update)	+(977 1) 425 5920 +(977 1) 4248808	+(977 1) 425 4890 +(977 1) 425 4890
89.	Netherlands Antilles and Aruba, Curacao	Martis Albert Asinto Eleuterip	En	albmartis@meteo.an	+(599 98) 393 363	+(599 98) 683 999
90.	Netherlands AE De Bilt	Monna Wim A	En	monna@knmi.nl	+(31 30) 220 6457	+(31 30) 221 0407
91.	New Zealand Wellington	Salinger Jim	En	j.salinger@niwa.co.nz	+(64 9) 375 2053 +(64 27) 521 9468 (Mobile)	+(64 9) 375 2051
92.	Niger Niamey	Daoūda Mamadou	En	dmn@intnet.ne	+(227) 732 160	+(227) 733 837
93.	Norway Oslo	Kielland Gabriel	En	gabriel.kielland@met.no	+(47 22) 963 000	+(47 22) 963 050
94.	Oman Seeb Airport	Al Shabibi Mansour	En	m.alshabibi@met.gov.om	+(968) 519 612	+(968) 519 363
95.	Pakistan Karachi	Mahmood Arif	En	pmdcdpc@khi.paknet.com.pk arifmahmood1954@hotmail.com	+(92 21) 461 2880	+(92 21) 461 2885
96.	Papua New Guinea Boroko	Gabi Tau (or) Thompson Robert	En	tgabi@pngmet.gov.pg rthomas@pngmet.gov.pg (Tentative, awaiting confirmation)	+(675) 324 4578	+(675) 325 2740
97.	Peru Lima	Chira Jorge	Sp	jchira@senamhi.gob.pe	+(51 1) 614 1414 (Pending confirmation)	+(51 1) 471 7287 (Pending confirmation)
98.	Philippines Quezon City	Tibig (Ms) Lourdes	En	lvtibig@yahoo.com	+(632) 434 2436	+(632) 434 2698
99.	Poland Warszawa	Lorenc Halina	En	halina.lorenc@imgw.pl	+(48 22) 569 4171	+(48 22) 569 4169
100.	Portugal	Abrantes (Ms)	En/Fr	teresa.abrantes@meteo.pt	+.....	+.....

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	Lisbon	Teresa				
101.	Qatar Doha	Al Madfa Khaled M. A	En	kalmadfaa@yahoo.com	+(974) 466 6011	+(974) 466 6021
102.	Romania Bucarest	Geicu Anton	En	geicu@meteo.inmh.ro (Incorrect – awaiting update)	+(40 21) 230 3116	+(40 21) 230 7762
103.	Russia Moscow	Zaitsev Alexandre	Ru	director@main.mgo.rssi.ru
104.	Rwanda Kigali	Mukaremera Pascasie	En	meteo@rwanda1.com	+(250) 575813	+(250) 572971
105.	Saint Lucia Vieux Fort	Descartes Venantius	En	vdscartes@hotmail.com	+(1 758) 454 6550	+(1 758) 454 9705
106.	Saudi Arabia Jeddah	Gari Abdul Ghafoor	En	obsys_pme@hotmail.com (Incorrect – awaiting update)	+(966 2) 651 2312 ext. 2566	+(966 2) 651 2312 ext. 2567
107.	Senegal Dakar-Yoff	Gueye Chouaibou	Fr	shuahibu.gueye@sentoo.sn	+(221) 869 5339	+(221) 820 1327
108.	Seychelles Mahe	Agricole Wills	En	w.agricole@pps.gov.sc	+(248) 384 066	+(248) 384 078
109.	Singapore Changi Airport	Tan Yong Piu	En	tan_yong_piu@nea.gov.sg	+(65) 6543 1764	+(65) 6545 7192
110.	Slovakia Bratislava	Štastný Pavel	En	pavel.stastny@shmu.sk	+(421 2) 5477 2004	+(421 2) 5477 2034
111.	Slovenia Ljubljana	Gregorič Gregor	En	gregor.gregoric@gov.si	+(386 1) 478 4065	+(386 1) 478 4054
112.	South Africa (New) Pretoria	Dube Lawrence Themba	En	Lawrence.dube@weathersa.co.za	+ (27 12) 367 6077	+(27 12) 367 6377
113.	Spain Madrid	Fernandez Sanchez Wis	Sp	cle@inm.es	+(34 91) 581 9679	+(34 91) 581 9767
114.	Sri Lanka Colombo	Kariyawasam Sunil H	En	Kariyawasam_sunil@hotmail.com (Incorrect – awaiting update)	+(94 112) 69 1443	+(94 112) 69 1443
115.	Sudan Khartoum	Magzoub Hag Ahmed (Ms) Hanan	En	ersad@sudanmail.net hanan_rabbah@hotmail.com	+(249 183) 77 8837	+(249 183) 77 1693
116.	Suriname Paramaribo	Becker Cornelis	En	cbecker@sr.net	+(597) 491 143	+(597)490 627
117.	Sweden Norrköping	Liljas Erik	En	erik.liljas@smhi.se	+(46 11) 495 8445	+(46 11) 495 8001
118.	Switzerland Zurich	Seiz Gabriela	En	gabriela.seiz@meteoswiss.ch	+(41 44) 256 9539	+(41 44) 256 9278
119.	Syria Damascus	Mohammed Ibrahim	En	syr-meteo@mail.sy	+(963 11) 662 0552	+(963 11) 662 0553
120.	Tajikistan Dushanbe	Safarov Mahamad	Ru	meteo@tjinter.com	+(992 372) 215471 +(992 372) 231821	+(992 372) 215522
121.	Tanzania Dar-es-Salaam	Mpeta Emmanuel J	En	empeta@meteo.go.tz	+(255 22) 246 0706 ext. 126	+(255 22) 246 0735 or +(255 22) 246 0718

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123.	Togo Lomé	Kougbada Tchibara	Fr	Not indicated	+(228) 221 4806	+(228) 222 4838
124.	Tonga Nuku' Alofa	Fa' anunu 'Ofa	Fr	ofaanunu@mca.gov.to (Incorrect – awaiting update)	+ (676) 35123	+(676) 31994
125.	Trinidad and Tobago Piarco	Mills Willis	En	dirmet@tstt.net.tt	+(868) 669 5465	+(868) 669 4009
126.	Tunisia Tunis-Carthage	Ben M' Hamed Chedly	Fr	??	+(216 71) 773 400	+(216 71) 772 609
127.	Turkey Ankara	Demircan Mesut	En	mdemircan@meteor.gov.tr	+(90 312) 302 2457	+(90 312) 361 2371
128.	Uganda Kampala	Nkalubo Michael S. Z.	En	michael.nkalubo@meteo-uganda.net	+(256 41) 251 798	+(256 41) 251 797
129.	Ukraine Kiev	Vasilchenko Maria	Ru	??	+(380 44) 239 9335	+(380 44) 246 5630
130.	United Arab Emir. Abu Dhabi	Khamis Al-Kilbani Yousef Nasser Mosbah	En	uaemet@uaemet.gov.ae	+(971 2) 666 7411	+(971 2) 666 1575
131.	United Kingdom Exeter	Turton Jon	En	jon.turton@metoffice.gov.uk	+(44 1) 392 886 478	+(44 1) 392 885 681
132.	United States Silver Spring, MD	Diamond Howard J	En	howard.diamond@noaa.gov	+(1 301) 713 1283	+(1 301) 713 0819
133.	Uruguay Montevideo	Sena Cianci (Ms) Virginia Carla	Sp	vsena@adinet.com.uy	+(598 2) 917 0710 ext. 4307	+(598 2) 917 0710 ext. 4321
134.	Uzbekistan Tashkent	Spectorman Tatyana	Ru	nigmi@albatros.uz	+(998 71) 133 1150	+(998 71) 133 1150
135.	Vanuatu Port Vila	Nihmei Salesa Kaniaha	En	skaniaha@meteo.vu kaniaha@yahoo.com.au	+(678) 24686 +(678) 23866	+(678) 22310
136.	Venezuela El Prado Maracay	Hernandez Velásquez Cristóbal Simon	Sp	climatologia@cantv.net	+(58 243) 237 8297	+(58 243) 237 8043
137.	Viet Nam Hanoi	Nguyen Dang Que	En	ndque26@hotmail.com	+(84 4) 773 0710	+(84 4) 835 6616
138.	Yemen Sana'a	Al-Mikhlafy Abdulwasea H	En	yms-cama@y.net.ye abdulwasead@yahoo.com	+(967 1) 419 774	+(967 1) 419 770 +(967 1) 419 778
139.	Zambia Lusaka	Nkomoki Jacob	En	jnkomoki@hotmail.com	+(260 1) 252 728	+(260 1) 252 728
140.	Zimbabwe Harare	Chawaguta Wilfred	En	wchawaguta@weather.utande.co.zw	+(263 4) 778 173	+(263 4) 778 161