Sub-task Number: AR-09-03d
Sub-task Title: Global Observing System (GOS)

Overarching Task*:* Advocating for Sustained Observing Systems
Area: ARCHITECTURE
Relevant Committee*: ADC*
Related Targets: *(to be included in 2009)*

Sub-task Definition *(as given in the 2009-2011 Work Plan):*

Achieve a complete and stable Global Observing System (GOS). The surface-based component should include *in-situ*, airborne, land and possibly ocean measurements; high priority should be given to a stable, and as much as possible automated, fully functional World Weather Watch Upper Air Network and the further development of the Aircraft Meteorological Data Relay (AMDAR) Programme. The space-based component should include operational geostationary and polar components building upon WMO efforts to (i) increase spatial and temporal resolution for geostationary imagers and sounders, and (ii) provide a broader availability of polar Doppler wind profiles for initial operational testing.

Leads *(GEO Member or PO, Entity carrying out the work, Contact: e-mail)*:

WMO (OBS/SAT), *Point of Contact:* Barbara Ryan, bryan@wmo.int

USA (NOAA), Howard Diamond, howard.diamond@noaa.gov

USA (NOAA), Tom Peterson, thomas.c.peterson@noaa.gov

WMO (OBS/OSD), Miroslav Ondráš, mondras@wmo.int

WMO (OBS/SAT/SBOS), Jérôme Lafeuille, JLafeuille@wmo.int

Motivation/Background

The Global Observing system (GOS) provides, from the Earth and from outer space, observations of the atmospheric, oceanic, and terrestrial domains.. It is operated by national Meteorological and Hydrological Services (NMHSs), national or international satellite agencies, and involves several consortia (such as AMDAR, ASAP, EUMETNET, DBCP) dealing with specific observing systems or specific geographical regions. Coordination mechanisms for the space-based component include, but are not limited to CGMS and CEOS.

Outputs *(e.g. products and services which result from the activities of the Task/sub-task; outlined in the form of deliverables with timelines)*

<u>*Planned*</u>*:* Enhanced observational capabilities of NMHs will constitute production of increasingly accurate and reliable weather and climate analysis, forecasts, advisories and warnings of severe hydrometeorological events.

<u>*Produced*</u> *(current status):* GOS provides observations for the preparation of weather analysis, forecasts, advisories and warnings, for climate monitoring and environmental activities carried out under programmes implemented by WMO and by other relevant international organizations.

Activities *(operations or work processes through which resources are mobilized to produce specific outputs; outlined in the form of milestones including timelines)*

<u>*Planned*</u>*:*

1. Provide for the collection and update of user requirements from WMO programmes and WMO co-sponsored programmes.
2. Provide for regular updates of the Statements of Guidance (SOG) for WMO application areas;

3. Develop BUFR Template for world-wide use of AMDAR data;
4. Improve standardization and compatibility of Rainfall Intensity (RI) Measurements through the WMO Field RI Intercomparison;
5. Seek increased participation of research space agencies in the space-based component of the GOS to advance the research to operations (R2O) transition for the observation of the Essential Climate Variables (ECVs).
6. Develop an implementation plan for the enhancements of the space-based component of the GOS aligned with the Vision to 2025.

Progress (current status): (SOG) for WMO application areas were last updated as specified on: http://www.wmo.int/pages/prog/sat/Refdocuments.html#SOG;

1. Various versions of AMDAR BUFR are used and interoperability is compromised;
2. WMO Field RI Intercomparison is still ongoing.;
3. User requirements for 12 application areas from WMO and GCOS have been updated.
4. Guidelines for the research to operations (R2O) transition of satellite missions have been developed.
5. A Vision for the GOS in 2025 has been developed and communicated to partner organizations.

Resources *(indication of resources – e.g. financial, human – contributed by GEO Members or Participating Organizations to produce outputs)*

The above are standard WMO activities and are all within the WMO human and financial resources complemented by extrabudgetary funds and/or secondments of staff from WMO Members and space agencies.

Architecture and Data Component

1) Please briefly describe any task-related Earth observation resources (data set, system, website/portal) and any related Web Service interfaces that are contributed to GEOSS. State whether these items are or will be registered with the GEOSS Component and Service Registry for access via the GEO Web Portals, and whether any associated standards or other interoperability arrangements will be registered in the Standards and Interoperability Registry.

2) Please also describe what data and information your activity/system needs that you would request to be accessible through the GEOSS Common Infrastructure.

Capacity Building Component

(capacity building is defined to include the development of capacity related to: (i) Infrastructure and technology transfer (Hardware, Software and other technology required to develop, access and use EO); (ii) Individuals (education and training of individuals to be aware of, access, use and develop EO) and (iii) Institutions – building policies, programs & organizational structures to enhance the value of EO data and products).

1) In accordance with the above definition does this Task have a capacity-building component? If so, please provide a short description of this component including a description of end users.

Elements of this task, particularly in activity 5, involve raising user awareness through workshops and promoting applications of new instrument data. End users include meteorological and environmental agencies in both developed and developing countries.

2) Have any additional CB needs for this Task been identified? Please provide a short description.

None to date.

User Engagement Component
(please briefly describe to what extent end users are engaged in this Task and influence the nature of the outputs produced)

1. Users are expressing requirements through Points of Contact (POCs) for each application.
2. Users, through the POCs, prepare draft SoGs;
3. Users collaborate in the development of BUFR Teplate for AMDAR;
4. Users are participating in the WMO Field RI Intercomparison

Science and Technology (S&T) Component
1) Please briefly describe the elements of scientific research or technological development contained in this Task.

2) In relation to the S&T component(s) of this task, please describe gaps, priorities, continuity needs, barriers, scientific expertise and additional resource needs (this information will be used for developing a gaps and needs assessment in Task ST-09-01)

Members and POs' Contributions to Outputs and Activities above:
(Input is optional. This section gives the chance to Members and POs to provide more details (3-5 lines) on their individual activities, making a clear connection with the Outputs and Activities outlined above).

Germany
University Hohenheim, Institut für Physik und Meteorologie: Supporting the definition of science homogeneity and validation requirements for weather observing systems.
We are very interested to contribute in this task by data collection and quality control. We think that our experience in handling and quality control of large European data sets in connection with Research and Development Projects of the World Weather Research Programme (see links below), which includes EUMETNET data sets like AMDAR, the European radar network but also space borne data such as GPS, will be very beneficial for this task.

Japan
ICHARM: Development of calibration methodology to improve the accuracy of satellite rainfall information.
JAMSTEC: To maintain and increase radar measurement system and others in the Indonesian Region, in order to contribute to the forecasting of the severe rainfall and water resources.
NICT: Contribute to GPM and EarthCARE missions.

USA
NOAA: Achieve a complete and stable Global Observing System (GOS). The surface-based component should include in-situ, airborne, land and possibly ocean measurements; high priority should be given to a stable, and as much as possible automated, fully functional World Weather Watch Upper Air Network and the further development of the Aircraft Meteorological Data Relay (AMDAR) programme. The space-based component should include operational geostationary and polar components building upon WMO efforts to (i) increase spatial and temporal resolution for geostationary imagers and sounders, and (ii) provide a broader availability of polar Doppler wind profiles for initial operational testing.

CEOS
NASA: Availability of operational prototype for flood monitoring and landslide warning using TRMM data. Production of Merged TRMM Multi-satellite Precipitation Products.
NOAA: Observing System Simulation Experiment (OSSE) to compare operational benefits of the various ROS constellation options identified in June 2007 at the WMO Workshop on the Re-design and Optimization of the Space-based GOS (OPT-2).

GCOS/WCRP
GCOS/WCRP Atmospheric Observation Panel for Climate: ensure that needs for atmospheric datasets for climate are met.

EC
EU-project HYPOX: build oxygen sensing capacities in shelf and open seas, and land locked water bodies in compliance with GEOSS standards (interoperability, data and metadata standardization, archiving, and sharing)

Participation *(Table to be filled in 2009):*

Type	Member or PO	Representing	Contact Name	EmailAddress
Lead(PoC)	WMO	OBS/SAT	Barbara Ryan	bryan@wmo.int
Lead	USA	NOAA	Howard Diamond	howard.diamond@noaa.gov
Lead	USA	NOAA	Tom Peterson	thomas.c.peterson@noaa.gov
Lead	WMO	OBS/OSD	Miroslav Ondráš	mondras@wmo.int
Lead	WMO	OBS/SAT/SBOS	Jérôme Lafeuille	JLafeuille@wmo.int
Contributor	CEOS	NASA	Steven Neeck	steven.neeck@nasa.gov
Contributor	CEOS	NOAA	Mitch Goldberg	Mitch.Goldberg@noaa.gov
Contributor	EC	EU-project HYPOX	Antje Boetius	aboetius@mpi-bremen.de
Contributor	GCOS/WCRP	GCOS/WCRP Atmospheric Observation Panel for Climate	Adrian Simmons	adrian.simmons@ecmwf.int gcosjpo@wmo.int
Contributor	Japan	ICHARM	Kazuhiko Fukami	k-fukami@pwri.go.jp
Contributor	Japan	JAMSTEC	Hitoshi Nakamura	nakamurah@jamstec.go.jp
Contributor	Japan	NICT	Motoaki Yasui	yasui@nict.go.jp
Contributor	USA	NOAA	Dave Helms	david.helms@noaa.gov
Contributor	USA	NOAA	Gary Davis	gary.davis@noaa.gov
Contributor	WMO	OBS/OSD/IMO	Isabelle Ruedi	Iruedi@wmo.int
Contributor	WMO	OBS/OSD/AIR	Michael Berechree	mberechree@wmo.int
Contributor	WMO	OBS/OSD/MAR	Etienne Charpentier	echarpentier@wmo.int
Contributor	Germany	University Hohenheim, Institut für Physik und Meteorologie	Volker Wulfmeyer	wulfmeyer@uni-hohenheim.de