



World Meteorological Organization (WMO)  
Observing and Information Systems Department  
WMO Information System (WIS)

# Leveraging the WMO Information System (WIS) for Climate Data

*Presented at the  
Second WMO/MEDARE International Workshop  
17 May 2010 by  
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Senior Scientific Officer, WIS*

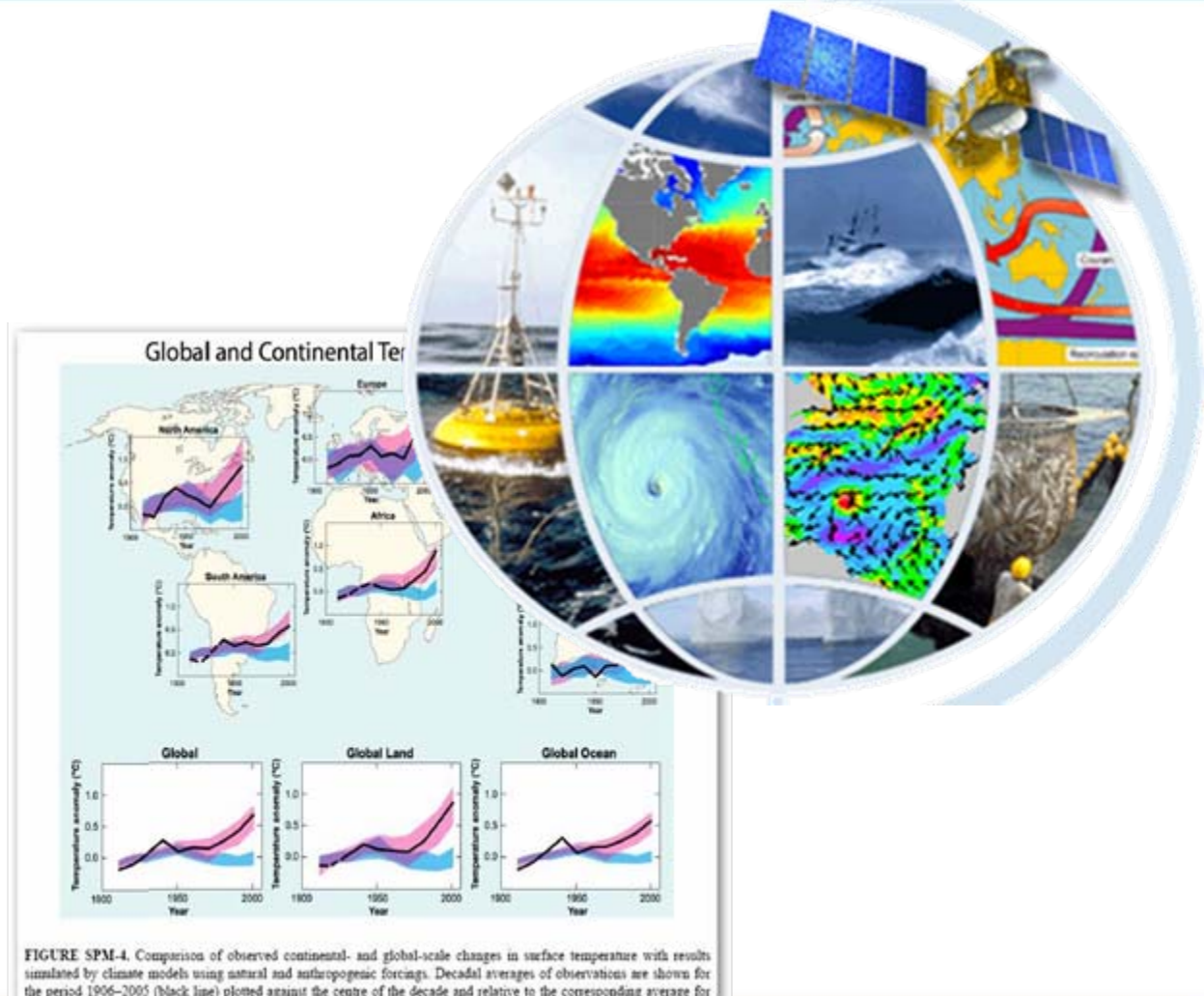


# WMO: Observations, Models, Data and Information



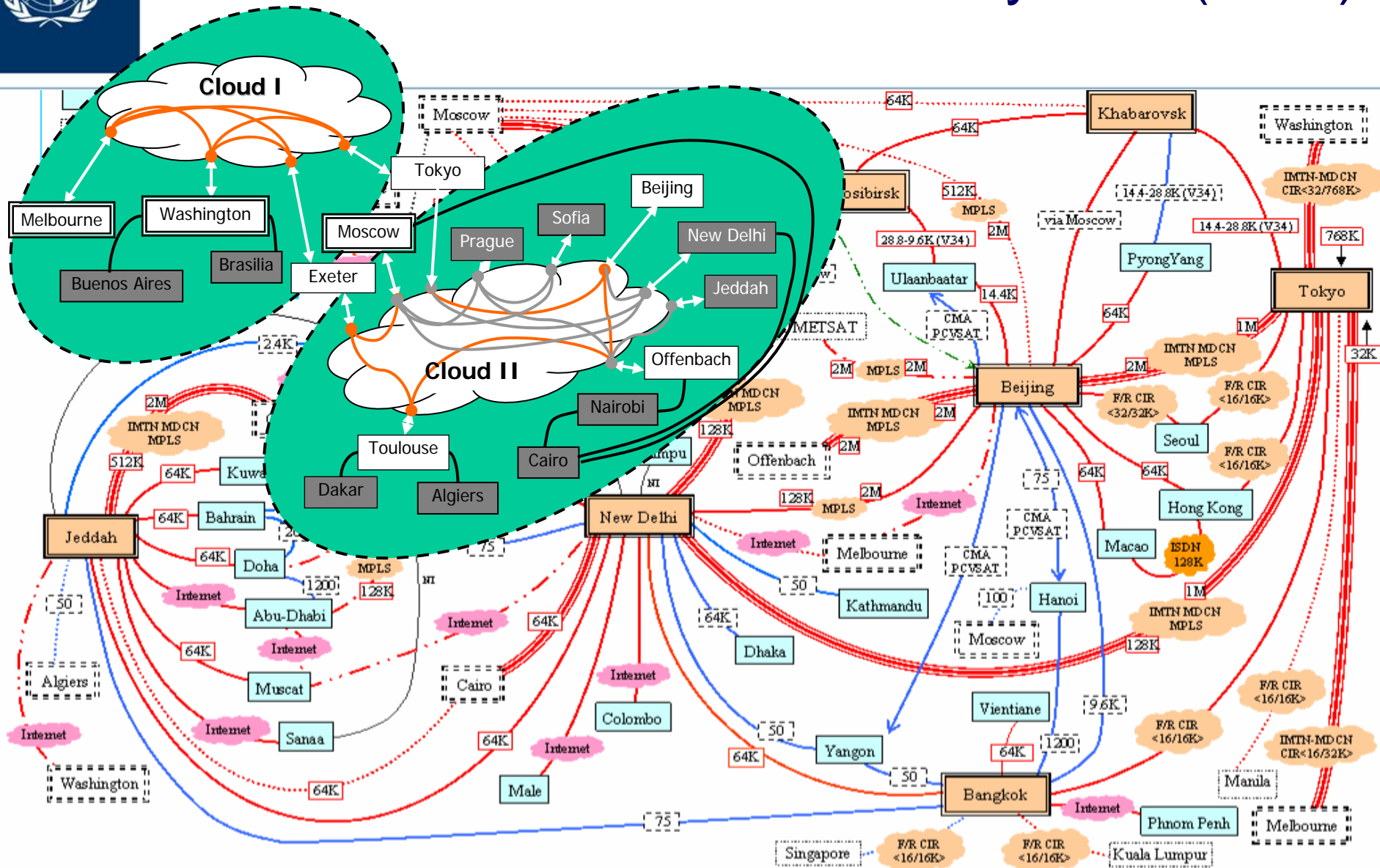
**World  
Meteorological  
Organization**

**Weather • Climate • Water**





# Global Telecommunication System (GTS)





# Vision of WIS

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WMO Members decided that WIS will:

- Use international industry standards
- Build on the Global Telecommunication System (GTS), with a smooth and coordinated transition;
- Provide time-critical data exchange, as well as data access and retrieval services;
- Support all WMO and related international programmes.



# Implementation of WIS

WIS is evolving in two parallel parts:

**Part A:** GTS continued consolidation and further improvements for data and products delivery

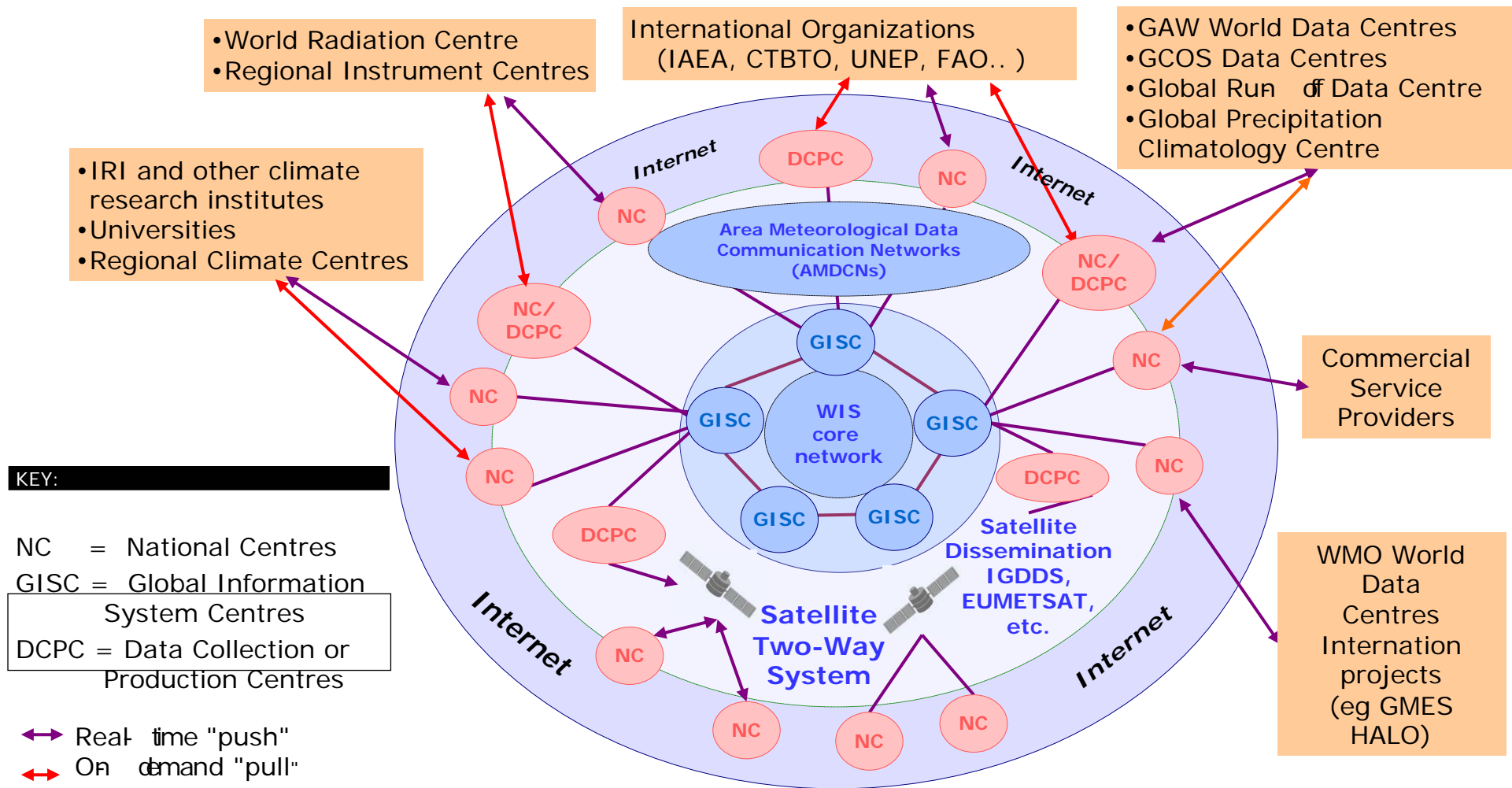
- Time-critical and operation-critical delivery based on real-time “push” via dedicated telecommunications
- Timely delivery based on delayed mode “push” via combination dedicated + public networks

**Part B:** extension of services through flexible data discovery, access and retrieval services, as well as flexible timely delivery





# Types of Centres: GISCs, DCPCs, and NCs



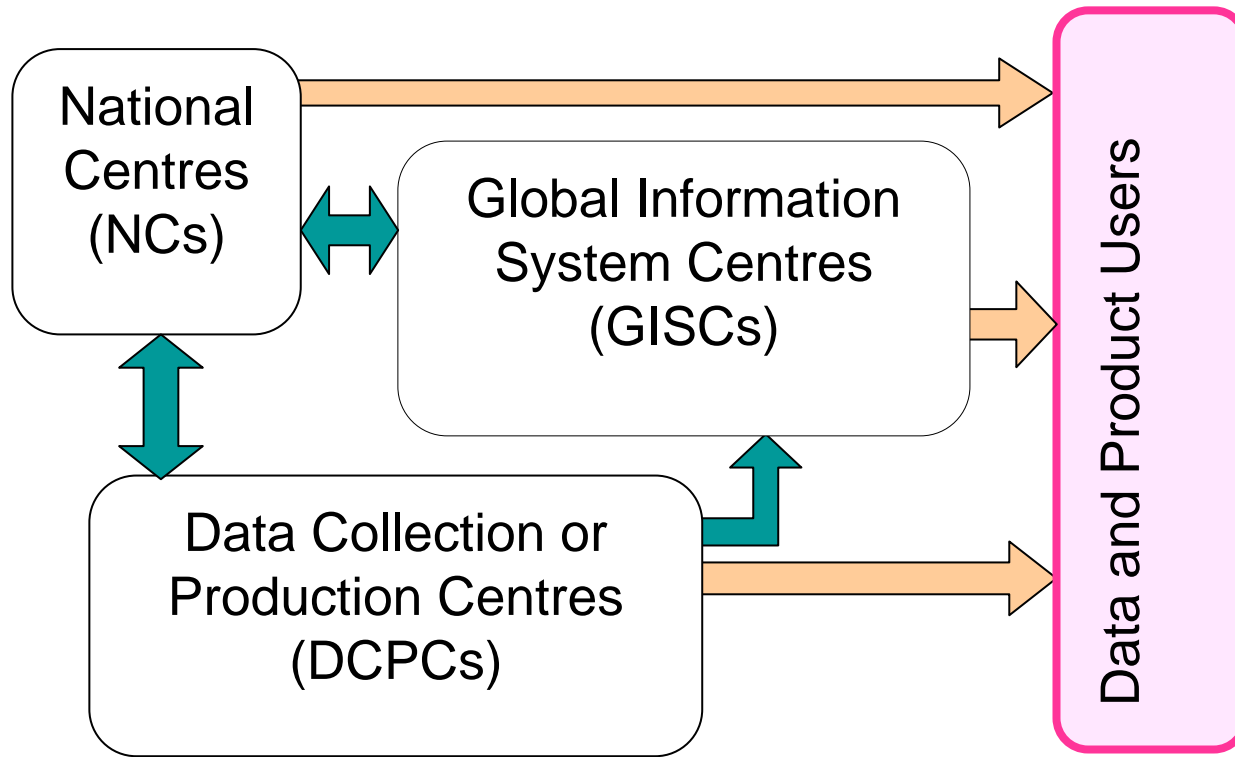


# WIS Compliance Specifications

- Existing centres within WMO Member States may apply for designation as one of the functional centres forming the core infrastructure of WIS (GISCs, DCPCs, NCs)
- Designation requires a statement of compliance with WIS requirements, compiled by the Inter-Commission Coordination Group on WIS (ICG-WIS)
- The WIS Compliance Specifications document is the authoritative source for specifications applicable to WIS GISCs, DCPCs, and NCs



# Interoperability and WIS Networking







# Interoperability with Semantics

"semantic mapping" associates concepts that are close enough for the purpose:

| What type is it?    | Who made it?           | What is its name? |
|---------------------|------------------------|-------------------|
| document            | author                 | title             |
| e-mail              | from                   | subject           |
| news article        | by-line                | headline          |
| file                | owner                  | file name         |
| scientific data set | principal investigator | data set name     |
| biological specimen | collector              | organism name     |
| spatial coverage    | originator             | title             |



# ISO 23950 Search Standard

[http://www.search.gov/gsdi/sru2kml.php?operation=searchRetrieve&version=1.1&maximumRecords=100&recordSchema=XML&query=\(geo.bounds within/partial/nwse "43.772 -101.411 31.7723 -77.7499"\) and \(geo.keywords any "biologic ecologic"\)](http://www.search.gov/gsdi/sru2kml.php?operation=searchRetrieve&version=1.1&maximumRecords=100&recordSchema=XML&query=(geo.bounds%20within/partial/nwse%20%2243.772%20-101.411%2031.7723%20-77.7499%22)%20and%20(geo.keywords%20any%20%22biologic%20ecologic%22))

latitude, longitude  
boundaries

terms, etc.



# ISO 23950 Search Standard

The screenshot displays an email client interface with a list of e-journals and a detailed view of a specific email. The email is from jlr-mailer@liontamer.stanford.edu and is titled "J. Lipid Res. Table of Contents for July 2006; Vol. 47, No. 7". The email content includes a URL, a section for Thematic Reviews, and a section for Research Articles. A SciFinder Scholar window is overlaid on the right, showing a chemical structure and a list of references, including "33069-62-4" and "-10913 References REGISTRY". A "Reaction Roles" dialog box is also visible, listing various roles such as Product, Reactant, Reagent, etc.

**Mail**

Category is All

**e-journals**

Arrange By: Sent | Newest on top

**Today**

- Jlr-mailer@liontamer.stanford.edu 12:38  
J. Lipid Res. Table of Contents for July 2006; Vol. 47, No. 7
- Jlr-mailer@liontamer.stanford.edu 12:23  
J. Lipid Res. Publish-Ahead-of-Print Contents for 27 Jun 2006

**Yesterday**

- pnas-mailer@liontamer.stanford.edu Tue 2:26  
PNAS Table of Contents for 27 June 2006; Vol. 103, No. 26
- jem-mailer@liontamer.stanford.edu Tue 12:18  
JEM Latest Articles for 26 Jun 2006
- jpet-mailer@liontamer.stanford.edu Tue 12:14  
J Pharmacol Exp Ther Publish-Ahead-of-Print Contents for 26...

**Monday (1)**

- circulationaha-mailer@liontamer.stanford.edu Mon 9:25  
Circulation Rapid Access for 26 Jun 2006
- circulationaha-mailer@liontamer.stanford.edu Mon 5:14  
Circulation Table of Contents for 27 June 2006; Vol. 113, No....

**Saturday (1)**

- sciencedirect-mailer@liontamer.stanford.edu Sat 9:31  
ScienceDirect Message Center
- sciencedirect-mailer@liontamer.stanford.edu Sat 9:31  
ScienceDirect Alert: Cardiovascular Research, Vol. 71, Iss. 2,...
- physiology-mailer@liontamer.stanford.edu Sat 12:14  
Am J Physiol Heart Circ Physiol Publish-Ahead-of-Print...

**Friday (4)**

- jleub-mailer@liontamer.stanford.edu Fri 8:47  
J Leukoc Biol Table of Contents for 1 July 2006; Vol. 80...

**J. Lipid Res. Table of Contents for July 2006; Vol. 47, No. 7**

From: jlr-mailer@liontamer.stanford.edu  
To: j.gitlin@uky.edu

URL: <http://www.jlr.org/content/vol47/issue7/tetoc>

**Thematic Reviews**

Thematic review series: The Pathogenesis of Ather  
interpretive history of the cholesterol controversy  
of the statins and the end of the controversy  
Daniel Steinberg  
J. Lipid Res. 2006;47 1339-1351  
<http://www.jlr.org/cgi/content/abstract/47/7>

Thematic review series: Lipid Posttranslational M  
metabolism of lipid-modified proteins  
Jui-Yun Lu and Sandra L. Hofmann  
J. Lipid Res. 2006;47 1352-1357  
<http://www.jlr.org/cgi/content/abstract/47/7>

**Research Articles**

C-terminal interactions of apolipoprotein E4 resp  
state  
Sarada D. Tetali, Madhu S. Budamagunta, John  
Rutledge  
J. Lipid Res. 2006;47 1358-1365  
<http://www.jlr.org/cgi/content/abstract/47/7>

Transgenic mice express human MPO -463G/A alleles  
lestons, developing hyperlipidemia and obesity in  
Lawrence W. Castellani, James J. Chang, Xupl  
and Wanda F. Reynolds  
J. Lipid Res. 2006;47 1366-1377  
<http://www.jlr.org/cgi/content/abstract/47/7>

**SciFinder Scholar**

33069-62-4

**-10913 References REGISTRY**

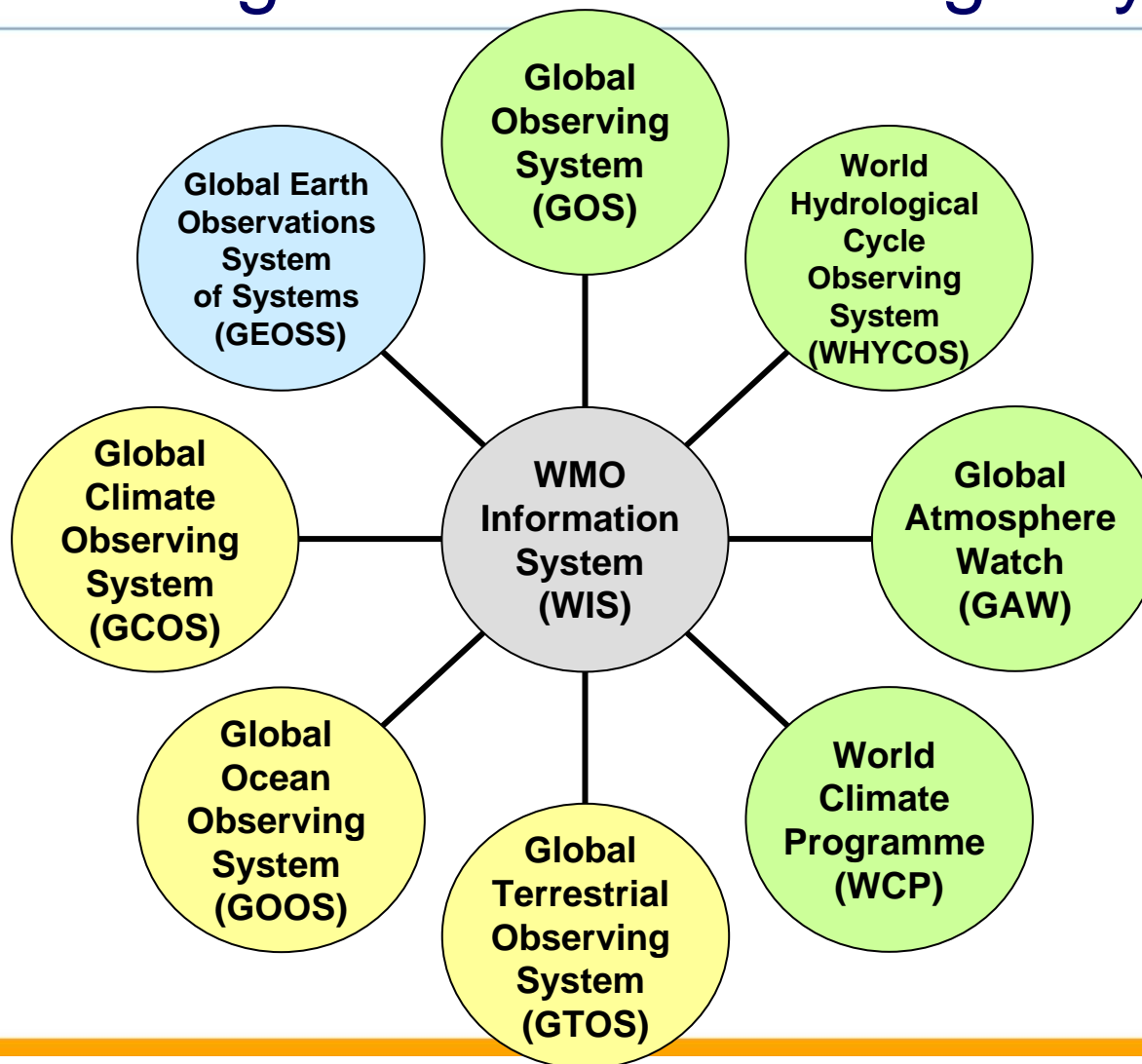
**Reaction Roles**

Select a reaction role:

- Product
- Reactant
- Reagent
- Reactant or Reagent
- Catalyst
- Solvent
- Any role

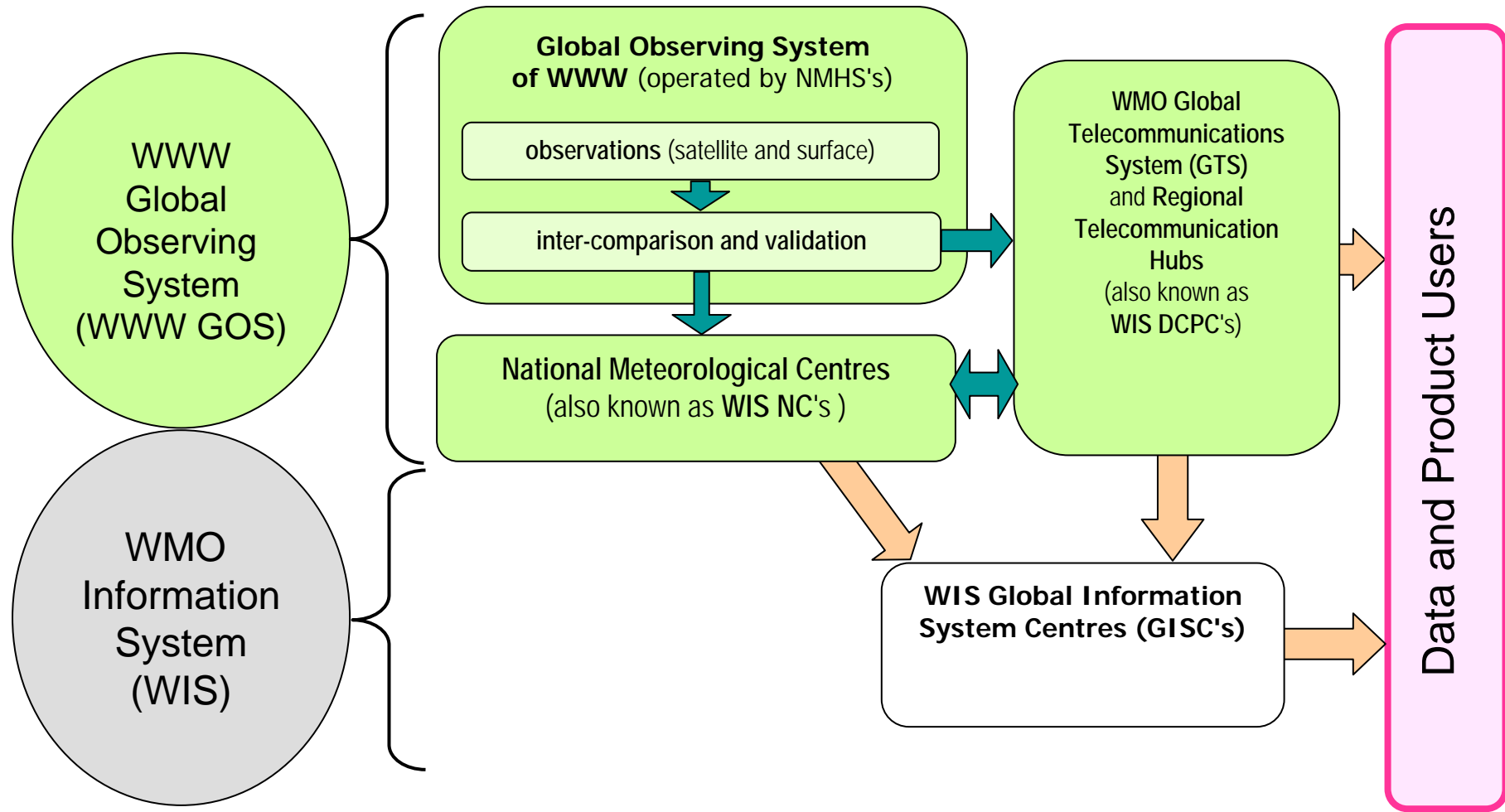


# WIS and Selected WMO Observing and Data Exchange Systems





# Global Observing System (GOS)





# Expose GTS Data via Metadata

Login

## Data Discovery

- Simple Search
- Extended Search
- Browse by theme
- Expert Search
- Package List

Registration

Miscellaneous

Imprint

© DWD 2009, Release 0.01

## Extended Search

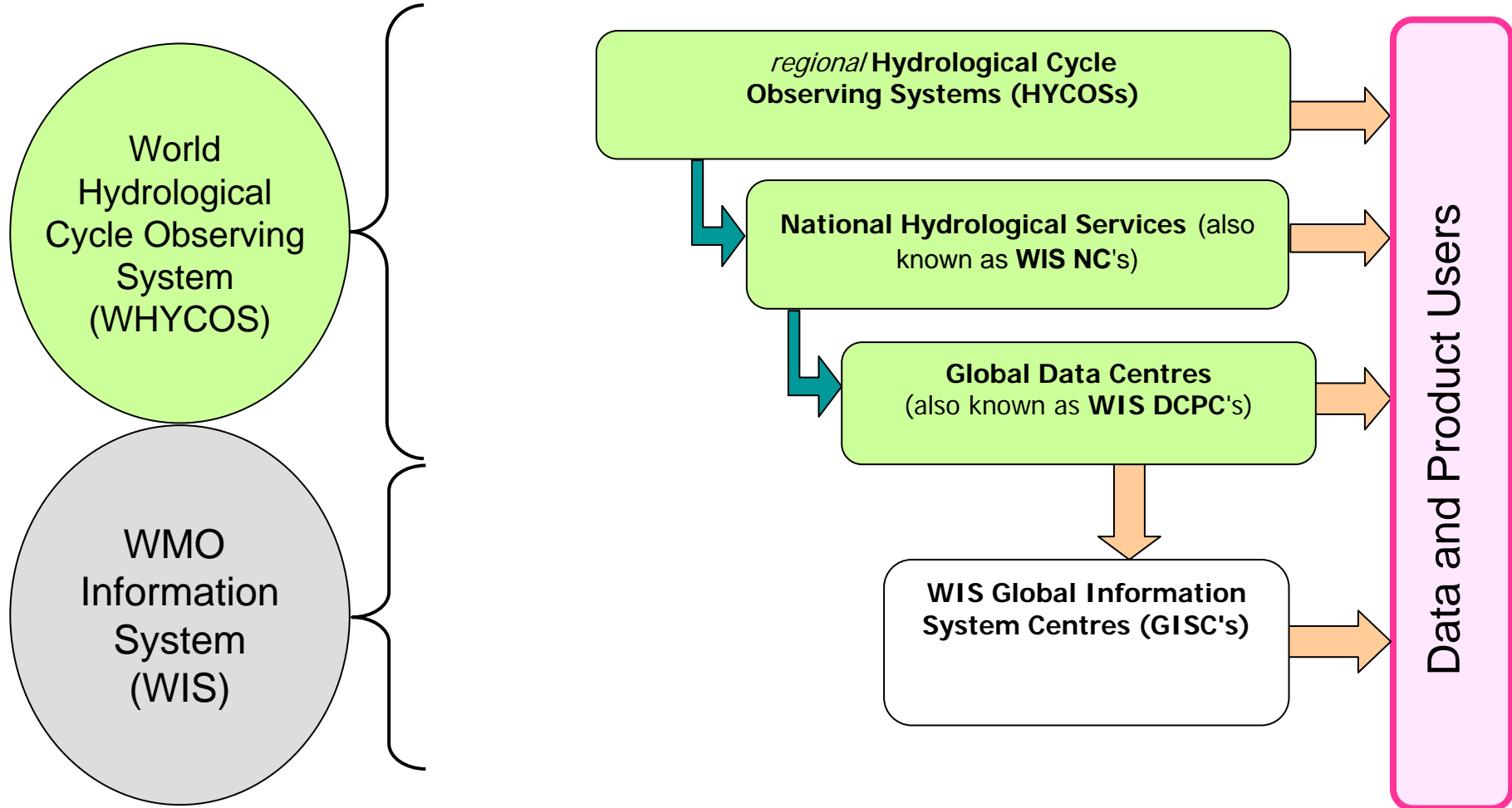
|   |  |                                      |
|---|--|--------------------------------------|
| Anywhere                                | <input type="text" value="precipitation"/>   |                                      |
| Title                                   | <input type="text"/>   |                                      |
| Abstract                                | <input type="text"/>   |                                      |
| Keywords                                | Select Keywords  |                                      |
| Provider                                | all  |                                      |
| Accessibility                           | all  |                                      |
| Begin                                   | <input type="text"/>   |                                      |
| End                                     | <input type="text"/>   |                                      |
| Only top level                          | <input type="checkbox"/>   |                                      |
| Accuracy                                | precise <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> imprecise |                                      |
| Geographic coordinates                  |  |                                      |
|   |  | <input type="text" value="56"/>      |
|   | <input type="text" value="1.1"/>   | <input type="text" value="20"/>      |
|   |  | <input type="text" value="43.1"/>    |
|   | Region   | Europe                               |
| <input type="button" value="Continue"/> |  | <input type="button" value="Reset"/> |





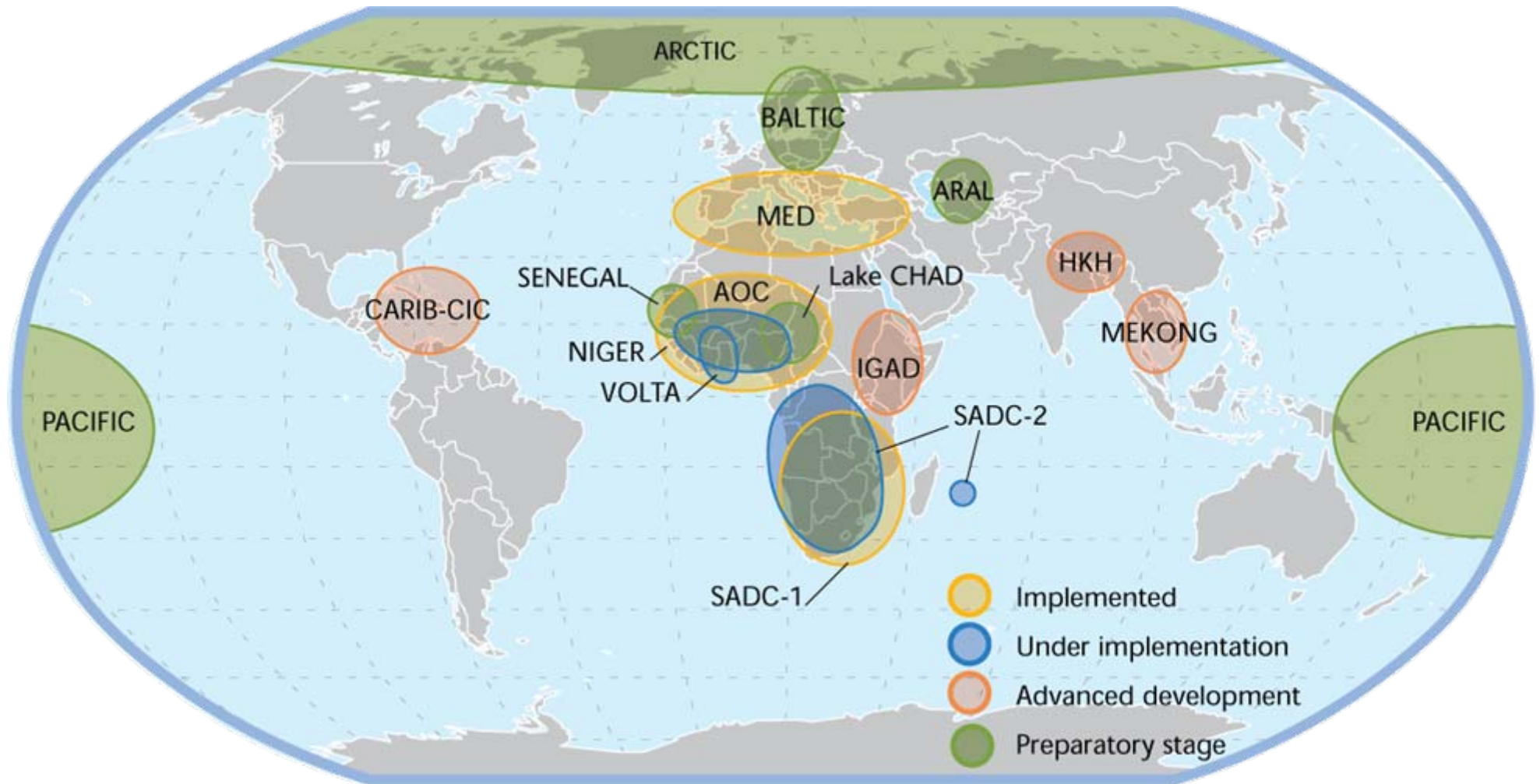


# World Hydrological Cycle Observing System (WHYCOS)



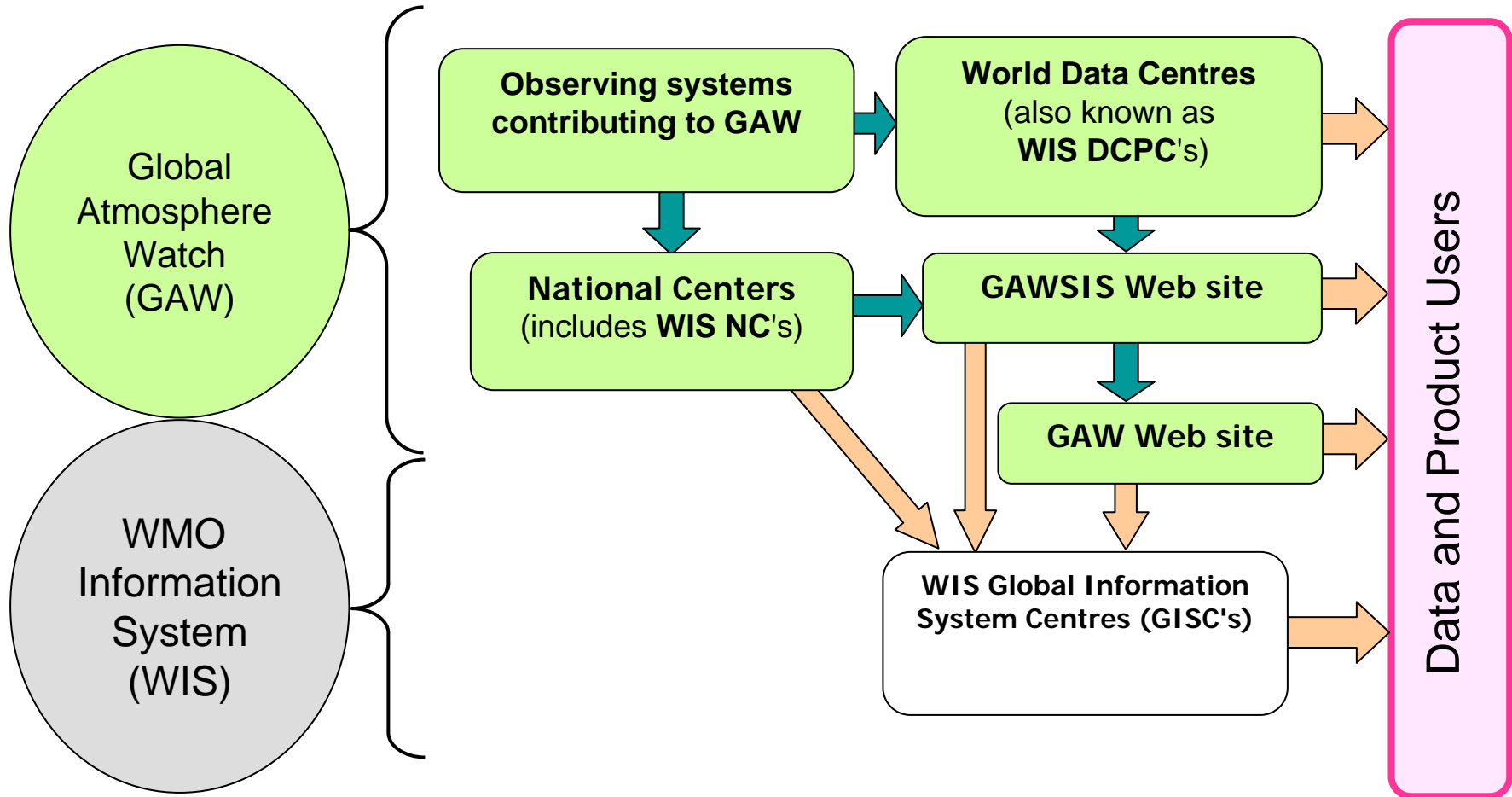


# WHYCOS Components





# Global Atmosphere Watch (GAW)





# Components of the WMO-GAW programme

**Expert Groups**

OPAG EPAC  
JSSC

Scientific  
Advisory  
Groups

ET-WDC

## Central Facilities

QA/SACs

WCC|RCC

Central  
Calibration  
Laboratory

World  
Data  
Centers

**Observing  
Systems**

**Research,  
Analysis &  
Applications**

**Research  
Projects**

**Programmes  
Systems**

## Management

WMO/GAW  
Secretariat

IGACO  
Offices

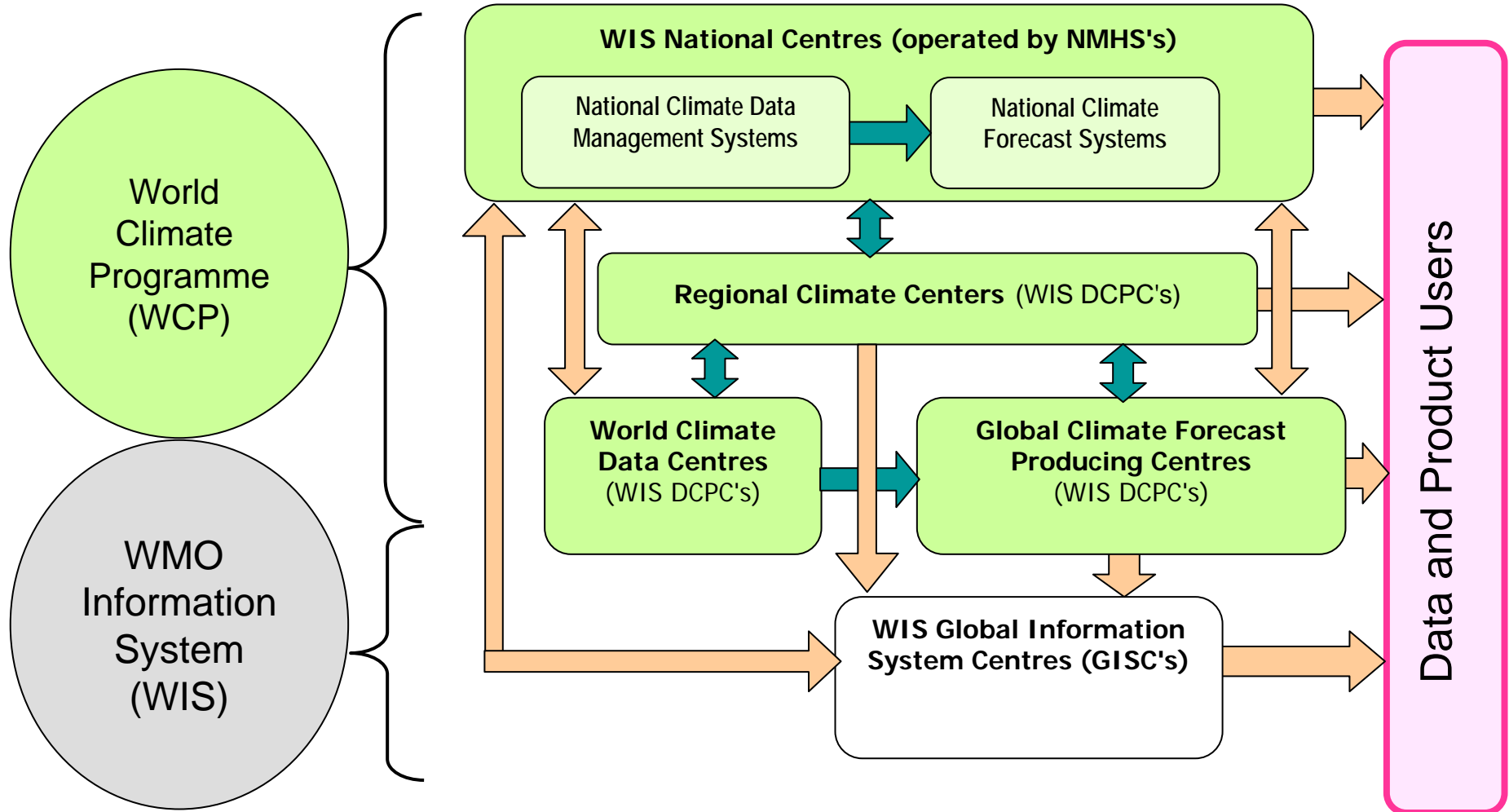
Models &  
Data  
Assimilation

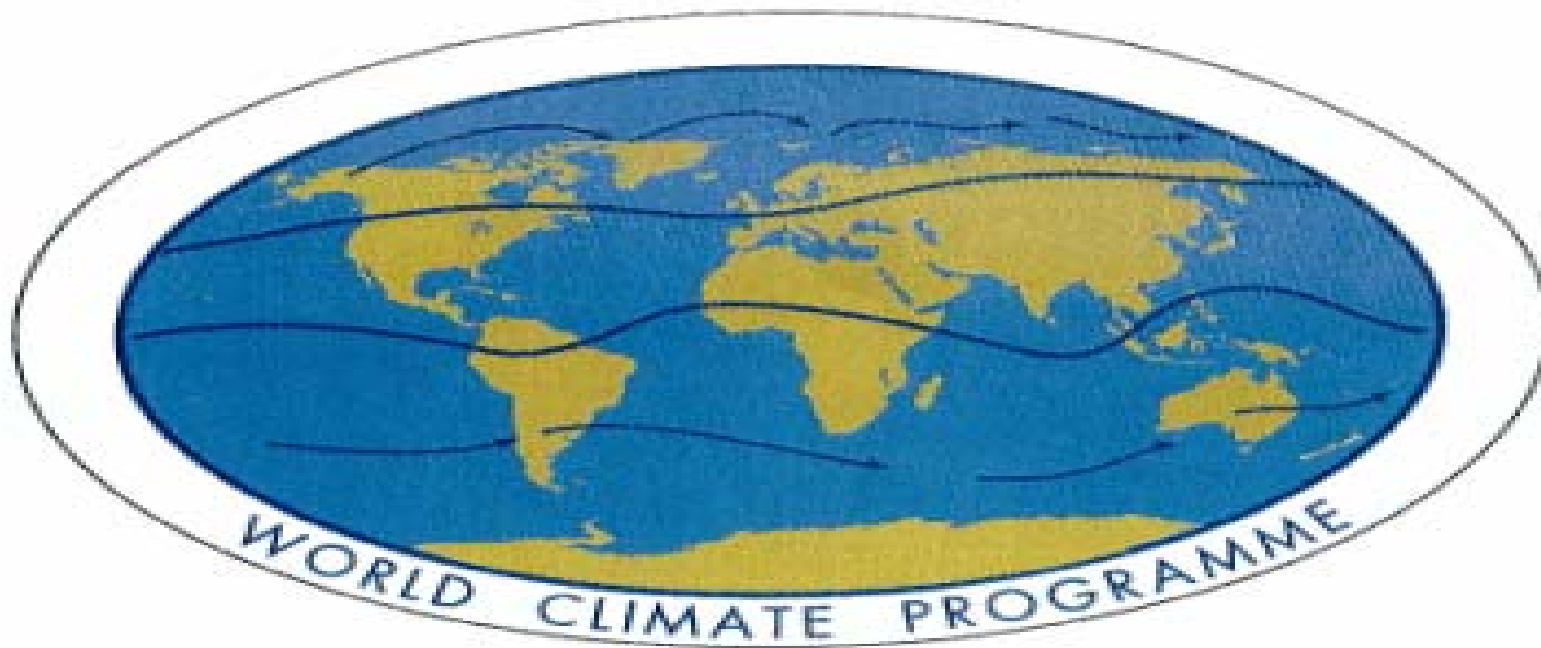
Parties  
to the  
Conventions

- Environ. Assessment
- Air Quality Prediction
- Climate Research
- Carbon Tracking
- Global Change Detection
- GHG Bulletins
- Ozone Bulletins etc.etc.



# World Climate Programme (WCP)





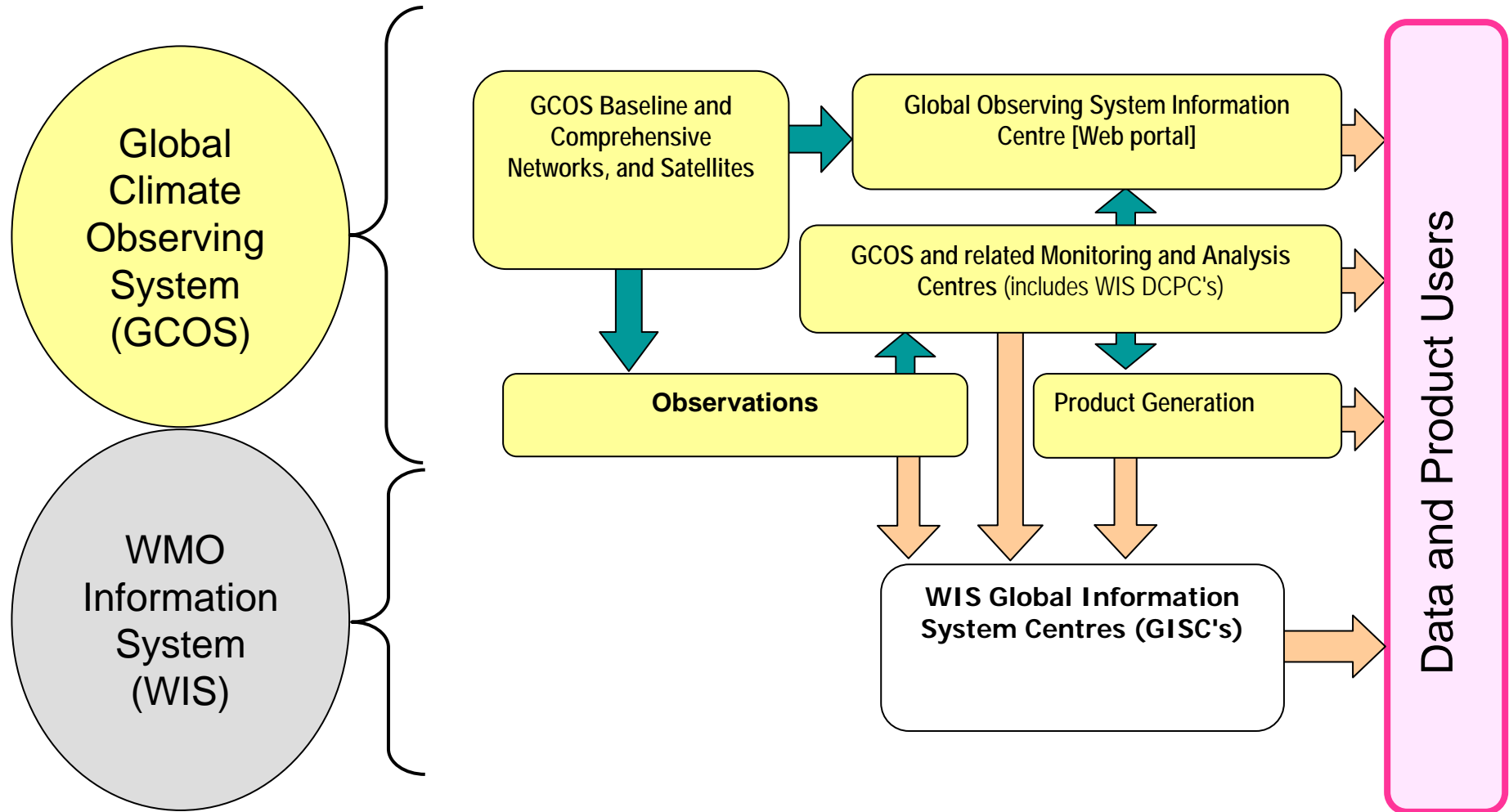
**Related Programmes and Activities**





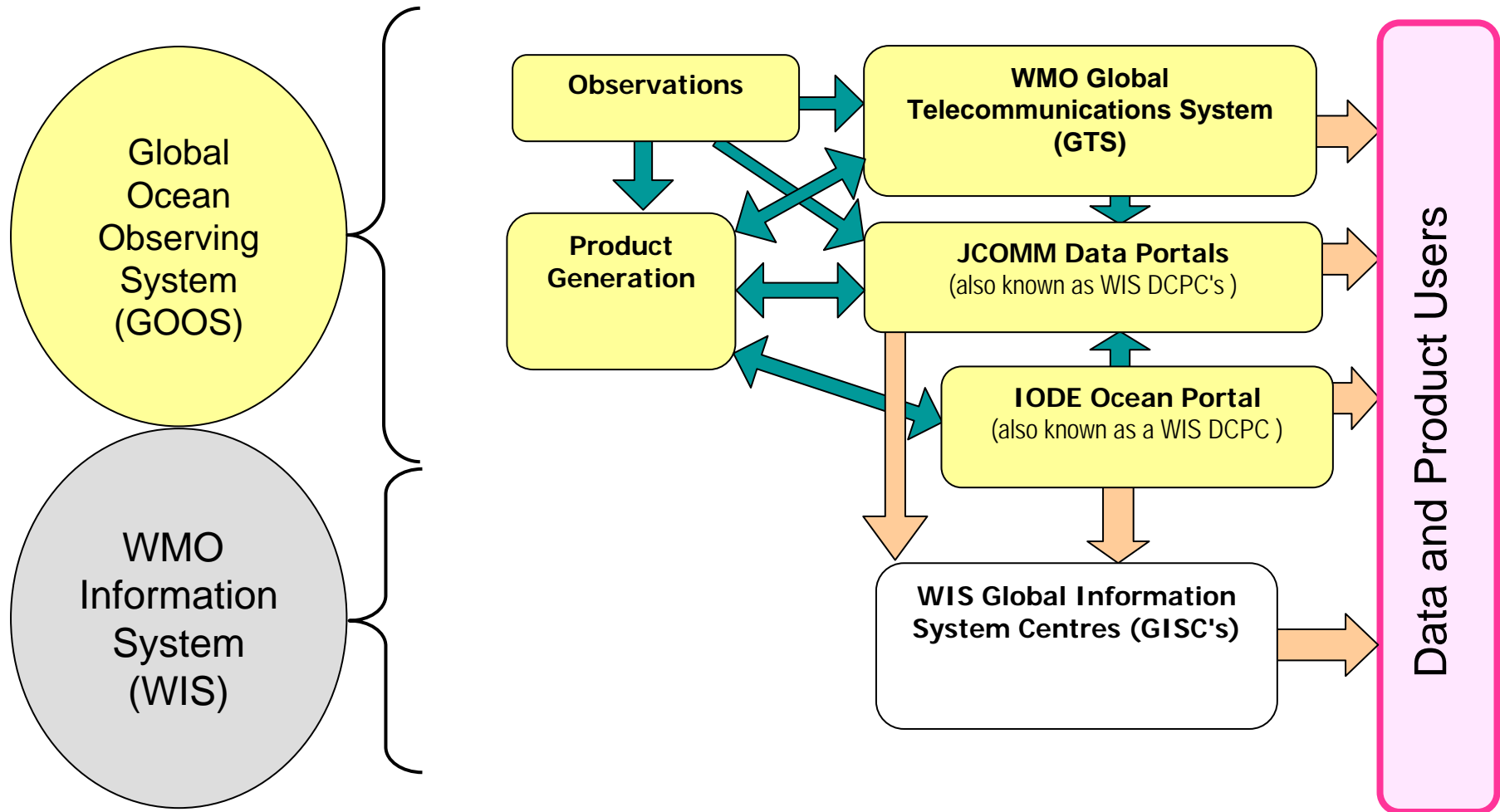


# Global Climate Observing System (GCOS)



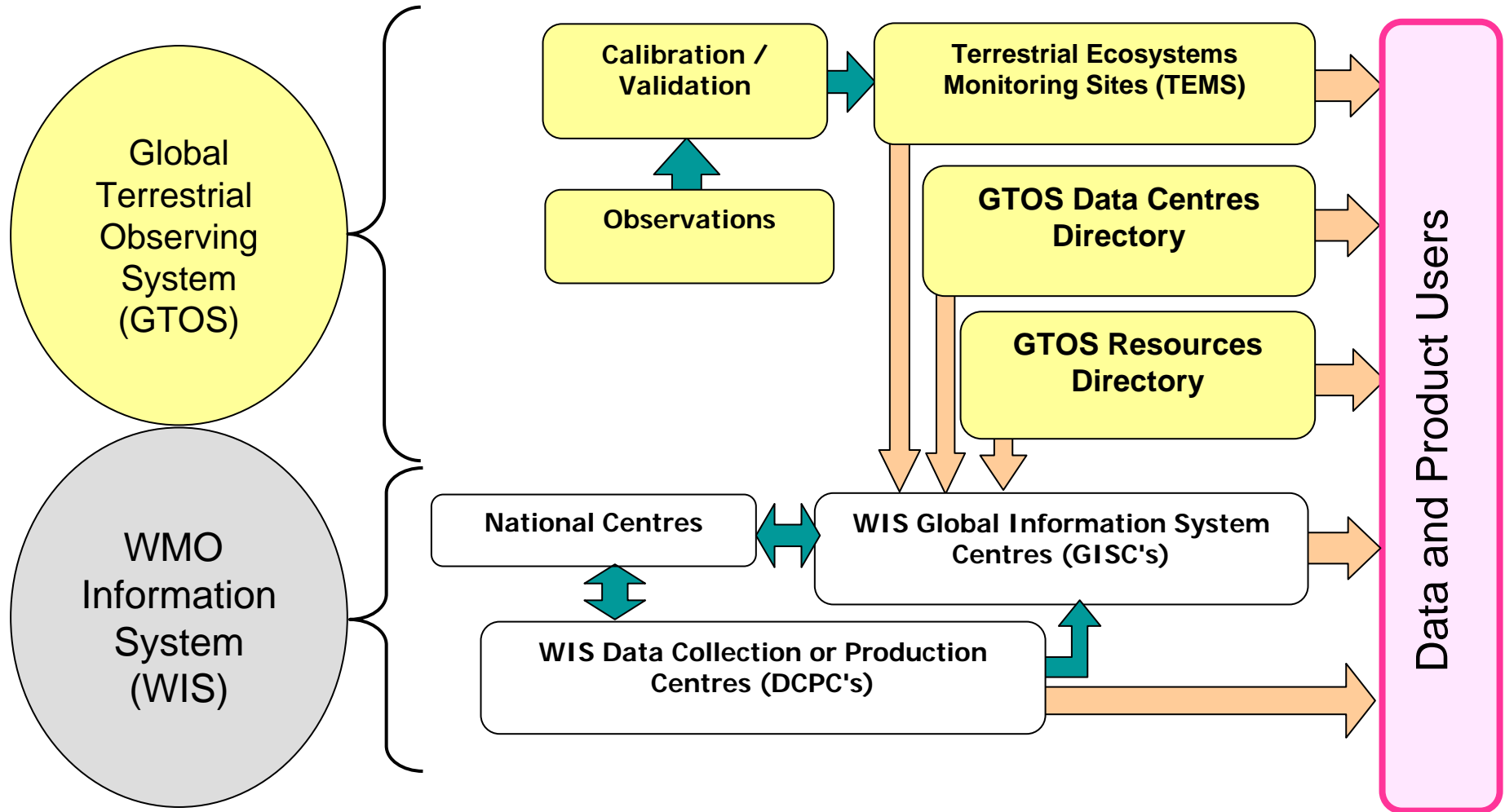


# Global Ocean Observing System (GOOS)





# Global Terrestrial Observing System (GTOS)



- Agriculture
- Atmosphere
- Biological Classification
- Biosphere
- Climate Indicators
- Cryosphere
- Human Dimensions
- Land Surface
- Oceans
- Paleoclimate
- Solid Earth
- Terrestrial Hydrosphere

- Data Centers
- Locations
- Instruments/Sensors
- Platforms/Sources
- Projects

### Spatial Search



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 W   E  
 S

POWERED BY  
Google

[Terms of Use](#)

### Full Text Search

in

and  or

in

### Temporal Search

This field is optional.  
Include?  YES  NO

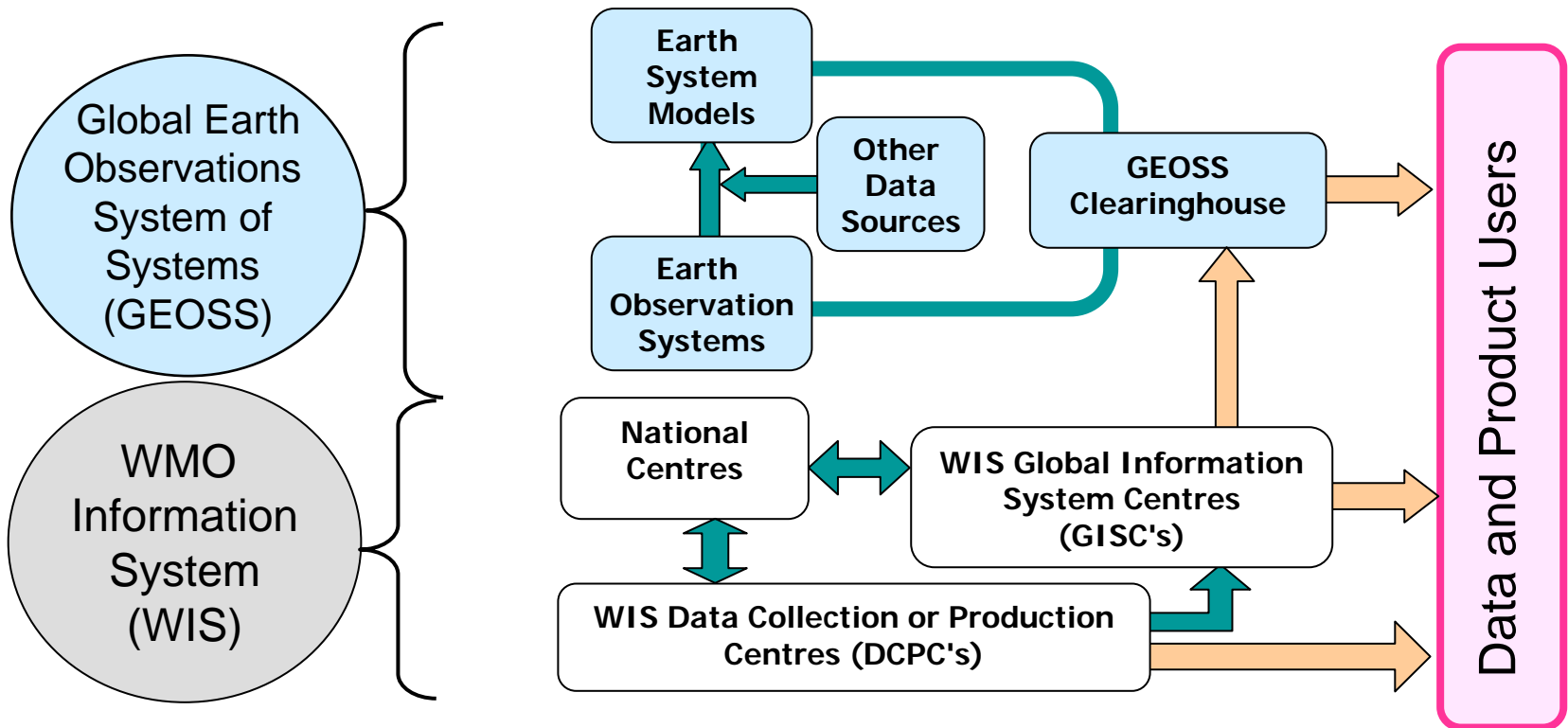
Search

Jan.  1950

through

Apr.  2010

# Global Earth Observations System of Systems (GEOSS)





GEO Portals Usability Survey

## WELCOME TO GEOPORTAL

The GEOportal provides an entry point to access remote sensing, geospatial static and in-situ data, information and services.

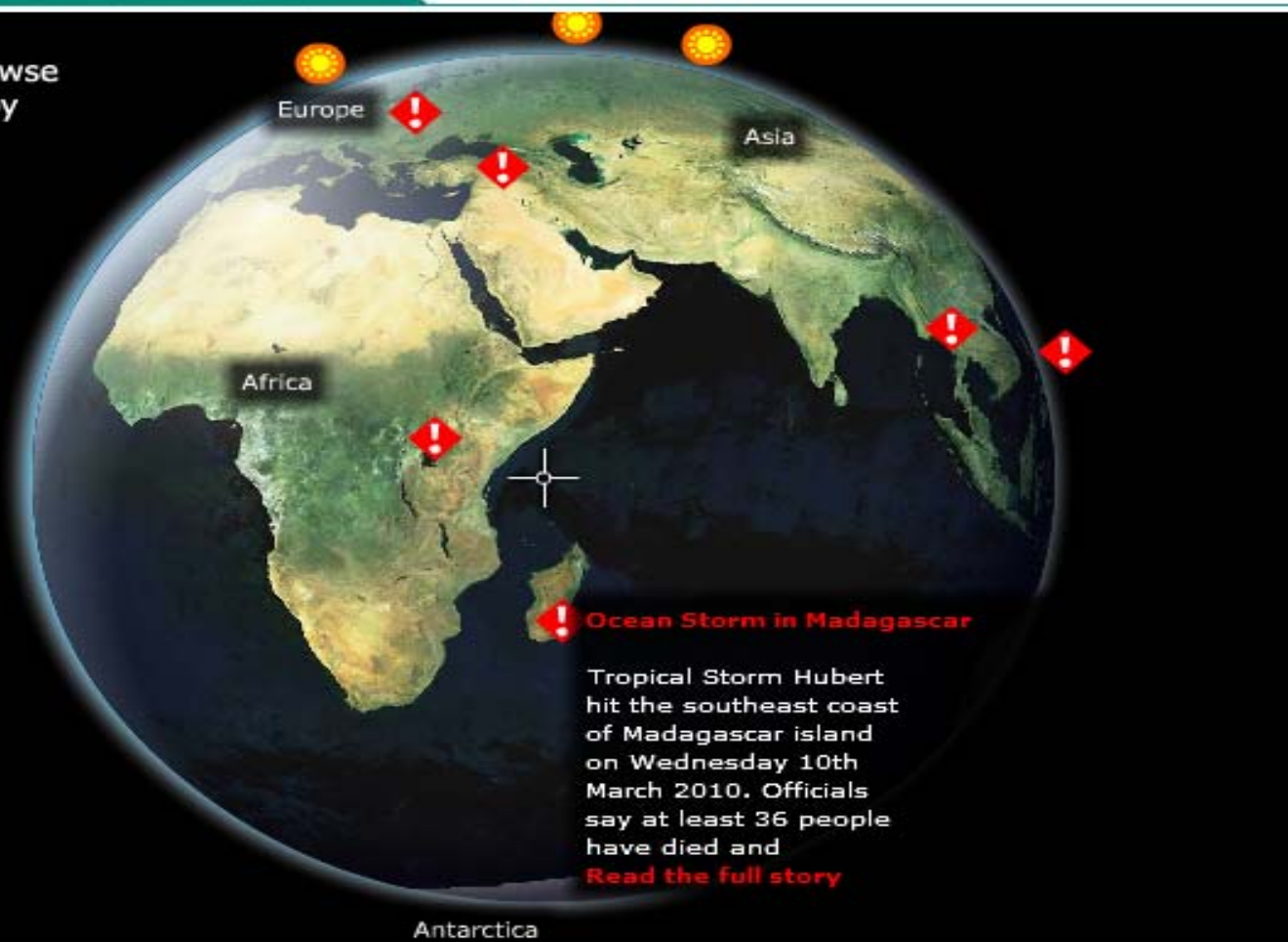
[More ...](#)

### BROWSE RESOURCES BY SOCIETAL BENEFIT AREAS

- DISASTERS
- HEALTH
- ENERGY
- CLIMATE
- WATER
- WEATHER
- ECOSYSTEMS
- AGRICULTURE
- BIODIVERSITY

### BROWSE RESOURCES BY LOCATION

Click to browse resources by location



Interoperable with GEOSS Clearinghouse





# Benefits of WIS

In addition to improving efficiency, WIS:

- Enhances collection of critical data
- Catalogs all WMO data and products
- Enhances availability of time-critical data and products at all national centres
- Opens up GTS to other types of data
- Exploits technology innovation