

GAW, NDACC, GCOS, GRUAN

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What is GAW?



WMO-GAW was established 1989 by merging two established WMO networks: GO₃OS and BAPMoN.



GAW focuses on global networks for GHGs, ozone, UV, aerosols, selected reactive gases, and precipitation chemistry.



GAW is a partnership involving contributors from 80 countries.



GAW is coordinated by the Atm. Env. Research Division of WMO's Research Dept.

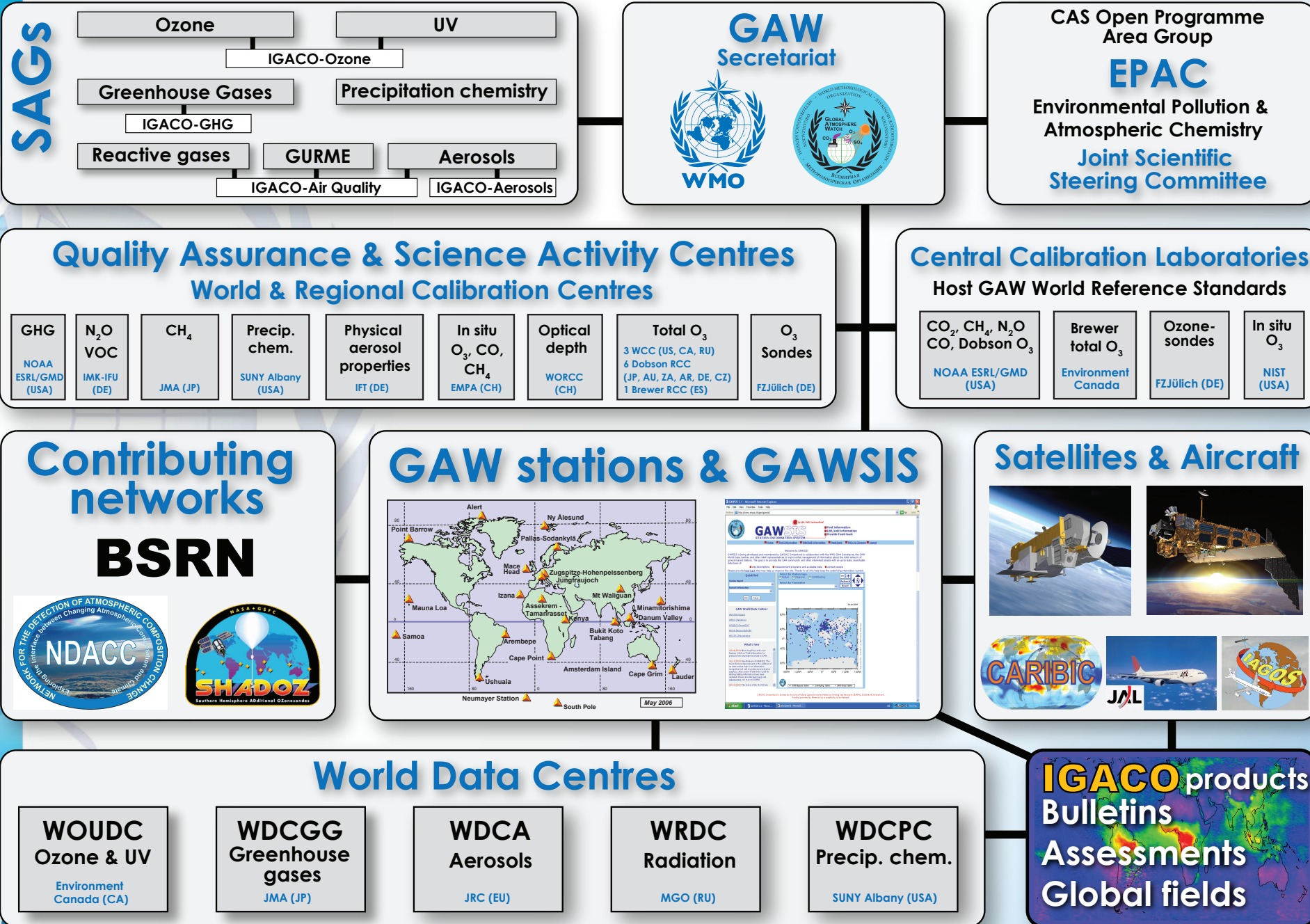


Currently GAW coordinates activities, data delivery and analysis products from 24 Global stations, 200 Regional stations, and many Contributing stations.

The GAW Mission

-  **Systematic Global Monitoring of the Chemical Composition of the Atmosphere**
-  **Analysis and Assessment in Support of International Conventions**
-  **Development of Air Pollution and Climate Predictive Capability**

The GAW System



Dobson Intercomparison Buenos Aires, Nov/Dec 2006



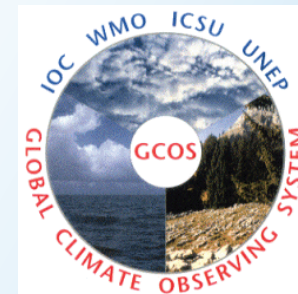
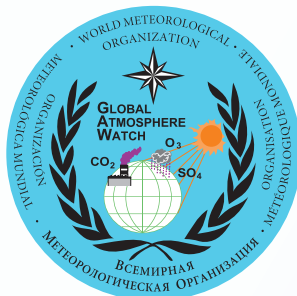
Dobson, Brewer & Sondes are now part of GCOS

**Dobson & Brewer Networks constitute:
WMO/GAW GCOS Global Baseline Total Ozone Network**

**Ozonesonde Network constitutes:
WMO/GAW GCOS Global Baseline Profile Ozone Network**

Endorsed by GCOS AOPC-XIII 23 April 2007

**Adopted at the 15th session of the GCOS
Steering Committee in Paris 16-19 Oct 2007**

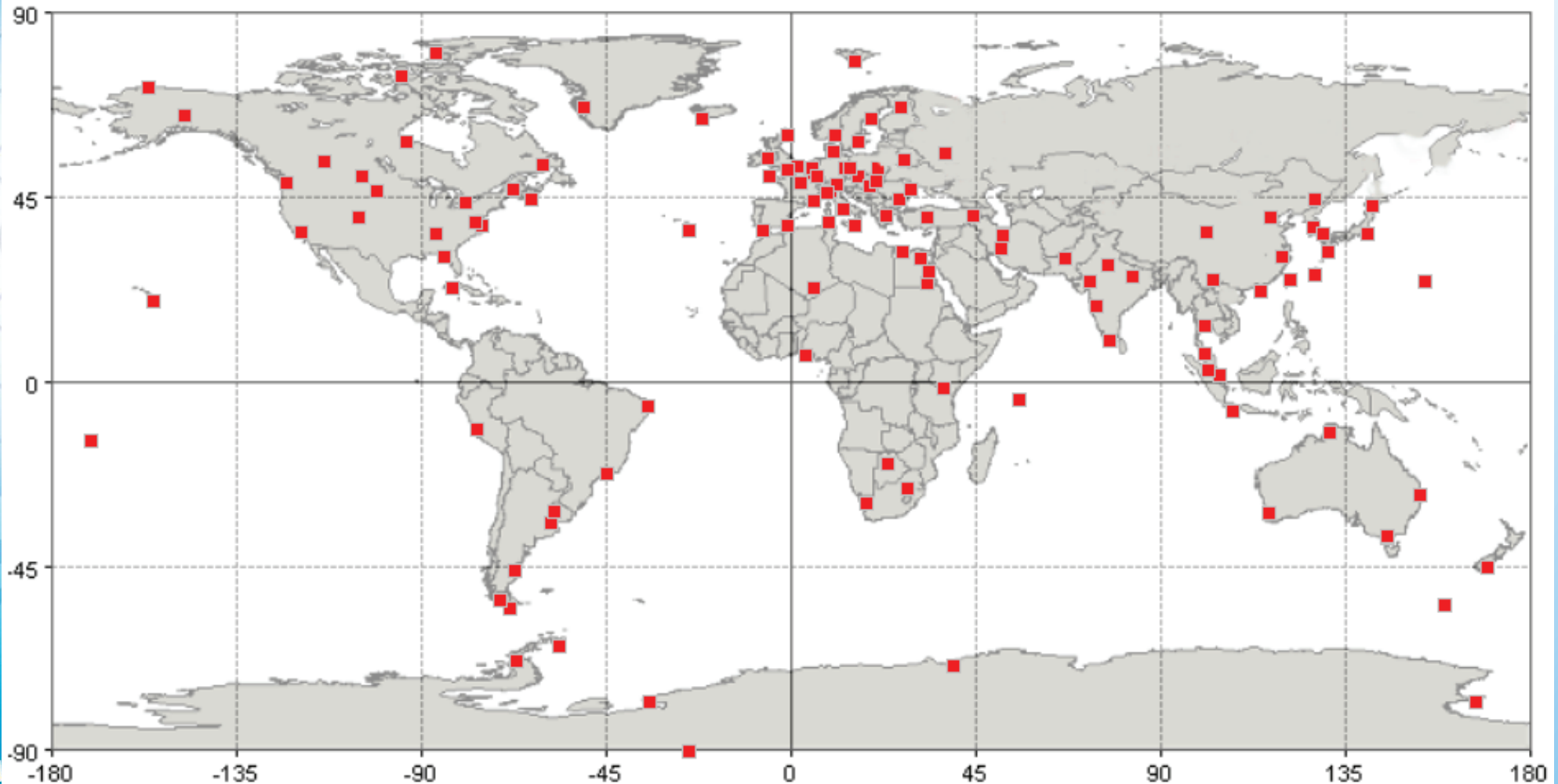




Global Atmosphere Watch Dobson & Brewer stations

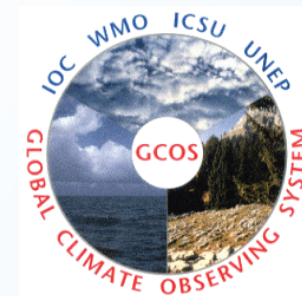


132 stations

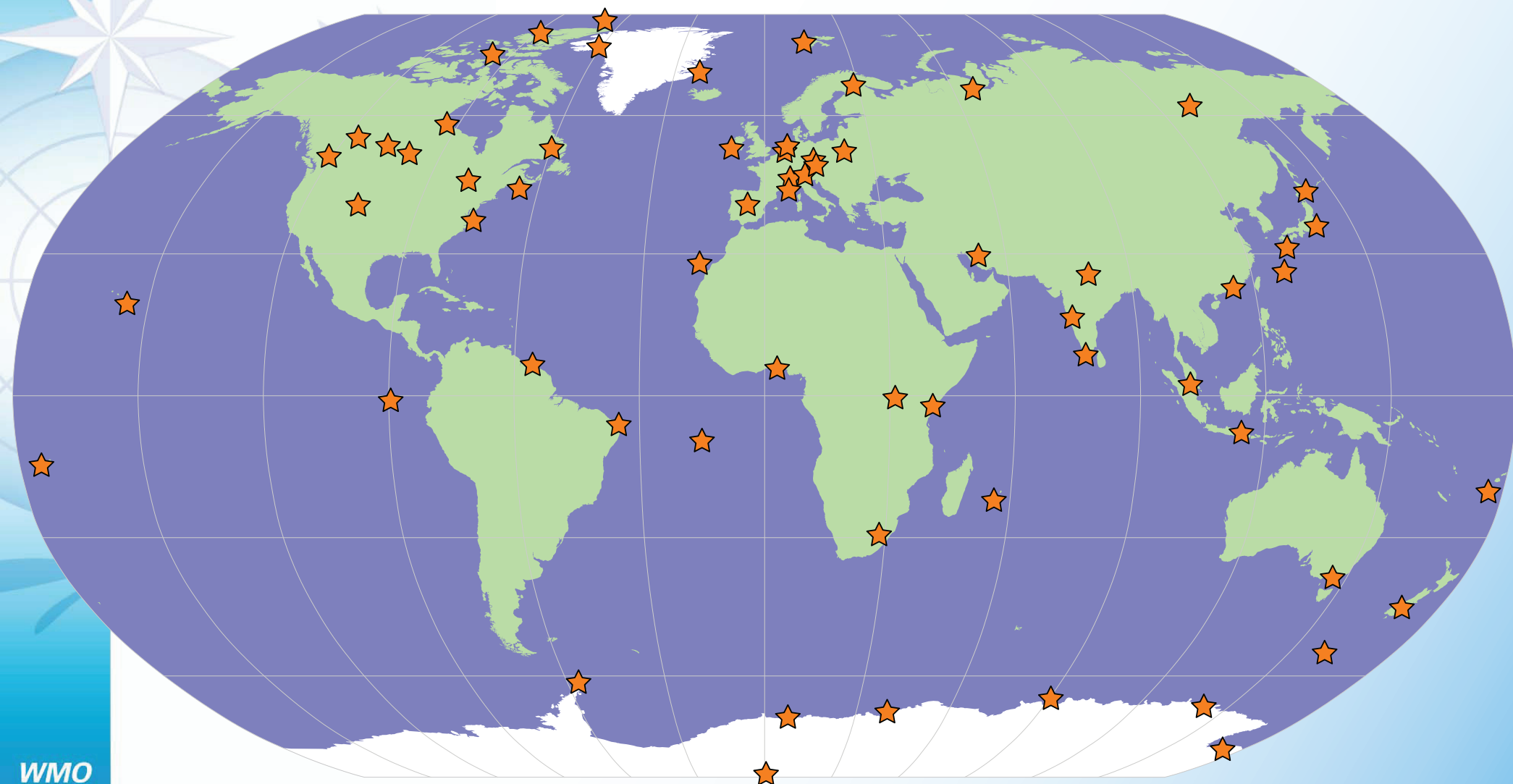




GAW/SHADOZ/NDACC Ozone sonde stations



63 stations

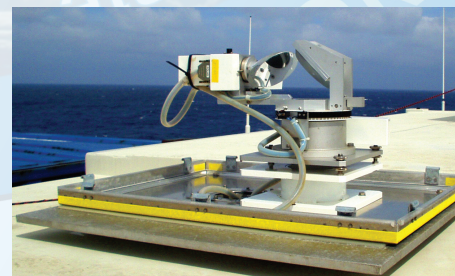
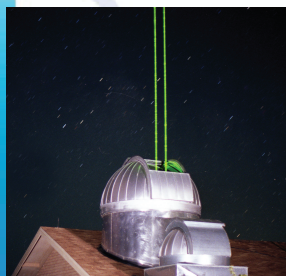


What is NDACC?

Network for the Detection of Atmospheric Composition Change

Priorities

- Studying the temporal and spatial variability of atmospheric composition and structure,
- Detecting trends in overall atmospheric composition and understanding their impacts on the stratosphere and troposphere,
- Establishing links between climate change and atmospheric composition,
- Calibrating and validating space-based measurements of the atmosphere,
- Supporting process-focused scientific field campaigns, and
- Testing and improving theoretical models of the atmosphere.



NDACC Site Selection

Primary and complementary sites

Primary sites have a comprehensive suite of measurements

Complementary sites have a more limited set of measurements

The quality criteria are the same

Stations in different regions

Polar regions (N and S)

Mid-latitude in both hemispheres

Tropical and equatorial sites

A station can consist of several sites

Arctic site: Eureka, Thule, Søndre Strømfjord, Ny-Ålesund

Alpine site: Jungfraujoch, OHP, Payerne, Bern, Zimmerwald, Arosa, Garmisch Partenkirchen, Zugspitze, Hohenpeissenberg

Antarctic site: South Pole, Dumont d'Urville, Arrival Heights, McMurdo and Scott Base.

NDACC: Focus on data quality



Strict criteria for being and staying affiliated



Network governed by a number of protocols

Data protocol: Compromise between data availability & IPR

Validation protocol

Instrument intercomparison protocol



Regular intercomparison campaigns

Mobile systems (Lidar, FT-IR)

Gathering of many instruments at the same location

Organisation of NDACC



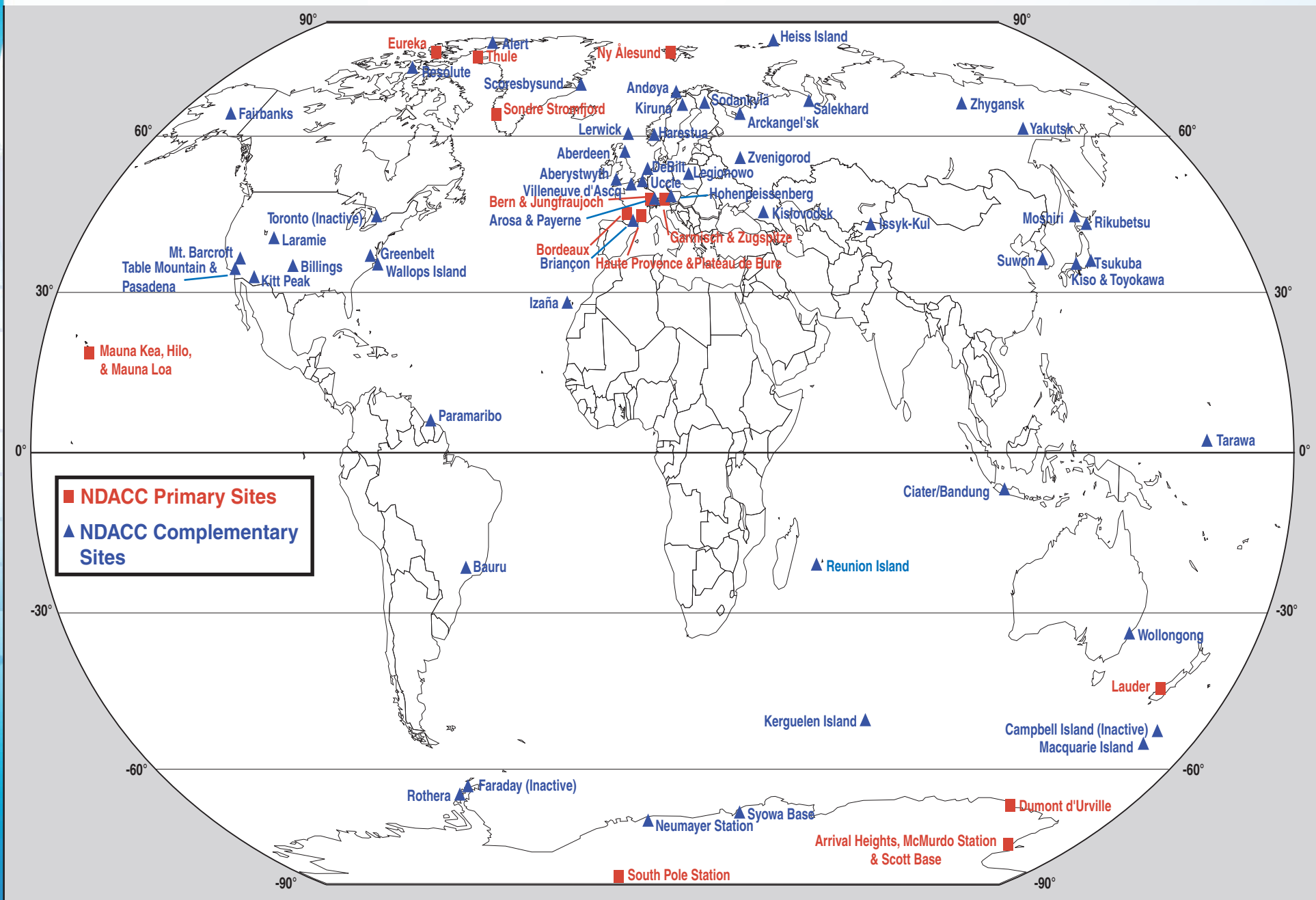
Working groups

UV-Vis, Spectral UV, Ozone&aerosol sondes, FT-IR, MW, Lidars, Dobson&Brewer

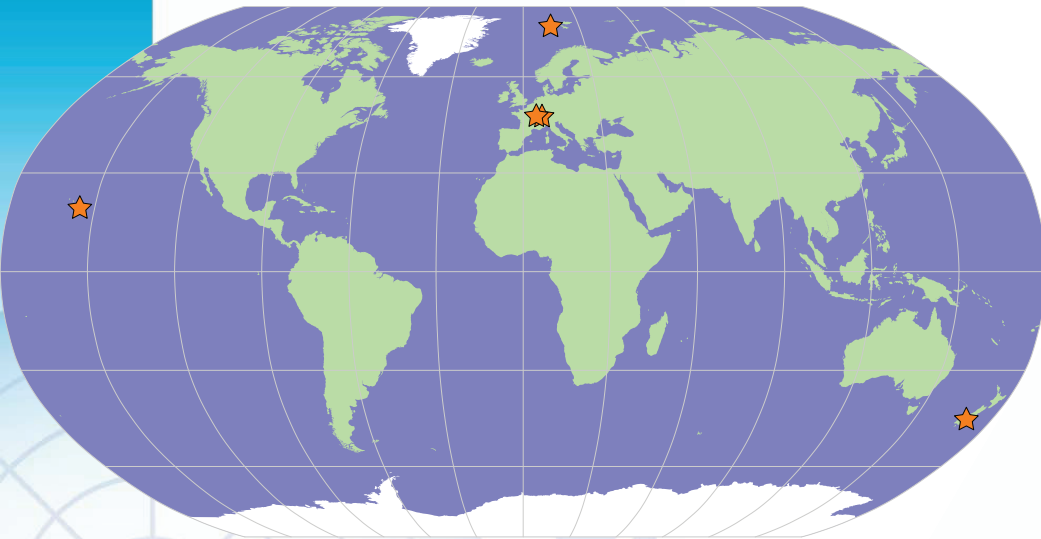
Working groups for Satellites, Theory&Analysis, H₂O, O₃

Steering Committee with Working Group representatives + peer and ex-officio members (~40 in all)

NDACC Station Map

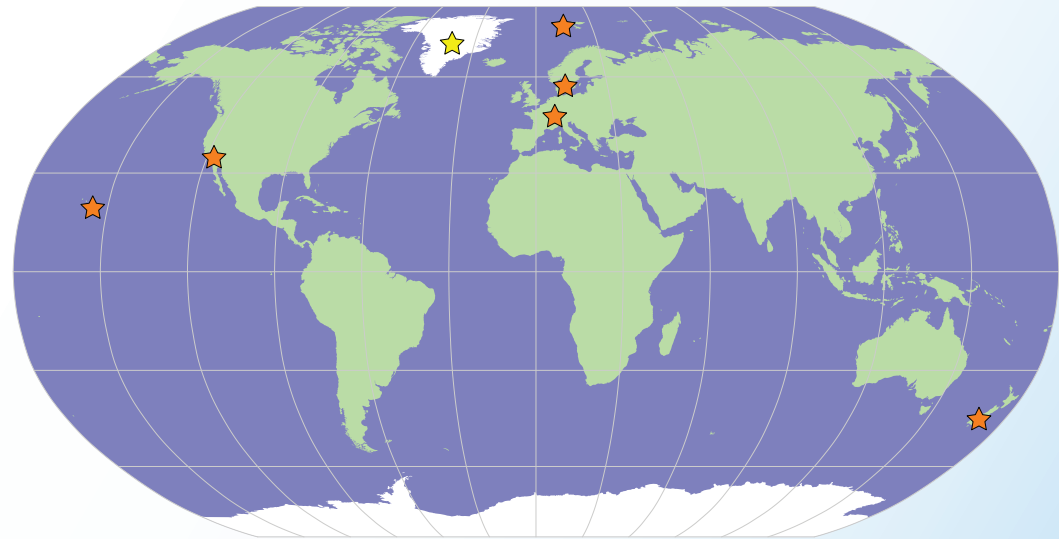


NDACC microwave sites



Ozone Characteristics

Altitude range: 20-70 km
Vertical resolution: 8-12 km



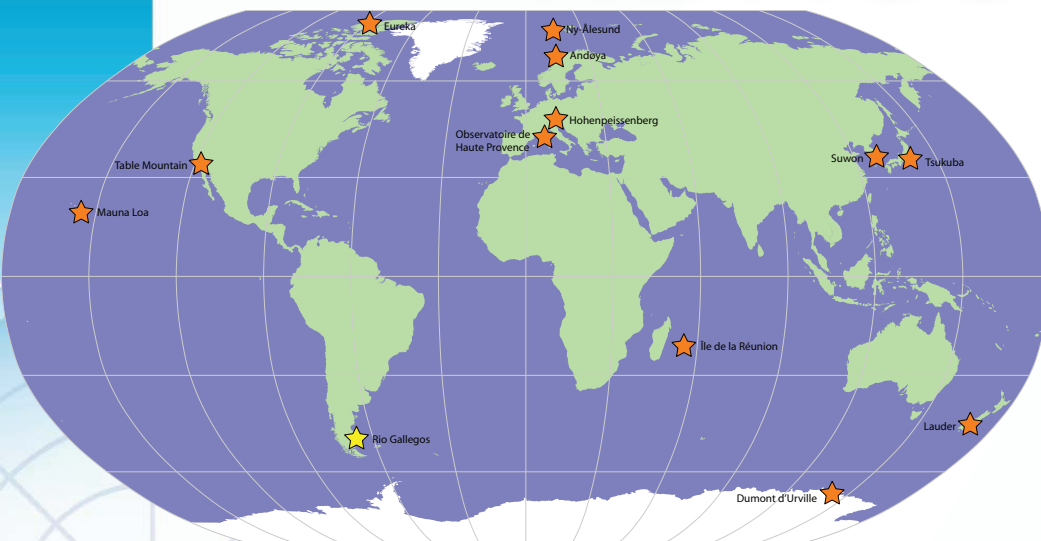
Water vapour Characteristics

Altitude range: 20-70 km
Vertical resolution: 8-12 km



Zimmerwald, CH

NDACC lidar sites



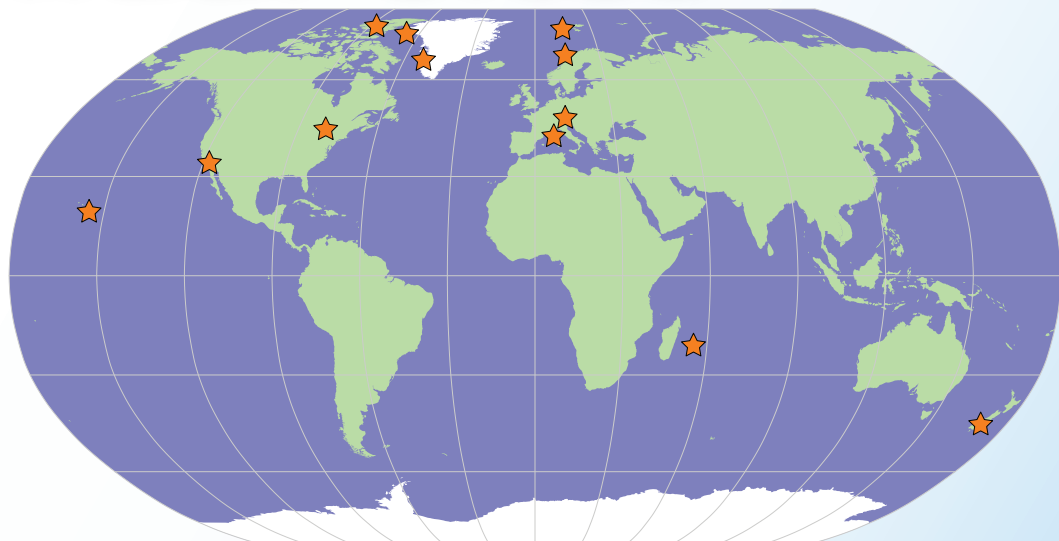
Ozone

Characteristics

Altitude range: 10 - 50 km

Vertical resolution: 0.5 - 5 km

**Network homogeneous within $\pm 2\%$
in the 20-35 km range**



Temperature

Characteristics

Altitude range: 10-80 km

Vertical resolution: 1-6 km

**Network homogeneous within ± 1 K
in the 35 - 60 km range**

NDACC lidar sites



Water vapour (Raman and DIAL)

Characteristics

Altitude range: ground to 8-17 km

Vertical resolution: 0.1 km

Detection limit: 15 ppb

Accuracy: Depends on calibration source (5-20%)

Precision: 0.001 to 50%

Essential climate variables (ECVs)

Variable	Priority	Lidar	FT-IR	μ wave	Dobson Brewer UV-Vis	Sondes
Temperature	1	X				x
Total water vapour	1		X			
Profile water vapour		X	X	X		x
Total Ozone	2		X		X	
Profile ozone	2	X	X	X		x
Methane	2					x

Initial station candidates

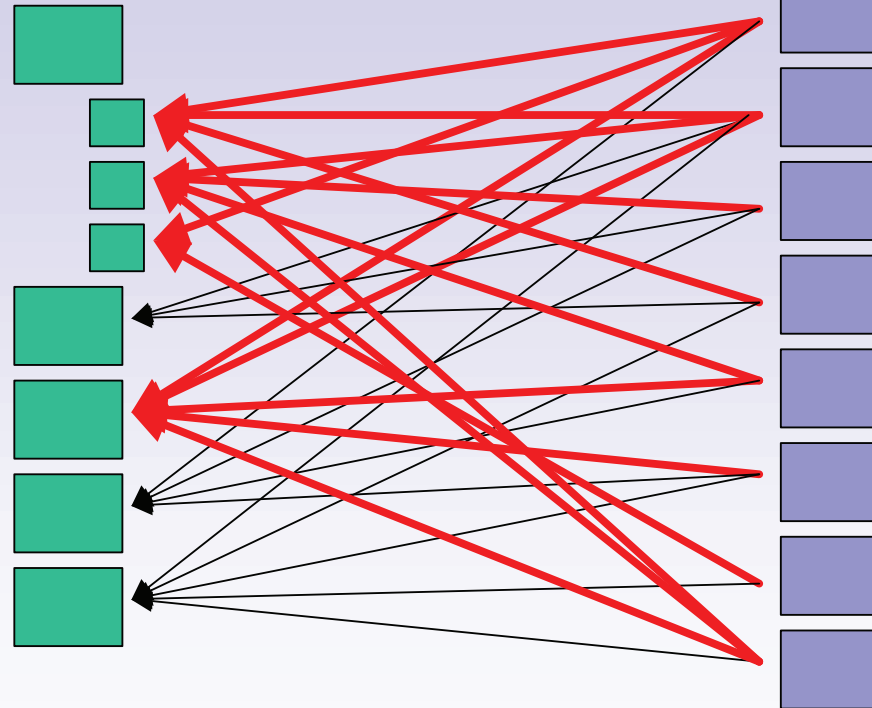
ARM Sites, Lindenberg, Camborne, *Payerne*, Cabauw, *Boulder*,
Sodankylä, Heredia, *Lauder*, Beltsville

Proliferation of data bases

Current situation

data providers

(e.g. ESA, NASA, NASDA, ECMWF, NCEP, station networks, individual stations, field campaign data centers, ...)



data users

(individual research groups)

← bureaucratic procedure, i.e., submission of proposal, annual reports, final report, etc.

← simple registration or free access

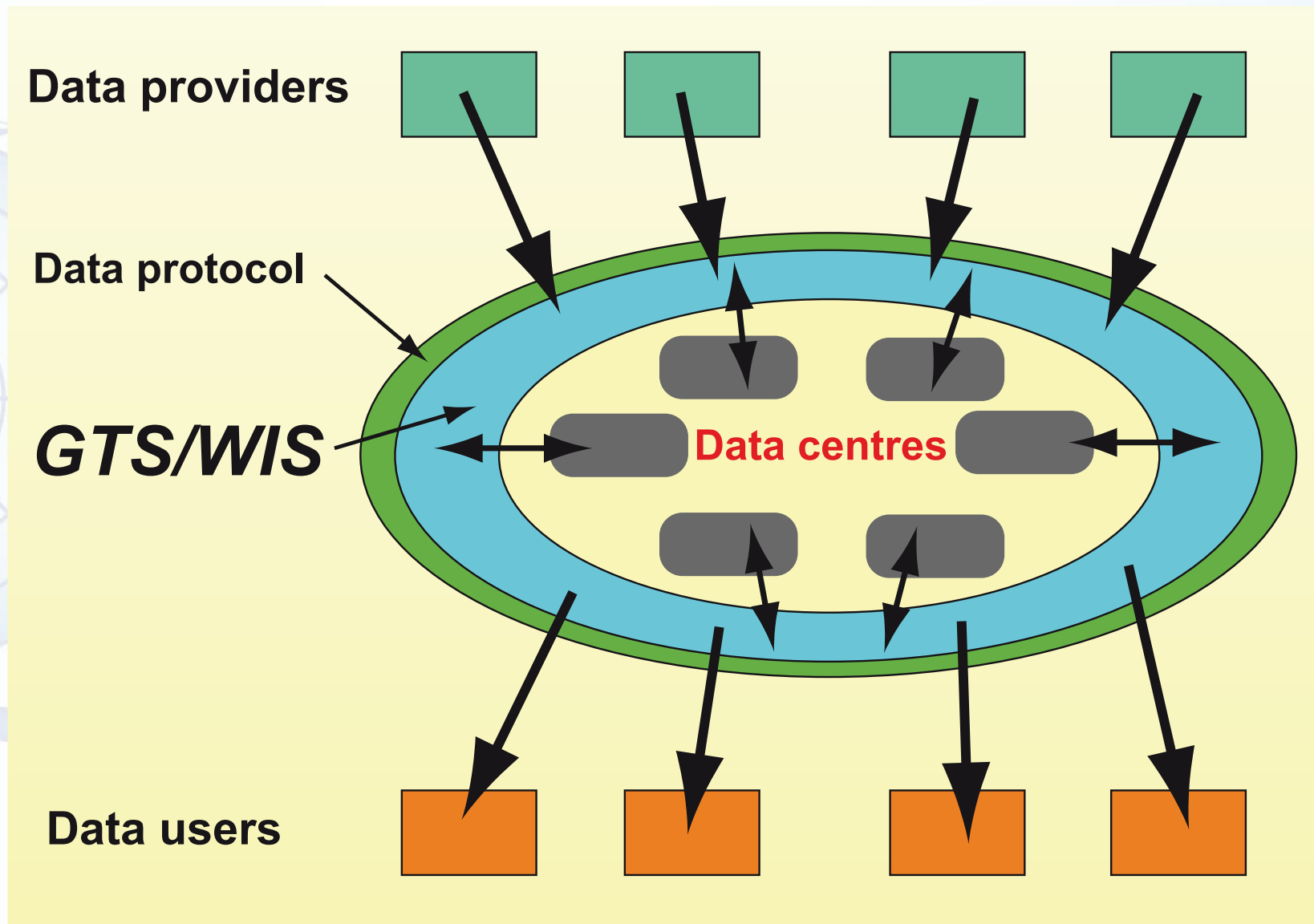
AWI

IGACO Workshop Greece, 15 May 2006



Figure courtesy of Markus Rex, AWI

Ideal situation



WMO Information System (WIS)

