

CONTRIBUTION TO WIS OPERATION AND IMPLEMENTATION

In response to CGMS action 35.32

The WMO Information System (WIS) provides an integrated approach suitable for all WMO Programmes to meet the requirements for routine collection and automated dissemination of observed data and products, as well as data discovery, access and retrieval services for all weather, climate, water and related data produced by centres and Member countries in the framework of any WMO Programme. A scope of the WIS is to ensure interoperability with other user communities including Earth sciences and the various GEO societal benefit areas within the Global Earth Observation System of Systems (GEOSS). WIS, as a system with essential data exchange and data management services, is expected to play a core role in the GEOSS with respect to weather, water and climate data and products. Contributions from satellite operators in the WIS operation and implementation are essential to ensure and facilitate the discovery and access of satellite data and products by users.

Action/Recommendation proposed:

Recommendation 1: Satellite operators to support the further development and expansion of IGDSS/RARS as operational components of the WIS architecture.

Recommendation 2: All Satellite operators to consider applying as DCPCs.

Recommendation 3: Satellite operators to prepare metadata related to satellite data and products to the GISCs in accordance with the WMO core profile of the ISO metadata standard and to make them available to the GISCs.

Recommendation 4: Satellite operators to apply ISO 23950 for search as an effective enablement for interoperability between systems, including WIS.

Recommendation 5: The CGMS Task Force on Satellite Data and Codes (TFSDC) to interact as appropriate with the WMO/CBS Inter-Programme Expert Team on Data Representation and Codes (IPET-DRC), and the WMO/CBS Inter-Programme Expert Team on Metadata and Data Interoperability (IPET-MDI) with a view to contributing to the development of the WMO/WIS data representation and code forms for satellite data and products, and to the development of a comprehensive WIS data representation system policy.

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1 INTRODUCTION

The WMO Information system (WIS) is the single coordinated global infrastructure responsible for the telecommunications and data management functions for all the WMO Programmes. It is the pillar of the WMO strategy for managing and moving weather, water and climate information. WIS provides an integrated approach suitable for all WMO Programmes to meet the requirements for routine collection and automated dissemination of observed data and products, as well as data discovery, access and retrieval services for all weather, climate, water and related data produced by centres and Member countries in the framework of any WMO Programme.

WIS will provide three fundamental types of services (as agreed by WMO Congress):

- (a) Routine collection and dissemination service for time-critical and operation-critical data and products: This service is based on real-time “push” mechanism including multicast and broadcast; it would be implemented essentially through dedicated telecommunication means providing a guaranteed quality of service;
- (b) Data Discovery, Access and Retrieval service: This service is based on request/reply “pull” mechanism with relevant data management functions; it would be implemented essentially through the internet;
- (c) Timely delivery service for data and products: This service is based on delayed mode “push” mechanism; it would be implemented through a combination of dedicated telecommunication means and of public data-communication networks, especially the internet.

The WMO Information System (WIS) implementation approach is to build upon existing WMO information systems in a smooth and evolutionary process. The WIS Implementation Plan has two parts being developed in parallel:

- (a) Part A: the continued consolidation and further improvements of the GTS for time-critical and operation-critical data, including its extension to meet operational requirements of WMO Programmes in addition to the World Weather Watch (including improved management of services);
- (b) Part B: an extension of the information services through flexible data discovery, access and retrieval services to authorized users, as well as flexible timely delivery services; it would be implemented essentially through the Internet.

A scope of the WIS is to ensure interoperability with other user communities including Earth sciences and the various GEO societal benefits. The Fifteenth WMO Congress emphasized that the WIS, as a system with essential data exchange and data management services, would have to play a core role in the GEOSS as an essential WMO contribution with respect to weather, water and climate data and products.

2 DEVELOPMENT AND IMPLEMENTATION OF WIS

2.1 IGDDS/RARS

EC-LXI supported the progress of the global DVB-S infrastructure of the Integrated Global Data Dissemination Service (IGDDS), with the implementation of inter-regional data exchange mechanisms and user support services. The Council encouraged their further development and expansion as operational components of the WIS architecture, and it supported implementation of WIS metadata and catalogue interoperability standards.

2.2 *Implementation of Global Information System Centres (GISCs), Data Collection or Production Centres (DCPCs), and National Centres (NCs)*

Existing centres within WMO Member States that comply with the required WIS functions and technical specifications will be designated as one of the three types of centres forming the core infrastructure of WIS: Global Information System Centres (GISCs), Data Collection or Production Centres (DCPCs), and National Centres (NCs). For regional and global connectivity, GISCs will collect and distribute the information meant for routine global dissemination, while serving as collection and distribution centres in their areas of responsibilities; providing entry points, through unified portals and comprehensive metadata catalogues, for any request for data held within the WIS. Connected to the GISCs, the DCPCs will be responsible for the collection or generation of sets of data, forecast products, processed or value-added information, and/or for providing archiving services. National Centres (NCs) will collect and distribute data on a national basis and will coordinate or authorize the use of the WIS by national users, normally under a policy established by the respective Permanent Representative with WMO.

CBS endorsed the adoption of ISO 23950 for search as an effective enablement for interoperability between systems allowing information discovery across WMO as well as connecting many other communities. The implementation of the search standard, combined with the use of ISO 19115, would allow Members to quickly see the benefits of standardization in making data collections more visible to a wider community and increase the profile of its Members. Experience gained through using information discovery will help in further refining of metadata and that this refinement would increase the value of the data with time.

In October 2008, through a WMO circular letter, WMO Members were invited to seek the identification of potential GISCs and DCPCs for an inaugural list of potential WIS centres to be presented to CBS-XIV and Executive Council-LXI in 2009. The information compiled by an ad hoc sub-group established by the Inter-Commission Coordination Group on WIS (ICG-WIS) for the identification of potential GISCs and DCPCs (see Appendix) is available on the WMO server (see <http://www.wmo.int/pages/prog/www/WIS/centres/index.html>). The list of potential GISCs and DCPCs include specialized satellite centres operated by EUMETSAT, Germany, Japan, Netherlands, Republic of Korea and USA as DCPCs.

EC-LXI endorsed the plan of action taken by CBS to:

- (a) Develop guidance and management procedures for the CBS demonstration and assessment of capabilities of candidate GISC and DCPC centres in the framework of the GISC-DCPC designation procedure as endorsed by Cg-XV; the outcome should be submitted to the forthcoming ICG-WIS session with a view to reporting to EC-LXII (2010);
- (b) Organize demonstrations of capabilities of candidate GISC and DCPC centres at the CBS Extraordinary Session (2010);
- (c) Submit formal designations of GISC and DCPC centres to Cg-XVI in 2011.

2.3 WIS data representation

CBS-XIV established the Inter-Programme Expert Team on Data Representation and Codes (IPET-DRC) with the task to maintaining the WMO data representation and code forms.

EC-LXI noted with satisfaction that the CBS had started assessing different Data Representation Systems and developing a CBS policy on Data Representation Systems driven by users' requirements. CBS-XIV agreed that the application of the ISO 191xx series of geographic information standards to the development of a WMO conceptual model of data Representation should be considered as a fundamental element of a CBS policy on data representation systems, in particular with a view to applying a standard approach for data representation, leading to the development of a WMO core profile of the ISO 191xx series for data and metadata, and with a view to facilitating the interoperability and data interchange between applications based on data representations systems associated to BUFR, CREX, GRIB, XML, NetCDF and HDF. The Council urged all WMO Technical Commissions, and CBS as the lead Commission, to participate actively in this activity with a view to urgently consolidating a comprehensive WIS data representation system policy. CBS-XIV established the Inter-Programme Expert Team on Metadata and Data Interoperability (IPET-MDI) with the task of developing this policy and assisting in its implementation.

Given the importance of satellite data and the required knowledge of the overall satellite mission and instrument context to efficiently address satellite data coding matters, the Task Force on Satellite Data Codes is expected to assist the IPET-DRC, the Inter-Programme Expert Team on Metadata and Data Interoperability (IPET-MDI) and the Expert Team on GTS-WIS Operation and Implementation (ET-OI) for satellite-related data representation issues.

3 CONCLUSION

Recommendation 1: Satellite operators to support the further development and expansion of IGDSS/RARS as operational components of the WIS architecture.

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APPENDIX

**IDENTIFICATION OF POTENTIAL GISCs AND DCPCs
As of 10 June 2009
By Members**

| | | |
|----------------|------|---------------------------|
| | DCPC | RTH/RSMC |
| Australia | GISC | WMC/RTH |
| Australia | DCPC | IPS |
| Australia | DCPC | NCC |
| Australia | DCPC | RSMC (Darwin) |
| Brazil | GISC | RTH |
| Bulgaria | DCPC | RTH |
| Canada | DCPC | RSMC |
| China | GISC | RTH |
| Croatia | DCPC | Marine Meteorology Centre |
| Czech Republic | DCPC | RTH |
| ECMWF | DCPC | RSMC |
| Egypt | DCPC | Regional Ozone Centre |
| Egypt | DCPC | RIC |
| Egypt | DCPC | RRC |
| Egypt | DCPC | RSMC |
| Egypt | DCPC | RTC |
| Egypt | DCPC | RTH |
| EUMETSAT | DCPC | Satellite Centre |
| Fiji | DCPC | RSMC (TC) |
| Finland | DCPC | Arctic Data Centre |
| France | GISC | RTH |
| France | DCPC | GPC/LRFMME |
| France | DCPC | RCC |
| France | DCPC | Regional NWP support |
| France | DCPC | RSMC (EER) |
| France | DCPC | RSMC (TC-La Réunion) |
| France | DCPC | VAAC (Toulouse) |
| Germany | GISC | RTH |
| Germany | DCPC | GCC |
| Germany | DCPC | GPCC |
| Germany | DCPC | GRDC |
| Germany | DCPC | GRUAN |

| | | |
|-----------------------|------|----------------------------------------|
| Germany | DCPC | RCC |
| Germany | DCPC | RSMC |
| Germany | DCPC | WDCC |
| Germany | DCPC | WDC-RSAT |
| Germany | DCPC | WRMC |
| Hong Kong (China) | DCPC | WWIS & SWI Centre |
| India | GISC | RTH |
| India | DCPC | RSMC (TC) |
| Iran, Islamic Rep. Of | GISC | RTH |
| Italy | DCPC | RSMC (Marine&Ocean) |
| Italy | DCPC | RTH |
| Japan | GISC | RTH |
| Japan | DCPC | GPC/LRF |
| Japan | DCPC | RSMC (DPFS) |
| Japan | DCPC | RSMC (EER) |
| Japan | DCPC | RSMC (TC) |
| Japan | DCPC | Satellite |
| Japan | DCPC | Tokyo Climate Centre |
| Japan | DCPC | WDC (Greenhouse Gasses) |
| Kenya | DCPC | RIC |
| Kenya | DCPC | RSMC |
| Kenya | DCPC | RTH |
| Korea | GISC | NMC |
| Korea | DCPC | COMS |
| Korea | DCPC | GPC/LRFMME |
| Korea | DCPC | WAMIS |
| Netherlands | DCPC | RCC |
| Netherlands | DCPC | Satellite Centre |
| New Zealand | DCPC | RSMC |
| New Zealand | DCPC | RTH |
| Niger | DCPC | AGRHYMET |
| Niger | DCPC | RTH / ACNAS |
| Norway | DCPC | Arctic Data Centre |
| Russian Fed. | GISC | WMC/RTH |
| Russian Fed. | DCPC | GDC (Solar Radiation) (St. Petersburg) |
| Russian Fed. | DCPC | RCC (Moscow) |
| Russian Fed. | DCPC | NODC & GDC (Obninsk) |

| | | |
|--------------|------|----------------------------|
| Russian Fed. | DCPC | RSMC (EER) Obninsk |
| Russian Fed. | DCPC | RSMC (Moscow) |
| Russian Fed. | DCPC | RTH/RSMC (Khabarovsk) |
| Russian Fed. | DCPC | RTH/RSMC (Novosibirsk) |
| Russian Fed. | DCPC | WDC (ICE) (St. Petersburg) |
| Saudi Arabia | GISC | RTH |
| Saudi Arabia | DCPC | RDMEC (Drought) |
| Saudi Arabia | DCPC | RSMC (Jeddah) |
| Senegal | DCPC | Aviation Centre |
| Senegal | DCPC | RSMC |
| Senegal | DCPC | RTH |
| Sweden | DCPC | IPY Data Centre |
| Sweden | DCPC | Nordic Radar |
| Sweden | DCPC | RTH |
| Thailand | DCPC | RTH |
| UK | GISC | RTH |
| UK | DCPC | Marine Obs |
| UK | DCPC | Ocean/Wave |
| UK | DCPC | RCPC |
| UK | DCPC | RSMC (EER) |
| UK | DCPC | RSMC (NWP) |
| USA | GISC | WMC/RTH |
| USA | DCPC | GOSIC |
| USA | DCPC | NCAR |
| USA | DCPC | NESDIS |
| USA | DCPC | NGDC |
| USA | DCPC | NODC |
| USA | DCPC | RSMC (EER) |
| USA | DCPC | RSMC (NWP) |
| USA | DCPC | RSMC (TC-Honolulu) |
| USA | DCPC | RSMC (TC-Miami) |
| USA | DCPC | WAFC |
| Uzbekistan | DCPC | RTH |