WMO INFORMATION SYSTEM (WIS)

Information Summary

Background

Towards the end of the 1990's it became apparent that the various WMO Programmes either had or were in the process of developing their own information systems independently of each other. Since the multiplicity of systems resulted in incompatibilities, inefficiencies, duplication of effort and higher overall costs for Members, the continued development of the systems in this uncoordinated manner would have exacerbated these problems and would have further isolated the WMO Programmes from each other and from the wider environmental community. Therefore, the Commission for Basic Systems (CBS) developed the concept of an overarching, integrated WMO Information System (WIS) that would meet the requirements for discovery, access, retrieval and automated dissemination/exchange of information of all WMO Programmes, and provide the possibility for relevant national non-NMHS users, international organizations and WMO programme centres to participate in WIS.

In 2003, the Fourteenth World Meteorological Congress confirmed that such an overarching approach was required. The fifty-sixth session of the WMO Executive Council (EC-LVI, 2004) set up a high-level coordination and collaboration mechanism spanning across the technical commissions to ensure the orderly evolution of WIS through the active participation and contribution of the WMO technical commissions.

In the aftermath of the December 2004 Tsunami catastrophe, the importance of WIS was underpinned because WMO's GTS of today, and consequently WMO's WIS of tomorrow, are the only 24/7 operational backbone networks for the exchange of information in support of multi-hazard, multi-purpose natural disaster early warning systems. EC-LVII (2005) realized the important role WIS played in contributing the essential data exchange and data management services to the GEOSS and in facilitating the effective role of all NMHS in disaster mitigation and prevention activities and warning systems. EC-LVII requested to expedite the development of key components of WIS with a view to beginning implementation, at least in some countries, in 2006 instead of 2008, as originally planned.

WIS concept

Beside the programmes which could benefit from the services offered by WIS for the implementation of their data exchange tasks, the individual users, either a person or an institution, would be the main beneficiary of WIS, because WIS would provide a single entry point for any data request, be it on a routine basis by dissemination of certain user defined information sets or on an ad-hoc basis for a special data set. The current diversification of access points and methods would be replaced by a common approach. Furthermore, the portal structure provided by WIS would make it possible for programmes to present their data to their users in a programme specific query format.

To better describe WIS, a functional view is adopted. Three major components are defined: National Centres (NC), Data Collection or Product Centres (DCPC) and Global Information System Centres (GISC), together with a data communication network connecting the components. It should be noted that the terms are only used for describing the necessary functions, not actual organizational entities. There may be organizations like NMHSs, which combine all three functions within their structure.

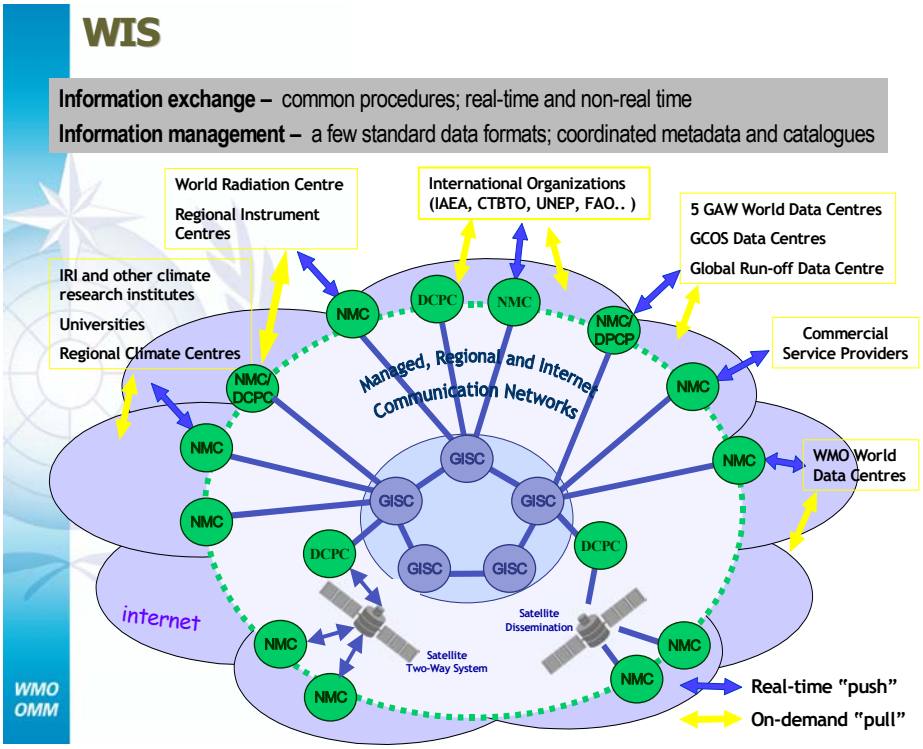

Fig. 1: WIS will provide the solution for the information exchange needs of NMHSs, and other national centres (NCs), such as relevant non-NMHS agencies/users, research facilities, and international programme centres. It will offer ("push" and "pull") automated collection and dissemination of time-critical information (e.g., meteorological, environmental and hydrological observations, forecasts, and warnings); timely delivery of high-volume data and products (appropriate to requirements); and ad-hoc information discovery/access/retrieval services.

The GTS has evolved as the core network of the WIS, which is, based on international ICT standards, fully operational and facilitates real-time, coordinated "push-pull" services and the information discovery, access and retrieval needs of all WMO and relevant co-sponsored international programmes, as well as eligible non-NMHSs users at national level; WIS will enhance the visibility and importance of the NMHS in the country. The NMHS gains timely and cost-effective access to information, in particular new data and products, which will enhance its own operations. The NMC will also be able to provide to other national agencies/users (NCs) dealing in relevant research, disaster mitigation, agriculture, energy and water management, and so forth, critical data that were, so far, not available to them. The NMC would "push" to them routine information, e.g., warnings, advisories, selected measurements, etc., and help discover, select and channel relevant information to the users, either ad hoc, in the "pulling" mode, or in reply to a non-real-time request.

Being based on industry standards, off-the-shelf hardware and open source software, WIS is a cost-effective solution for all Members and their NMHSs. This means that the initial investment is determined by the cost of PCs and the Internet and/or VPN connections, as required. Generic solutions will be the exception. Whether there might be an additional financial burden on the NMC will depend on how the national network is organized. This will not be the case if the "other" NCs are directly connected to the Network Service Provider as their data do not flow through the NMC

circuits. There can be an additional administrative burden if a NMC assumes the responsibility of the national WIS network manager addressing NC access rights, accounts, service availability, etc.

WIS complies with the WMO data policy (Res. 40 (Cg-XII) and Res. 25 (Cg-XIII)), and it is flexibly designed to follow an evolution of the WMO data policy. In particular, the handling of essential and additional data and products and related conditions with respect to Res. 40 (Cg-XII) remains unchanged. Procedures for managing of access rights, control of data retrieval, registration and identification of users, etc. can be defined as and when required. Anonymous downloading is technically possible, but depends on whether a NC permits that feature. WIS has no system-inherent features that would violate international legal frameworks, laws, conventions, copyrights, or patents.

Implementation

The implementation of WIS builds upon the most successful components of existing WMO information systems, and a smooth and coordinated transition is crucial. The concept of WIS requires development of the following major functions and the necessary software packages:

- Metadata catalogues;
- Internet portal;
- Data acquisition service;
- Data discovery service;
- Data distribution service: push and pull;
- Monitoring;
- Operational aspects like data synchronisation, back-up, administrative issues, etc.

To that end, valuable work is being already undertaken by the various pilot projects in the different Programmes, such as:

- The JCOMM GISC-E2EDM prototype;
- The VPN Pilot Project in RAs II and V;
- CliWare in the Russian Federation;
- The EUMETNET UNIDART project;
- The RA VI - VGISC project;
- CAgM WAMIS;
- TIGGE activities.

By the end of 2006, it might be possible to achieve, in a few countries, a smooth transition from the current GTS-based systems to the new WIS structures running in a semi-operational mode. The following milestones would need to be met by participating Members to realize this ambitious goal:

- Reference implementation WMO Core Profile version of metadata by 1Q06;
- Integration of metadata structures into pilot GISCs and DCPCs by 3Q06;
- Internet portal in 1Q06;
- Basic data acquisition using metadata by 2Q06;
- Data discovery service by 3Q06;
- Agreement on specification of data access rights by relevant CBS Expert Teams in 2Q06;
- Data distribution service: push in 2Q06 - pull in 4Q06;
- Exchange of monitoring information in agreed format by 3Q06.

Outlook

A concerted effort by the WMO Members that crosscuts over all WMO Programmes and integrates their information exchange needs is required to reach these ambitious goals. In this connection, the WMO Executive Council stated in 2003:

"*The support and involvement of regional associations and technical commissions [is] needed, as early as possible, in all phases of the WIS development in order to ensure a full and shared ownership of the project, and its effective implementation.*"

Furthermore, industrial involvement and a strong project coordination are crucial. A crosscutting programme should be set-up in WMO, which should proactively coordinate these tasks and also act as a channel to the industry. During the Technical Conference to be held in connection with the CBS-Ext.(06) session in late 2006, the status of the implementation should be reviewed.

Based on conclusions and agreements of CBS, pilot projects should become semi-operational to gather valuable experience with the WIS concept. The newly created GISCs should at that time implement the global data exchange envisaged. As a next step, various DCPCs should offer their data for access and ease the data discovery and retrieval burden for the related Programmes. Furthermore, at this stage the different Programmes should extend the metadata catalogue held in the GISCs by bringing in their own special data requirements and use the WIS features to disseminate their products. In this way, the enhanced functions provided by WIS will be gradually introduced and expanded from 2006 onwards.

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