

# WMO Integrated Global Observing Systems (WIGOS) and WMO Information System (WIS)

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# Outline

- Cg-XV
- EC-LIX
- WIGOS (EC WG WIGOS/WIS-1)
  - Concept of Operations
  - WIGOS Dev & Imp Plan
  - Monitoring plan
  - Pilot and Demonstration Projects
  - Sub Group on WIGOS
- WIS

# Cg-XV & EC-LIX

## Cg-XV

- High priority “Towards Enhanced Integration between the WMO Observing Systems”
- Establish a mechanism
- Consideration at Cg-XVI (2011)

## EC-LIX

- Established EC WG WIGOS-WIS with TORs
  - Develop WIGOS Dev and Imp Plan
  - Refine WIS IP
  - Monitor
  - Pilot [and Demonstration] Projects

# EC WG WIGOS-WIS-1, Dec 2007

WIGOS is a comprehensive, coordinated and sustainable system of observing systems, ensuring interoperability between its component systems

Aiming to:

- Address in most cost/effective way all WMO Programme requirements
- Ensure availability of required information
- Facilitates access in real and quasi-real time to all required information through WIS
- Ensure data quality standards
- Facilitate archiving and technological innovations

## Four broad WIGOS objectives:

- Atmospheric, oceanic and terrestrial including hydrological and cryosphere domains
- Ensure broader governance frameworks (e.g. inter-agency co-sponsorship of systems) and relationships to improve management and governance of component systems
- Increase interoperability between various systems with particular attention given to complementarity between the space-based and *in-situ* components
- Other international initiatives are respected, sustained and strengthened

# Benefits derived through integration for WIGOS

- Improved services
- Increased quality and access to observations
- More efficient use of resources
- Better preparedness to incorporate new observing systems and to interface with non-WMO systems

# WIGOS Components

- Weather observing networks (e.g. WWW/GOS, AMDAR, ASAP etc);
- Atmospheric composition observing networks (e.g. GAW);
- Radiation observing networks (e.g. BSRN);
- Marine meteorological networks and arrays (e.g. VOS, drifting and moored buoy arrays etc.);
- Hydrological observing networks (e.g. observing components of WHYCOS etc.); and
- Climate components of various atmospheric, oceanographic and terrestrial observing systems contributing to GCOS
- Global Cryosphere Watch

## WIGOS observations and products will:

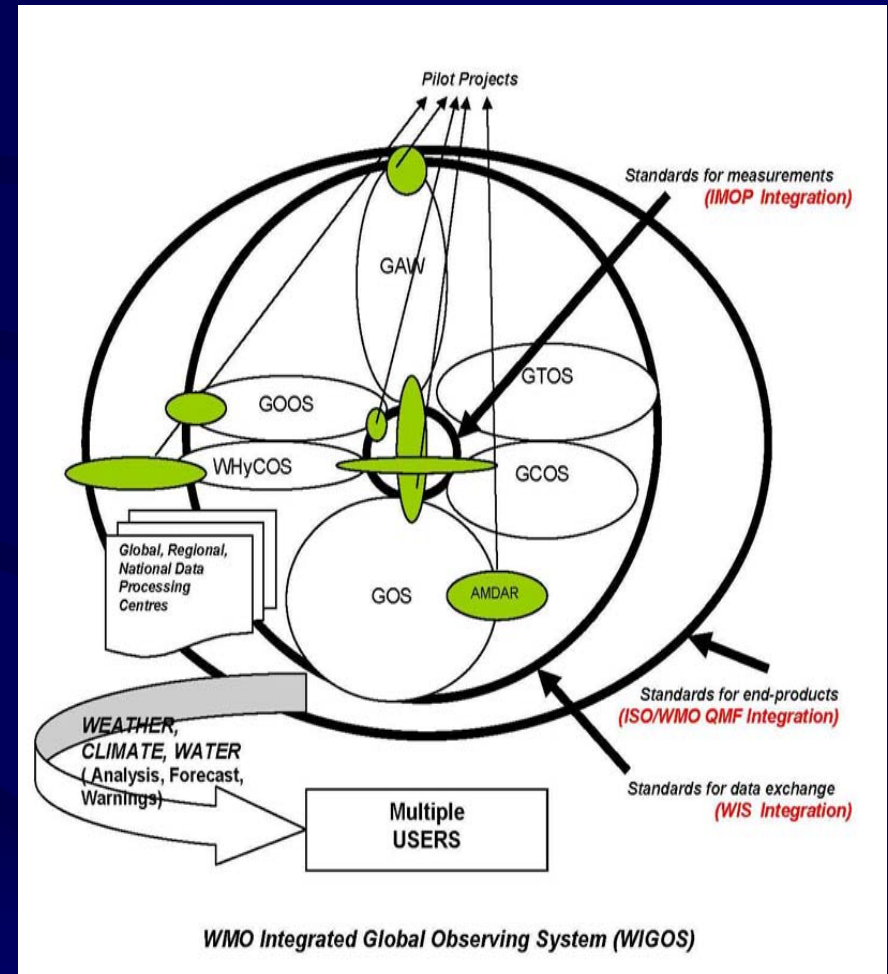
- be moved via WIS using WIS data and metadata formats
- use WIGOS compatible hardware and software
- adhere to WIGOS instrument and methods of observation standards and standard observing network practices and procedures
- be archived in WIGOS approved formats and resolutions at WMO authorized centers



# WIGOS integration levels

As a system of observing systems, integration accomplished at three levels:

1. Observation standardization
2. Common information infrastructure, i.e. WIS
3. End-product quality assurance



# WMO Information System -WIS

- Routine collection and dissemination service for time-critical and operation-critical data and products, Real-time “push” mechanism including multicast and broadcast; dedicated telecommunication providing guaranteed quality of service;
- Data Discovery, Access and Retrieval service: Request/reply “pull” mechanism with relevant data management functions, essentially through the Internet;
- Timely delivery service for data and products: Delayed mode “push” mechanism; implemented through combination of dedicated telecommunication means and of public data-communication networks, especially the Internet.

# Structure of WIS

- **National Centres (NC)**
  - Links national data providers and users to regional and global data exchange nodes, and administrates access to WIS
- **Data Collection or Production Centres (DCPC)**
  - Provides for regional and international exchange of WMO programmes' data and products
  - Supports data and information push and pull
- **Global Information System Centres (GISC)**
  - Provides for global exchange of data and products
  - Collects and provides metadata for all data and products
  - Supports data and information discovery and pull
- **Data communication networks (including the internet)**

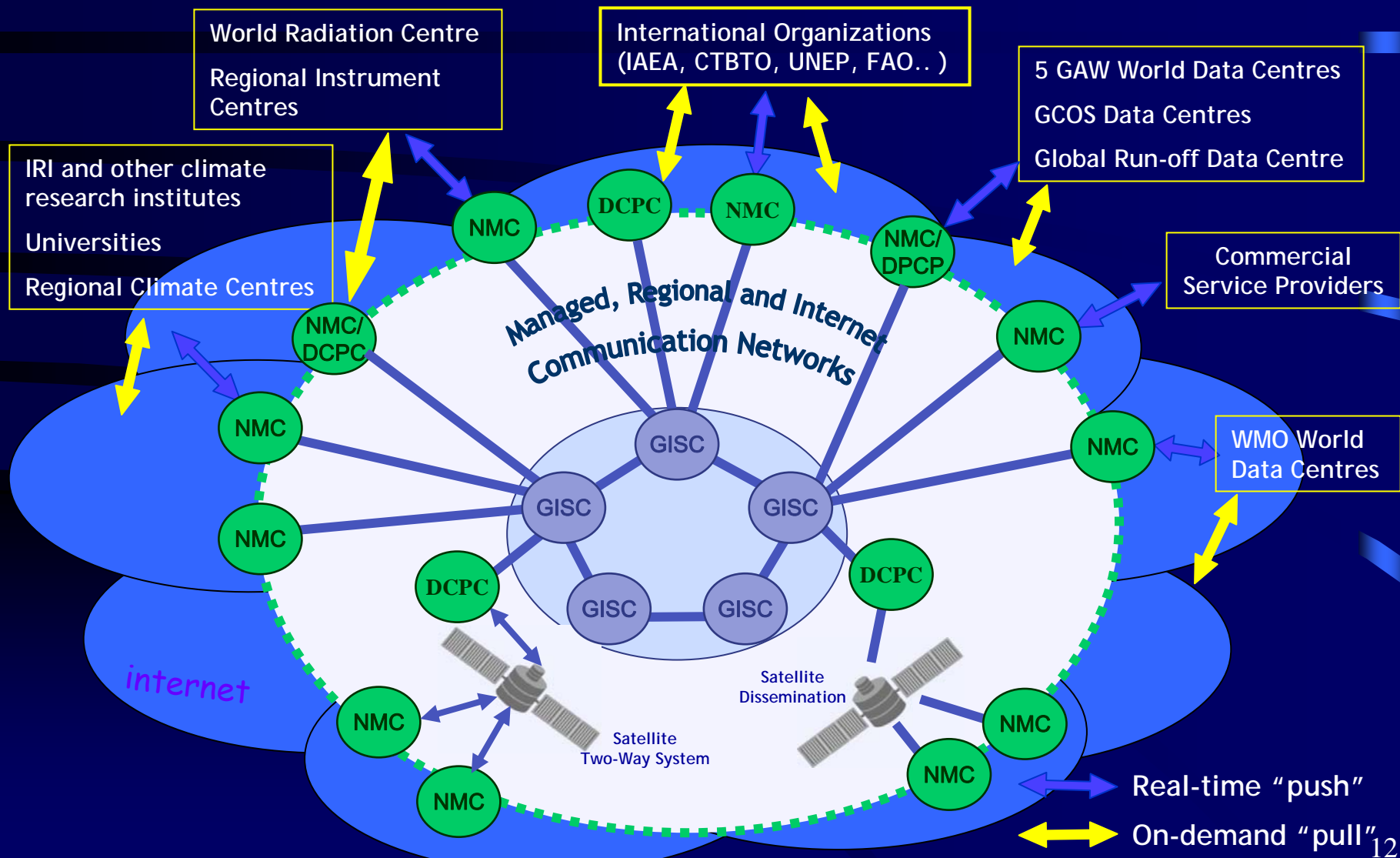
*For more information on WIS see*

*[http://www.wmo.int/pages/themes/wis/index\\_en.html](http://www.wmo.int/pages/themes/wis/index_en.html)*

# WIS

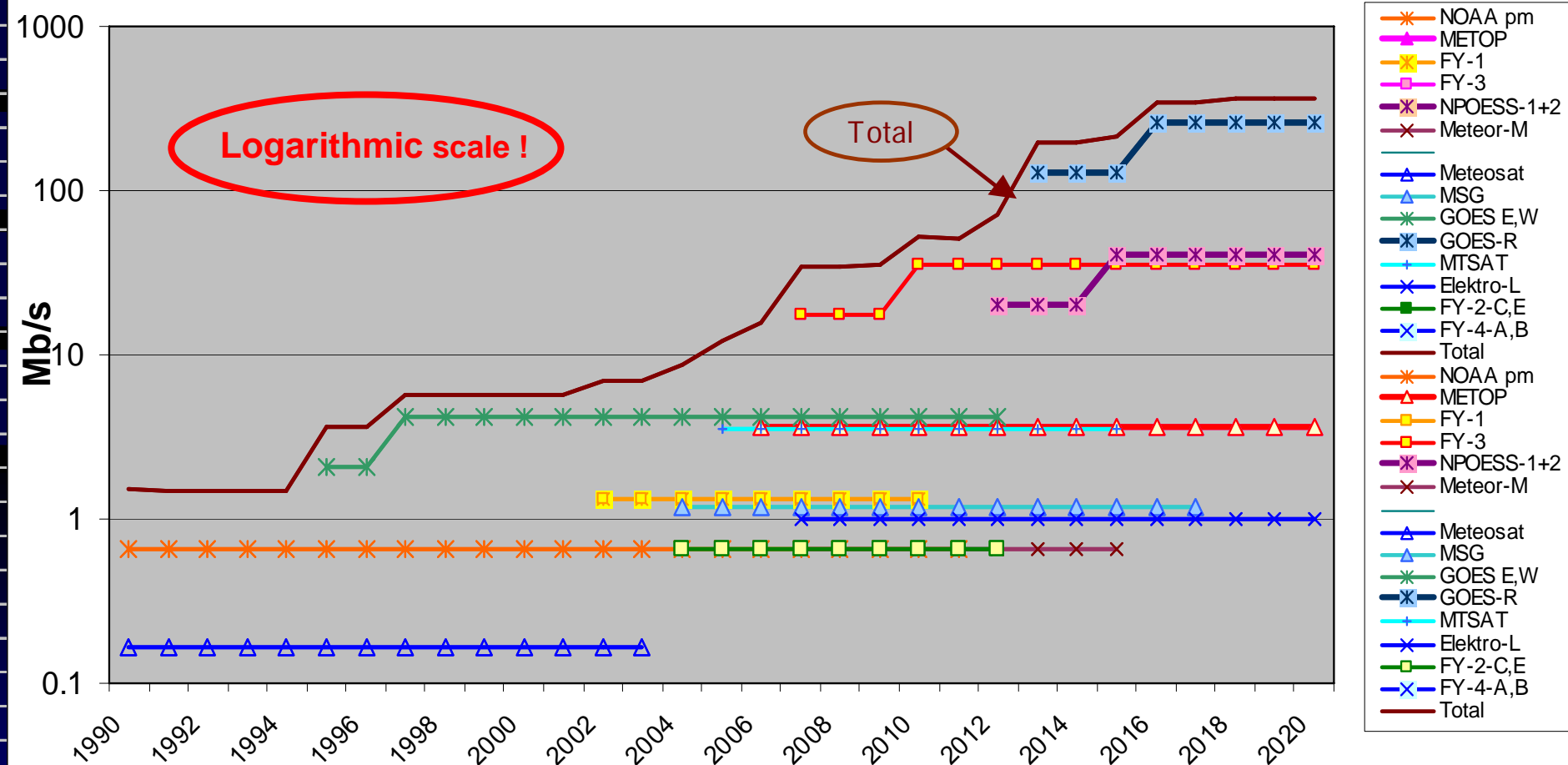
Information exchange – common procedures; real-time and non-real time

Information management – a few standard data formats; coordinated metadata and catalogues



# Data volume increase

## Estimated Evolution of Satellite Data Rates based on Direct Broadcast rates



# Benefits of WIS

- Ensure continued improvements in the GTS
- Provide central metadata catalogues listing all available WMO data and products and how to get them.
- Allow non WMO centres to become DCPCs within WIS.
- Open WIS catalogues to the web.
- Manage metadata and data policies (i.e. security)
- Provide
  - better access to information to assist in weather, water & climate affected activities
  - the ability to collect & share critical information necessary to monitor and predict the state of the environment
- Enhance profile and level of services of NMHS
- Interface with GEOSS

# Requirements of WIS

- Metadata is based on WMO profile ISO19115
- WIS atomic items are a file pair
  - Information file
  - Metadata file
- Unique file names
  - WIS utilizes the file names to identify relevant metadata file. Used in DAR as well as message handling.
- Preferable to utilize WMO data representation and codes
- Designation procedures exist for incorporating a new DCPC in WIS
  - Annex III of Final Report - CBS Ext06  
[http://www.wmo.ch/pages/prog/www/CBS/Reports/CBS-Ext06/WMO-1017\\_English.pdf](http://www.wmo.ch/pages/prog/www/CBS/Reports/CBS-Ext06/WMO-1017_English.pdf)
  - Only Interfaces of what needs to be the same are specified
  - Key is to make metadata catalogues and information available

# WIGOS ,WIS and IPY

- Observing networks established or improved during IPY should be kept in operational mode for as many years as possible to provide data for the detection and projection of climate change (WMO EC–LVI Recommendation, June 2004)
- IPY projects provide great opportunity for the integrated observations of the polar environment. IPY should contribute to a suitable WIGOS Pilot Project for the integration of WMO observing systems and linked to one of the main Expected Results of the WMO Strategic Plan (WMO Cg-XV Recommendation, May,2007)



# Increased reports in IPY period

The successful start of IPY resulted in an increase in the number of reports from traditional observational networks of atmosphere in Polar Regions (according to results from WWW monitoring from 1 to 15 July 2007 compared with the same period in 2006)

## In the Arctic

- the number of synoptic stations transmitting 90-100% of expected reports increased by 8 stations located on the coast and islands of the Euro-Asian sector,
- the number of BUOY reports has increased by 1096

## In the Antarctic

- the number of synoptic stations increase by 2 stations,
- the number of BUOY reports increased by 18,150 (five times more)

# IPY data management activities

- At present a major impediment to effective IPY implementation is the lack of any formal support or system that would ensure quick, easy and reliable discovery of and access to IPY data, as well as the lack of a formal pathway for IPY scientists to archive their data and make available metadata to ensure their future access and archival
- WMO Inter-commission Task Group (ITG) on IPY supported the proposal by the IPY JC to consider the Canadian ArcticNet portal and its associated searchable metadata as an IPY portal, which would meet most of the needs of a great majority of the IPY scientists to provide access to data through searchable metadata related to their projects
- Noting that these activities would be highly useful as a Pilot Project to demonstrate an operational national contribution to WIS, the ITG recommended that WIS should work closely with ArcticNet to ensure it became fully compliant with the WIS portal and metadata standards

# Legacy of IPY observing systems

IPY legacy should be built upon the surge observational programmes and converted into sustainable long-term research and monitoring capabilities. ITG requested relevant technical commissions to be actively involved in this process within their areas of responsibility through the expert teams and panels related to the evolution of the GOS, WIS development, AMDAR, WHYCOS and GAW implementation. In strongly supporting the JC roadmap development towards creation of a legacy embracing IPY observing systems, the ITG urged WMO Members to participate in this activity

# WMO EC Panel of Experts on Polar Observations and Research

- Successful implementation of IPY 2007-2008 will result in a legacy of enhanced polar observing systems and research of polar environment
- WMO EC at its upcoming session (June 2008) will consider a new Panel of Experts on Polar Observations and Research to:
  - ensure coordination of acquisition, exchange, and archiving of observational data from polar regions in compliance with WIGOS and WIS requirements
  - provide a WMO high-level Partnership in activities aimed to secure IPY observing system Legacy in close communications with operational agencies in Member-countries and international organizations such as the Arctic Council, International Arctic Science Council, the Antarctic Treaty Consultative Meeting, the Scientific Committee on Antarctic Research and others

## Status report at PTC

- Five Pilot Projects active
- Demonstration Projects with WMO Regions
- EC-LX to review/approve CONOPS, WDIP, and support Pilot/Demo Projects
- WIS implementation accelerated, initial operational capability in 2008

**Thank you**