

Data centers and ICSU-WDS (World Data System)

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Ken Murata (NICT) and NICT space weather project,
Hiroo Hayashi (Kyoto Univ.) and IUGONET project**

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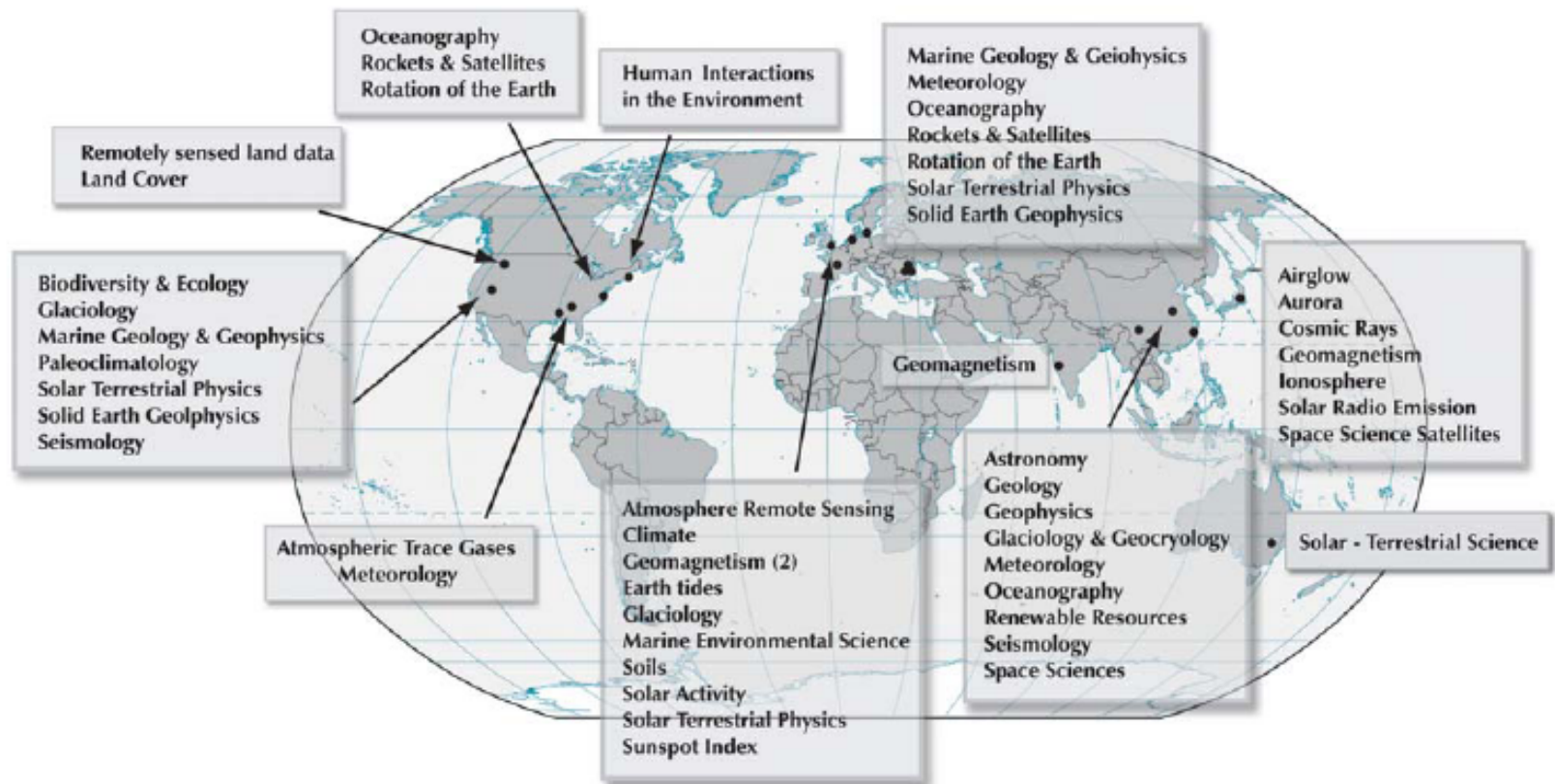
1. Situation of WDS

- WDC+FAGS => WDS, open data policy
- WDS-IPO: to be set up in NICT, Japan
- Toward system of data centers/network of various data systems...
- data management by each data centers (WDS facilities)

2. Examples of data sharing related to developing countries (not necessarily WDCs)

- Space weather/Upper atmosphere observing network
- IUGONET (Inter-university Upper atmosphere Global Observation NETwork)

“Old” World Data Centres



The WDC system was created 50 years ago with sites in Europe, The Soviet Union, Japan and North America. The system was subsequently enhanced in a variety of disciplines in response to international programs and extended to other countries, most notably China. Recent additions are more broadly environmental. A new WDC on 'Biodiversity and Human Health' is currently under consideration in South Africa. However, the large majority of WDCs are still located in northern hemisphere countries, an imbalance that the Panel has undertaken to remedy by focusing on electronic technologies for data access and exchange, including the development of 'mirror sites'.

GLOBAL **CHALLENGES**



**Energy
crisis**



**Environ-
mental
Problems**



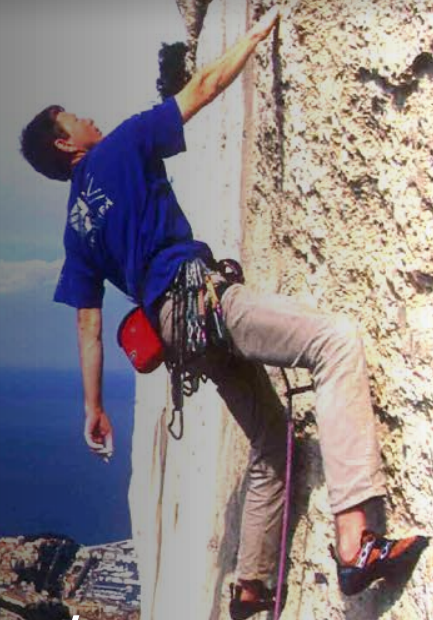
**Global
Diseases**



**Growing
Biocapacity/
Consumption
Misbalance**



**Information
Boom**



WDS Transformation

past

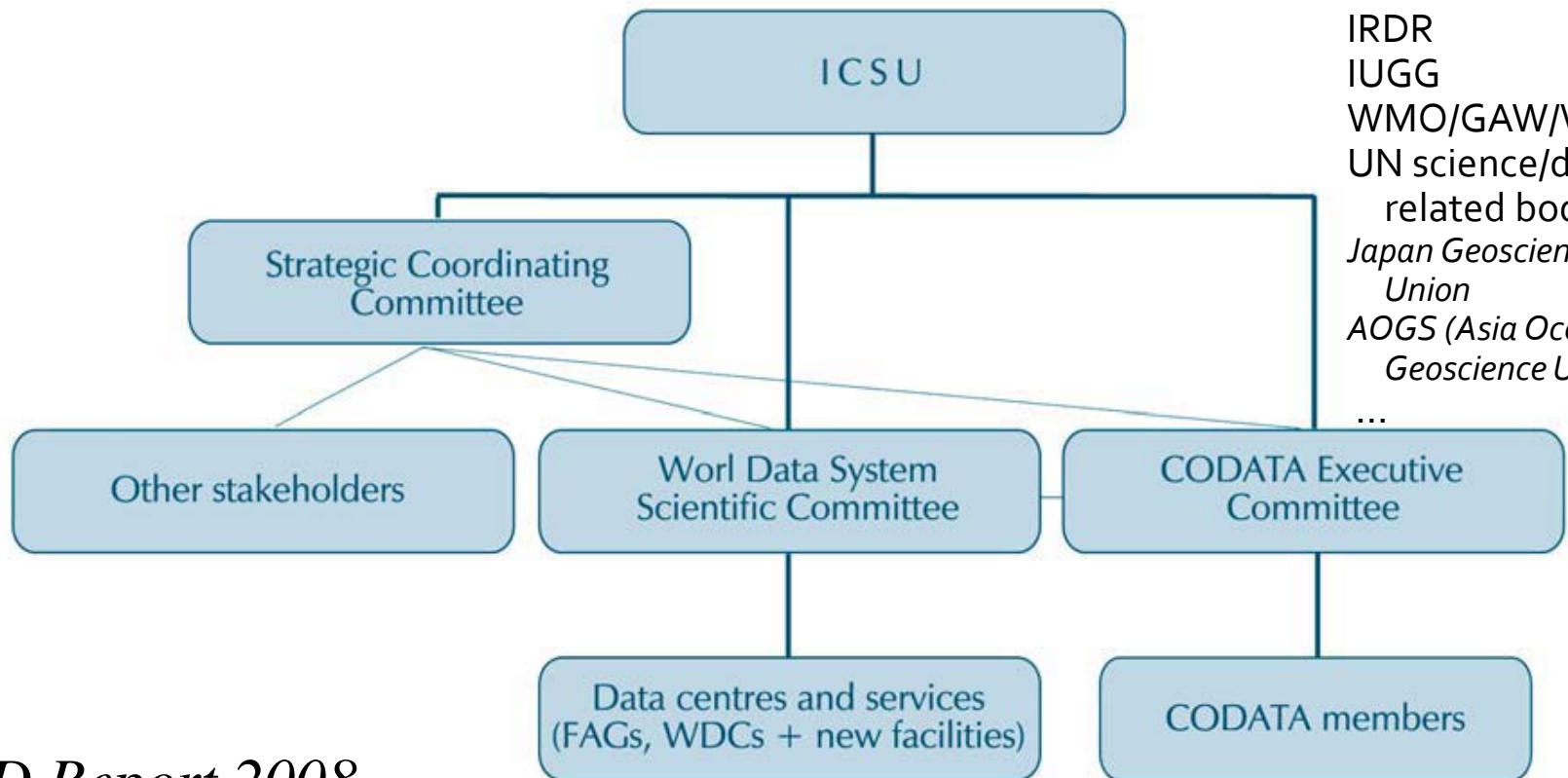
SCID, WDS-TT, SCCID, WDS-SC

present

- WDCs (1957 – 2008)
 - FAGS (1956 – 2008)
-
- WDS: 2008 – ...
 - CODATA: 1966 –



IRDR
IUGG
WMO/GAW/WDCs
UN science/data
related bodies
*Japan Geoscience
Union*
*AOGS (Asia Oceania
Geoscience Union)*
...





ICSU-SCID vision

The International Council for Science envisions a
Global World Data System, in order to:

- emphasize the **critical importance of data** in global science activities
- further ICSU strategic scientific outcomes by addressing **pressing societal needs** (e.g. sustainable development, digital divide)
- highlight the very positive impact of **universal and equitable access** to data and information
- support services for D&I **long-term stewardship**
- promote and support **data publication and citation**



The ICSU WDS Data Policy



WDS Data Policy Final Statement

The International Council for Science World Data System (ICSU WDS), recognizing the benefits and importance of contributing to the growing international efforts of data sharing, has adopted the same principles from GEO/GEOSS data sharing principles as follow:

- There will be full and open exchange of data, metadata and products shared within WDS, recognizing relevant international instruments and national policies and legislation;
- All shared data, metadata and products will be made available with minimum time delay and at minimum cost;
- All shared data, metadata and products being free of charge or no more than cost of reproduction will be encouraged for research and education.

Example of a “System of data systems”

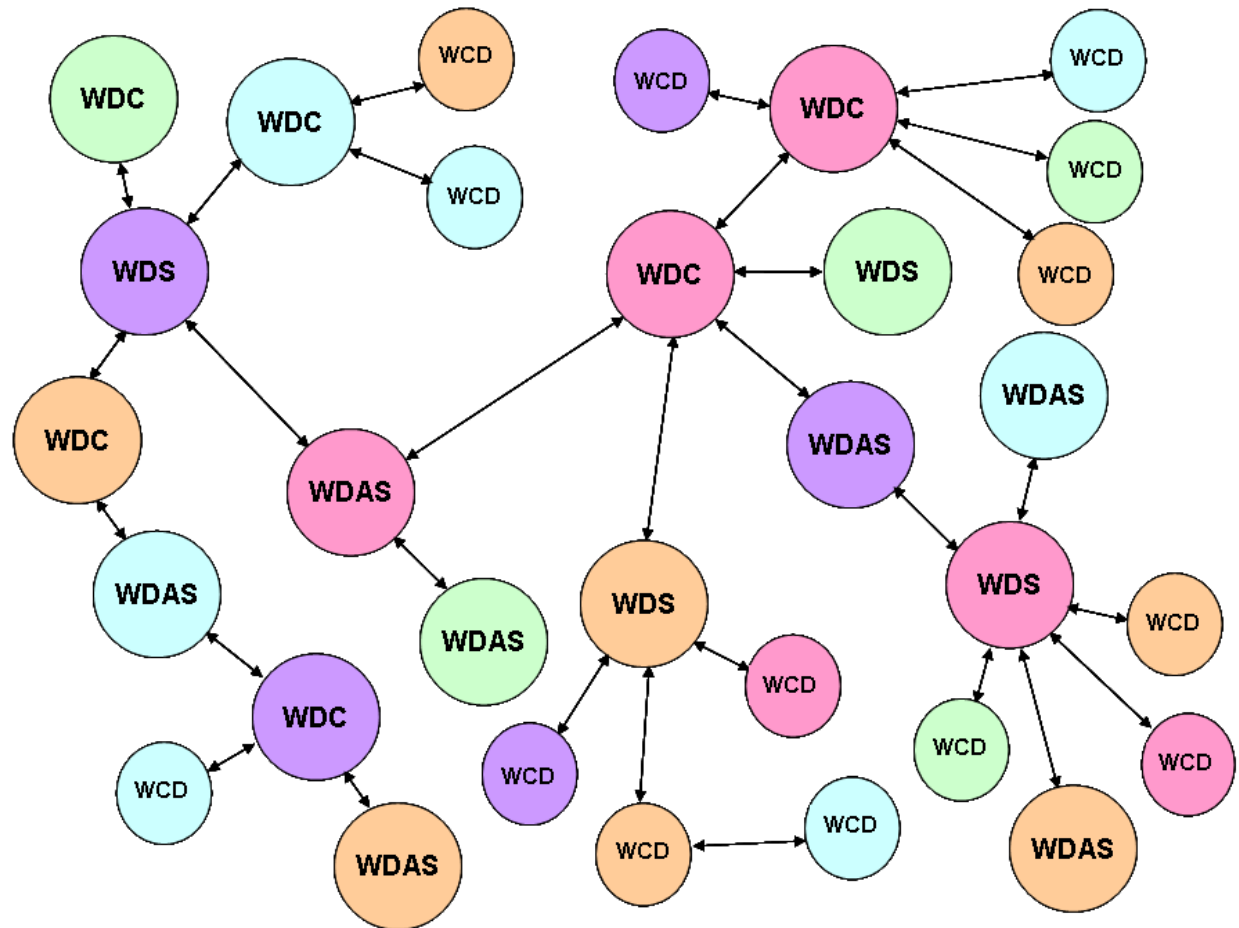
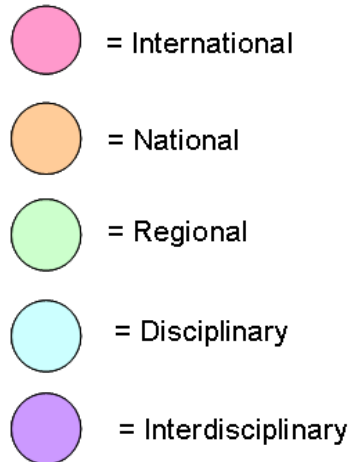
Parallel concept to GEOSS

WDC = World Data Center

WDS = World Data Service

WDAS = World Data Analysis Service

WCD = World Center for Data



Illustrative example of the interoperability between the components of a GDSS

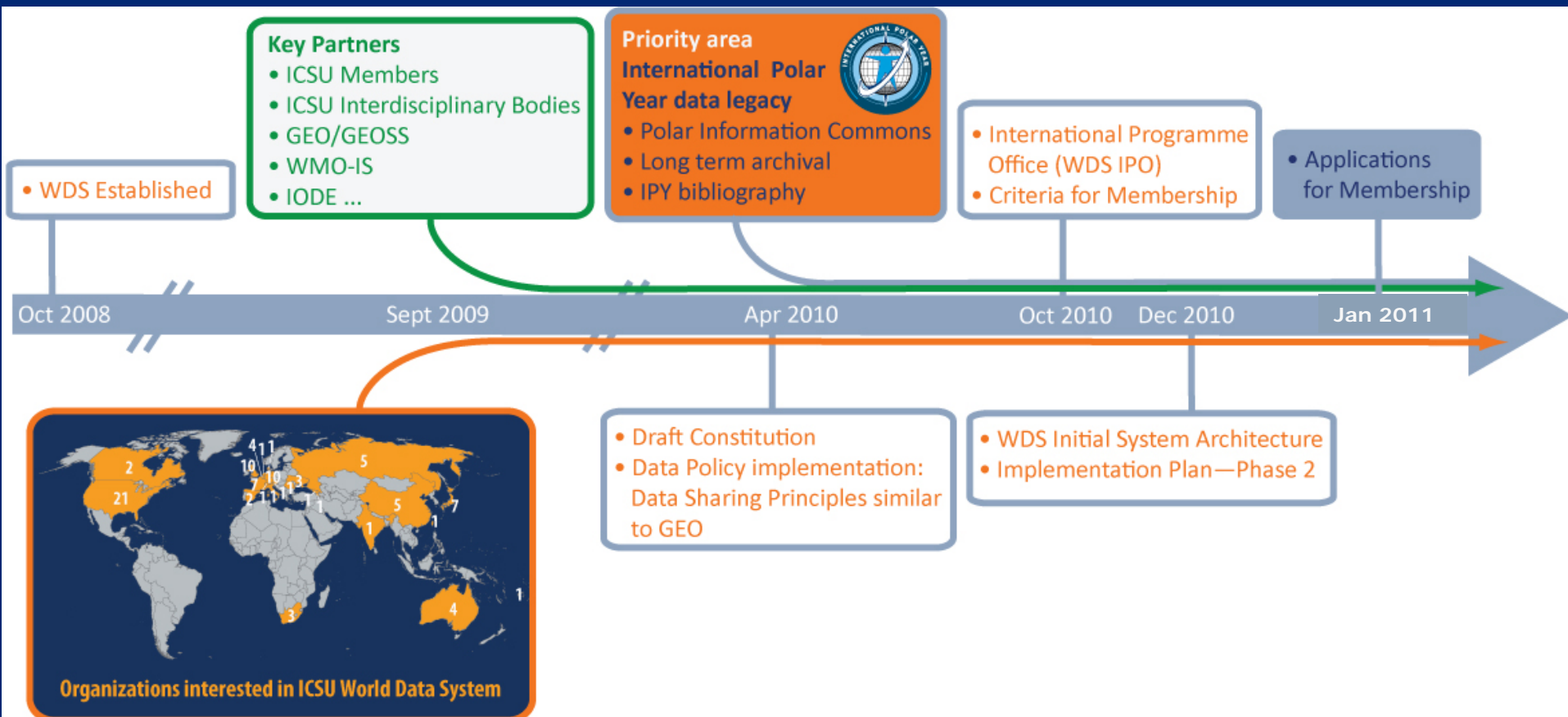


WDS International Program Office (IPO)

- To be established in NICT (National Institute of Information and Communications Technology), Japan.
- Announced late 2010, start date 2nd quarter 2011 (hopefully)?
- Based at NICT Headquarters, Koganei, Tokyo
- Search for WDS IPO Executive Director and staff beginning soon (!?)
- <http://www.nict.go.jp/index.html>



Where we are... and where we are going



NICT Space Weather Monitoring Networks (NICT-SWM)

(Ken Murata, 2010)



Magnetometer

Magnetometer & HF radar
observations in Far East Siberia

South-East Asia low latitude
Ionospheric Network
(SEALION)

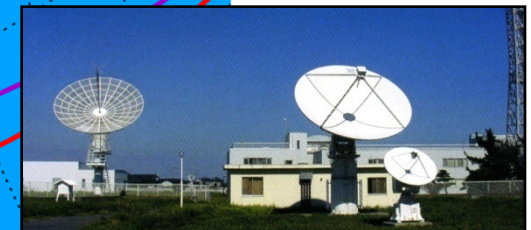
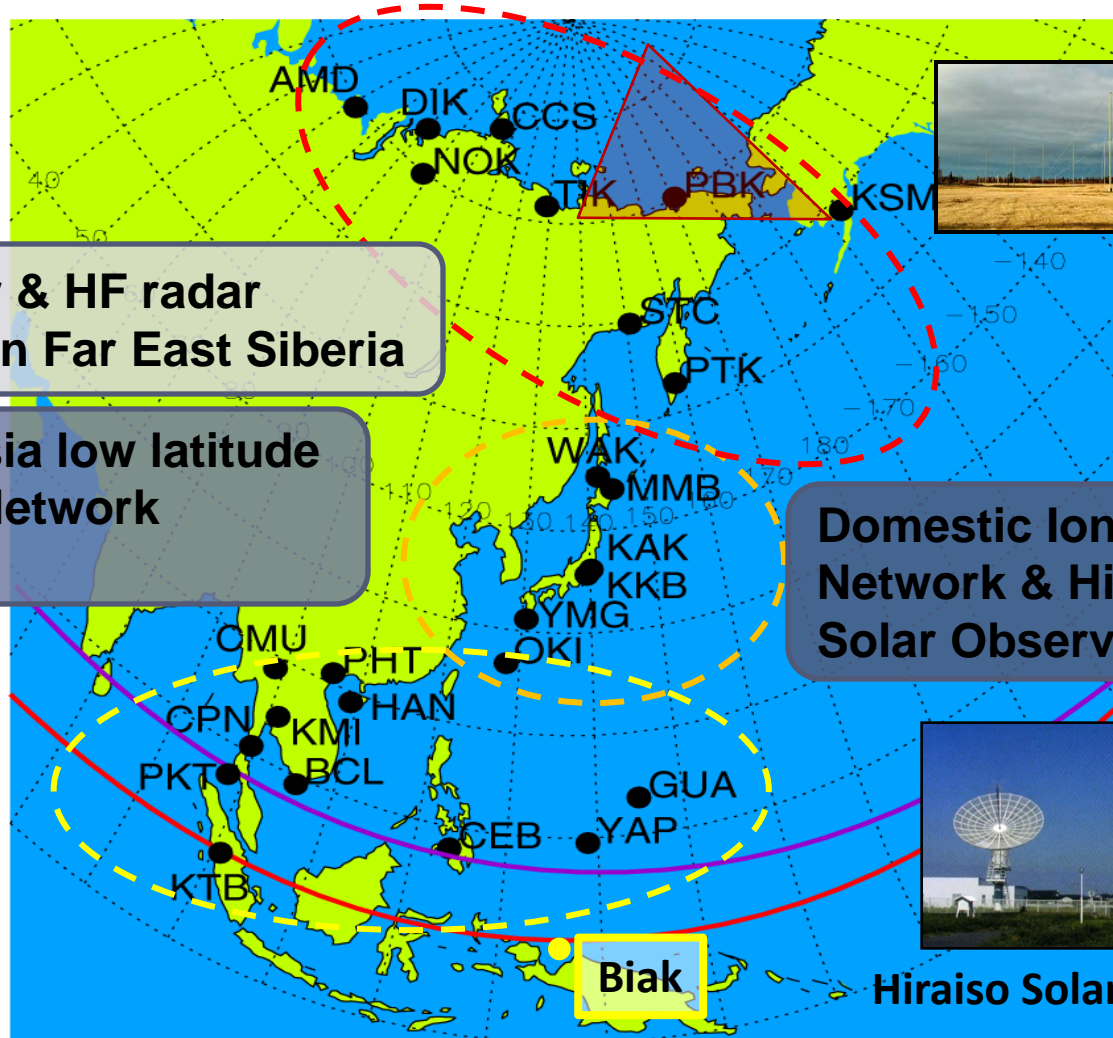


HF radar
(SuperDARN)

Domestic Ionosonde
Network & Hiraio
Solar Observatory



Ionosonde

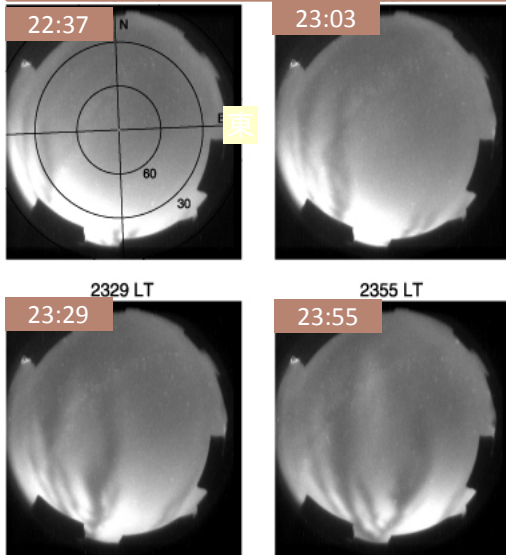


Hiraio Solar Observatory

(Under National / International collaborations)

Near Future Plan: Observation Project

Plasma bubble via all sky imager

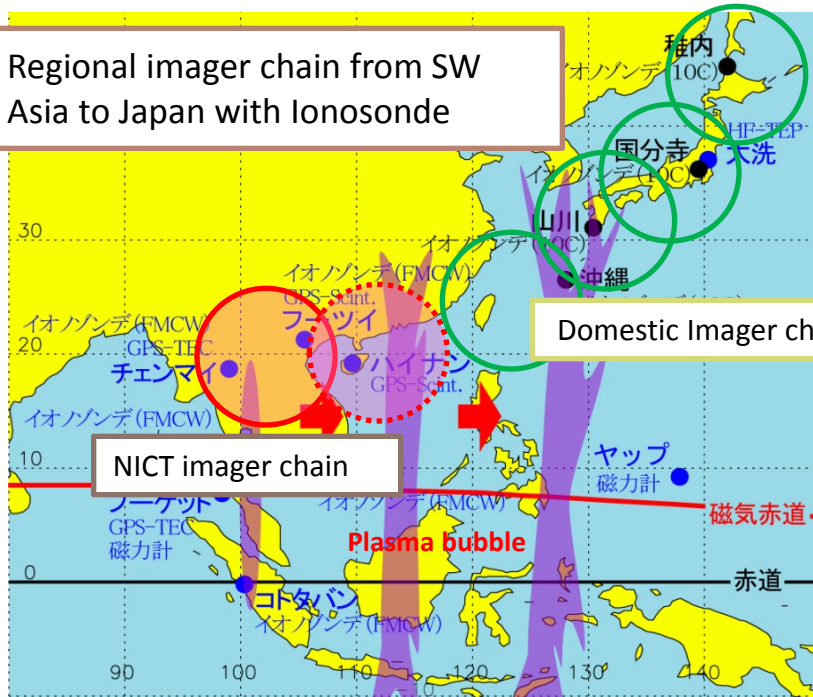


Chain observation via all sky imager

Equipment of ASI



Regional imager chain from SW Asia to Japan with Ionosonde



Domestic Imager chain

NICT imager chain

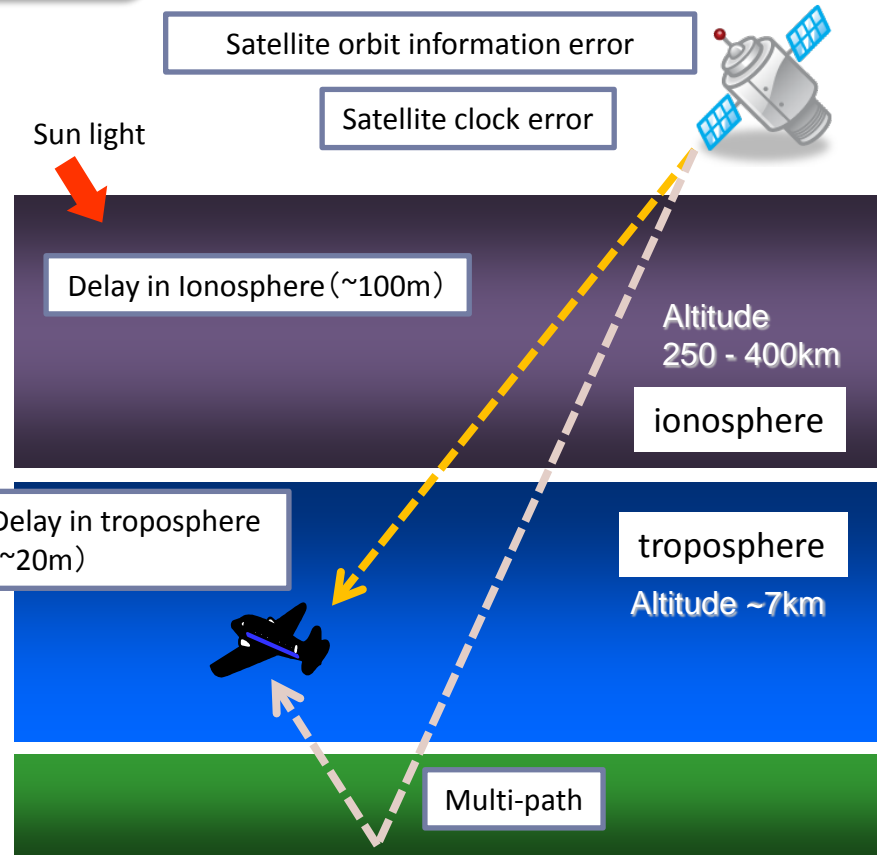
Plasma bubble

Development of High precision GPS positioning system

Satellite orbit information error

Satellite clock error

Sun light



NICT inside collaboration to develop high precision GPS positioning system

Distributed low cost storage servers

(as of 2010)

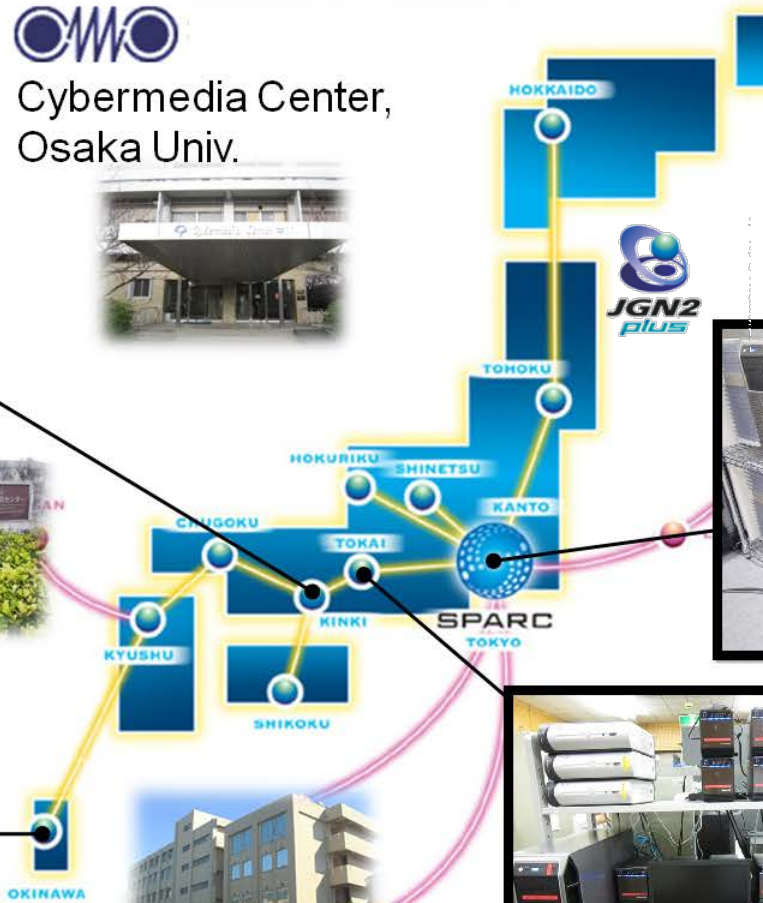


Cybermedia Center,
Osaka Univ.



NICT Headquarters

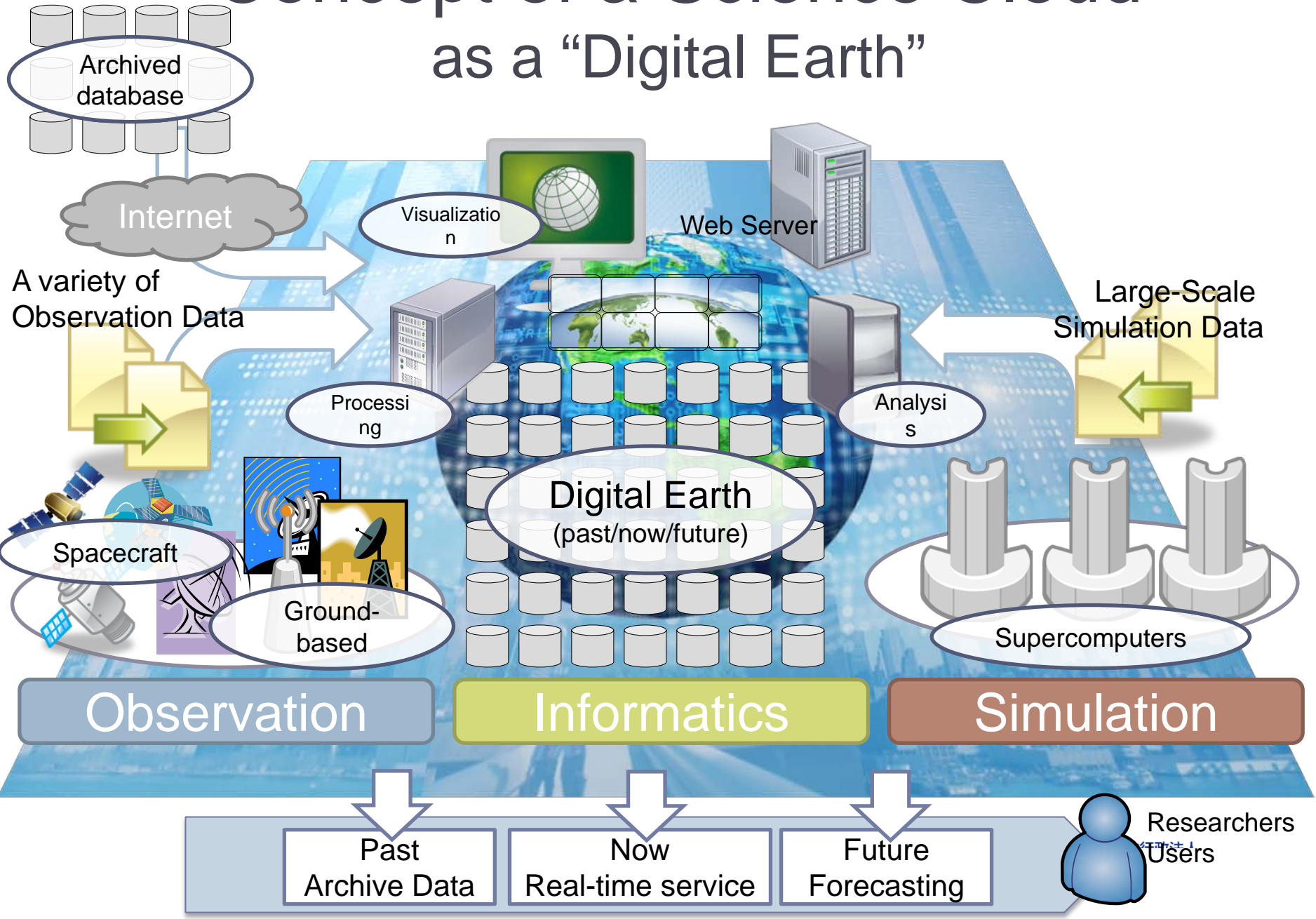
NICT Okinawa
Subtropical Environment
Remoto-Sensing Center



Information Technology
Center, Nagoya Univ.



Concept of a Science Cloud as a “Digital Earth”



Network infrastructure:
An international program of Internet research



Asia-Pacific Backbone Topology
by funding source



IUGONET

Metadata DB for Upper Atmosphere

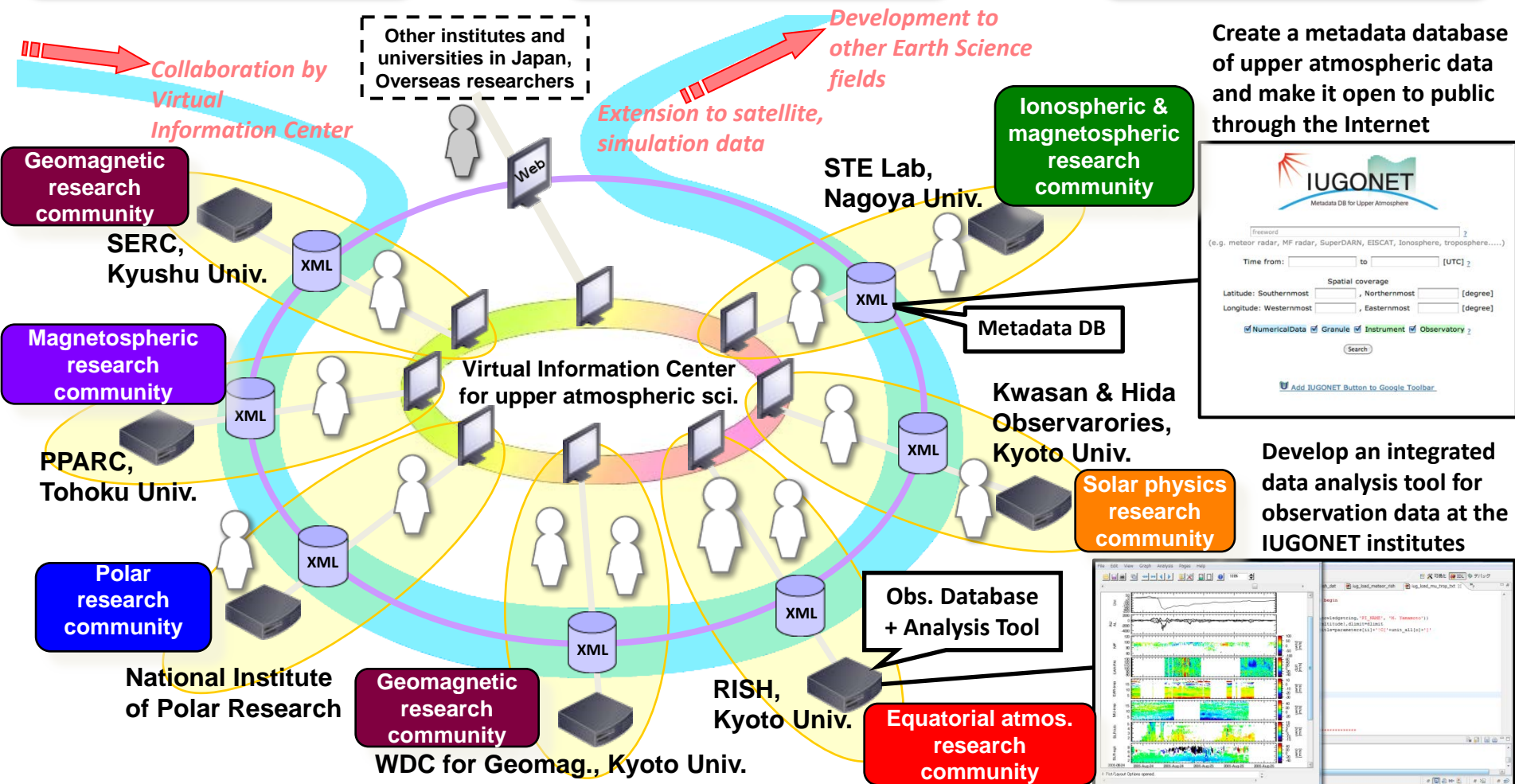
超高層大気長期変動の全地球上ネットワーク観測・研究
Inter-university Upper atmosphere Global Observation Network

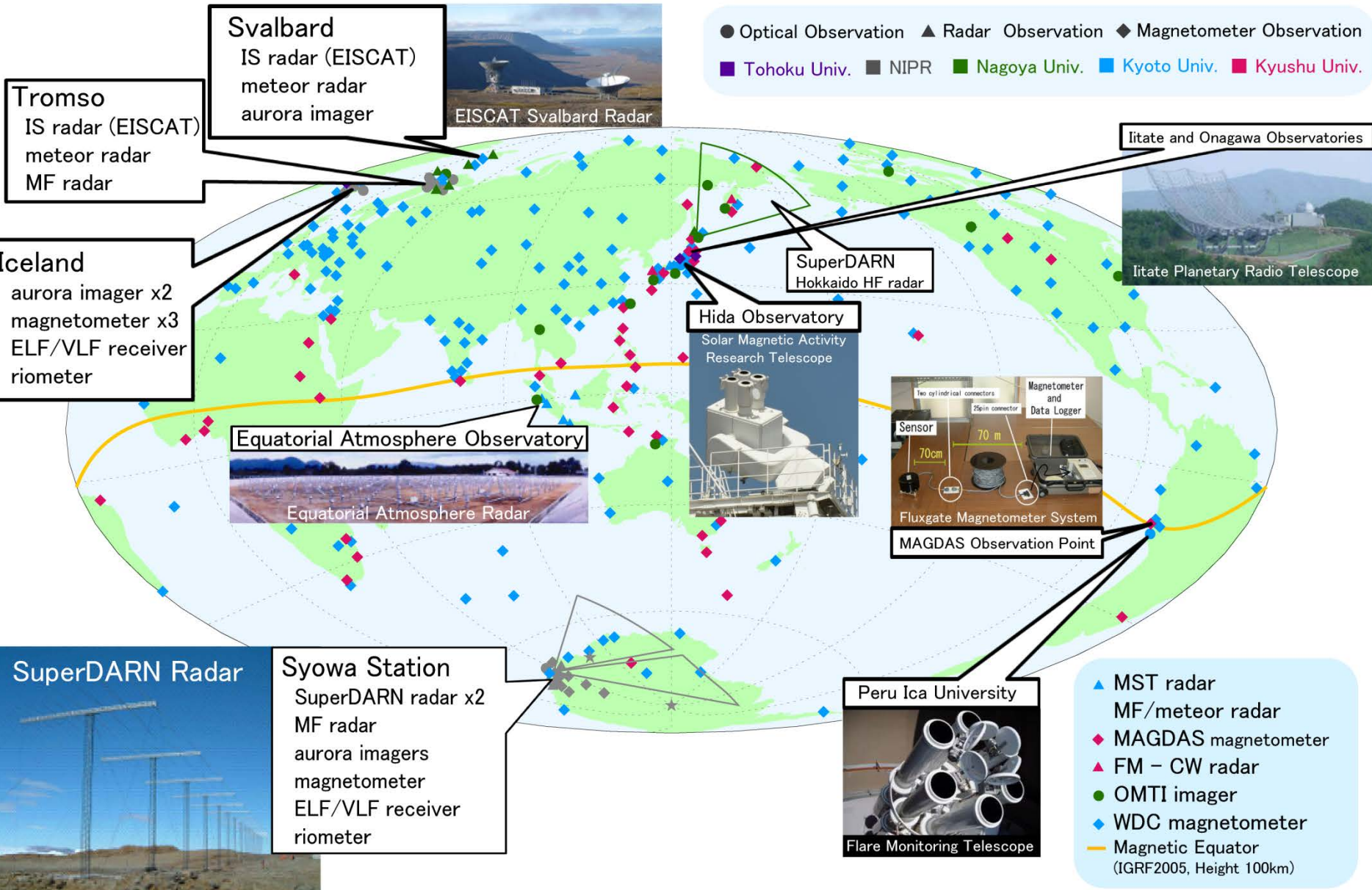
Inter-university Global Observation Network (Kyoto U/RISH & Faculty of Science, Nagoya U, Kyushu U, Tohoku U, and Ntnl. Inst. of Polar Research)

PROBLEM: Many, various kind of observation data spread over institutes and universities

SOLUTION: Create a metadata database for cross-search of these observation data

Promote new types of upper atmospheric research by analysis of multi-disciplinary data





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1st WDS
Conference
in Kyoto, Japan
(3-6 Sept. 2011)

WDS-SC meeting
(7-8 Sept. 2011)

<http://wds-kyoto-2011.org/>

SECOND CIRCULAR



The First ICSU World Data System Conference

– Global Data for Global Science –
September 3-6, 2011
KYOTO UNIVERSITY, KYOTO, JAPAN





FIN.

Thank you for your attention!