WORLD METEOROLOGICAL ORGANIZATION

FIRST MEETING OF AD-HOC CBS CAS EXPERT GROUP ON *'JOINT GOS-GAW PILOT PROJECT TO ACCELERATE IMPLEMENTATION OF WIGOS/WIS'*

GENEVA, SWITZERLAND, 25 – 27 MARCH 2008

Meeting Report

For list of participants, please see Annex I.

The meeting documentation is available at:
http://www.wmo.int/pages/prog/arep/gaw/gaw_wicos_wis.html
The meeting Agenda is at:
http://www.wmo.int/pages/prog/arep/gaw/documents/agenda_wigos_final.doc
The presentations are available at the above Agenda website.

1. Opening of the meeting

Don Hinsman, Director OBS/WMO

noted that WIGOS and WIS have equal status, recalled WIS mandate from Cg; WIS concept and development plan; pilot and demonstration projects.

Len Barrie, Director RES/WMO

recalled that GAW contains all the relevant components of an integrated System; the GAW Strategic Plan (GSP) for 2008-2015 is a detailed implementation plan for integration; NRT use of chemical data in NWP is coming up; GAW WDCs look forward to benefiting from WIS/WIGOS.

Øystein Hov, Chair OPAG EPAC

discussed the GSP as it relates to this meeting, the GAW objectives should be used as guiding lights and WIGOS as mechanism for achieving these; acknowledged the processes going on in Europe: GMES (air quality and health, UV, GHG, monitoring in support of alternative energies); GEOSS; referred to the need to keep in mind climate change adaptation; pointed out the relevance of population migration into cities, i.e. restructuring of societies.

2. Adoption of the agenda

The draft agenda was adopted. The final agenda is in Annex II.

3. Background on WIGOS Pilot Projects and
4. Joint GOS-GAW Pilot Project to Accelerate implementation of WIGOS/WIS

Mirsolav Ondras (WMO) (Agenda item 3.1)

Presentation - Overview of the Report of first meeting of the EC Working Group (WG) on WIGOS-WIS. This included background information and workplan for the EC group; purpose, objectives, aim, characteristics and components of WIGOS. The EC WG will report to next WMO Congress in 2011.

Discussion

Don Hinsman: Pilot projects are established from the perspective of Technical Commissions, demonstration projects from the perspective of NMHSs, the latter are to demonstrate the benefit of WIGOS to the entire WMO community.

Rainer Dombrowsky (Agenda item 3.2)

The document on CIMO role and responsibilities in WIGOS pilot projects was presented. An EC WG on WIGOS/WIS Subgroup (SG) on WIGOS has been formed. This SG is chaired by the CIMO President and will include a representative for each WIGOS pilot project. The CIMO

pilot project will address capacity building; impact of WIGOS on CIMO is increasing interaction with other commissions

Len Barrie: Concerned about defocusing outside of meteorological measurements, need to fill the needs for classical meteorological measurements.

Miroslav Ondras: Need standards across all of WIGOS.

Chris Wehrli (Agenda item 4.3)

Presentation – NRT data delivery for aerosols. Different aspects of observations and aerosol data requirements, submission, evaluation were discussed, especially for aerosol optical depth (AOD) measurements with PFR instruments. The PFR network is a benchmark network, it is a background network for traceability from national networks to Davos. It was also noted (once again) how institutes that are not part of NMHS cannot access data directly (for instance the data needs to be requested for in writing) and that it would be hoped the situation would improve through WIS.

Discussion

Eliot Christian: WIS/WIGOS will not impose data policies: open policies are in the spirit of WIS, but restrictions are possible; the common standards will facilitate exchange.

Joerg Klausen (Agenda item 3.4)

Presentation – Overview of GAW quality assurance, quality control, and data management activities. GAW mission overview, information on World Data Centres (e.g. on WDC-RSAT), GAWSIS-WDC integration.

Discussion

It was noted that the GAW central facilities are voluntary contributions from Members. It was also noted that the data policy for GAW is of a science type, which reflects the current clientele, which is expected to broaden.

On discussion on data availability, it was noted that although WIS is to serve also those outside of the WMO community, there is not much knowledge of WIS out there.

Pilot projects were seen to be good for addressing these issues.

Jim Purdom (Agenda item 3.5)

The Document on Integrated Observing Systems Activities within the WIGOS Framework was presented. There is interest in targeted observations. A question was asked on the networks GAW collaborates with, for instance on the relationship to AERONET. It was noted that GAW Rep 162 (WMO/GAW Experts Workshop on a Global Surface-Based Network for Long Term Observations of Column Aerosol Optical Properties, Davos, Switzerland, 8-10 March 2004**)** addresses exactly this question. It was noted that there is a training need on how to use the data. It is a lot of work to get aircraft measurements, there is a need to collaborate on this. It was noted that GAW, which participates in IAGOS-ERI (an EU aircraft measurement project), has a working relationship with the Aeronautical meteorology division. Jim Purdom would like to see coordination between the different kinds (atmospheric chemistry, oceanographic, hydrological) measurements. Øystein Hov noted that that would be very useful as there is a strong pressure and demand for GAW data from operational side of meteorology.

Liisa Jalkanen (Agenda item 4.1)

Presentation - Background for the development of the *Joint GOS-GAW Pilot Project to accelerate Implementation of WIGOS/WIS*. Overall GAW structure was presented, value of GAW Station Information System (GAWSIS) was noted. GAW data coverage in space and time, GAW collaborators include NMHSs and others, overall quality of observations increases through GAW. Background was given for NRT delivery of ozone, aerosol and existing project proposals (Annex 1-3 of Annnex III).

Eva Cervena (Agenda item 4.2)

The document on NRT data delivery for ozone was presented. Many countries doing Dobson ozone measurements are in principle ready for NRT data transfer, same for Brewers, but the data submitters need to be convinced of the importance of this. It would be good to have ozone sonde data available on the GTS (and then on WIS).

Vincent-Henri Peuch (Agenda item 4.4)

Presentation - European initiatives towards a GMES atmospheric service and NRT chemical data exchanges. The usefulness of NRT data was reviewed and the reasons why NRT data flow is not yet a reality, overview of European initiatives was given. There was discussion on

alerts. Through PROMOTE there are service agreements, but responsibility of issuing alerts is outside their scope.

Eliot Christian (Agenda item 3.3)

Presentation - WIS Requirements within GOS/GAW Pilot Project. WIS specifications, GAW WDCs role and overcoming disconnections between NMHSs, EPAs and universities was discussed. It was noted that relationships need to be built on the value of the data.

5. Development of the description for the *Joint GOS-GAW Pilot Project to accelerate implementation of WIGOS/WIS* (Agenda item 5)

General discussion

The definition of NRT and delay times for compositional data was discussed. NWP has very clear cut-off times. WMO requirements are listed in WMO Special publications.

Alexander Karpov clarified background on WMO workings and the history on WIGOS, CONOPS (concept of operations). WIGOS is a comprehensive, sustainable, interoperable system of systems; there is no intention of depriving ownership. Dec 2007 meeting of the EC WG on WIGOS-WIS defined and clarified WIGOS issues. GOS and GAW plans need to be coordinated, in particular as regards satellites. He pointed out that rolling requirements review is critical and that training must be included with high priority. It is important to coordinate efforts on gap analysis, how the system satisfies WIS requirements, and how it satisfies QMF requirements. He remarked that this needs to be done in such a way that it is clear on all levels.

Discussion on the pilot projects

Each three levels of WIGOS integration should be addressed: instruments/measurements, WIS/dissemination of data, quality management. Proposed pilot projects: Ozone (column, profile) and AOD; get the data into and through the system; follow up is the assessment of these data in the context of NWP.

Len Barrie: Need good reasons for enhancing availability of data, such as the need for ozone and aerosol data in NWP.

Steve Forman: The data flow in WIS should be a two-way process, we need also to consider the needs of those not in NMHSs and submitting/requiring data. The added value of enhancing data availability in this manner (pilot projects) needs to be stated. He reminded that the meeting is to identify projects that create synergies between GOS and GAW.

Vincent-Henri Peuch: What is the expected WIGOS/WIS component of this project? Is it that other than matadata will be in WIS? Or will it demonstrate that other than NMHSs can really participate in WIGOS/WIS? Currently some data are available, some need contract. It was noted that we need to think about expanding communities, in this meeting the meteorological community approach was seen to be dominant. EPAs and their needs/systems need to be respected if we want them to participate in WIS, otherwise they might end up developing their own corresponding system. There is the danger that WIS is seen as something developed only for the meteorological community.

Slobodan Nickovic: Users outside of WMO have interest in obtaining data from the GTS.

It was agreed that pilot project 2.1 (Annex 3 of Annex III) was very appropriate and would be expanded in this meeting.

The Chair summarized the discussion and the agreement on what pilot projects should fulfil:

- Leave legacy
- Consider WIGOS requirements
- Demonstrate principle of WIS
- Demonstrate benefits of WIS to NMHSs and those outside NMHSs
- NRT ozone and AOD data flow as pilot project
- Do we confine to these (that are needed by the NWP community)? Or will air quality forecasting be included?
- Do we keep pilot projects 2.2 and 2.3 (see Annex 3 of Annex III)?
  Need to take into account ongoing work on these in e.g. ESA, WMO, GMES/GAS (atmospheric services)
- Need to have deliverables that someone will want.

Jim Purdom noted that ozone data is already available. He felt there is a need for a gap analysis, to see what needs to be added. Point is to prove that data can be brought in and the assessment of the utilization of the data by NWP centres. Could perhaps also take in data that is not so NRT?
Rainer Dombrowsky: Filling the template gives WIGOS office a view on what we're going to be doing. The SG WIGOS will monitor the pilot projects. After the template has been filled, need to lay out a step by step implementation plan.
Øystein Hov: The GAW SAGs can produce implementation plans. They need to see that the activities are useful. It needs to be noted that GAW is based on voluntary contributions and that there are many drivers for the activities of those involved in GAW. We could do NRT data delivery for ozone and AOD for NWP.
Eliot Christian supported this.

Jörg Klausen requested the group to consider whether or not to follow up on proposal idea 2.2 which is not focused on NRT. The GAW WDCs are not geared towards NRT data. The benefit of WIS would be to open up a good way for data flow even if it is not NRT. It is important to convince WDC managers of the usefulness of WIS. But this needs resources.

The issue of ownership needs to be considered, surface ozone data resides largely outside of WMO. As per AOD, AERONET is pretty well NRT. Ozone soundings are going into ECMWF.

It was decided to combine pilot project proposal 2.2 into 2.1 (Annex 3 of Annex III). Pilot project 2.3 on satellites was unanimously decided not to be pursued as it was felt that the timeframe would not allow for its development and that action should be taken with the WMO Space Programme. It was decided that the question of inclusion of air quality would be addressed while filling the pilot project template.

The group then focussed on filling in the template (Doc 4.5 Draft of the Pilot Project Proposal), which was the goal of the meeting.

The Chair summed up actions for the pilot project proposal:

- to be sent to Ozone and Aerosol SAGs and ET NRT for consideration
- to include the proposals from Cervena, Wehrli and the July 2007 ET EGOS meeting as Annexes
- to include estimated project cost.

The final version of the GOS GAW Pilot Project (PP) Proposal is attached as Annex III to this report, with the title '*Improvement of Dissemination of Ozone (total column, profiles and surface) and Aerosol observations through the WIS'*.

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ANNEX I – Participant list
ANNEX II– Final agenda
ANNEX III – GOS GAW Pilot Project (PP) Proposal "Improvement of Dissemination of Ozone (total column, profiles and surface) and Aerosol observations through WIS"

Annex I

List of participants

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Annex II

Meeting of ad hoc CBS CAS experts group to finalize the description for the *Joint GOS-GAW Pilot Project to accelerate implementation of WIGOS/WIS*

WMO Secretariat, Geneva, Salle 6L
25 to 27 March 2008

Agenda

Tuesday 25 March 2008

14.00 Opening of the meeting (*agenda item 1)*
Director OBS/WMO, Don Hinsman
Director RES/WMO, Len Barrie
Chair OPAG EPAC, Øystein Hov

14.10 Adoption of the agenda (*agenda item 2)*

BACKGROUND ON WIGOS PILOT PROJECTS (*agenda item 3)*

14.30 Overview of the Report of first meeting of the EC Working Group on WIGOS-WIS (*agenda item 3.1*)
Miroslav Ondras

15.00 World Meteorological Day ceremony, Salle A, WMO

16.50 CIMO role and responsibilities in WIGOS pilot projects (*agenda item 3.2*)
Rainer Dombrowsky

World Met Day Reception (17.30 onwards Attic Restaurant)

Wednesday 26 March 2008

JOINT GOS-GAW PILOT PROJECT TO ACCELERATE IMPLEMENTATION OF WIGOS/WIS (agenda item 4)

09.00 NRT data delivery for aerosols (*agenda item 4.3*)
Christoph Wehrli

AGENDA ITEM 3 CONTINUED

09.20 Overview of GAW quality assurance, quality control, and data management activities (*agenda item 3.4*)
Joerg Klausen

09.55 Integrated Observing Systems Activities within the WIGOS Framework (*agenda item 3.5)*
Jim Purdom

AGENDA ITEM 4 CONTINUED

10.15 Background for the development of the *Joint GOS-GAW Pilot Project to accelerate Implementation of WIGOS/WIS* (*agenda item 4.1*)
Liisa Jalkanen

10.30 NRT data delivery for ozone (*agenda item 4.2*)
Eva Cervena

10.45 European initiatives towards a GMES atmospheric service and NRT chemical data Exchanges (*agenda item 4.4*)
Vincent-Henri Peuch

11.00 WIS Requirements within GOS/GAW Pilot Project (*agenda item 3.3)*
Eliot Christian

DEVELOPMENT OF THE DESCRIPTION FOR THE *JOINT GOS-GAW PILOT PROJECT TO ACCELERATE IMPLEMENTATION OF WIGOS/WIS (agenda item 5)*

11.15 Development of the description for the *Joint GOS-GAW Pilot Project to accelerate implementation of WIGOS/WIS* (*agenda item 5*)
Meeting to develop the above under lead of Øystein Hov

17.30 Meeting adjourned for the day

Thursday 27 March 2008

9.00 Summary of discussions and pilot project description
Meeting Chair (Øystein Hov) and rapporteurs

11.00 Meeting adjourned

Annex III

GOS GAW Pilot Project (PP) Proposal
Improvement of Dissemination of Ozone (total column, profiles and surface) and Aerosol observations through WIS

Project Name	**I**mprovement of **D**issemination of **O**zone (total column, profiles and surface) and **A**erosol observations through the WIS
Acronym	GAW-IDOA
Project Type	WIS-WIGOS Pilot
Project Status	Planning
Project Overview	This pilot will improve availability of ozone and Aerosol Optical Depth (AOD) and surface Particulate Matter (PM) observations to the user community and prepare documentation to help other communities make their observing practices compatible. This pilot project combines activities already proposed by four advisory groups: SAG Ozone, SAG Aerosol, ET-NRT, ET-EGOS. The original proposals as provided to the March 2008 meeting are in annexes to this pilot project document.
Project Aims	*Improve dissemination of ozone (total column, profiles and surface) and aerosol observations through the WIS (noting that WIS includes the GTS)* *for:* • Ingestion into atmospheric models using data assimilation • Support improved forecasts of weather, surface UV and air quality • Verification of models *by:* • Dissemination on timescales appropriate to the applications • Instituting a Rolling Review of Requirements (RRR) Process, as prescribed by the Manual on GOS (WMO-No. 544) • Supporting training and capacity building as necessary *Assist other observing communities to make their observations more widely available by documenting:* • Benefits, challenges and solutions encountered • Procedures developed for the ozone and AOD communities

Partners/Participants	*Key participants* MACC partnership (Monitoring Atmospheric Composition and Climate, led by ECMWF) with collaborating environmental agencies, WDCA (World Data Centre for Aerosols), WOUDC (World Ozone and Ultraviolet Radiation Data Centre), CBS, CAS, CIMO, PMOD/WRC, JMA (WDCGG, World Data Centre for Greenhouse Gases), WMO Secretariat *Also contributing* Atmospheric composition community, WMO Members, HMEI (HydroMeteorological Equipment Industry Association), Universities
Project cost	Estimates to be confirmed Support for meetings of 3 expert groups: CHF50k One meeting of Ad Hoc group: CHF10k Consultants: 6 months: CHF60k
Funding Source(s)	WIGOS Trust Fund, Government grants
Project Timescale	Report to EC WG on WIGOS/WIS at the end of 2009 on the status of the objectives.
Expected Key Deliverables	Description of deliverables will be provided by the three CAS groups referenced in the project overview in coordination with CBS, using the three areas of interoperability of WIGOS: measurement, distribution (WIS), quality. Measurement • Increase the number of stations delivering observations for use in NWP, air composition forecasting and possibly hazard warning. Distribution • Increase in ozone and AOD observations received by Numerical Weather Prediction (NWP) and other centres (compared with 2008 baseline) on a time scale determined by the RRR • “quick look” AOD data available (with initial quality control but without finalized quality assurance) to centres executing experimental sand and dust storm models (Task 6.5 of GAW strategy) on timescales determined by the RRR • Document the further enhancements needed for WIS Quality • Standard procedures for quality control in accordance with GAW strategic plan

Project Links	http://need a project web site
Project Summary	Ozone and aerosol observations from the GAW network are needed for ingestion into atmospheric models, via data assimilation techniques, in support of improved forecasts of weather, surface UV and air quality. To be useful, the data must be disseminated in near real time, which will benefit in addition such products as the Ozone Bulletins. This project will contribute to the design of activities that enhance the transfer of GAW data in near real time through WIS. A detailed implementation plan is being developed by the three component leads in cooperation with CBS. The project will be implemented on the basis of current programmes and activities, carried out by Expert Teams of CAS, CBS and CIMO. Other relevant Programmes would be involved. The Secretariat and component leads will facilitate the implementation of the project. The WIGOS GOS-GAW Pilot Project Ad-hoc Group Chairman will monitor the results and report to the EC SG on WIGOS/WIS. *Management outcomes* • Identify the benefits and challenges associated with moving to use of the WIS for data dissemination and integration of GAW data into the work of other Programmes, including hazard warnings • Document a procedure that could be used to guide interoperability of other atmospheric chemistry components with WIS/WIGOS and propose changes to the Manual on the GOS and other Technical Regulations where appropriate *Common to ozone and AOD* • Expand the number of stations submitting ozone and AOD observations to operational users in near real time via WIS • Increase the availability and use of ozone and AOD observations to NMHS and other user communities • Develop and deliver training and provide capacity building to support increased provision and use of the data and products created from the data • Update the WMO database of observation requirements to take account of the Rolling Review of Requirements

	• Promote the measurement of ozone and AOD to a common set of standards • Identify a set of relevant standards as a candidate for an WMO/ISO standard • Standardise on BUFR/CREX format for data distribution • Ensure that WIS can distribute the data (including ensuring that telecommunications headers are defined) *Total Ozone and Ozone Profiles* • Invite NMHSs to make use of the ability of the computer program DOBSON to produce total ozone data in CREX for transmission via WIS on timescales identified by the RRR • Encourage NMHSs using Brewer spectrophotometers to implement the subroutine CX.RTN to prepare total ozone data in CREX for transmission via WIS on timescales identified by the RRR • Initiate distribution of ozone sounding data from NILU using the WIS • Invite producers of sounding systems to upgrade their software to allow production of ozone sounding data in BUFR or CREX • Encourage development and implementation of BUFR/CREX encoding programs for other types of instrumentation that measure total ozone or ozone profile observations (eg DOAS, lidars, FTIR) *Surface Ozone* • Demonstrate routine exchange of hourly data in at least one region Aerosols • Develop communications headers for AOD information
Date of Last Update	27 March 2008
Contact Person	Dr Liisa Jalkanen

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First Meeting of the ad hoc CBS CAS experts group to finalize the description for the *Joint GOS-GAW Pilot Project* to accelerate implementation of *WIGOS/WIS*

GENEVA, 25-27 MARCH 2008

GOS-GAW WIGOS-PP/Doc. 4.2 Add 1

(21.3.2008)

Original: ENGLISH only

Near Real Time delivery of Ozone

(Submitted by Eva Červená)

Summary and Purpose of Document

The document proposes a GOS-GAW WIGOS pilot project on Near Real Time delivery of total ozone and ozone sounding data through WIS.

ACTION PROPOSED

The meeting is invited to take the content of this document into consideration.

Near Real Time Delivery of Ozone

Project Name	Near Real Time Delivery and Use of Total Ozone and Ozone Sounding Data through WIS
Acronym	GAW-OD (??)
Project Type	
Project Status	Planning Stage
Project Overview	Undertake a pilot project to deliver ozone data from GAW stations and upper-air stations in NRT
Project Aims	To expand significantly the number of stations submitting ozone data to operational users in NRT via GTS/WIS.
Partners/Participants	WMO GAW representative WMO WIS representative GAW-SAG-Ozone GAW ET on NRT Data Transfer CBS ET on Data Representation and Codes Solar and Ozone Observatory, CHMI, Czech Rep. Norwegian Institute for Air Research (NILU), Norway
Funding Source(s)	WIGOS Surplus budget
Project Timescale	2 years beginning 1 July 2008
Expected Key Deliverables	Availability of ozone data would allow ingestion into atmospheric models in support of improved weather forecasts, and provision of better information for users.
Project Links	
Project Summary	- To invite NMSs to make use of the ability of program DOBSON to produce total ozone data for transmission via GTS/WIS in NRT. - To encourage NMSs using Brewer spectrophoto-meters to implement subroutine CX.RTN to transmit total ozone data via GTS/WIS in NRT. - To contact NILU with a request to produce bulletins containing ozone sounding data in CREX that could be transmitted via GTS/WIS. - To invite producers of sounding systems to upgrade their SW to allow producing ozone sounding data in BUFR or CREX.

	- To encourage development and implementation of BUFR/CREX subroutines for other types of instrumentation for total ozone and ozone profile observations (e.g. DOAS, lidars, FTIR).
Date of Last Update	
Contact Person	WMO Secretariat Dr Karel Vaníček, Dr Eva Červená, CHMI

WORLD METEOROLOGICAL ORGANIZATION

GOS-GAW WIGOS-PP/Doc. 4.3

(20.3.2008)

First Meeting of the ad hoc CBS CAS experts group
to finalize the description for the
Joint GOS-GAW Pilot Project to accelerate
implementation of *WIGOS/WIS*

Original: ENGLISH only

GENEVA, 25-27 MARCH 2008

Near Real Time delivery of Aerosols

(Submitted by C. Wehrli, R. Hoff, and L. Barrie)

Summary and Purpose of Document

The document proposes a pilot project for WIGOS/WIS GAW/GOS on Near Real Time Delivery of Aerosol Observation contains information through WIS.

ACTION PROPOSED

The meeting is invited to take the content of this document into consideration.

Near Real Time Delivery of Aerosols

Project Name	Near Real Time Delivery and Use of GAW PFR Aerosol Optical Depth Observations Through WIS
Acronym	GAW-AOD
Project Type	
Project Status	Planning Stage
Project Overview	Undertake a pilot project to deliver routinely the data form 12 GAW PFR stations to users inside and outside NMHSs
Project Aims	To enhance the availability of aerosol observations to NMHSs and partners through WIS.
Partners/Participants	Chris Wehrli WORCC, DAVOS Ray Hoff, U. Of Maryland GAW SAG MeteoSwiss WIS experts WMO WIS representative WMO GAW representative
Funding Source(s)	WIGOS Surplus budget
Project Timescale	2 years beginning 1 July 2008
Expected Key Deliverables	Enhanced access to AOD data from the surface based aerosols optical depth measurement community by users particularly NWP research and operational models for aerosols and the WMO SDS_WAS
Project Links	
Project Summary	Chris Wehrli and Ray provide input. Chris Provide and ANNEX I describing the network and what you wopuld like to do Ray was to ask a student to demonstrate “pull” of data of the WIS system and to document experiences and make recommendations. Provide this in ANNEX II
Date of Last Update	
Contact Person	Secretariat L.A. Barrie PI Chris Wehrli

Excerpt from Final report of the third session of the Expert Team on Evolution of the Global Observing System (ET-EGOS), Geneva, 9-13 July 2007: http://www.wmo.int/pages/prog/www/OSY/Reports/ET-EGOS-3_Final-Report.pdf

ET-EGOS PROPOSALS FOR INITIAL WIGOS PILOT ACTIVITIES

WMO Integrated Global Observing System (WIGOS) pilots

1. Introduction

The ET-EGOS was invited to address the objectives of the process for developing WIGOS as set out in Cg-XV/PINK 7.4(3), with a view to:

- Assessment of the WIGOS concepts;
- Further specification of the proposed roadmap;
- Providing guidance for the development of concepts and plans for pilot projects;
- Starting the preparation for the WIGOS Implementation Plan.

ET-EGOS discussed its role within the WIGOS development process. It stressed the importance of ensuring that initial projects have easily understandable benefits for WMO Members, and hence the advantage in focusing the projects on specific improvements in the availability of observations in response to identified user requirements. ET-EGOS appreciated that many of the long-term benefits of WIGOS would come from improvements in high-level system architecture and data management. The proposals for initial projects do not focus on these aspects. However, ET-EGOS expects the proposed pilot projects to be good vehicles for developments in improved architectures and procedures, in concert with WIS developments.

It is proposed to initiate pilot projects under four headings:

- Improved access to observations of atmospheric composition
- Improved access to marine observations
- Improved access to aircraft observations
- Improved access to observations for the hydrological user community

2. Improved access to observations of atmospheric composition

The emphasis currently of GAW is mainly on surface monitoring of the atmospheric composition. However, the mandate of GAW includes the integration of satellite and aircraft observations with surface measurements, as well as the integration of chemical data and numerical models. GAW observations are archived and made available by World Data Centres. The purpose of these is to collect and archive processed GAW data, to make them publicly available, and to provide support in the quality assurance, analysis and interpretation of these data for scientific advances and policy decisions. There is a growing need for the near real time data delivery, which GAW is addressing.

The services for operational, time-critical applications in atmospheric chemistry need to be defined and coordinated so that GAW and other environmental observational data are available to users online and when possible, in near real time. It is expected that integrated weather/climate-chemistry modeling systems will provide new classes of products and also improve the quality of conventional weather forecasting. Such systems require enhancement of global near real time transmission of chemical observations to support the assimilation component of the forecasting systems.

Pilot project 2.1 Improve the dissemination of ozone (total column, profiles and surface) and aerosol observations on the GTS/WIS.

Motivation: Ozone and aerosol observations from the GAW network are needed for ingestion into atmospheric models, via data assimilation techniques, in support of improved forecasts of weather, surface UV and air quality. To be useful, the data must be disseminated in near real time, which will benefit in addition such products as the Ozone Bulletins. This project will contribute to the design of activities that enhance the transfer of GAW data in near real time through GTS/WIS in partnership with the GAW Expert Team on Near Real Time Data Transfer (ET-NRT CDT). This project supports Task 6.1 of the GAW Strategic Plan and Recommendation G6 of the EGOS-IP. The project will be carried out in collaboration with GEMS.
Goal: To expand significantly the number of stations submitting ozone and aerosol observations to operational users in near real time via GTS/WIS.

Pilot project 2.2 Map the current situation of GAW data providers and review the existing services and tools.

Motivation: Considering the increasing number of stations reporting data, and an increasing number of parameters on which data are reported, the burden on both data submitters and the data centres needs to be reduced. This needs to be reconciled with the need to extend the amount of metadata. In addition data providers are often submitting data to many different data centres that may require different formats. This project will provide a quantitative understanding of the different databases/formats the data providers need to support. The information will be used for simplification of data submission procedures. A review of provided services and tools is also necessary. The assessment performed within the GSE PROMOTE project on ozone, UV, greenhouse gases, and air quality services can be used as background information for developing services. The users of data will benefit as they will have access to more data and better services as a result of simplified submission procedures. This project supports the GAW Strategic Plan. It will be carried out in collaboration with PROMOTE (ESA) and DLR.
Goal: To simplify the data submission processes of data providers in order to increase the submission of data, preferably in near real time, for better access by data users.

Pilot project 2.3 Develop a Vision for a satellite constellation for atmospheric composition
Motivation: Space based observations are an important component of an integrated global atmospheric chemistry observing system. They are especially beneficial in providing information in remote areas, particularly over oceans and continental areas where there are gaps in GAW's surface-based monitoring network. Satellite observations of atmospheric composition are expensive. It is beyond the resources of any one Member or agency to provide the observations needed to meet stated

user requirements; requirements will only be met through coordinated planning of an international constellation of satellite missions/instruments. This need was identified at the Workshop on the Re-design and optimization of the space-based GOS (OPT-2, Geneva, June 2007) and supports the IGACO strategy and Tasks 3.13 and 3.16 of the GAW Strategic Plan.

Goal: To create a high-level Vision of the constellation of satellite missions/instruments for atmospheric composition, through collaboration between GAW, WMO Space Programme and CEOS.