

QA/SACs – Terms of Reference

5.2.2 *Quality Assurance/Science Activity Centres (QA/SACs)*

Specific activities:

- QA-1. Provide an operating framework for GAW quality assurance activities and calibration facilities for a specific variable and geographical area of responsibility (world, regional, national).
- QA-2. Coordinate the activities of WCCs and RCCs in the area of their responsibility.
- QA-3. Provide advice and support for the local QA system at individual GAW sites.
- QA-4. Where appropriate, coordinate instrument calibrations and intercomparisons and other measurement activities.
- QA-5. Perform or oversee regular system audits at GAW sites.
- QA-6. Provide training, long-term technical help, and workshops for station scientists and technicians.
- QA-7. Promote the scientific use of GAW data, and encourage and participate in scientific collaboration.



Existing QA/SACs

8.2 GAW Central Facilities

Table 8.2 - GAW Central Facilities
(green colour indicates the Central Facilities with agreement in place)

Variable	Quality Assurance / Science Activity Centre	Central Calibration Laboratory	World Calibration Centre	Regional Calibration Centres	World Data Centre
CO ₂	JMA ² (Asia, South-West Pacific)	NOAA-ESRL	NOAA-ESRL (round robin) Empa (audits)		JMA ²
CO ₂ Isotopes		MPI-BGC			JMA ²
CH ₄	Empa (Americas, Europe, Africa) JMA ² (Asia, South-West Pacific)	NOAA-ESRL	Empa (Americas, Europe, Africa) JMA ² (Asia, South-West Pacific)		JMA ²
N ₂ O	UBA	NOAA-ESRL	KIT/IMK-IFU		JMA ²
SF ₆		NOAA ESRL	KMA		JMA ²
CFCs, HCFCs, HFCs					JMA ²
Surface Ozone	Empa	NIST	Empa	OCBA (South America)	NILU
CO	Empa	NOAA-ESRL	Empa		JMA ²
VOCs	UBA	NPL (Ethane, Propane, n-butane, n-pentane, Acetylene, Toluene, Benzene, Isoprene) NIST (monoterpenes)	KIT/IMK-IFU		NILU
NO _x	UBA	NPL (NO)	FZJ (IEK-8) (NO)		NILU
SO ₂					NILU
H ₂		MPI-BGC			JMA ²
Precipitation Chemistry / Wet Deposition	NOAA-ARL (Americas)	ISWS	ISWS		NOAA-ARL
Total Ozone	JMA ² (Asia, South-West Pacific)	NOAA-ESRL (Dobson instruments) EC (Brewer instruments)	NOAA-ESRL (Dobson instruments) EC (Brewer instruments)	Dobson instruments: BoM (Australia & Oceania) NOAA-ESRL JMA ² (Asia) DWD-MQHP (Europe) CHMI-SOD-HK (Europe) OCBA (South America) SAWS (Africa)	EC (ground-based observations) DLR### (Satellite-based observations)

Ozone Profile	FZJ(IEK-8)	FZJ(IEK-8)	FZJ(IEK-8)		Brewer instruments: IARC-AEMET (Europe) Filter instruments: MGO
UV Radiation			PMOD/WRC		NOAA-ESRL (Americas) EC
Aerosol Physical Properties	UBA		IT		NILU (ground-based observations) DLR### (satellite-based observations)
Aerosol Optical Depth		PMOD/WRC (Precision Filter Radiometers)	PMOD/WRC		NILU (ground-based observations) DLR### (satellite-based observations)
Aerosol Chemical Properties					NILU
Solar Radiation**		PMOD/WRC	PMOD/WRC		MGO

exchange of letter between JMA and WMO
all facilities are established through EC resolutions
agreement has expired

BoM Bureau of Meteorology, Melbourne, Australia (Regional Dobson Calibration Centre, RDCC for Australia)
BSRN Baseline Surface Radiation Network, Federal Institute of Technology (ETH), Zurich, Switzerland
CIHM Czech Hydrometeorological Institute
DLR German Aerospace Centre, Oberpfaffenhofen, Weßling, Germany
DWD German Meteorological Service (Deutscher Wetterdienst)
EC Environment Canada, Toronto, Ontario, Canada
EML Environmental Measurements Laboratory, Department of Energy (DoE), New York City, New York, USA
Empa Swiss Federal Laboratories for Materials Testing and Research, Dübendorf, Switzerland
FZJ (IEK-8) Forschungszentrum Jülich, Institute for Energy and Climate Research: Troposphere (IEK-8), Jülich, Germany
IARC-AEMET Izaña Atmospheric Research Centre, State Meteorological Agency of Spain
IT Institute for Tropospheric Research, Leipzig, Germany
ISWS Illinois State Water Survey, Champaign, Illinois, USA
JMA Japan Meteorological Agency, Tokyo, Japan

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WMO Global Atmosphere Watch (GAW)
Implementation Plan: 2016-2025

GLOBAL ATMO. WATCH



QA/SAC Switzerland



Global Atmosphere Watch
QA / SAC Switzerland

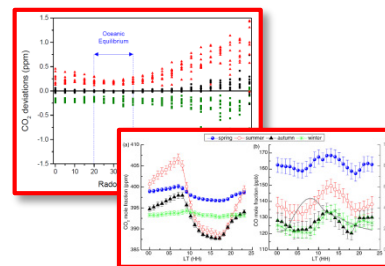
closely linked to WCC-Empa (surface O₃, CO, CH₄, CO₂)



training & capacity building



outreach



science



networking

QA/SACs world-wide

QA/SAC	Host	Parameters	Link to other Central Facilities
QA/SAC-CH	Empa	O3 (surface), CO, CH4, CO2	WCC-Empa
QA/SAC Germany	UBA	N2O, VOCs, NOx, aerosols	WCC-N2O, WCC-VOC, WCC-NOx, WCCAP (GAWTEC)
QA/SAC O3	FZJ	O3 (profiles)	WCCOS
QA/SAC Americas	NOAA-ARL, University of Illinois	Total Atmospheric Deposition	WDCPC
QA/SAC Japan	JMA	CH4, others?	WCC-CH4, WDCGG

QA/SACs: Status / Issues & Shortcomings / Way Forward

Status

- Tasks, duties and requests are divers and extensive
- Visibility of the activities of the QA/SACs is low
- Collaboration and communication among the QA/SACs lacks refinement

Issues & Shortcomings

- Available resources (manpower, travel, material) are limited
- Commitments and restrictions exist due to conditions of the funding agencies
- Focus on specific focal areas, world regions / countries

Way Forward

- Sharpen the QA/SAC(s) profile(s) (web pages, outreach (QA/SAC reports?), ...)
- Improve the communication among the QA/SACs
- Identify interfaces
- Can QA/SACs complement one another?

How can the available resources be used best to achieve maximum benefit for the GAW quality management framework?

Are there any particular tasks the GAW community would like to see to be tackled by the QA/SACs?