WAMIS Grid Portal under WIS

Recent Implementation by CAgM

Byong-Lyol Lee

National Center for AgroMeteorology
KMA-RDA-FSA-SNU

8 ER – 5 ST – 3 GSN of WMO GFCS

1. **Improving Service Quality/Delivery**
   - ① EC for High Quality resources to meet user requirements
   - ② EC for Risk Management against natural hazards
2. **Advancing Science & Technology with Implementing Applications**
   - ③ EC for better meteorological information under climate change/variability
   - ④ EC for earth system monitoring relevant to meteorological information
   - ⑤ EC for active participation in global S & T development in meteorology
3. **Strengthening Capacity-building**
   - ⑥ EC to fulfill mandates in emerging members
4. **Establishing Closer Collaborations**
   - ⑦ Better partnership and cooperation at national & global levels
5. **Strengthening Good Governance**
   - ⑧ Effective and efficient Organization

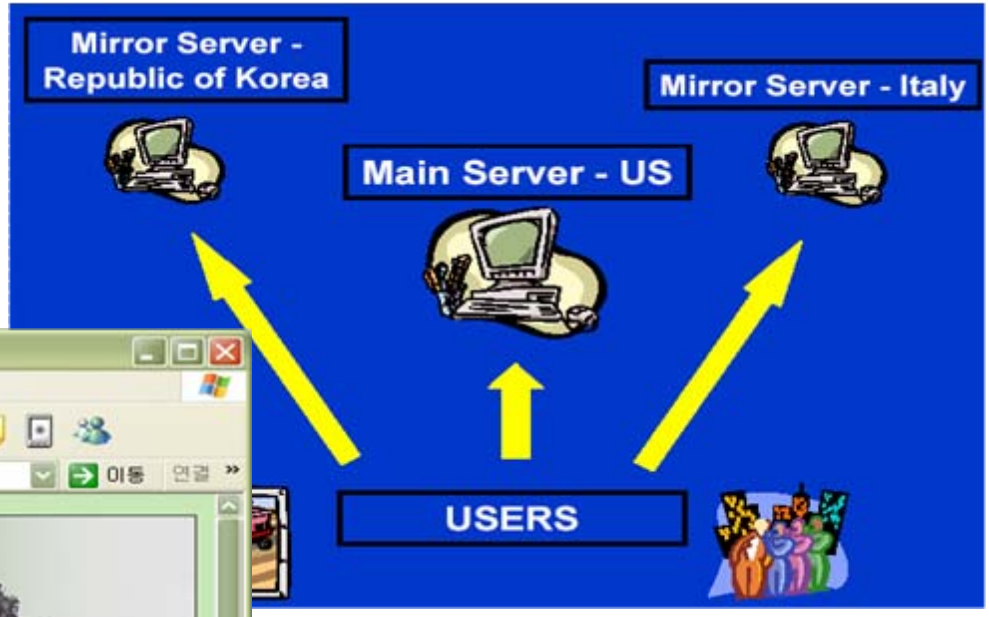
NWP-based high resolution information service in time, space, elements through the joint institution with educational support for multi-disciplenary R&D

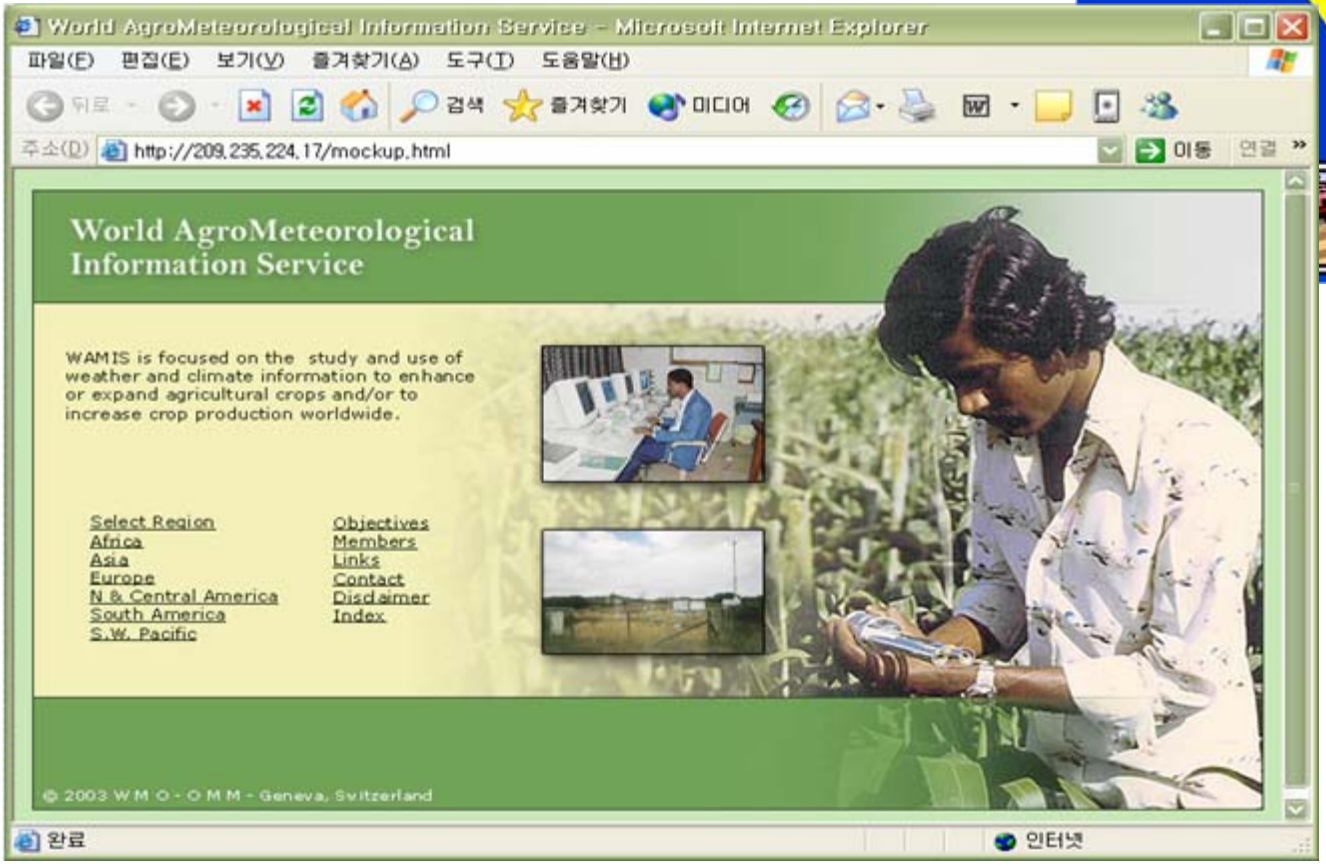
- ❖ Ghglfdwhg/#rlqw#qvwlwxwlrq##Qdwlrqdo#Fhqwhu#ru#DjurPhwhrurorj|#
- ❖ Fruh#J)G##QZS0edvhg#rshudwlrqdo#djphw#vhuylfhv#dw#dup huvÚvlwh

WAMIS – 1st Step for information sharing

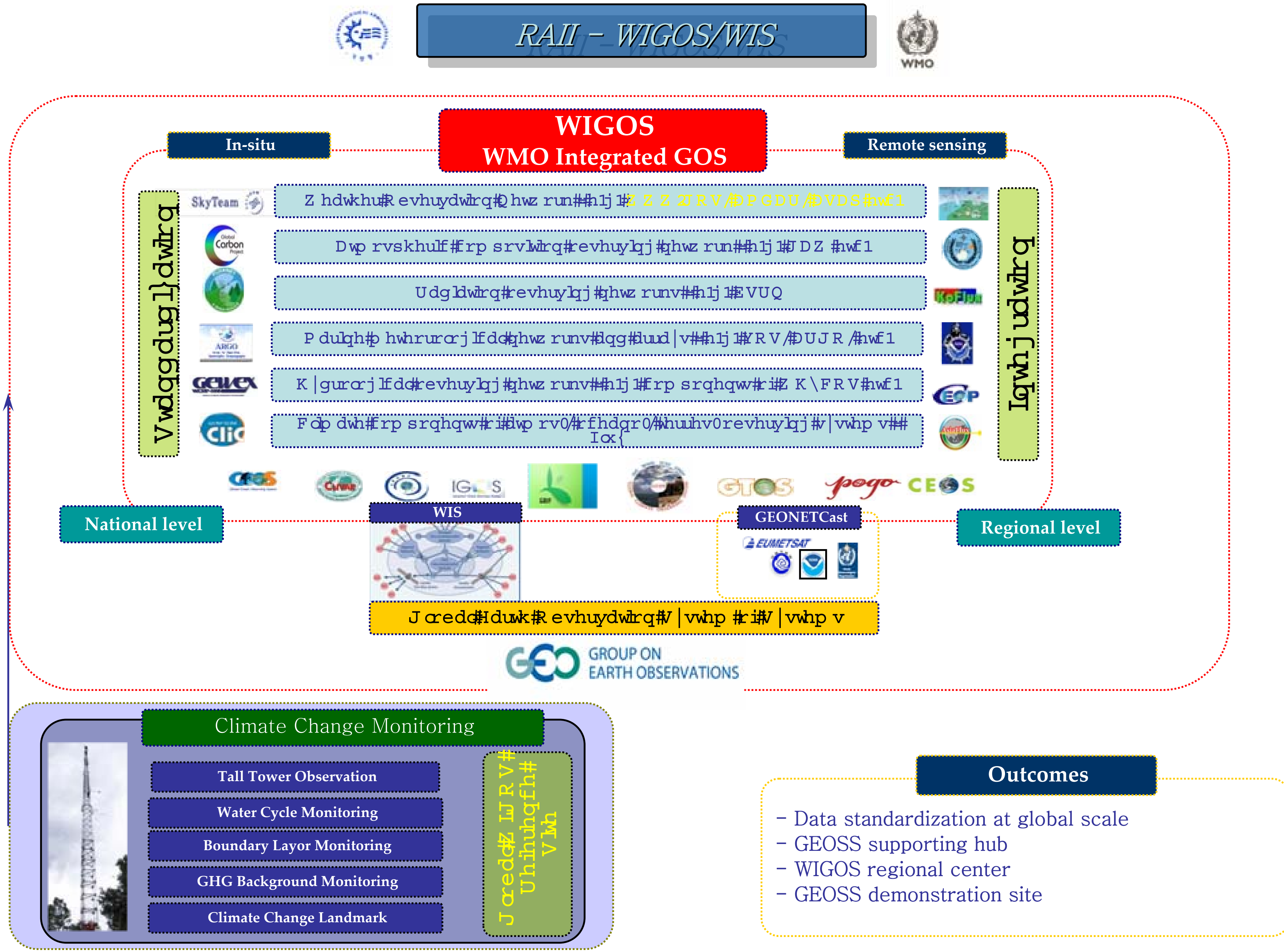
Information Sharing System

Implementation strategy
Key components
Service Architecture
DB requirements

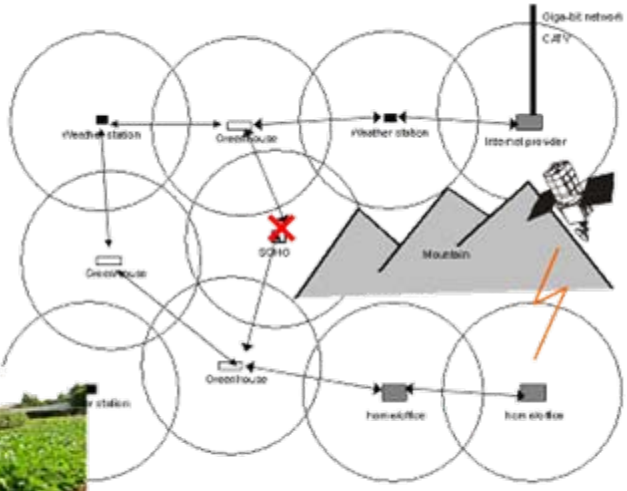




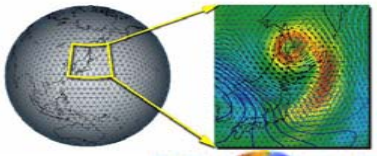
GEOSS and WMO activities


RAII – WIGOS/WIS
WMO
WIGOS
WMO Integrated GOS
In-situ
Remote sensing
SkyTeam
Carbon
ARGO
GEWEX
CliC
CEOS
GTOS
pogo
National level
WIS
GEONETCast
EUMETSAT
Regional level
GROUP ON
EARTH OBSERVATIONS
Climate Change Monitoring
Tall Tower Observation
Water Cycle Monitoring
Boundary Layor Monitoring
GHG Background Monitoring
Climate Change Landmark
Outcomes
– Data standardization at global scale
– GEOSS supporting hub
– WIGOS regional center
– GEOSS demonstration site

USN-based integrated observation network



WIS - DCPC – WAMIS – WIGOS - GEOSS



GEOSS

Earth System Models
- Oceans
- Cryosphere
- Land
- Atmosphere
- Solid Earth
- Biosphere

WIS

Predictions and Analysis

High Performance Computing; Communication Visualization

ES² Earth System

Decision Support
- Assessment
- Decision Support Systems

Policy Decisions

Management Decisions

WIS

Assimilation

WIS

Other Data Sources
Socio-economic data

Impact Assessment
氣象 / 氣候 環境影響評價

Emergence Response
國家/地域 非常對應體系

Earth Observation Systems
- *In situ*
- Airborne
- Space-based

Standards & Interoperability

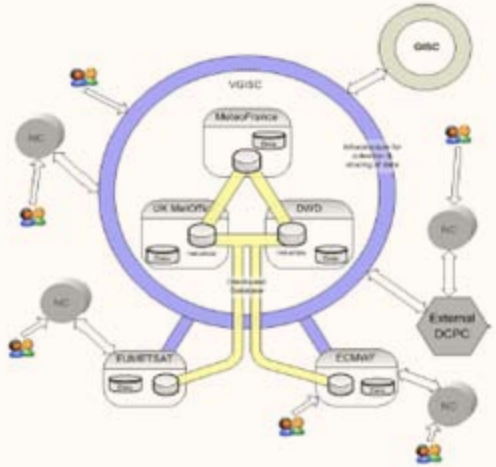
Observations

WIS

WIS

WIGOS
WMO Integrated GOS

WIS



WIS

GEO Center
DCPC–WAMIS

WIS

WIS

APCN

GISC
METASERVER
RDF/OWL

DCPC
Data/Production
RDF/OWL

NCAM

G/R-Server
WAMIS
Grid Portal
Web Service

WIS Pilot Project

WAMIS as Grid Portal

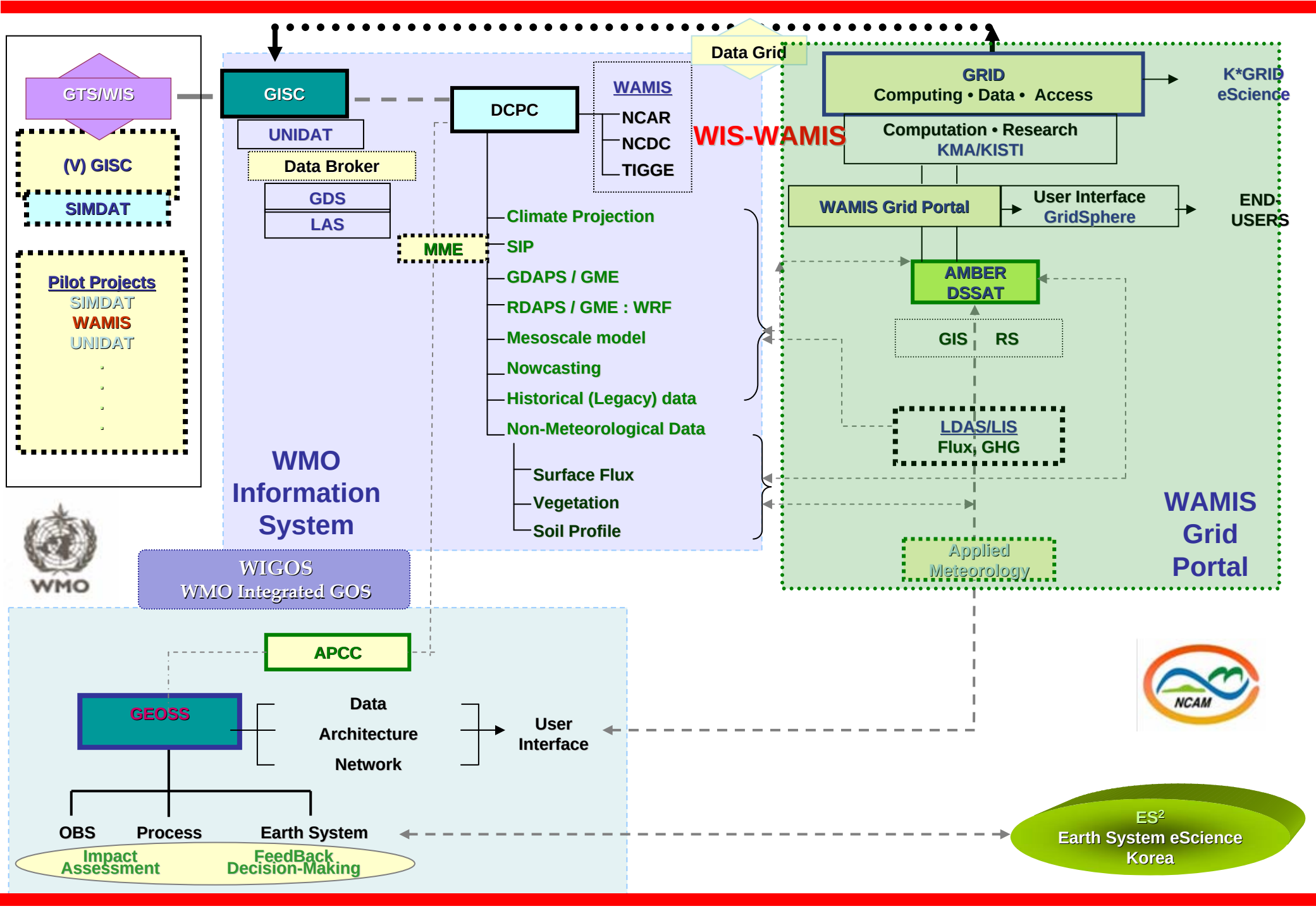
Web Portal — information sharing

- XML-based service : standard schema development
- Machine translation : multi-lingual interfaces
- Operational applications based on Web service architecture
- Tutorial interfaces for real practices

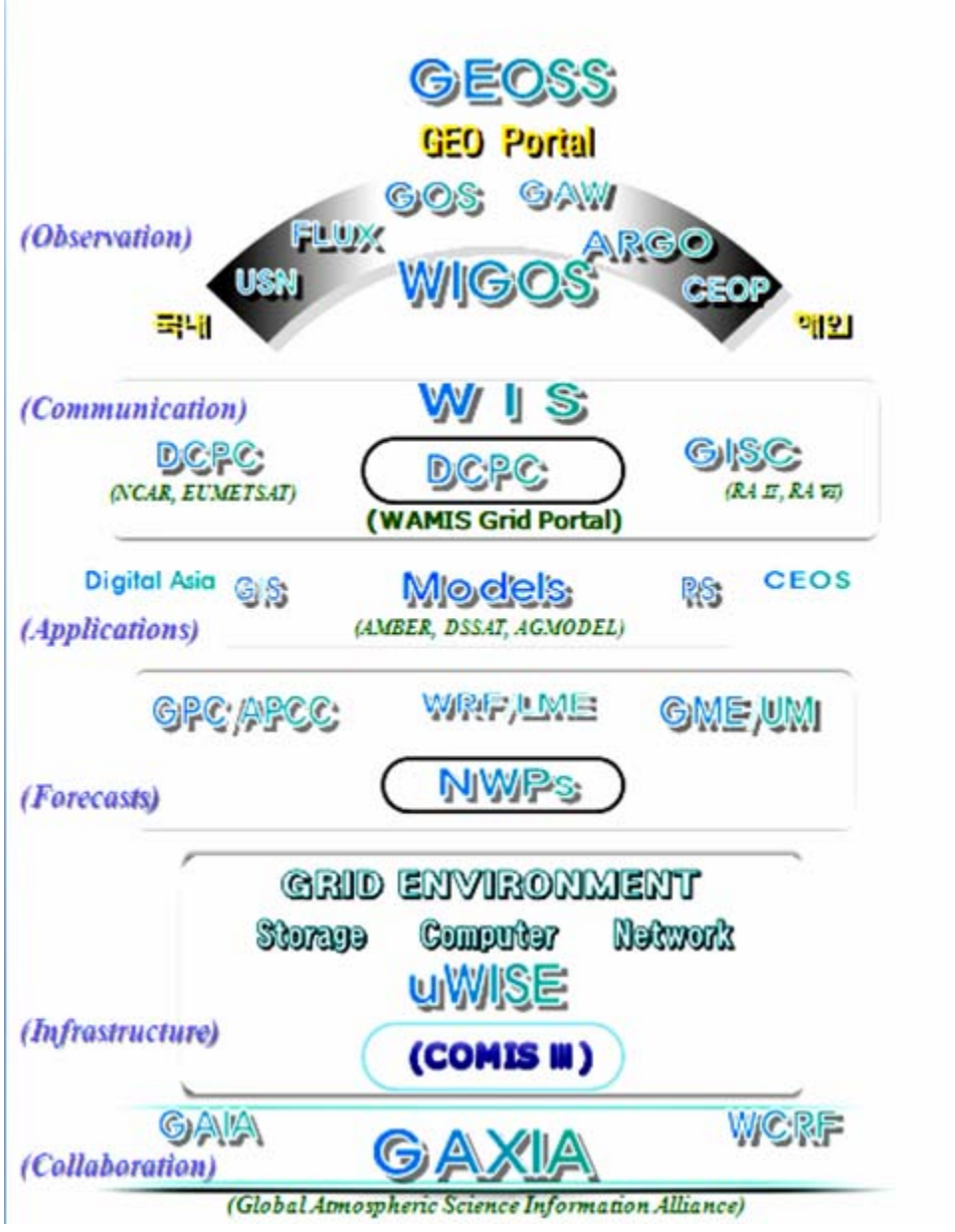
GRID Portal — Resource sharing

- Forecast-based AgMet Services for researcher / extension
- Benchmarking on AMBER (DWD), expanding with DSSAT
- NCAR (GDAS, MM5, WRF), DWD (GME, LM) as NWPs
- Super ensemble of Seasonal Forecasts (APCC / GPC-LC KMA, etc.)
- GISC / DCPC dedicated to WAMIS will be established (NCAR, DWD)
- LIS (NASA) as a framework for LSM (GDS / LAS + GRID)

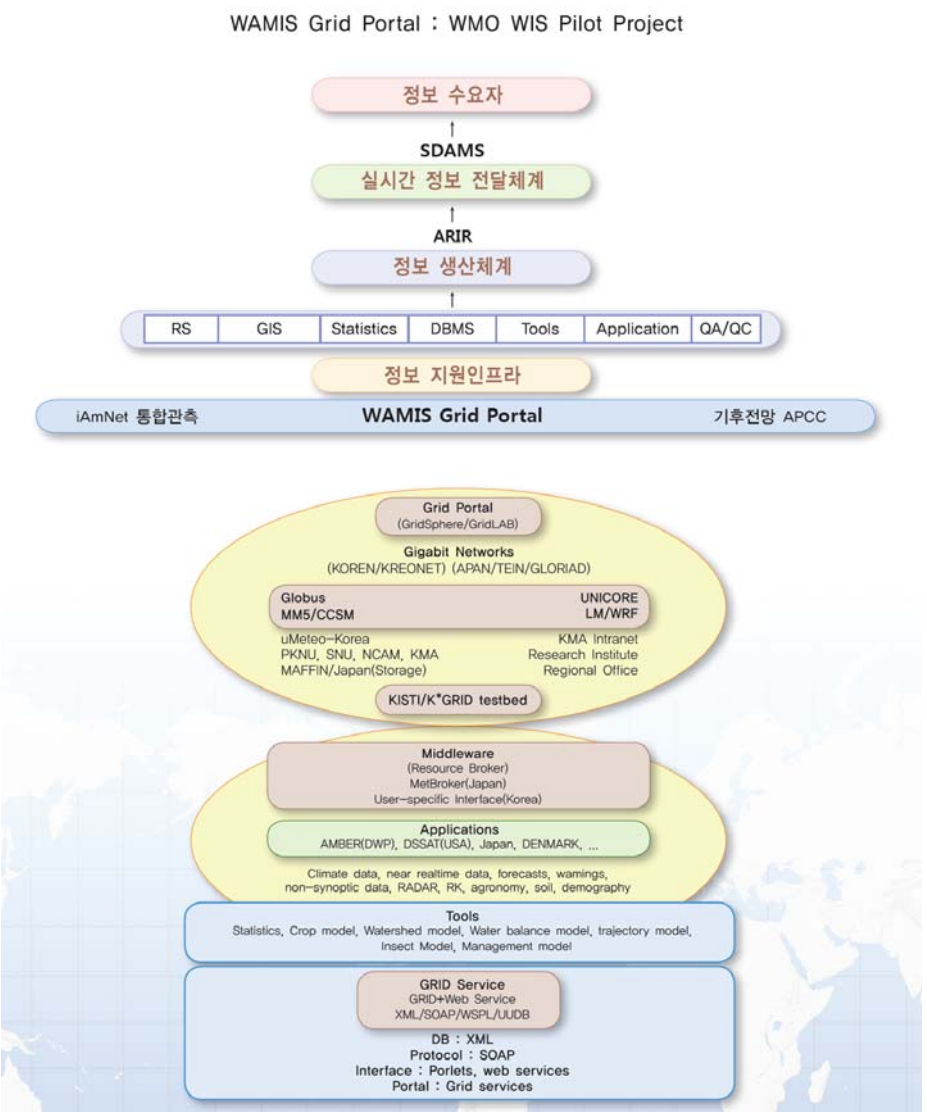
[ET 1.3 pilot project → uCAgM project → WAMIS grid portal →
FWIS pilot project → WIS pilot project]


GTS/WIS
(V) GISC
SIMDAT
Pilot Projects
SIMDAT
WAMIS
UNIDAT
GISC
UNIDAT
Data Broker
GDS
LAS
DCPC
WAMIS
NCAR
NCDC
TIGGE
MME
Climate Projection
SIP
GDAPS / GME
RDAPS / GME : WRF
Mesoscale model
Nowcasting
Historical (Legacy) data
Non-Meteorological Data
Surface Flux
Vegetation
Soil Profile
WMO Information System
Data Grid
WIS-WAMIS
GRID
Computing • Data • Access
K*GRID
eScience
Computation • Research
KMA/KISTI
WAMIS Grid Portal
User Interface
GridSphere
END-USERS
AMBER
DSSAT
GIS
RS
LDAS/LIS
Flux, GHG
Applied Meteorology
WAMIS Grid Portal
WMO
WIGOS
WMO Integrated GOS
APCC
GEOSS
Data
Architecture
Network
User Interface
OBS
Process
Earth System
Impact Assessment
FeedBack Decision-Making
NCAM
ES2
Earth System eScience
Korea

WIS environments within KMA



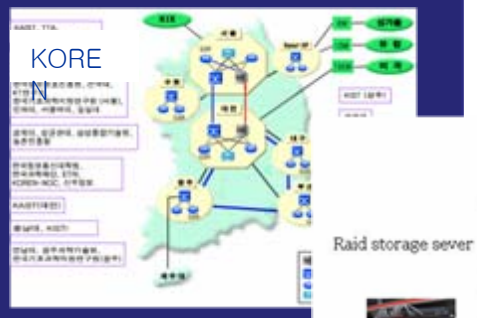
System diagram of WAMIS Grid Portal

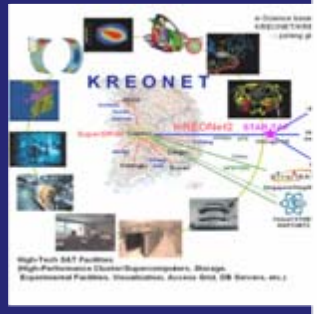


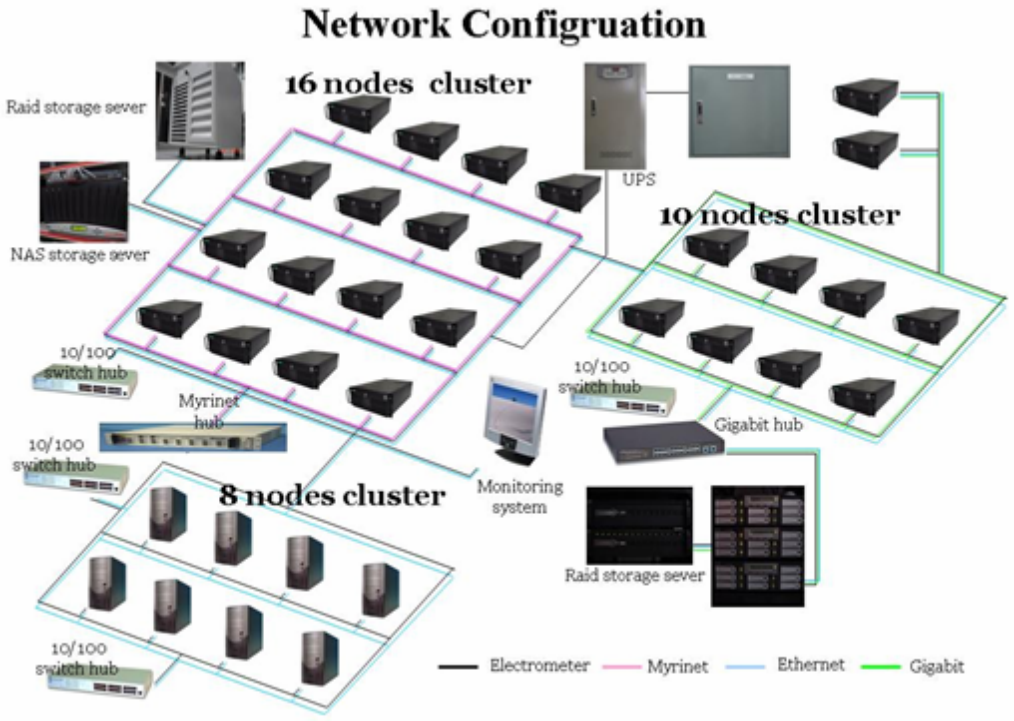
Grid Resources available for WAMIS

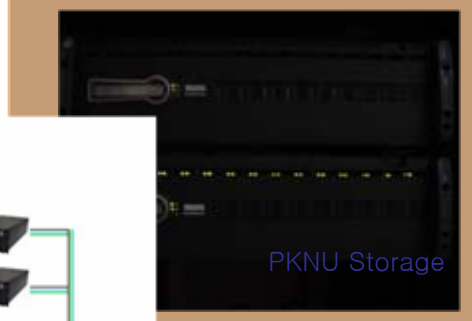
• High Performance Network • High Performance Computing • Distributed Storage

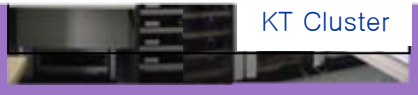
Computational Grid resources





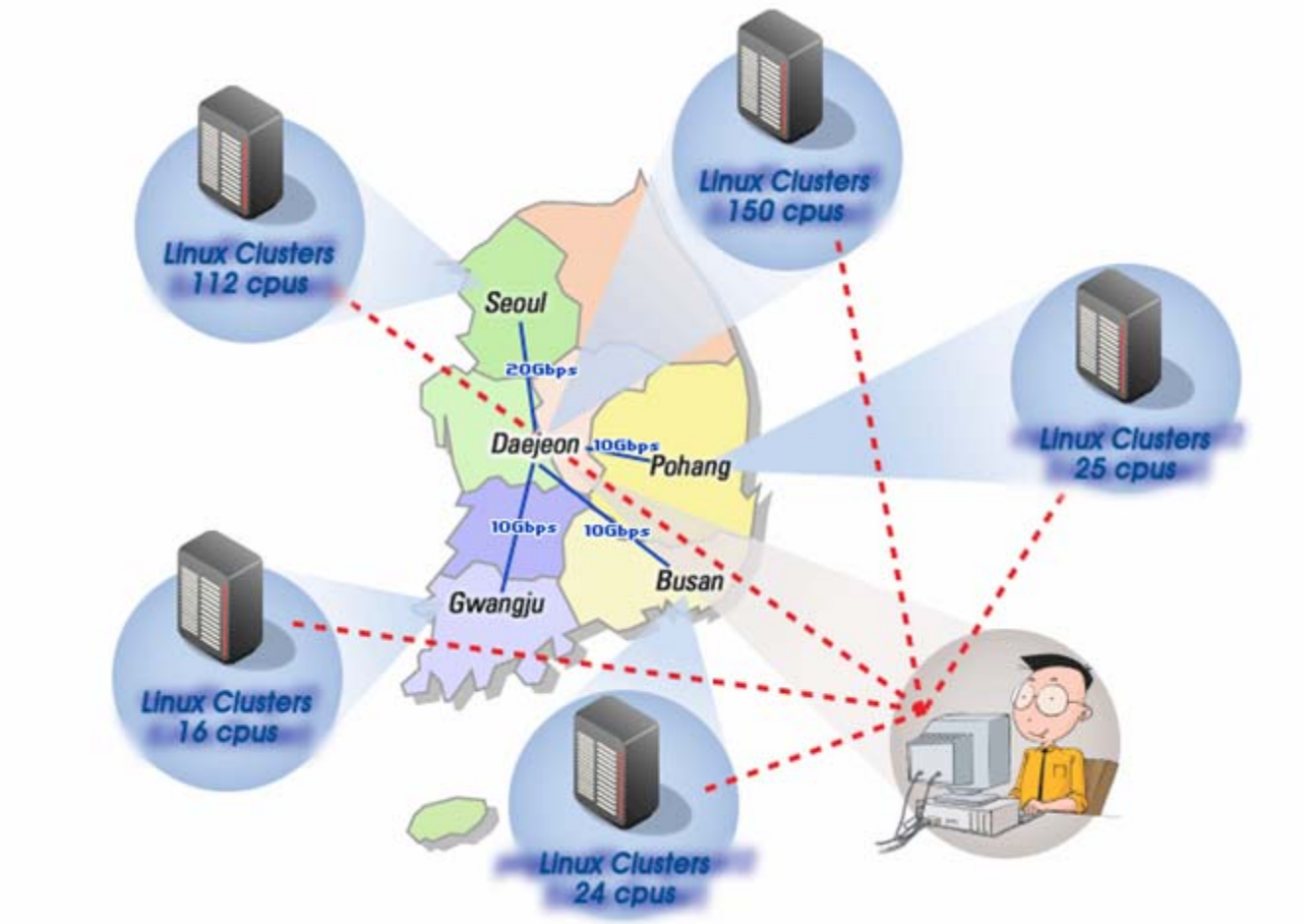




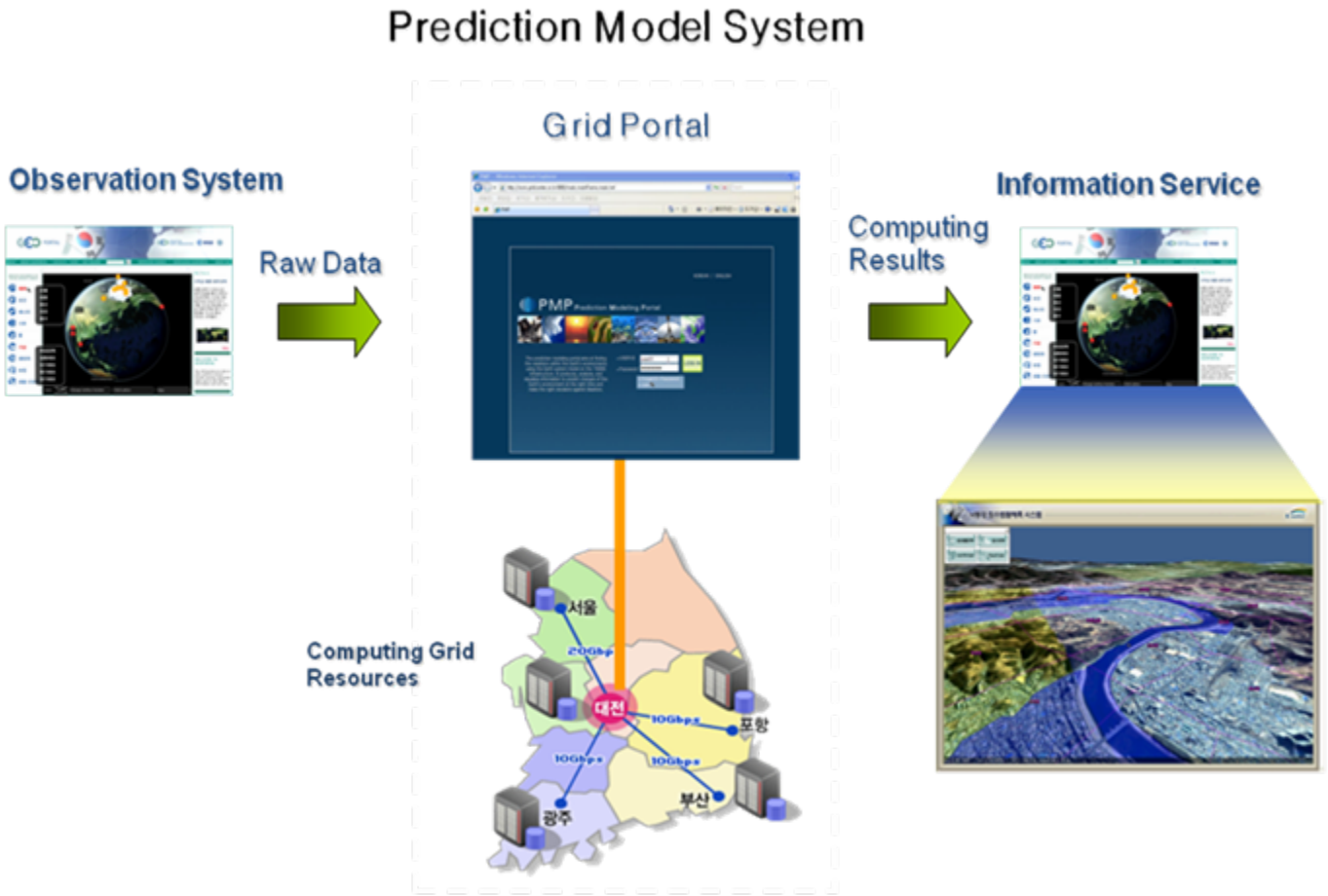


Required
ore storage!

Grid-based computer resource sharing



Prototype Grid Portal to run mesoscale NWPs



Application visualization by Grid Portal

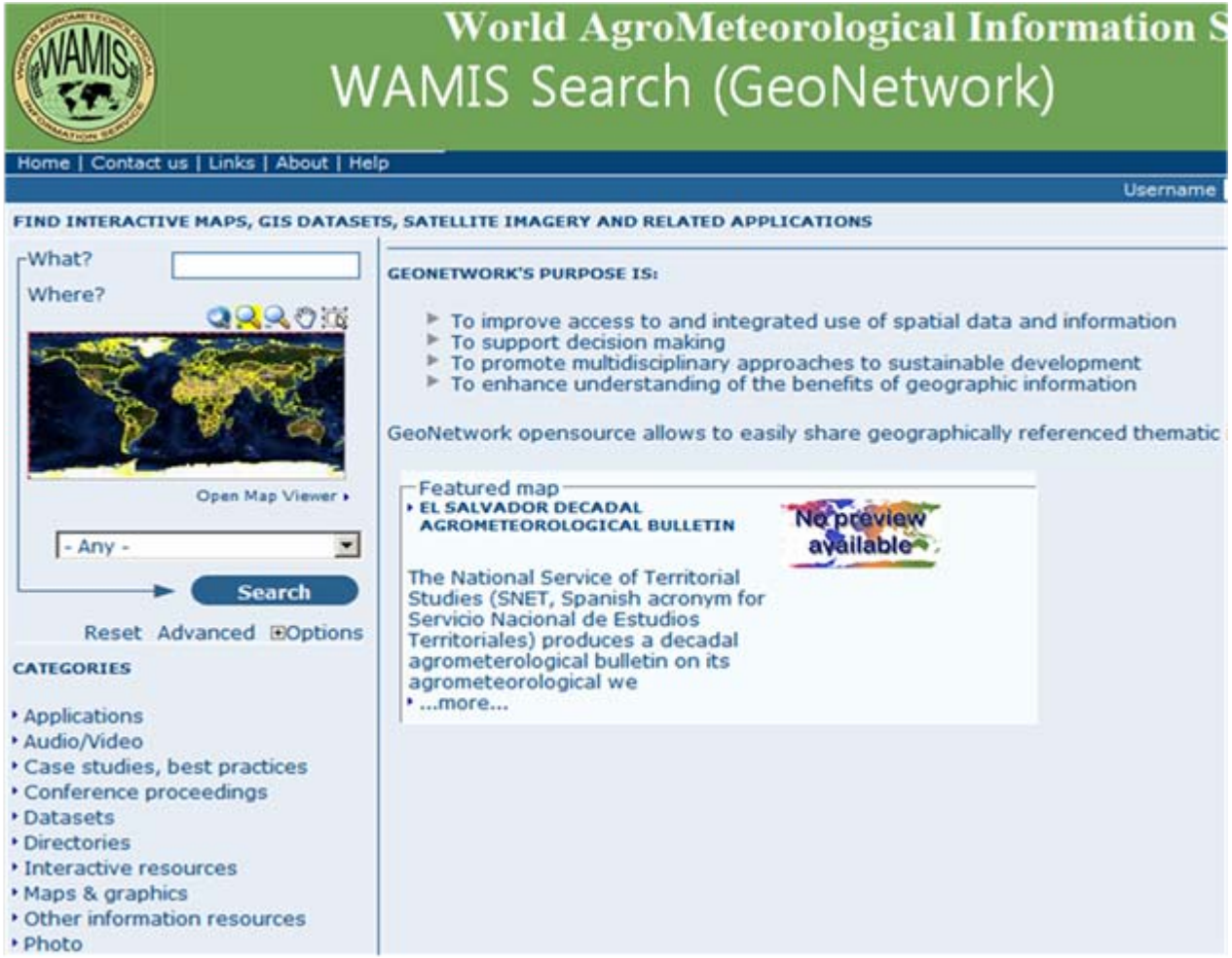
Visualizing the Results on the Web

Overlay the output of the MM5 model
on the Google Earth

Horizontal

Vertical

WAMIS search page with GeoNetwork



Example WMO Metadata for a GTS Bulletin

The example bulletin collects FM 12-XII Ext. reports (SYNOP, Report of surface observation from a fixed land station)

The SMKO04 TTAAii Data Designators decode as:

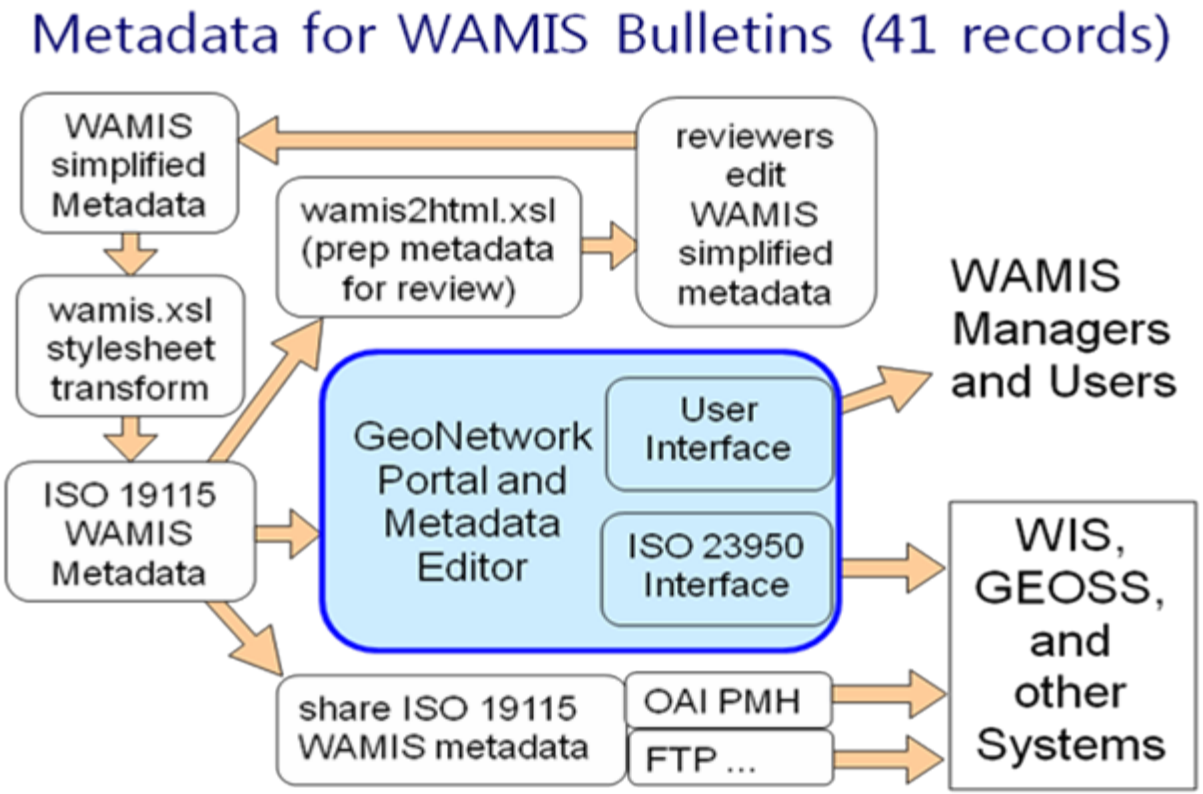
- T1 (S): Surface data
- T2 (M): Main synoptic hour
- A1A2 (KO): Korea, Republic of

The bulletin collects reports from stations:

Senbong, Samjiyon, Pungsan, Supung, Changjin, Kusong, Huichon, Sinpo, Anju, Yangdok, Nampo, Changjon, Sariwon, Singye, Ryongyon, Kaesong and Pyonggang

[click here to view metadata]

Schematics of WAMIS metadata service



WAMIS Grid Portal (CAgM)

A Step for WIS beyond WMO

- BACKGROUND & GOALS
- GRID IMPLEMENTATION
- METADATA IMPLEMENTATION
- OTHER INVOLVEMENTS
- ISSUES TO CONSIDER
- **Recent Implementation**

On-going implementations

Vxep lvvlrq#ri#wkh#dssdfdwlrq#ru#Z LV0GFSF#ghglfdwhg#wr#Z DPLV

- Collaborations with associated institutions in implementations
- Restoration of WAMIS mirror server at KMA with advanced network (Giga bit)
- Development of prototype user interface for Grid Portal
- Case study on linkage between NWP output and Applications
- Downscaling of NWP output to meet requirements from AgModels

Vhfxulqj#FW#hvrxufhv#wr#vxssruw#Z JS#ru#hvrxufh#vkdulqj

- Agreement on ICT resource support by KISTI for CAgM
- KREONET (Giga LAN) was linked without any charge to NCAM
- Linux Clusters and other computer resources will be arranged when needed
- High volume of information storage will be provided with DBMS
- Plan to make MoU among CAgM/KISTI/NCAM

On-going implementations

P reld}lqj#Djulfxowxudo#p rgho v#dqg#lqvwuxp hqw#dydlodeh#ru#F DjP #dfwlylwlhv

- DWD & KMA have a bilateral agreement on AMBER
- Prof. Hoogenbum agreed on joint development of DSSAT as an open source
- NARC/Japan is willing to provide JAVA based AgModels, MetBroker, FieldServer

Mrlqw#W#wudlqlqj#surjudp #lq#DjurP hwhrurorj|#ru#fdsdflw|#exloglqj

- KOICA is going to support for the expanded AgMet ICT training course
- RTC-Nanjing and NCAM will work together for future joint training programs
- Seoul National University will provide training experts and facilities relevant
- KMA is going to offer hosting of international training center for ICT training

National Center for AgroMeteorology

On-going implementations

Odxqfk#ri#h{sdqghg#Q dwlrqdo#F hqwhu#ru#D jurP hwhruroj | dv#d#udp hz run

- Four institutions (KMA, RDA, FA, SNU) made MoU for closer collaborations in AgMet
- Expanded NCAM was launched as of 12 Nov at Seoul National University
- NCAM will give an emphasis on strengthening education & training program initiatives
  - Dedicated division is included within NCAM umbrella
  - Core ICT technologies will be developed based on IT infrastructure
    GIS, RS, Models, etc.

Tentative schedule (~2011)

Ixuwkhu#p sdp hqwdwlrq#ri#Surwrw|shv#rq

Iqwhudfwlyh#Z DP IV#Julg#Sruwdo

- Ghp rqvwudwlrq#ri#Z DP IV#Julg#Sruwdo#dw#vhp lOrshudwlrqdo#hyho
- Hvwdeodvkp hqw#ri#ghglfdwhg#J IVF2GFSF#z lwk#Z IV#vwdqgdugv#
- R shq#wr#p hp ehu#frxqwulhv#dw#rshudwlrqdo#hyho