WORLD METEOROLOGICAL ORGANIZATION

WMO Information System (WIS) and Global Telecommunication System (GTS)

Managing & Moving Weather, Water and Climate Information in the 21st Century

Hiroyuki ICHIJO
(Japan Meteorological Agency)

WMO OMM

MIC

ITU/MIC Japan Symposium on ICTs and Climate Change
(Kyoto, 15-16 April 2008)

ITU and Climate Change

WIS Vision

- Over-arching approach for solving data management problems for all WMO and related international programmes
- A single coordinated global infrastructure for the collection and sharing of information

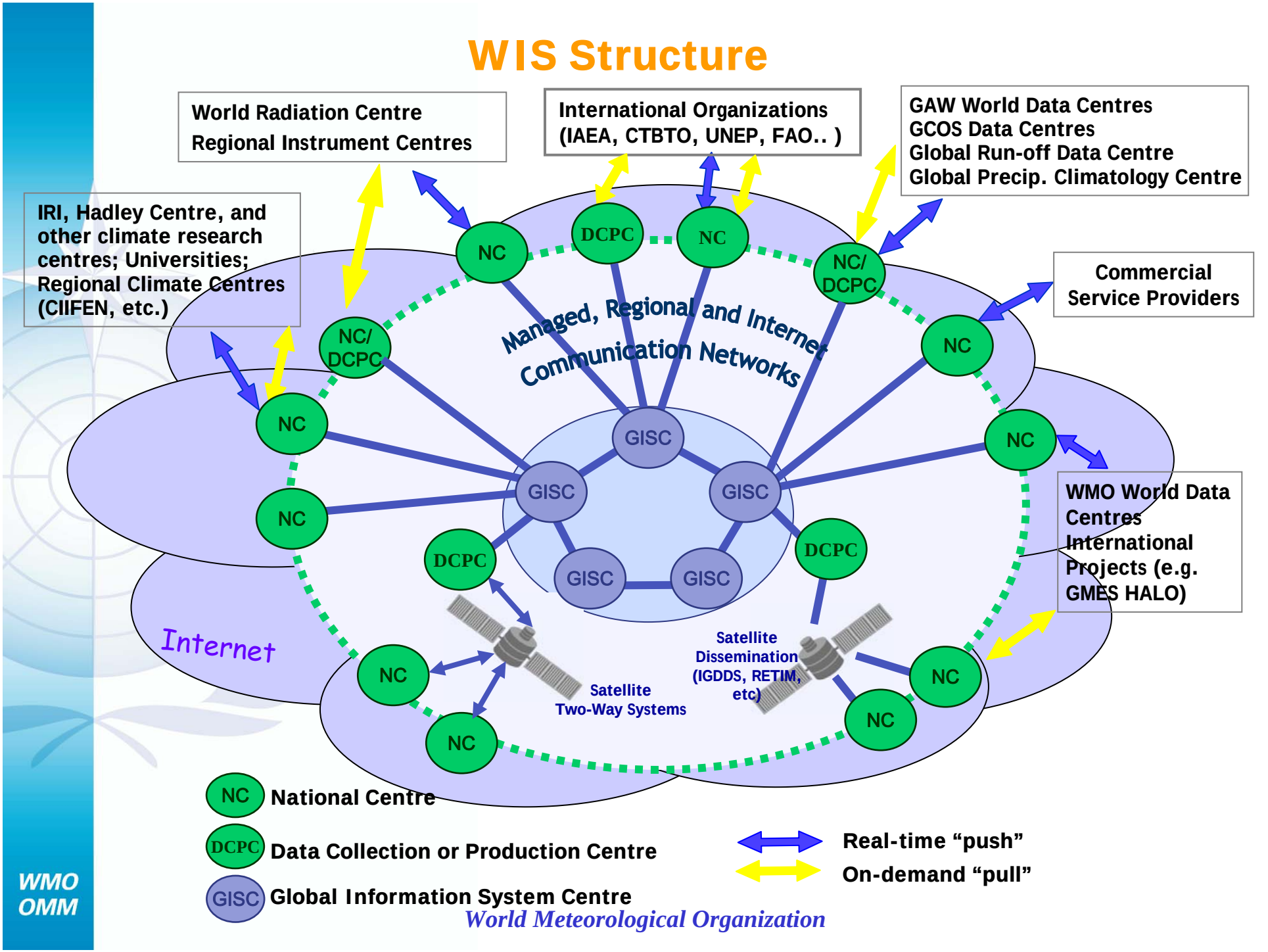
Features of WIS

- Common information exchange standards, functions and services for all WMO programmes
- Inter-disciplinary discovery, retrieval and exchange of information in real-time and non-real time
- Inter-operability through on-line catalogues using metadata based on ISO 19100 (geographic information standard)
- Industry standards and off-the-shelf hardware and software systems to ensure cost-effectiveness and compatibility

WIS Services

- **Routine collection and dissemination service for time-critical and operation-critical data and products**
  - Real-time “push” mechanism including multicast through dedicated telecommunication means
- **Data Discovery, Access and Retrieval (DAR) service**
  - Request/reply “pull” mechanism through the Internet (HTTP, FTP,...)
  - Coordinated and standardized metadata
  - Catalogue synchronization among WIS data portals
- **Timely delivery service for subscription data and products**
  - Delayed mode “push” through dedicated telecommunication means and public data networks, especially the Internet

WIS Structure



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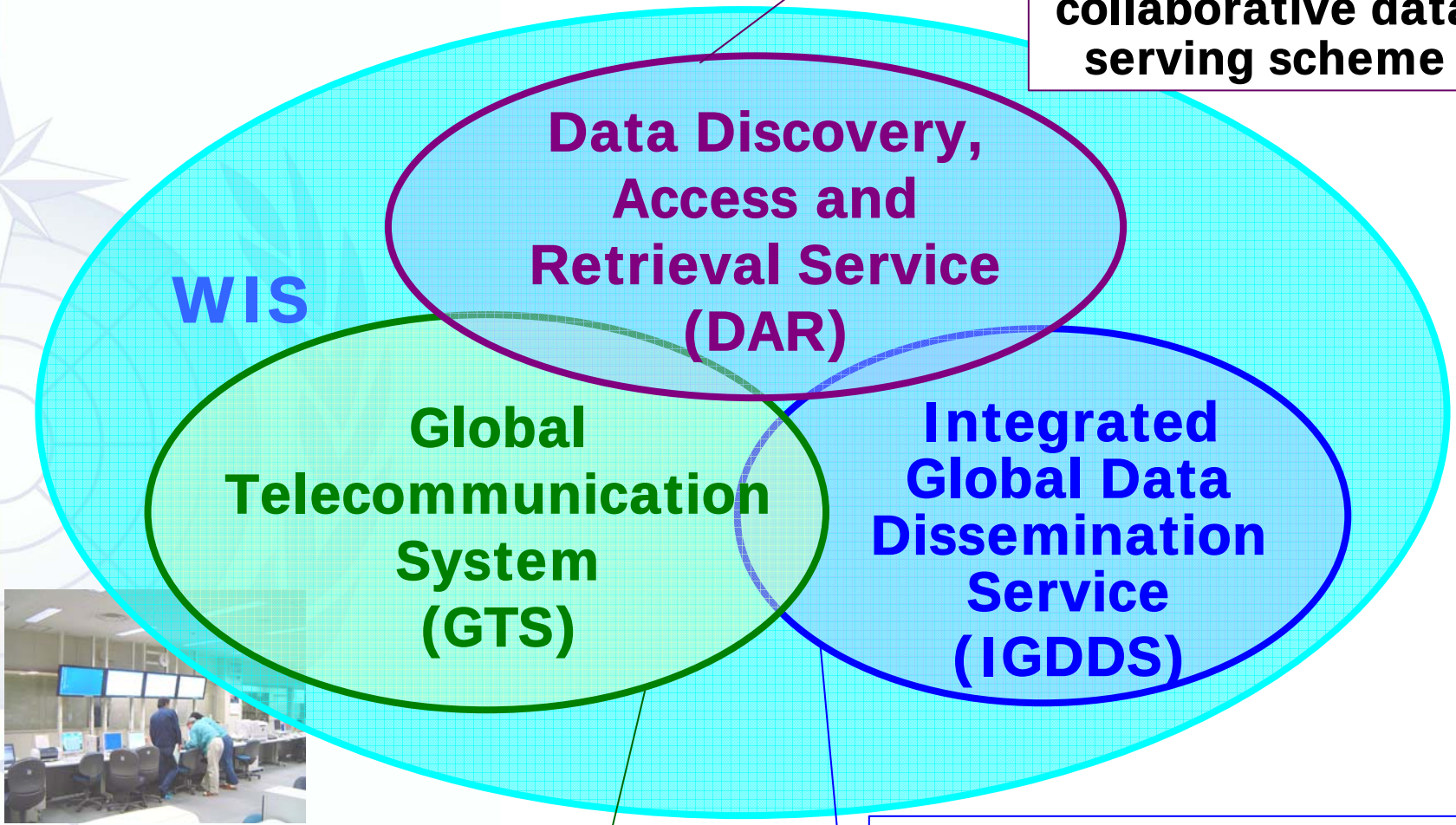
WIS components



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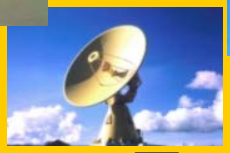
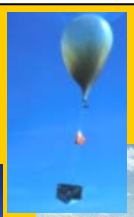
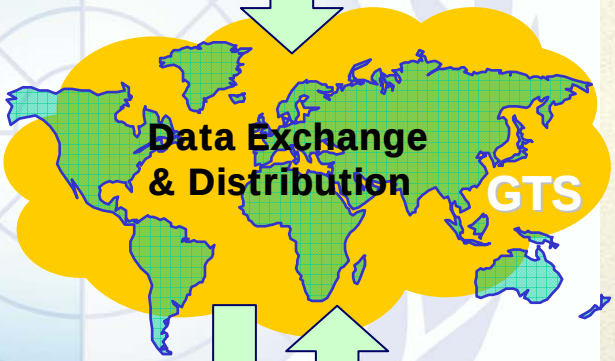
GTS in World Weather Watch (WWW)

Data Collection



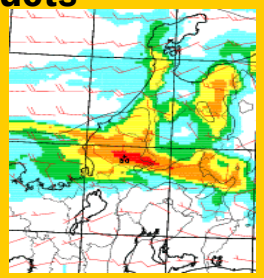


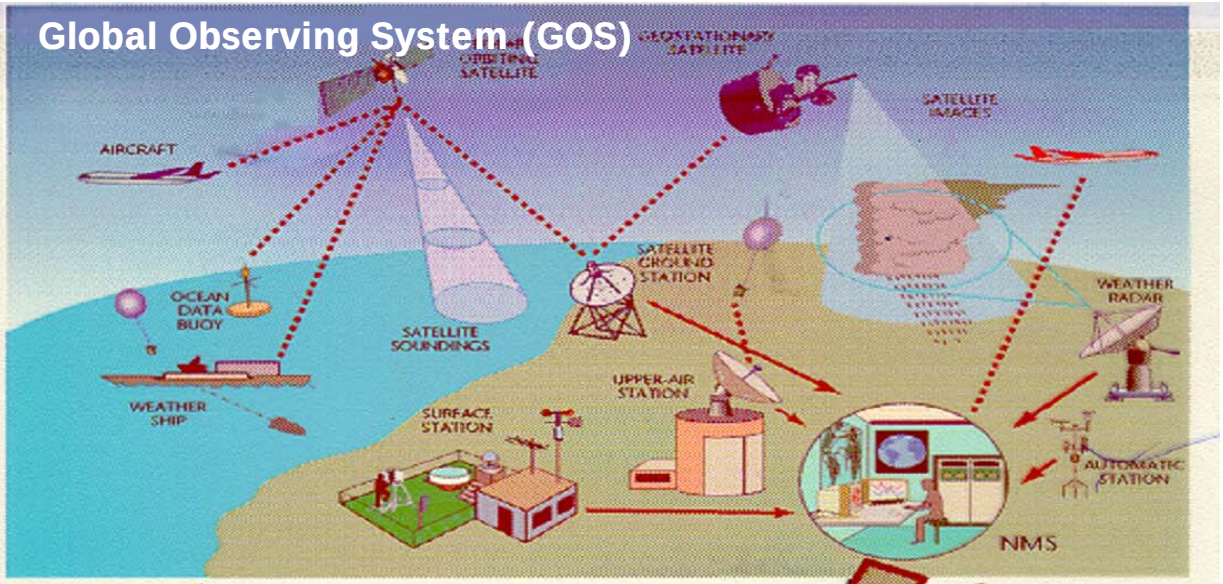
GOS

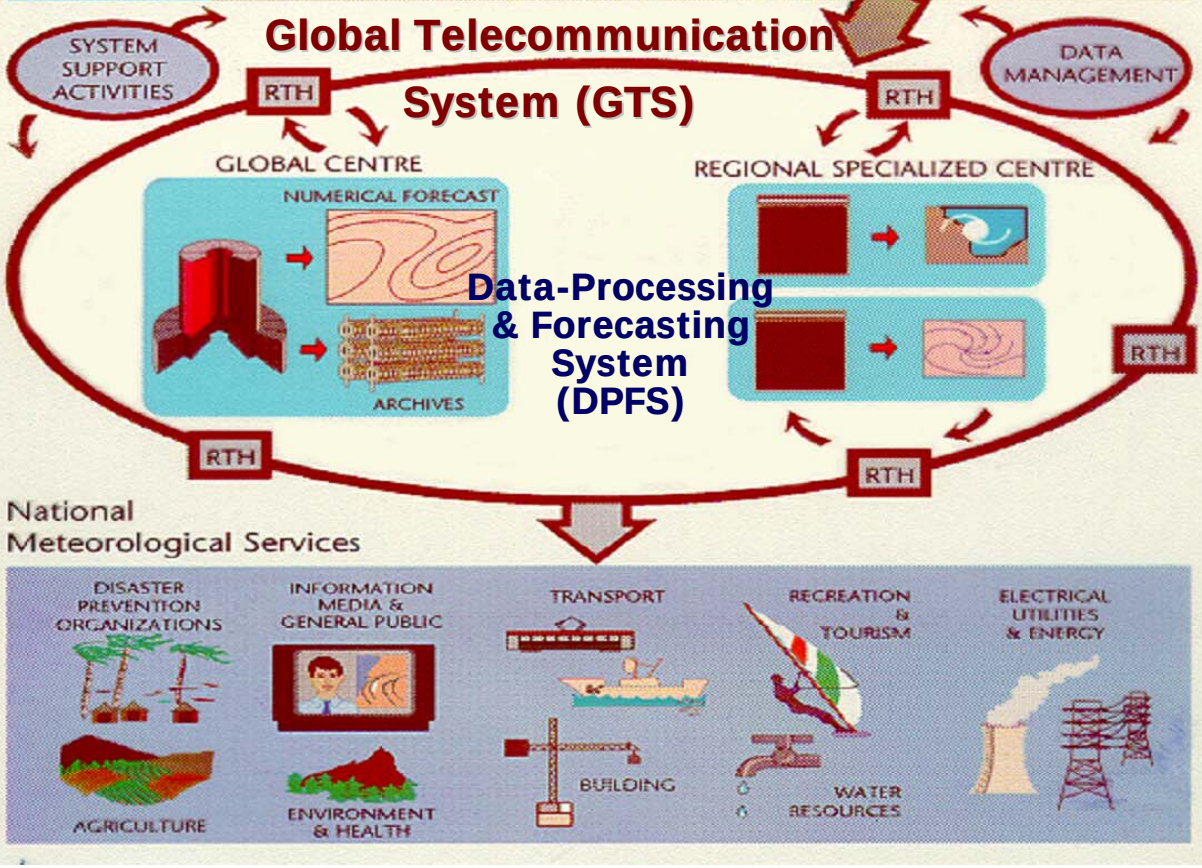


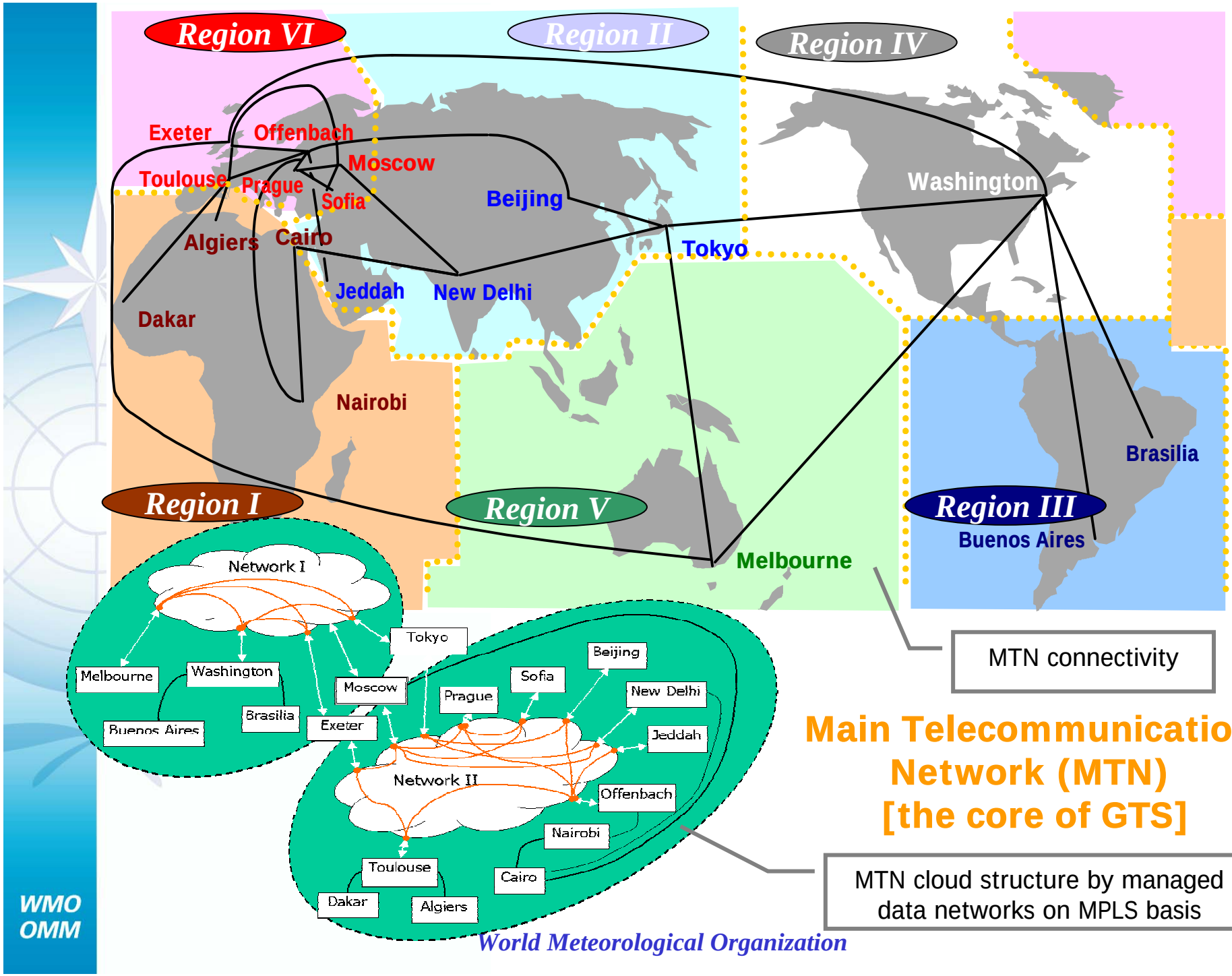
Modeling, Forecasting & Creating Products

DPFS








Region VI
Region II
Region IV
Exeter
Offenbach
Moscow
Toulouse
Prague
Sofia
Beijing
Washington
Algiers
Cairo
Tokyo
Jeddah
New Delhi
Dakar
Nairobi
Brasilia
Region I
Region V
Region III
Buenos Aires
Melbourne
Network I
Tokyo
Beijing
Melbourne
Washington
Moscow
Sofia
Prague
New Delhi
Brasilia
Exeter
Jeddah
Buenos Aires
Network II
Offenbach
Nairobi
Toulouse
Cairo
Dakar
Algiers
MTN connectivity
Main Telecommunication Network (MTN) [the core of GTS]
MTN cloud structure by managed data networks on MPLS basis
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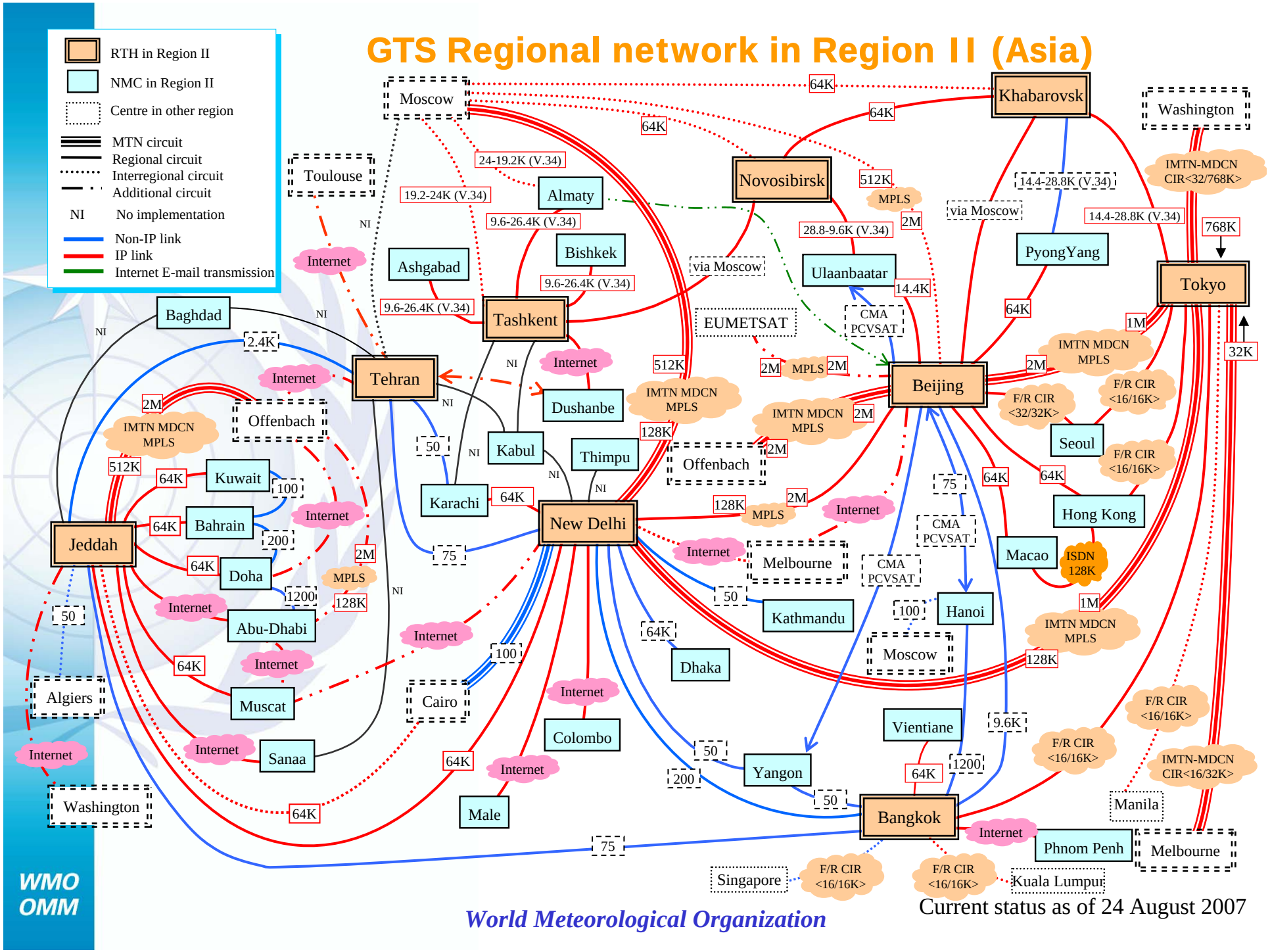

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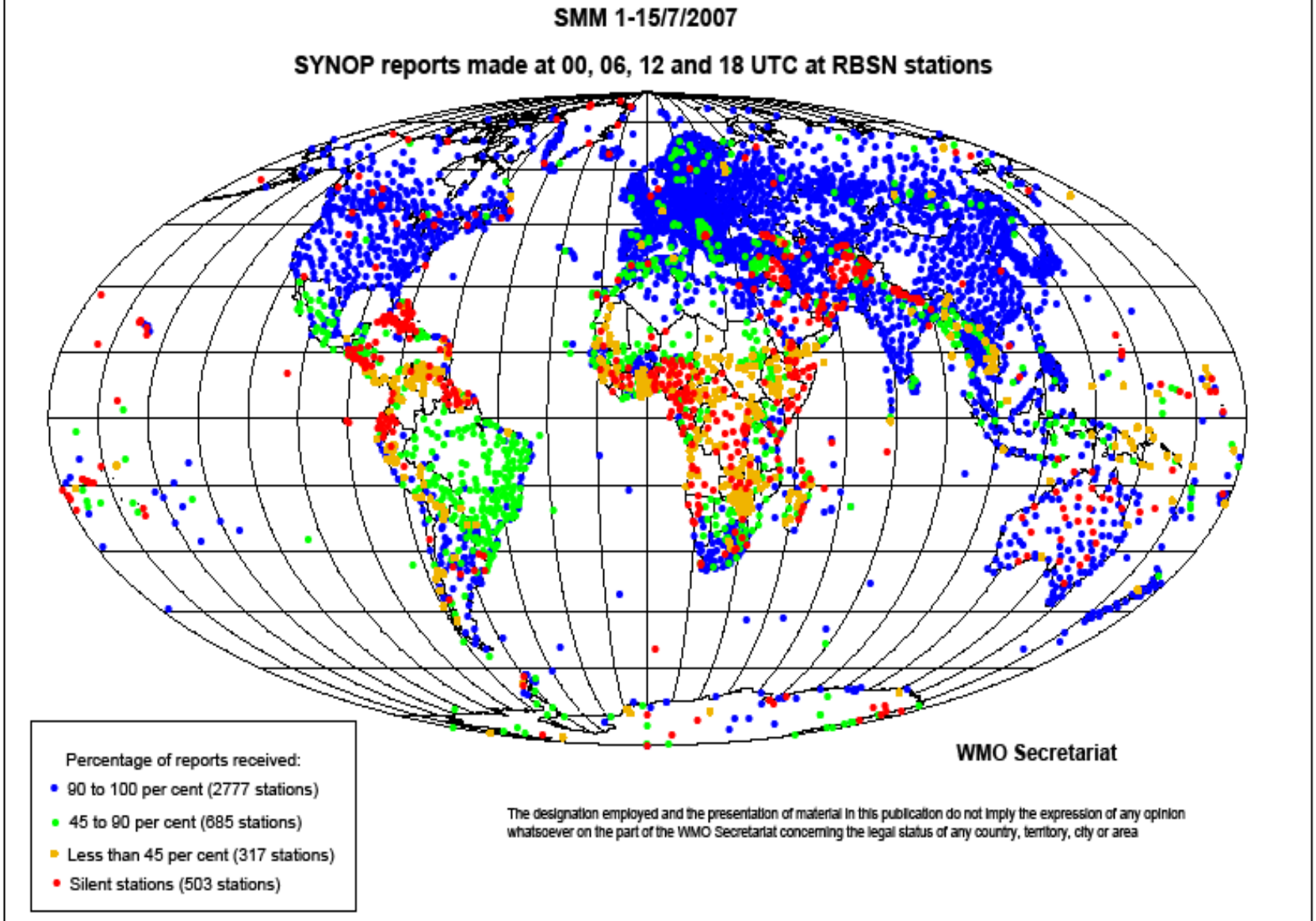
World Meteorological Organization

Current status as of 24 August 2007

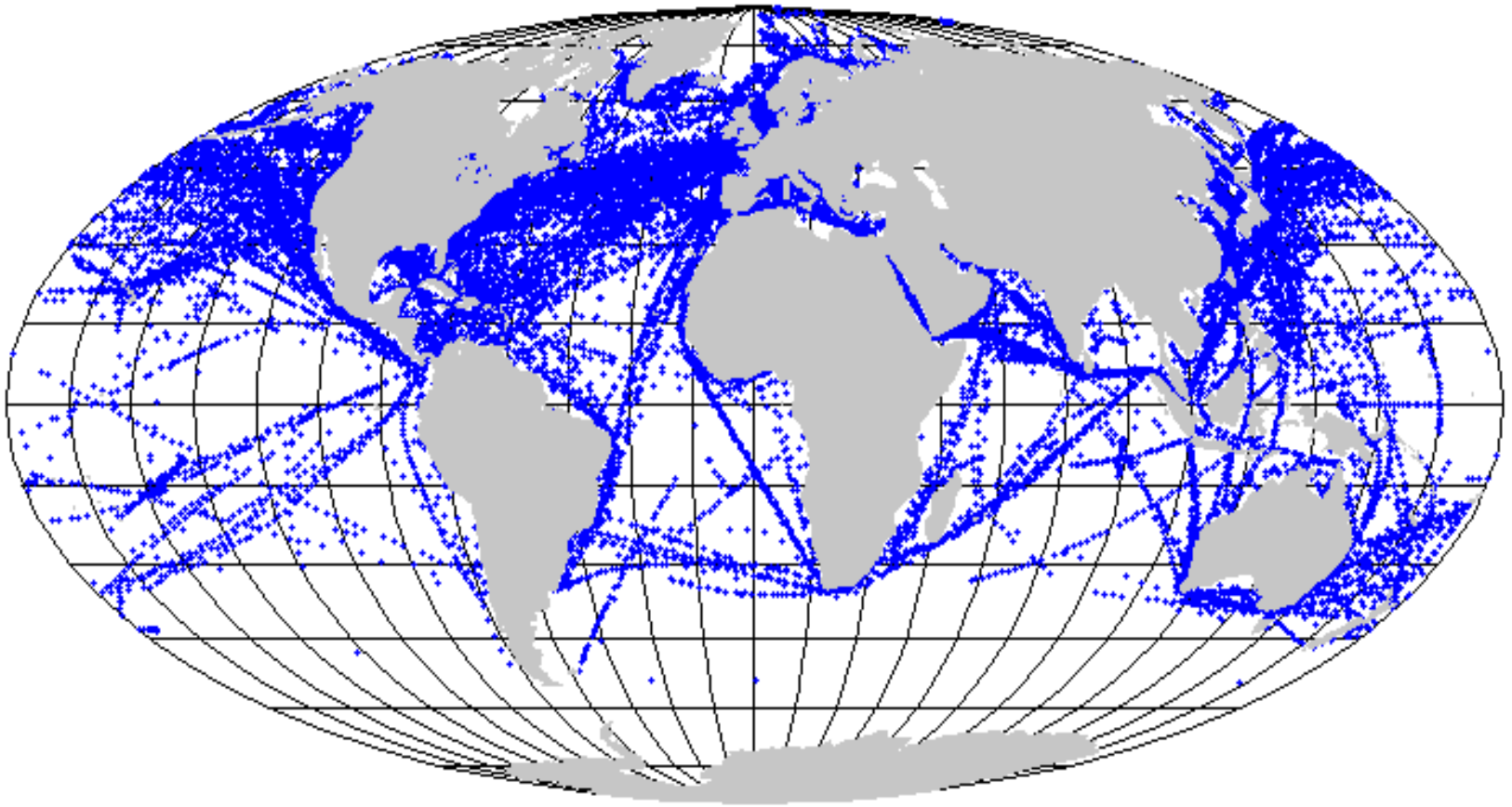
Routine exchange data through the GTS



Routine exchange data through the GTS

SMM 1-15/7/2007

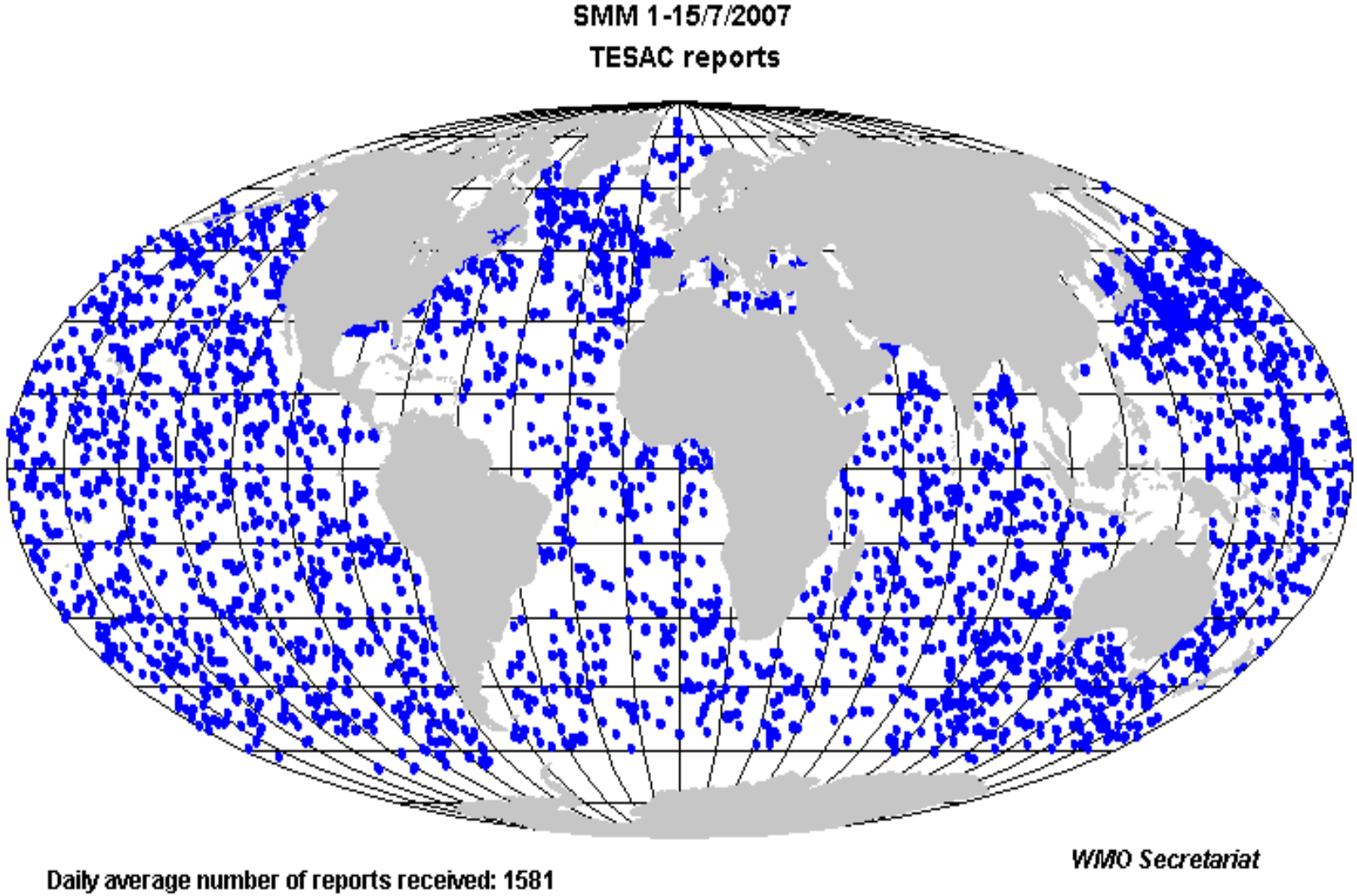
SHIP reports made at 00, 06, 12 and 18 UTC



WMO Secretariat

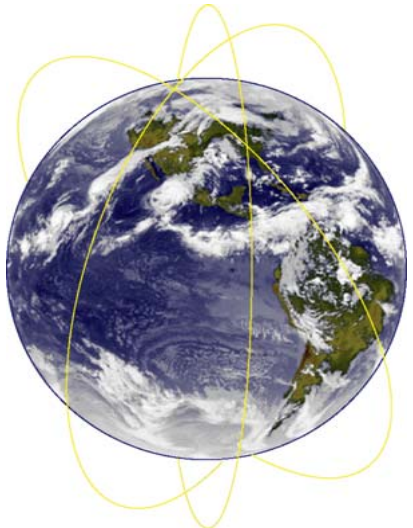
Daily average number of reports received: 2765

Routine exchange data through the GTS



TESAC: Temperature, salinity and current report from a sea station

IGDDS within the WIS



Low Earth Orbit (LEO) satellites
Global data (recorded/dumped)

Geostationary Orbit (GEO) satellites
in the region

Polar orbiting satellites
Network of HRPT stations
RARS

Local processing | Local processing | Local processing

Research & Development Satellites

Central processing

Central processing

Regional processing

products

Data exchange with other DCPCs

DCPC
Data, metadata & user management

Interoperability

GISC
(Data, metadata and user management)

Routine Dissemination

ADM

Other media

Request/ reply (Internet)

Request/ reply (Internet)

National centres and other users

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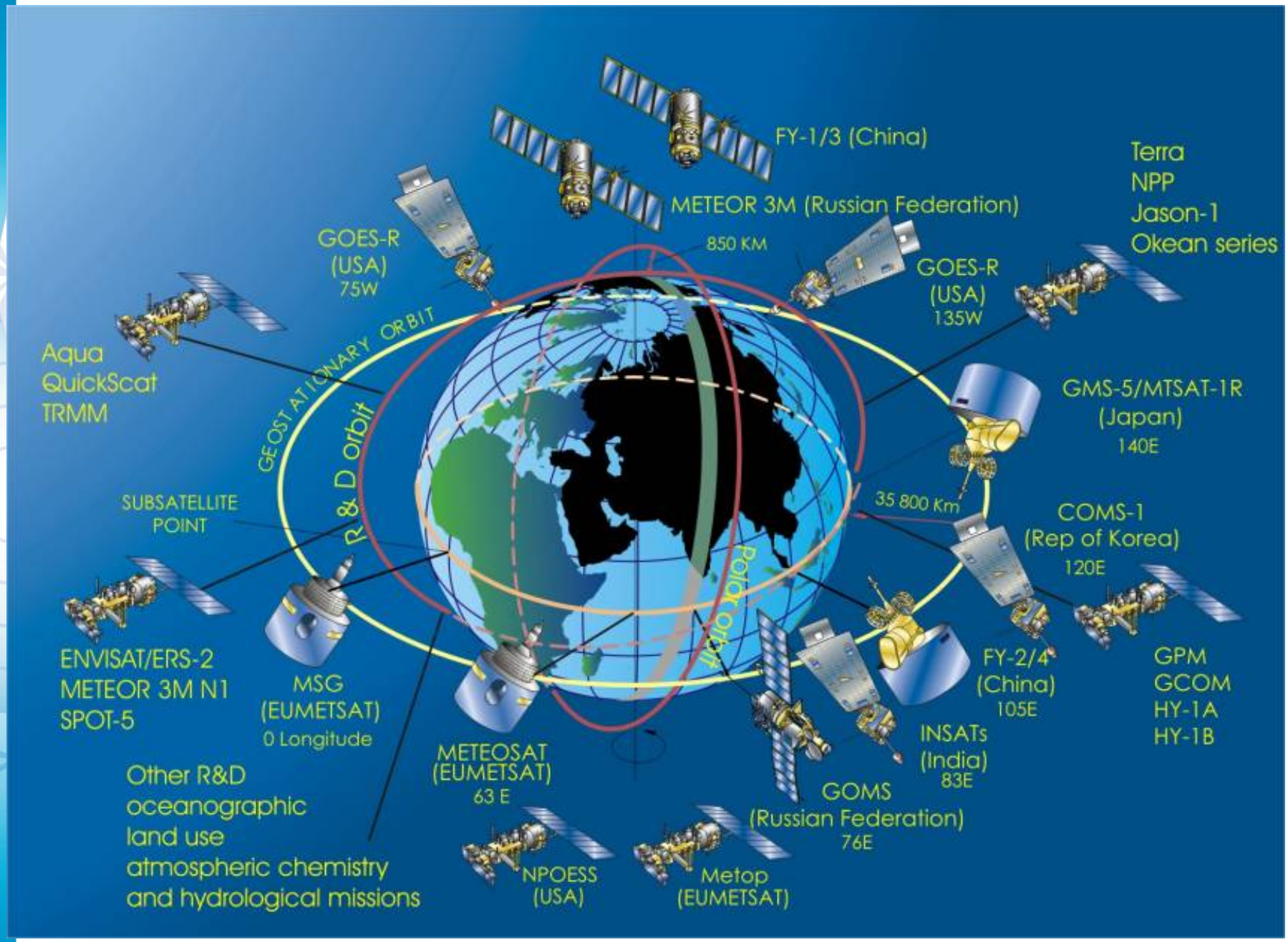

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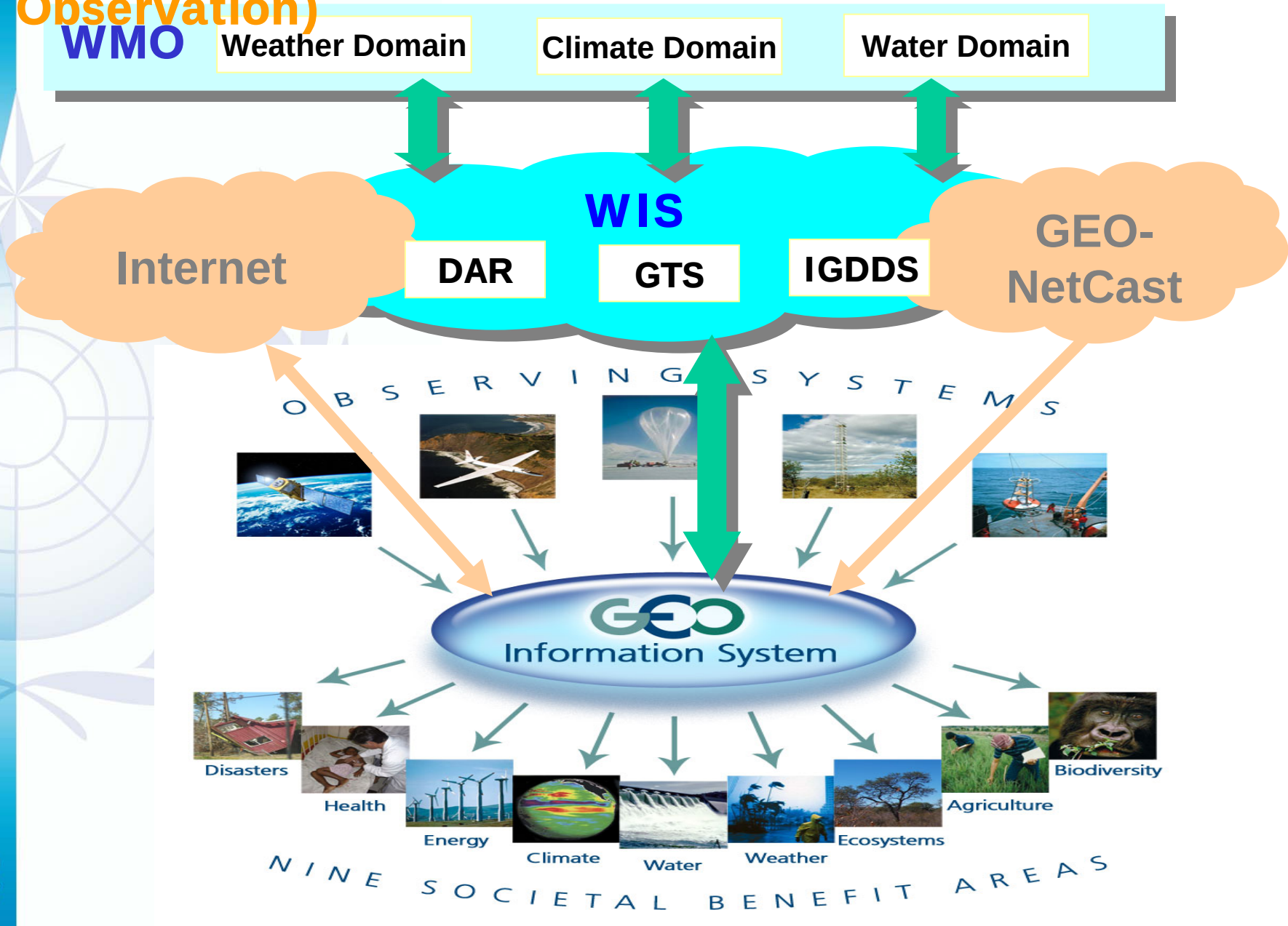
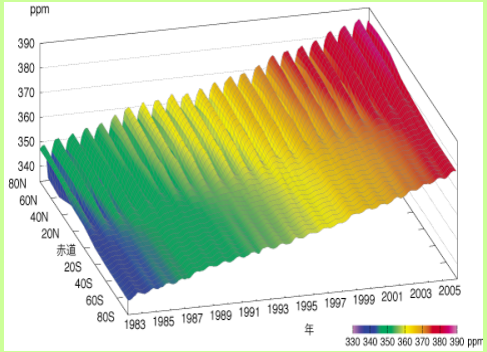
WIS contribution to GEO (Group on Earth Observation)

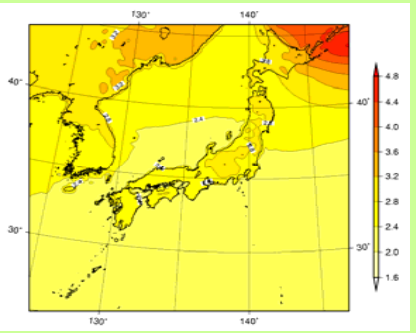


Activities for climate change in Japan Meteorological Agency



Monthly variation in zonal averaged CO_2 distribution

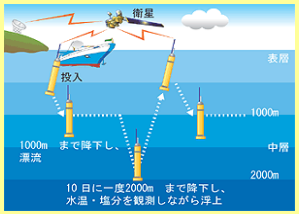
Monitoring of greenhouse gases

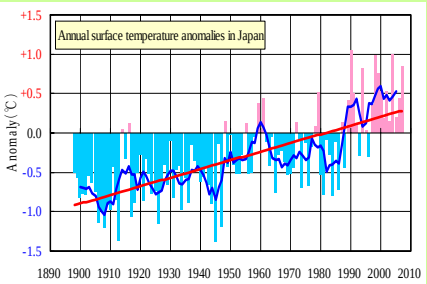


Projected change in annual mean surface temperature around Japan

WMO **JMA**

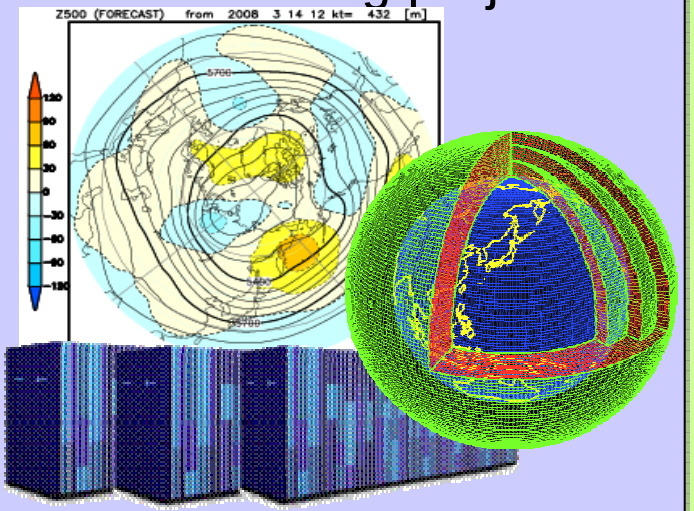
Monitoring of Climate System





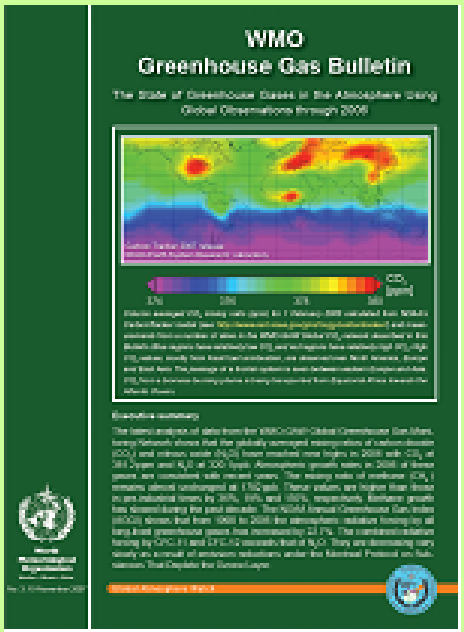
Annual anomalies in global surface temperature

Global warming projection



Tokyo Climate Center (TCC) **http://ds.data.jma.go.jp/tcc/tcc/index.html**

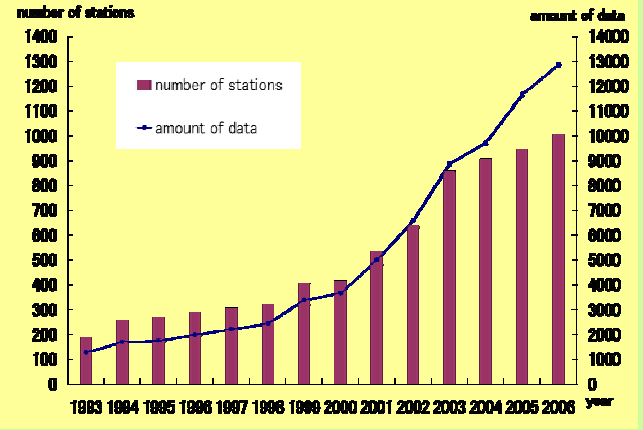
World Data Center for Greenhouse Gases (WDCGG)

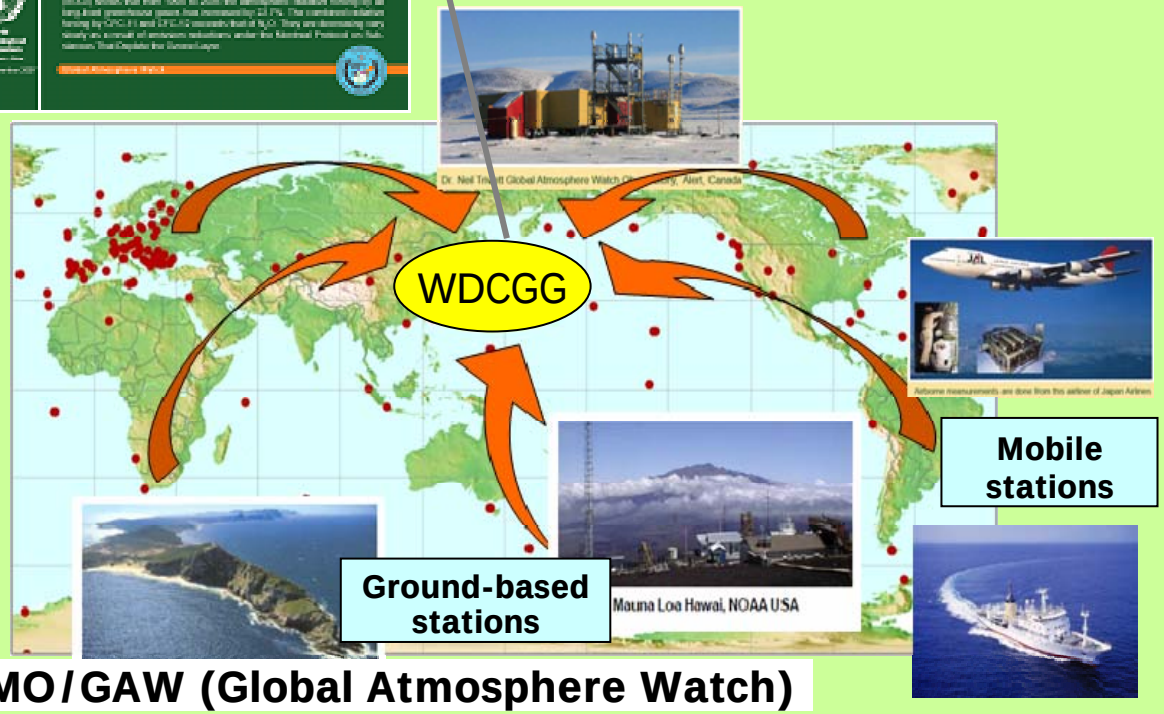


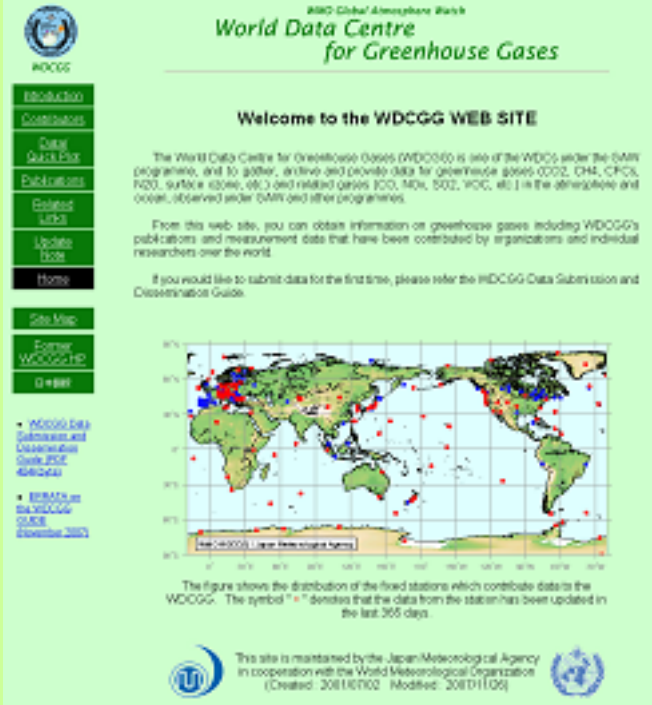
For Greenhouse gases (CO2, CH4, CFCs, N2O, surface ozone, etc.) and related gases (CO, NOx, SO2, VOC, etc.) in the atmosphere and ocean, observed under GAW and other programmes

- Gathering data and their quality check
- Archive of observation data
- Creation of value added products
- Dissemination of data and products

Annual increase of Archived data



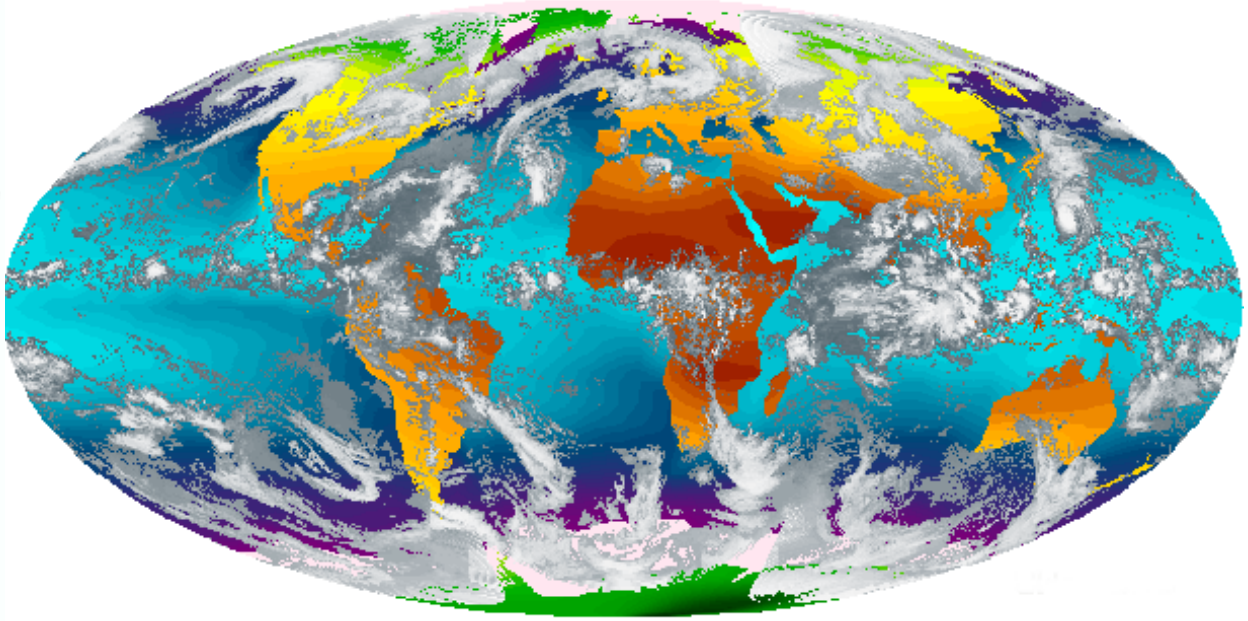




WMO/GAW (Global Atmosphere Watch)

WDCGG http://ds.data.jma.go.jp/tcc/tcc/index.html

Thank you for your attention



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