

Observation Monitoring Workshop ECMWF

3rd – 4th July 2013

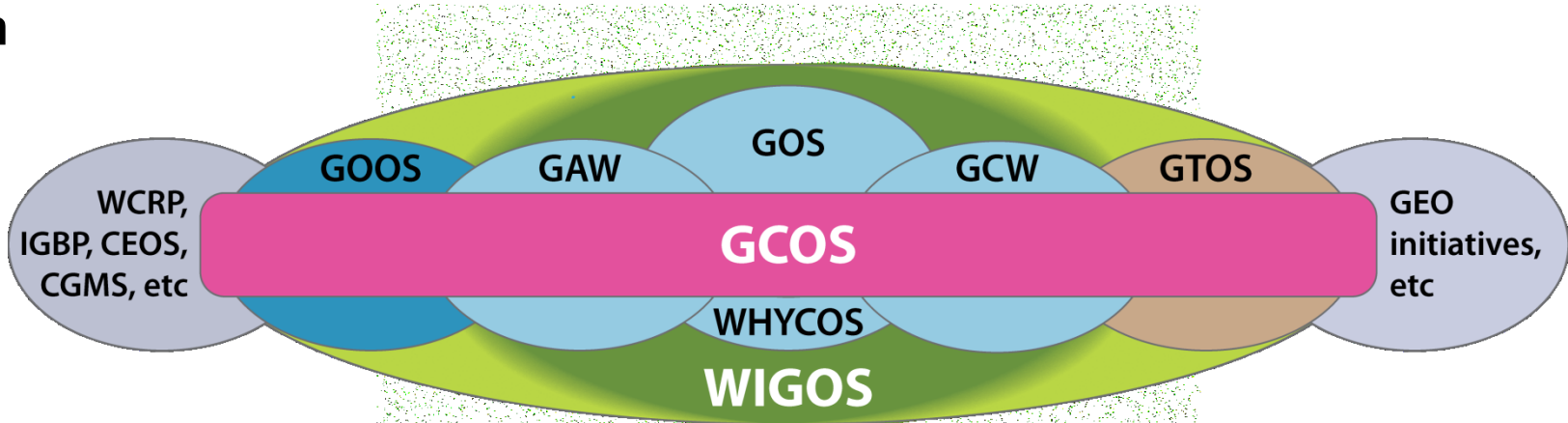
Tim Oakley, GCOS Implementation Manager



What does GCOS do?

The vision of GCOS is that all users have access to the climate observations, data records and information which they require to address pressing climate-related concerns. GCOS users include individuals, national and international organizations, institutions and agencies. The role of GCOS is to work with partners to ensure the sustained provision of reliable physical, chemical and biological observations and data records for the total climate system – across the atmospheric, oceanic and terrestrial domains, including hydrological and carbon cycles and the cryosphere.

GCOS covers the climate components of WMO and co-sponsored observing systems for atmosphere, ocean and land, and other clim



GCOS assesses progress and requirements, advises on implementation

WIGOS provides a new framework for integration and coordination

Mutual interests include network design, designation and quality

PRECIPITATION



ATMOSPHERIC TEMPERATURE,
HUMIDITY & COMPOSITION



CLOUD PROPERTIES



SOIL MOISTURE



UPPER AIR



LAKES



SOLAR RADIATION
BUDGET



CARBON



SEA-ICE



ATMOSPHERIC SURFACE



FIRE DISTURBANCE



ICE SHEETS &
GLACIERS



SNOW COVER



ATMOSPHERIC
COMPOSITION



AEROSOLS



BIOMASS



SEA STATE



PERMAFROST



CO₂ / METHANE / CO



RIVER DISCHARGE



SEA LEVEL



OCEAN SURFACE



OCEAN CARBON,
OCEAN TEMPERATURE,
SALINITY & NUTRIENTS



OCEAN SUB-SURFACE



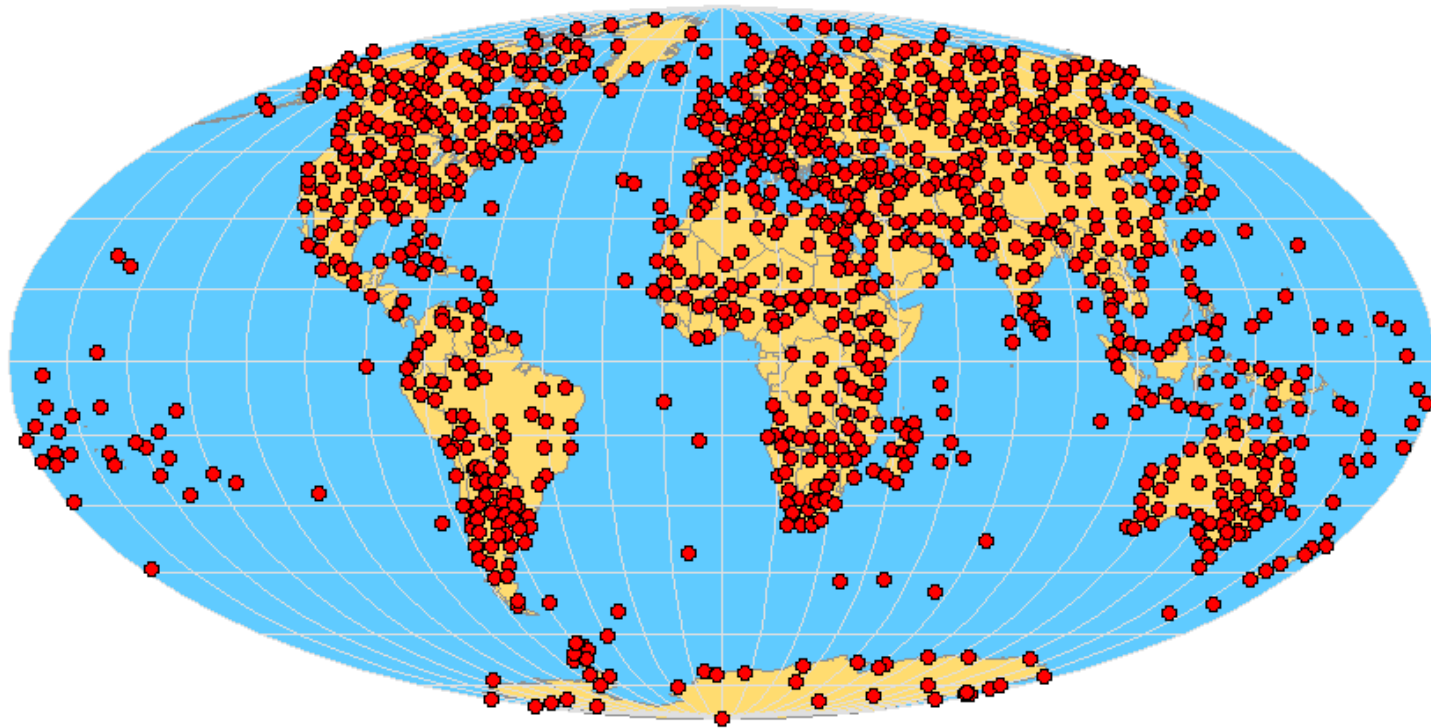
SOIL MOISTURE



Whilst GCOS works with all the 50 GCOS Essential Climate Variables (ECV's) with equal priority, in practice my work as the Implementation Manager is currently focused on 2 networks:

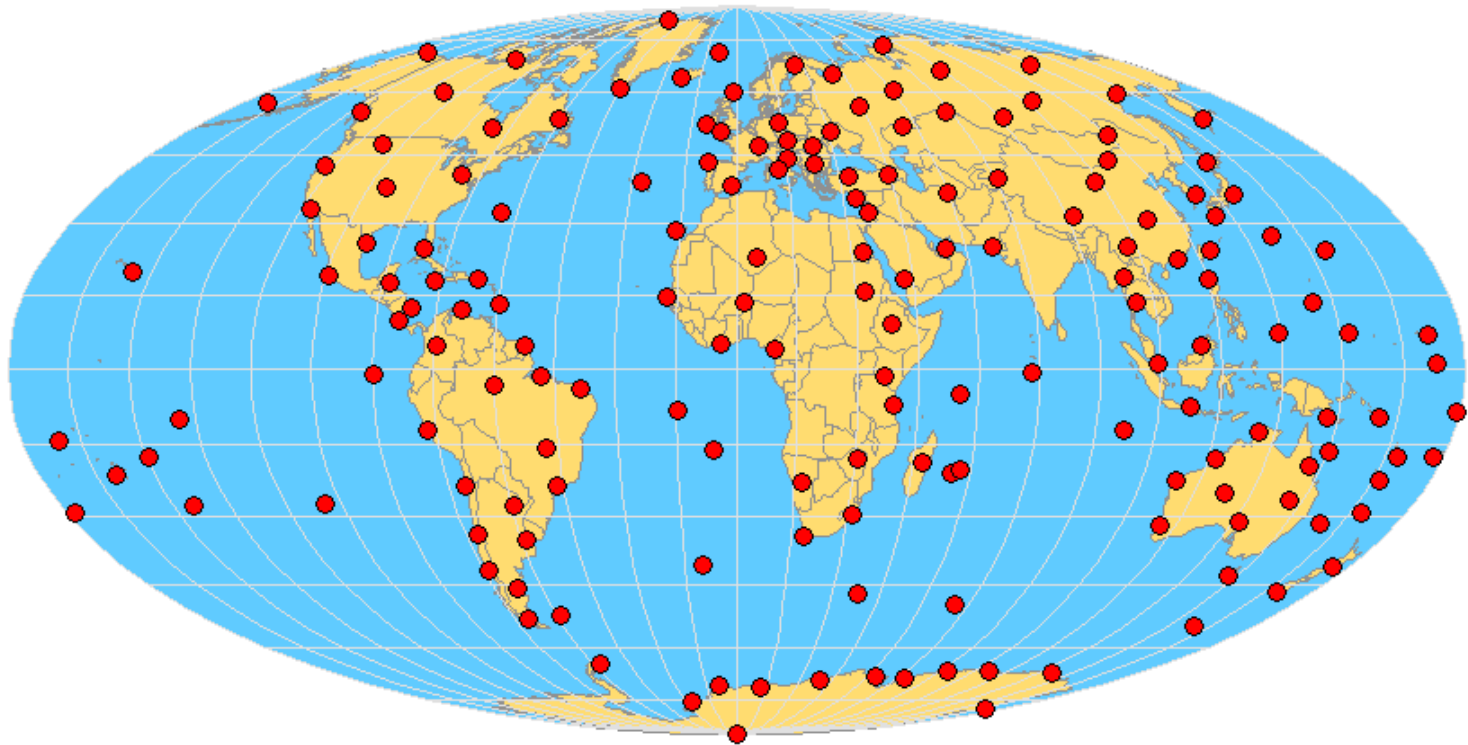
- GSN (GCOS Surface Network, which also now includes the Regional Baseline Climate Network RBCN)
- GUAN (GCOS Upper Air Network).

GCOS Surface Network (1018 Stations)



GCOS Secretariat, 1 January 2013

GCOS Upper-air Network (172 Stations)



GCOS Secretariat, 1 January 2013

GCOS Minimum Requirements

GSN

- **Monthly means of daily maximum, minimum and mean temperature**
- **Monthly precipitation amounts**
- ***If only monthly values, number of days in calculation***
- **Monthly CLIMAT message**

GUAN

- **Temperature up to 30hPa**
- **Humidity up to tropopause**
- **Wind direction/speed to 30hPa**
- **1 report - 25 days each month**
- **TEMP message**

http://www.wmo.int/pages/prog/gcos/Publications/GCOS-144_en.pdf

Monitoring Resources/Information (GSN)

GOSIC Global Observing Systems Information Center



Facilitating Access to Global Observing Systems Data and Information

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Indicators

GSN Stations Performance Indicators

• Monitoring Reports (DWD)	Udo Schneider
• Monitoring Products (DWD)	Udo Schneider
• Monitoring Methods (DWD)	Udo Schneider
• Summary of GSN Stations - Year to Date (Hourly, Synoptic Observations and CLIMAT Data Counts) (NOAA/NCDC)	GCOS.NCDC@noaa.gov
• Summary of GSN Stations - 1/2001 to current (Hourly, Synoptic Observations and CLIMAT Data Counts) (NOAA/NCDC)	GCOS.NCDC@noaa.gov
• Summary of GSN stations Data - 1/1901 to current (Surface Hourly, Synoptic Observations and CLIMAT data) (current and inactive Stations) (NOAA/NCDC)	GCOS.NCDC@noaa.gov
• Summary of all surface stations and WMO regions - 1/1901 to current (including R9 unknown regions) (WMO Numbers) (Summary of Surface Hourly, Synoptic Observations and CLIMAT data) (CLIMAT data begins around 1990) (~70MB) (NOAA/NCDC)	GCOS.NCDC@noaa.gov
• Region 1 (Africa) - Summary of all surface stations - 1/1901 to current (WMO Numbers) (Surface Hourly, Synoptic Observations and CLIMAT Data) (~6MB) (NOAA/NCDC)	GCOS.NCDC@noaa.gov
• Region 2 (Asia) - Summary of all surface stations - 1/1901 to current (WMO Numbers) (Surface Hourly, Synoptic Observations and CLIMAT Data) (~22MB) (NOAA/NCDC)	GCOS.NCDC@noaa.gov
• Region 3 (South America) - Summary of all surface stations - 1/1901 to current (WMO Numbers) (Surface Hourly, Synoptic Observations and CLIMAT Data) (~5MB) (NOAA/NCDC)	GCOS.NCDC@noaa.gov

Monitoring Resources/Information (GUAN)

GOSIC Global Observing Systems Information Center



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Indicators

GUAN Stations - Performance Indicators

<p>GUAN Stations Summaries by Region:</p> <ul style="list-style-type: none"> • Summaries 	<p>WMO/GCOS</p>
<p>Frequency of Reception Data for GUAN Stations: (ECMWF)</p> <ul style="list-style-type: none"> • Frequency of Reception Data 	<p>obsmon@lists.ecmwf.int</p>
<p>Upper Air Height Inventory (Regions 1-7) (updated monthly) (NOAA/NWS/NCEP)</p> <ul style="list-style-type: none"> • GUAN & NON-GUAN Stations Inventory 	<p>Bradley Ballish</p>
<p>Summary of GUAN Station Observations:</p> <ul style="list-style-type: none"> • Latest Month (Regions 1 through 7) (NOAA/NCDC) • Latest 6 Months (Regions 1 through 7) (NOAA/NCDC) • Long-term (10/2001 to Current) (Regions 1 through 7) (NOAA/NCDC) 	<p>GCOS.NCDC@noaa.gov</p>
<p>OGIMET (SYNOP Report Queries, Latest TEMP Reports by Country or Territory, CLIMAT Monthly Weather Summaries and more) (OGIMET.com)</p>	<p>Guillermo Ballester Valor</p>

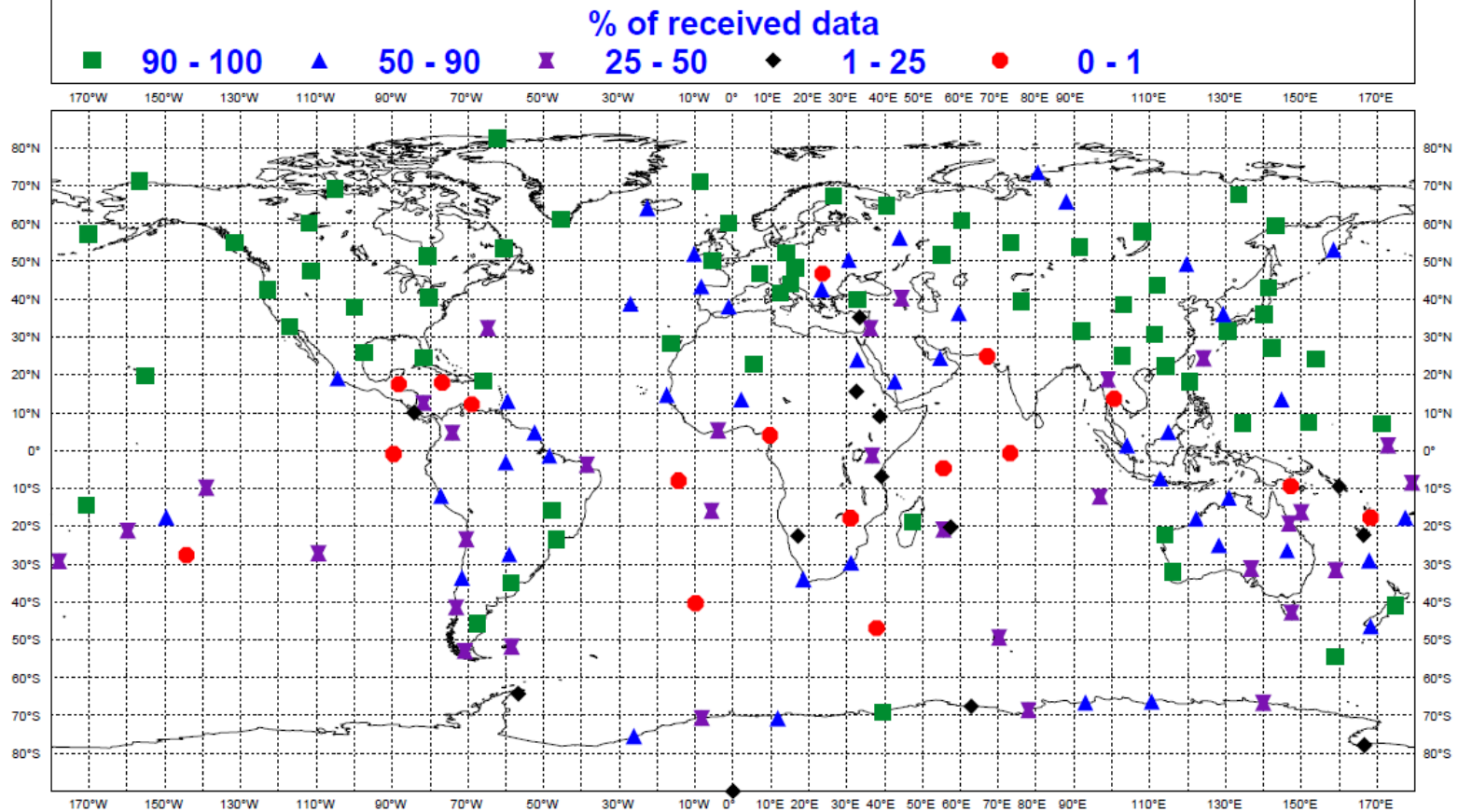
DWD CLIMAT Message monitoring (monthly)

	A	B	C	D	E	F	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	
1						x = INPUT VIA GTS	2070	2011	2036	2053	2051	2017	2041	2008	2069	2001	2001	1909	2022	1983	1994	1991	0	0	
2						E = INPUT VIA EMAIL	13	6	17	35	18	8	20	19	46	22	64	48	44	61	68	51	0	0	
3						F = INPUT VIA FTP-SERVER	38	38	41	19	39	41	38	40	18	40	25	42	41	42	27	39	0	0	
4						SUM OF INPUT	2121	2055	2094	2107	2108	2066	2099	2067	2133	2063	2090	1999	2107	2086	2089	2081	0	0	
5	Region	IndexNbr	StationName	CLIMAT	GSN	Country/Operating	JAN	FEB	MRZ	APR	MAI	JUN	JUL	AUG	SEP	OKT	NOV	DEZ	JAN	FEB	MRZ	APR	MAI	JUN	
2459	3	83698	CAMPOS	X		BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2460	3	83702	PONTA PORA	X		BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2461	3	83704	IVINHEMA	X		BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2462	3	83716	PRESIDENTE PRUDENTE	X		BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2463	3	83726	SAO CARLOS	X		BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2464	3	83738	RESENDE	X		BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2465	3	83746	GALEAO	X	X	BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2466	3	83766	LONDRINA	X		BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2467	3	83781	SAO PAULO	X	X	BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2468	3	83783	CAMPO MOURAO	X		BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2469	3	83827	FOZ DO IGUACU (AEROPORTO)	X	X	BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2470	3	83836	IRATI	X		BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2471	3	83842	CURITIBA BACACHERI	X	X	BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2472	3	83881	IRAI	X	X	BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2473	3	83897	FLORIANOPOLIS	X		BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2474	3	83967	PORTO ALEGRE	X		BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2475	3	83980	BAGE	X		BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2476	3	83997	ST.VITORIA DO PALMAR	X		BRAZIL	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2477	3	84008	SAN CRISTOBAL (GALAPAGOS)	X	X	ECUADOR	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		
2478	3	84071	QUITO AEROPUERTO	X		ECUADOR	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		
2479	3	84088	IZOBAMBA	X	X	ECUADOR	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		
2480	3	84135	PORTOVIEJO	X		ECUADOR	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		
2481	3	84140	PICHILINGUE	X	X	ECUADOR	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		
2482	3	84203	GUAYAQUIL AEROPUERTO	X		ECUADOR	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		
2483	3	84270	LOJAILA ARGELIA	X	X	ECUADOR	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		
2484	3	84370	TUMBES	X		PERU	x	x	E	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2485	3	84377	IQUITOS	X	X	PERU	x	x	E	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2486	3	84390	TALARA	X		PERU	x	x	E	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2487	3	84401	PIURA	X		PERU	x	x	E	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2488	3	84405	HUANCABAMBA	X		PERU	x	x	E	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2489	3	84425	YURIMAGUAS	X		PERU	x	x	E	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2490	3	84435	MOYOBAMBA	X		PERU	x	x	E	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2491	3	84444	CHACHAPOYAS	X	X	PERU	x	x	E	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2492	3	84452	CHICLAYO	X		PERU	x	x	E	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2493	3	84455	TARAPOTO	X	X	PERU	x	x	E	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2494	3	84472	CAJAMARCA	X		PERU	x	x	E	x	x	x	x	x	x	x	x	x	x	x	x	x	x		

GUAN STATIONS MAY 2013

Frequency of RECEPTION data at ECMWF

Level: 50 hPa Temperature SUMMARY 00/12 UTC



GUAN – NCEP Monitoring (Monthly)

Upper Air Height Inventory for May 2013 GUAN Stations

ID = Station call letters
 NS = Number of Soundings with data received by final runs by NCEP for the month.
 SR = Number of soundings with Significant Rejections (more than 10% total)
 SA = Number of Soundings with Any rejections
 CR = Number of soundings in that pressure Category with any Rejections
 NT = Number of heights in that pressure category for the month Total
 NR = Number of heights Rejected in that pressure category for the month

Under "Termination Cat" are the number of soundings terminated in certain pressure categories.

A = at or above 400 mb
 B = at or above 200 mb
 C = at or above 100 mb
 D = at or above 50 mb
 E = at or above 30 mb
 F = at or above 20 mb
 G = at or above 10 mb

REGION 1														Termination Cat							
GUAN SITE	NS	SR	SA	CR	NT	{SFC - 400}			{399 - 100}			{99 - 0}			A	B	C	D	E	F	G
60680 Tamanrasset, Al	62	0	0	0	310	0	0	310	0	0	185	0	62	62	62	61	52	11	0	0	0
64910 Douala, Cameroon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65578 Abidjan, Cote d'Ivoire	50	0	0	0	350	0	0	249	0	0	135	0	50	50	49	30	27	27	16	0	0
62414 Asswan, Egypt	57	0	0	0	398	0	0	274	0	0	215	0	56	55	53	52	50	49	11	0	0
63450 Addis Ababa, Ethiopia	18	0	0	0	89	0	0	90	0	0	33	0	18	18	18	16	0	0	0	0	0
63741 Nairobi, Kenya	25	0	0	0	148	0	0	120	0	0	100	0	24	24	24	22	22	18	14	0	0
63894 Dar es Salaam, Tanzania	15	0	0	0	105	0	0	73	0	0	45	0	15	15	13	12	12	8	0	0	0
61995 Vacoas, Mauritius	10	0	0	0	60	0	0	50	0	0	19	0	10	10	10	5	5	4	0	0	0
67083 Antananarivo/Ivato	61	0	0	0	353	0	0	294	0	0	231	0	60	60	58	56	51	49	19	0	0
62721 Khartoum, Sudan	11	0	0	0	66	0	0	53	0	0	7	0	11	11	10	2	2	1	0	0	0
68110 Windhoek, Namibia	21	0	0	0	125	0	0	92	0	0	50	0	20	19	16	13	12	9	2	0	0
61052 Niamey-Aero, Niger	62	0	0	0	433	0	0	305	0	0	203	0	62	62	61	52	48	39	6	0	0
61901 St. Helena Island	30	0	0	0	210	0	0	149	0	0	150	0	30	30	30	30	30	30	30	0	0
61902 Ascension Is Wideawake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61980 Saint-Denis/Gillot	31	0	0	0	217	0	0	155	0	0	143	0	31	31	31	30	28	28	27	0	0
61998 Port aux Francais	30	0	0	0	208	0	0	140	0	0	60	0	29	29	26	22	15	1	0	0	0
61641 Dakar/Yoff, Senegal	52	1	1	1	363	7	1	260	5	1	171	5	52	52	52	45	38	32	6	0	0
63985 Seyschelles IAP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68816 Cape Town AP, South Africa	61	1	1	0	427	0	1	297	1	1	139	3	61	59	59	48	31	2	0	0	0
68906 Gough Is, South Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68994 Marion Is, South Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68592 King Shaka Int'l Airport	59	0	0	0	407	0	0	292	0	0	177	0	59	59	58	55	45	19	0	0	0
60018 Tenerife-Guimar	61	0	0	0	425	0	0	297	0	0	249	0	60	60	60	60	56	54	19	0	0
67774 Harare, Zimbabwe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CBS Lead centres for GCOS

1. Diagnose problems in the GSN and GUAN by using the monitoring reports produced by the [GCOS Monitoring and Analysis Centres](#);
2. Liaise with nominated [National Focal Points for GCOS and related Climatological Data](#), and other responsible officials, to improve data and meta data availability and quality;
3. Co-ordinate activities with other GCOS centres and/or other centres as appropriate;
4. Monitor and report to CBS and GCOS on actions taken, progress achieved, concerns and recommendations on a yearly basis in a time frame that corresponds to planned [AOPC](#) and CBS meetings;
5. Assist AOPC in the revisions of GSN and GUAN stations;
6. Assist the [WMO Secretariat](#) in maintaining the list of [National Focal Points for GCOS and related Climatological Data](#).

- **GCOS Obs Monitoring currently restricted to GSN & GUAN**
- **Wide range of monitoring tools and centres but tends to focus on availability**
- **Use:-**
 - Global network management (Significant)
 - Network review and prioritisation (Significant)
 - Regional network management (Some, region dependent)
 - National network management (Limited)
 - Data Quality (Limited)

- **Consistency of statistics between the different monitoring centres**
- **Access to data quality information (real time and time series)**
- **Monitoring of 'live' data reception, global management at a local/station level**
- **Single point for station/fault information, with ability for all monitoring centres plus managers to upload information**
- **Monitoring workshops/training**