GAW, WIGOS & WIS

WMO
OMM

What is WIGOS?

- **The WMO Integrated Global Observing Systems (WIGOS) is a concept for a comprehensive, coordinated and sustainable system of observing systems. WIGOS is based on all WMO Programmes' observational requirements. It ensures availability of required data and information and facilitates access through the WMO Information System (WIS) according to identified requirements. Additionally, it helps ensure high data quality standards and benefits from archival and technological innovations. It will provide a single focus for the operational and management functions of all WMO observing systems as well as a mechanism for interactions with WMO co-sponsored observing systems. Integration will lead to efficiencies and cost savings that can be reinvested to overcome known deficiencies and gaps in the present structure and working arrangements.**

Objectives

- Increasing interoperability between systems with particular attention given to space-based and in-situ components of the systems
- Addressing the needs of the atmospheric, hydrologic, oceanographic, cryospheric and terrestrial domains within the operational scope of a comprehensive integrated system;
- Ensuring that broader governance frameworks (e.g. inter-agency co-sponsorship of systems) and relationships with other international entities are sustained and; strengthened.
- Improving WMO management and governance (use of resources, planning, institutional and programme structures, and monitoring

Aims

- Ensure the availability of all required information produced within the various WMO observing systems, and WMO components of co-sponsored systems (e.g. GCOS, GOOS, GTOS, etc.) with particular emphasis on information generated by satellite, radar, wind-profilers, airborne systems, in situ ocean platforms, and other next generation observing systems;

- Address in the most cost-effective approach to meet WMO Programme requirements with a view toward reducing the financial burden on Members; while maximizing administrative and operational efficiencies;

- Facilitate the access, in real/near-real time and delayed mode, of observations required for WMO and WMO co-sponsored programmes as well as relevant international conventions which are generated by systems implemented and managed by cooperating agencies, organizations and programmes;

- Ensure required data quality standards are met and sustained for all programme requirements;

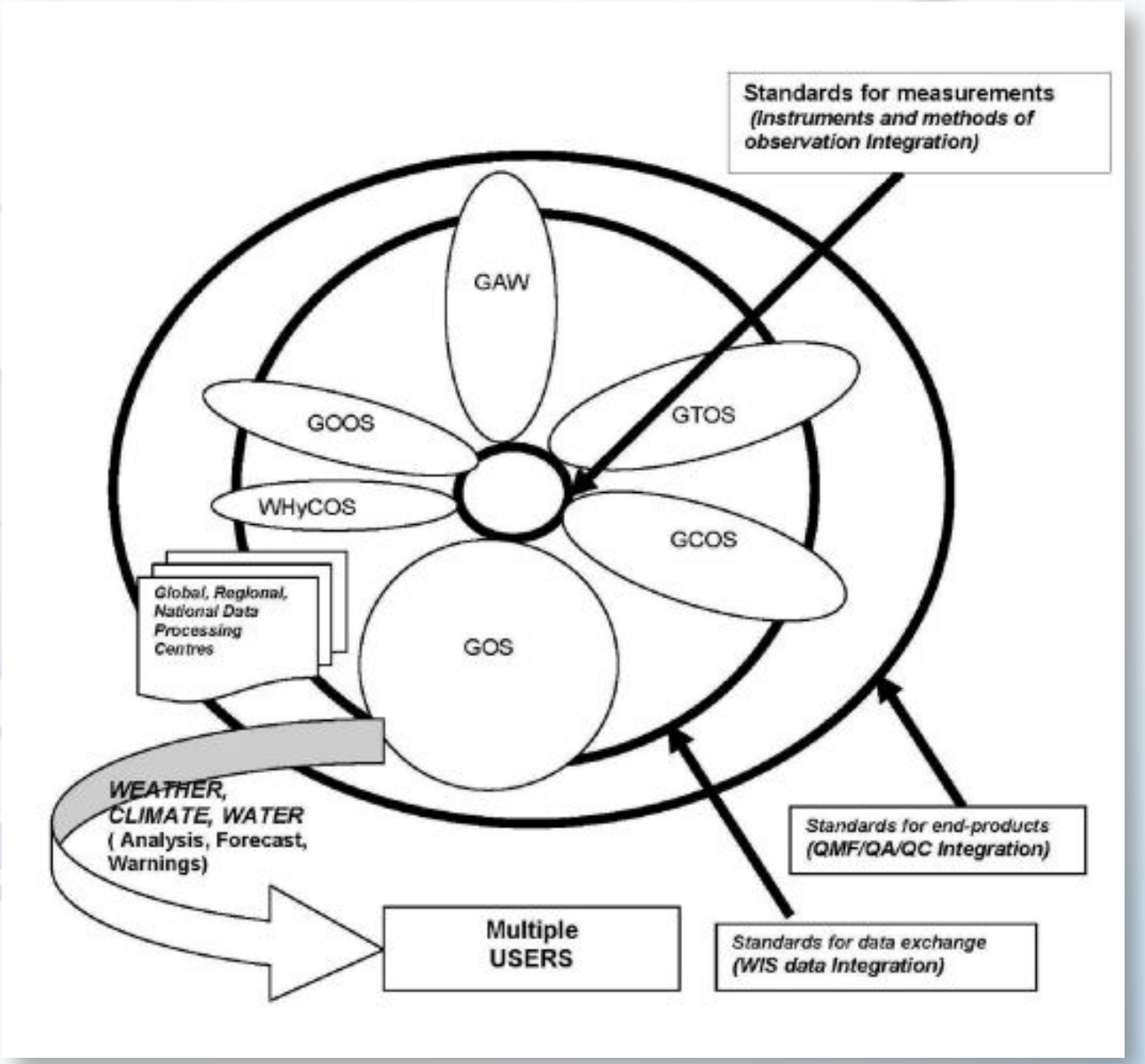
Aims cont.

- Facilitate improved data management including archival and data retrieval capabilities;
- Facilitate technological innovation opportunities;
- Continue on-going coordination with instrument manufacturers and scientific institutes in the development and testing of next generation observation instruments;
- Develop appropriate regulatory documentation including organization and recommended practices and procedures;
- Link existing technologies in an integrated manner to provide societal benefits.

Roadmap for Integration

- WMO agreed that planning and implementation of the WIGOS integration process should proceed in phases and it was foreseen that implementation of WIGOS and WIS would culminate at its Congress in 2011. To that end an Executive Council Working Group was appointed to ensure oversight, review and direction. It also agreed to establish a number of Pilot Projects with in the Technical Commissions and Demonstration Projects in the Regions to test and gain experience with the WIGOS concepts.

WIGOS Levels of Integration



The 1st level of integration (inner circle): Observation standardization

- A sustained, optimized, end-to-end WMO Integrated Global Observing System should encompass homogeneity, interoperability, compatibility of observations from all WIGOS constituent observing systems. This should be based on guidance and studies and achieved through implementation of recommendations on methods of observations within WIGOS constituent networks including tests, calibration and intercomparisons. This would be an "instruments and methods of observation level of integration."

The 2nd level of integration: Common information infrastructure

- **The planning and implementation of WIGOS should proceed in parallel to the planning and implementation of WIS. It is therefore crucial that as from its early planning stages the WIGOS activities be coordinated with WIS. This will be accomplished through:**
  - **Oversight by the Executive Council Working Group on WIGOS/ WIS;**
  - **Direction from the Sub-Group on WIGOS ;**
  - **Participation of representatives of Regional Associations and Technical Commissions ;**
  - **Coordination by the WMO Secretariat.**

Technologically, the key action leading to the desired integrated networks will be the generation of data and information from WIGOS constituent networks using a comprehensive, standardized data presentation in compliance with WIS information exchange requirements for all WMO Programmes. This would be "*WIS data level of integration*".

The 3rd level of integration: End-product quality assurance

The third level of standardization for a sustained, optimized, end-to-end WMO Integrated Global Observing System should embrace a quality management framework to ensure the best possible products to be delivered to end users. This should be based on agreed-upon quality assurance and control standards. This would be "Quality Management/Quality Assurance/Quality Control end-product quality assurance of integration" with the following goals:

- **To ensure integrated/coordinated data acquisition efforts among National Meteorological and Hydrological Services (NMHS) and other operators to minimize duplication;**
- **To reduce costs and maximize data and products availability and quality;**
- **To develop an integrated management system which delivers reliable and timely data streams with adequate quality control**

WIGOS Relationships/Links

WMO Information System (WIS)

WIGOS development and implementation will proceed in parallel with the planning and implementation of the WMO Information System (WIS). The combination of both efforts will allow for an integrated WMO end-to-end system of systems designed to improve Member's capability to effectively provide a wide range of services and to better serve research programme requirements.

GEOSS

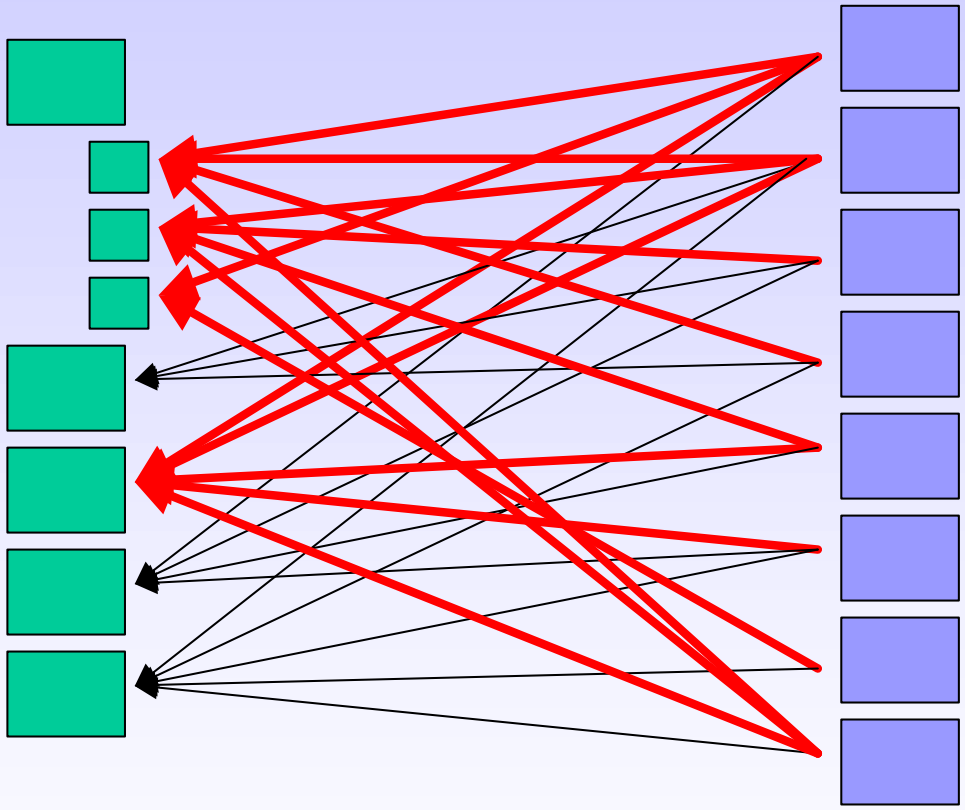
WMO has endorsed the concept of a Global Earth Observation System of Systems (GEOSS) and emphasized that the relevant WMO components should also be GEOSS components. WMO participation in GEOSS would be on a basis of mutual benefit, to maximize synergies and minimize duplication and to facilitate the free and unrestricted exchange of data and ,in particular, that all essential data be made available through the GEO interoperable arrangements.

Proliferation of data bases

Current situation

data providers

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



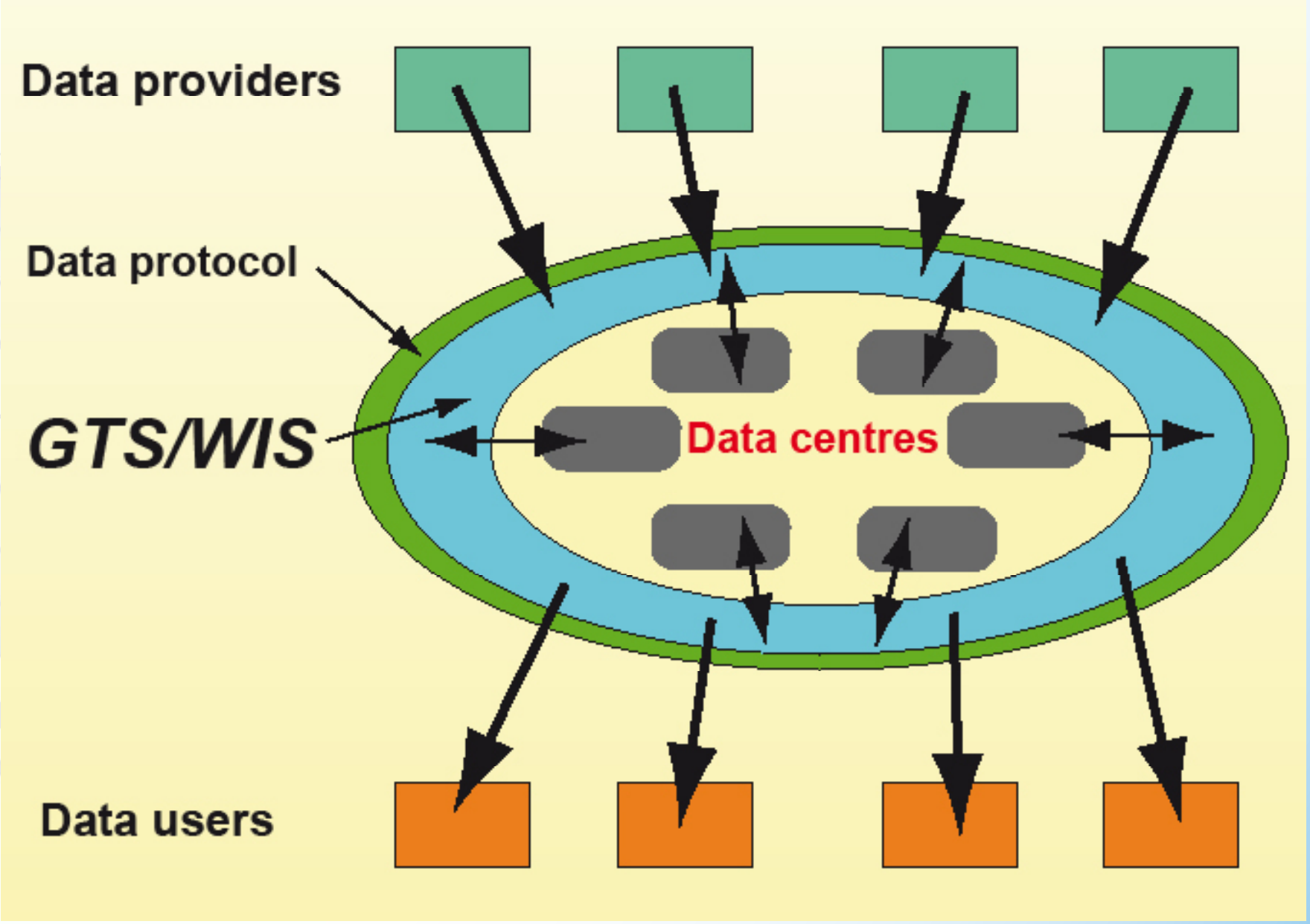
data users

(individual research groups)

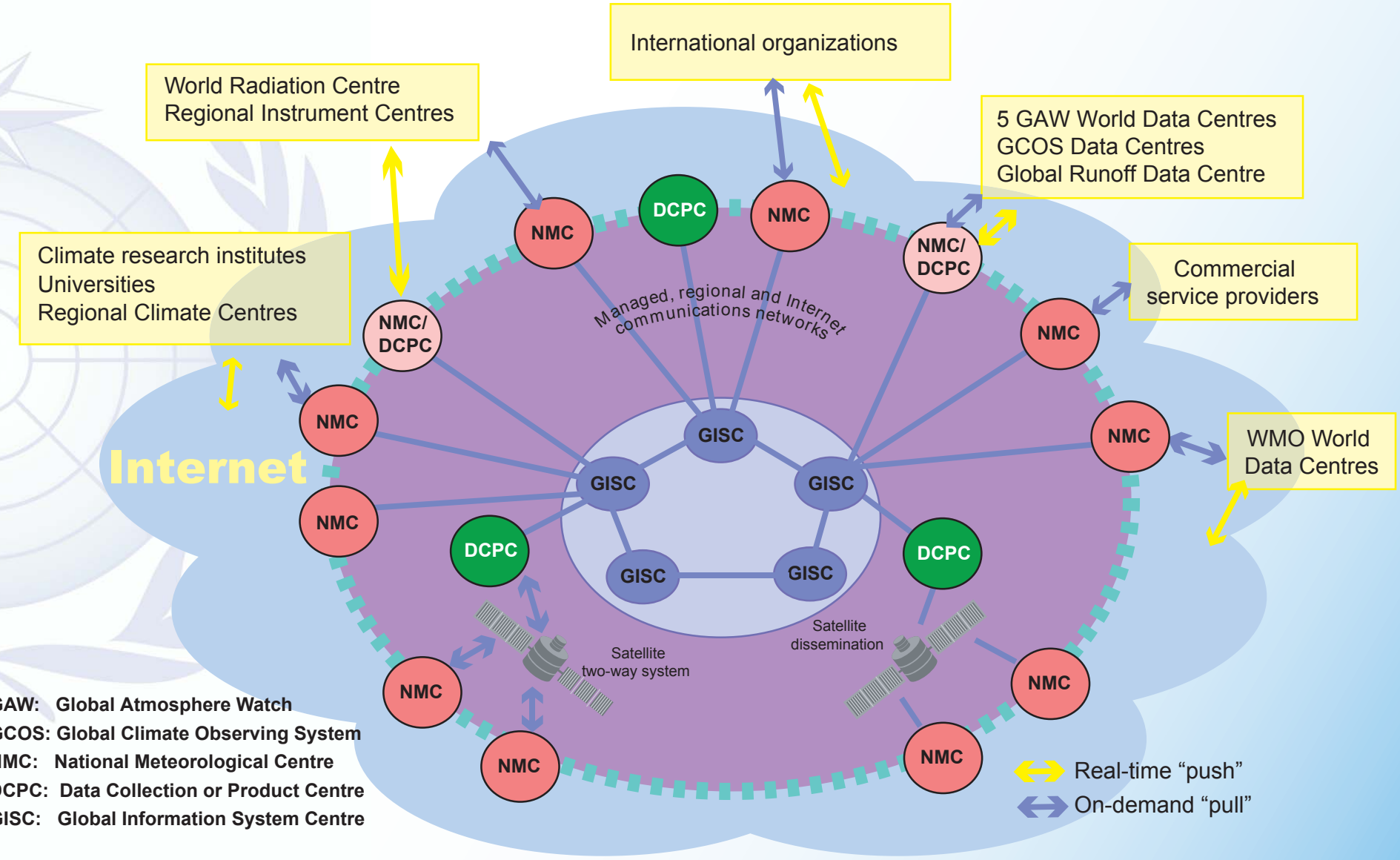
bureaucratic procedure, i.e., submission of proposal, annual reports, final report, etc.

simple registration or free access

Ideal situation



WMO Information System (WIS)



GAW: Global Atmosphere Watch
GCOS: Global Climate Observing System
NMC: National Meteorological Centre
DCPC: Data Collection or Product Centre
GISC: Global Information System Centre

WIS

- Will gradually replace the GTS
- GTS does not meet all needs of members
- GTS needs to be open to all WMO activities to provide time critical information exchange
- Internet should be a part of WIS to allow support of less critical requirements
- The continuous improvement and adaptation of new technologies in the GTS should be maintained.
- The WIS should be open to more than just WMO programs allowing partners to participate

- **Need seamless discovery, access and retrieval (DAR) across all WMO systems, including collaborators and partners.**

Development of metadata standard: up to 2008

- WMO profile of ISO19115
- Basically an implementers guide

Implement first operational GISC: 2009

- European VGISC started tender process (Germany, France & UK)
- DCPC partners are ECMWF, EUMETSAT, Norway
- NCAR and Russia NODC remain active participants
- Russia GISC in early development
- China/Japan collaborating on RA II GISC
- USA WIS catalogue online soon (Staged GISC implementation)

Implement other operational GISCs: 2009 - 2011

- Australia before 2011
- India and Saudi Arabia both planning for major WIS centres

Implement DCPCs: 2008-2011

- Commissions beginning to identify DCPCs
- WIGOS Pilot Projects assisting in moving DCPCs forward

ISO Standards

- **ISO 23950**
  Makes it possible for machines to carry out search
- **ISO 19115**
  Standards for metadata

Pilot projects

- Pilot project on Improvement of Dissemination of Ozone (total column, profiles and surface) and Aerosol observations through WIS
- Pilot project on better integration of the GAW WDCs