

# Operational use of space-derived geospatial data: the key role of GEOSS

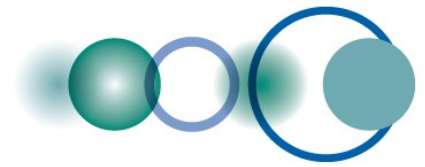
**Giovanni Rum,  
GEO Secretariat**

**COPUOS**

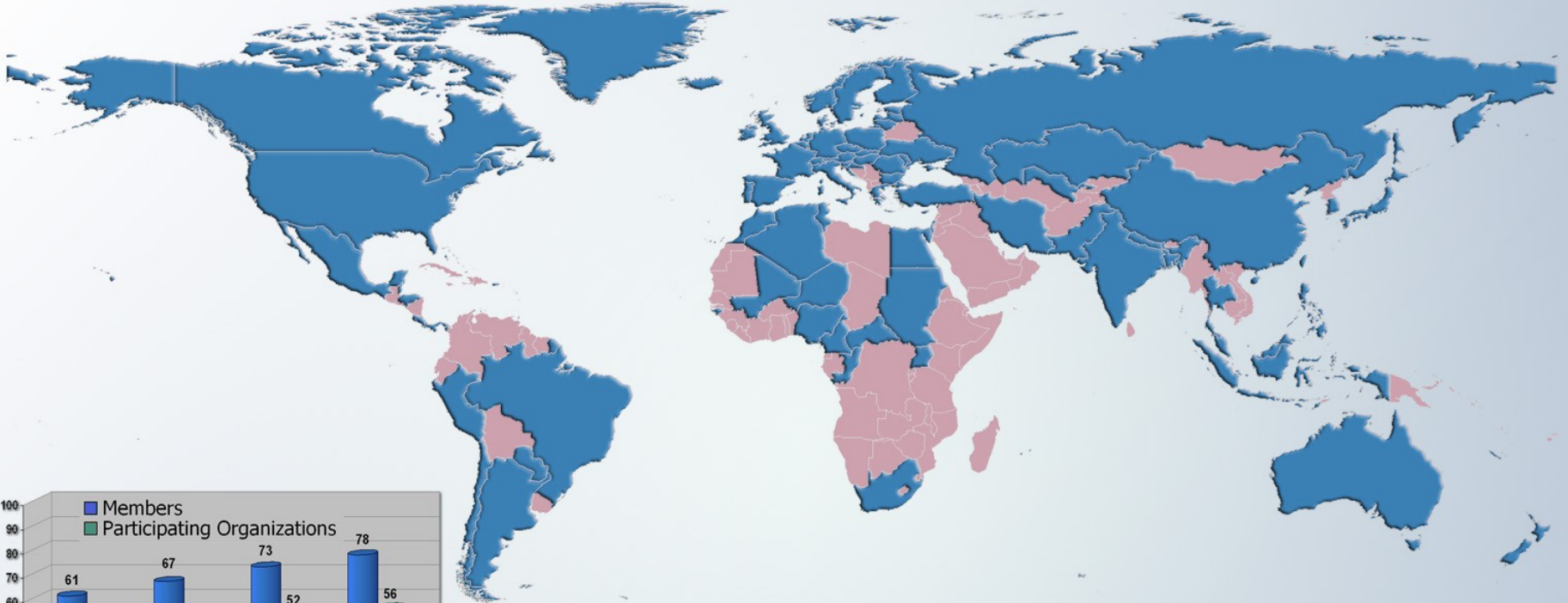
**52nd Session – Vienna**

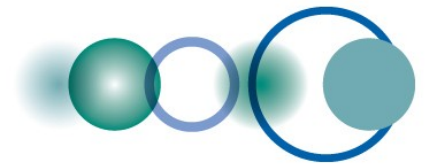
**June 2009**





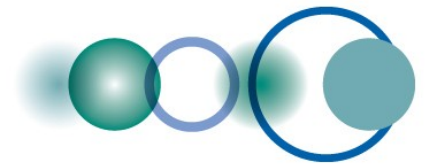
78 Members  
56 Participating Organizations



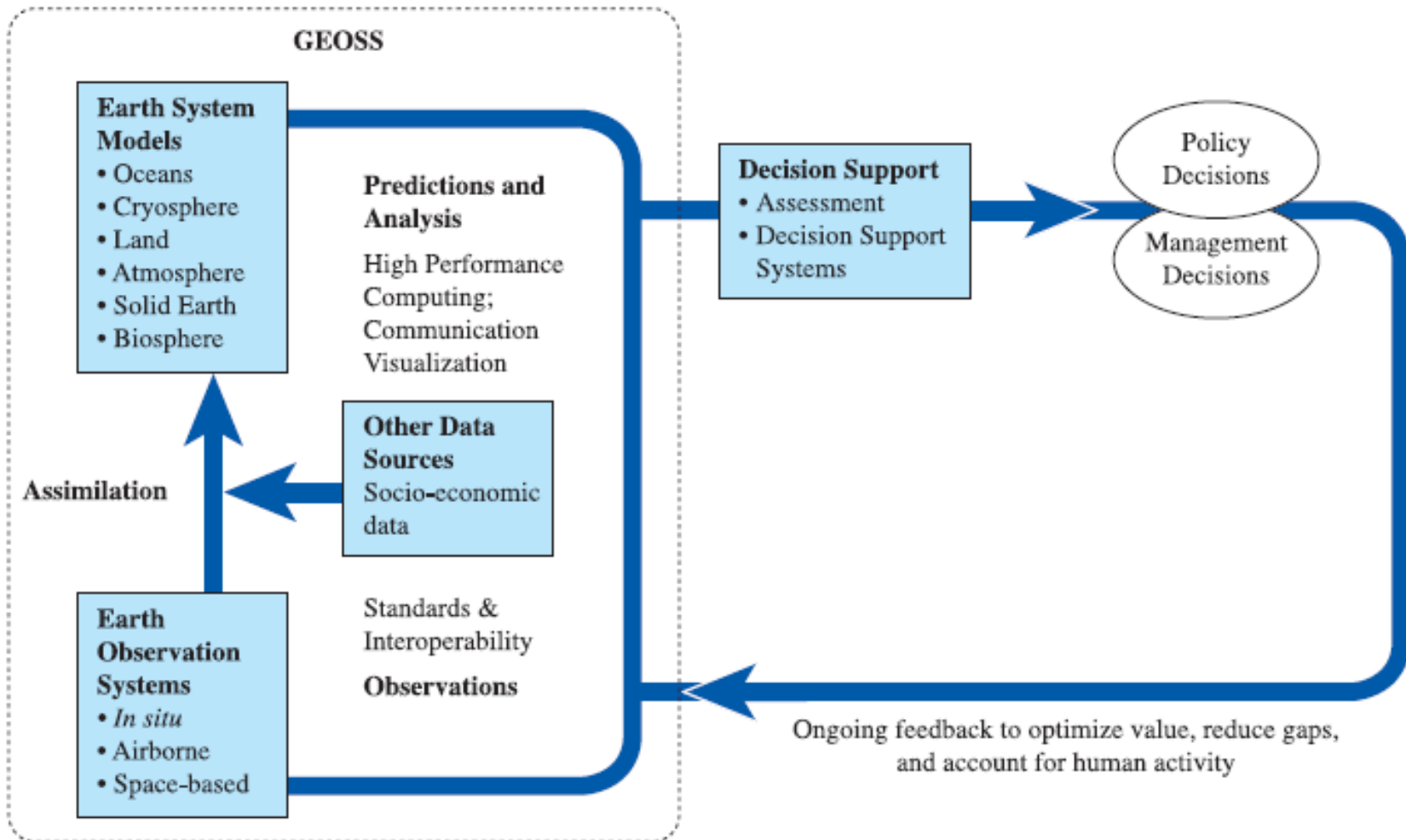


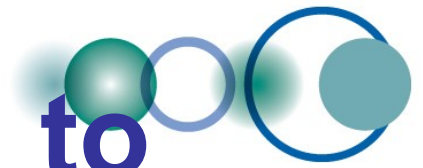
## THE GLOBAL EARTH OBSERVATION SYSTEM OF SYSTEMS



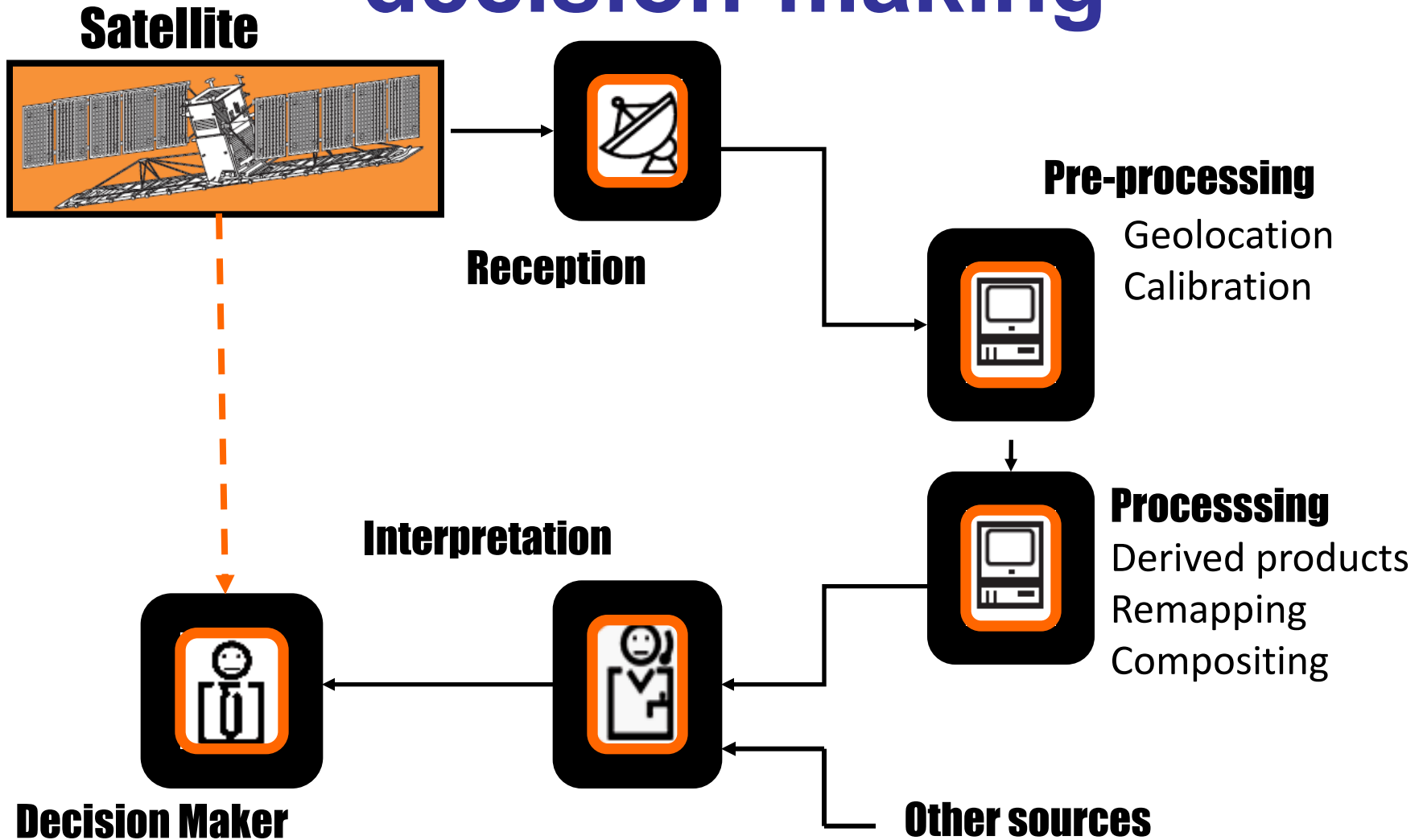


# GEOSS in the User process

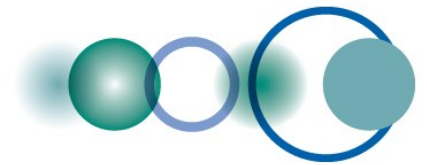




# From satellite data to decision-making

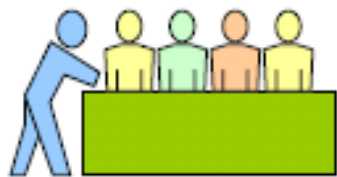






# How GEOSS will support operational use of geospatial data

- Providing access to data, by developing the infrastructure and defining associated policies
- Providing the framework to ensure coordination of correlated activities worldwide, thus ensuring development of consistent, easily searchable data sets
- Facilitating development of new and improved applications
- Ensuring continuity of observations and of datasets availability



Standards and Interoperability Forum

### GEOSS Common Infrastructure

#### Registries

GEOSS Component and Service Registry

GEOSS Standards and Interoperability Registry

Best Practices Wiki

User Requirements Registry

Registration

Concept of Operations

Guidance Documents (e.g. Strategic, Tactical...)

Others Documents (e.g. Usage Statistics)

Main GEO Web Site

Web browser

Applications

User

GEO Web Portal

GEOSS Clearinghouse

Unregistered Community Resources



Web pages



Documents

*Clearinghouse provides means to connect to registered services via metadata from catalogues*

Registered components and services



Websites/ Portals (Components)



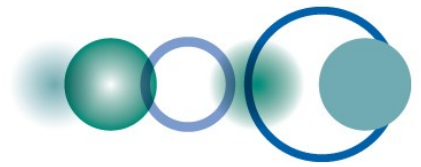
Services



Data and Service Catalogues

Catalog queries





HOME
ABOUT GEOPORTAL
CONTACTS
NEWS
MAP VIEWER

go
ADVANCED SEARCH
DOWNLOAD GEOPORTAL
ABOUT GEO

**BROWSE RESOURCES BY SOCIAL BENEFIT AREAS**

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

**GEOSS CLEARINGHOUSE**

px | English

North America  
Europe  
Asia  
Africa

zoom -


Key

**BREAKING NEWS**

**FLOODING IN BOLIVIA**

Heavy rains are causing serious damages in communities living in bordering areas of the main rivers in lowlands and valleys, namely Cochabamba, Santa Cruz, Chuquisaca, La Paz, Potosi. According to weather forecasts by the National Meteorological Service (SENAMHI) rains will continue until March. So far, 27 deaths and 4 missing persons were reported.

[More...](#)

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**WELCOME TO GEOPORTAL**

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

**CAPACITY BUILDING**

[GEONETCAST](#)

**FOCUS ON**

**GEO and ITU join forces on Earth observation satellites, emergencies and capacity building**

**SHOWCASE**

**Flood in the United Kingdom, July 2007**

Following the severe flooding that had affected the central and northern parts of England in the end of June and the beginning of July, the South-west of England and Wales have been hit by severe weather again, with flooding affecting thousands of homes and leaving many without water and electricity. The areas worst affected include the counties of Gloucestershire, Oxfordshire and Berkshire, Hereford and Worcestershire.

[More...](#)

## Sample pages

HOME
ABOUT GEOPORTAL
CONTACTS
NEWS
MAP VIEWER

go
ADVANCED SEARCH
DOWNLOAD GEOPORTAL
ABOUT GEO

**BROWSE RESOURCES BY SOCIAL BENEFIT AREAS**

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

**GEOSS CLEARINGHOUSE**

Browsing for: Disasters

**DISASTERS**

Information Services (91) View All

- [Early warning \(4\)](#)
- [Monitoring services \(20\)](#)
- [Analysing services \(2\)](#)
- [Mapping services \(5\)](#)
- [Assessment services \(6\)](#)
- [Alert systems \(3\)](#)
- [Geospatial web services \(12\)](#)
- [Data processing \(0\)](#)
- [Data Provision \(39\)](#)

Showcase of Datasets (10) View All

- [Layers \(0\)](#)
- [Maps \(10\)](#)

**RECENT CHARTER ACTIVATIONS**

- Flooding in Bolivia
- Volcanic eruption in Ecuador
- Floods in southern Africa

— IMAGES —

**DISASTERS**

- [Pollution Events](#)
- [Coastal Hazards](#)
- [Sea and Lake Ice](#)
- [Tropical Cyclones](#)
- [Extreme Weather](#)
- [Flood](#)
- [Landslides](#)
- [Volcanoes](#)
- [Earthquakes](#)
- [Wildland Fires](#)

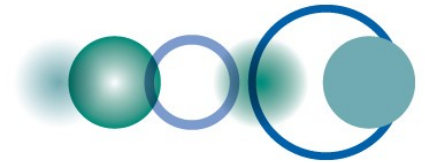
**International Initiatives (8)** View All

- [Asian Water Cycle Initiative](#)
- [EGY - Electronic Geophysical Year](#)
- [GNES \(Global Monitoring for](#)

**Service Providers (65)** View All

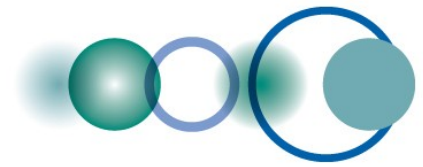
- [UN Org's \(12\)](#)
- [Coordination Bodies \(7\)](#)
- [International Org's \(10\)](#)
- [National Org's \(12\)](#)
- [Space Agencies \(11\)](#)
- [Research Centres \(13\)](#)
- [NGOs \(0\)](#)
- [Private Companies \(0\)](#)





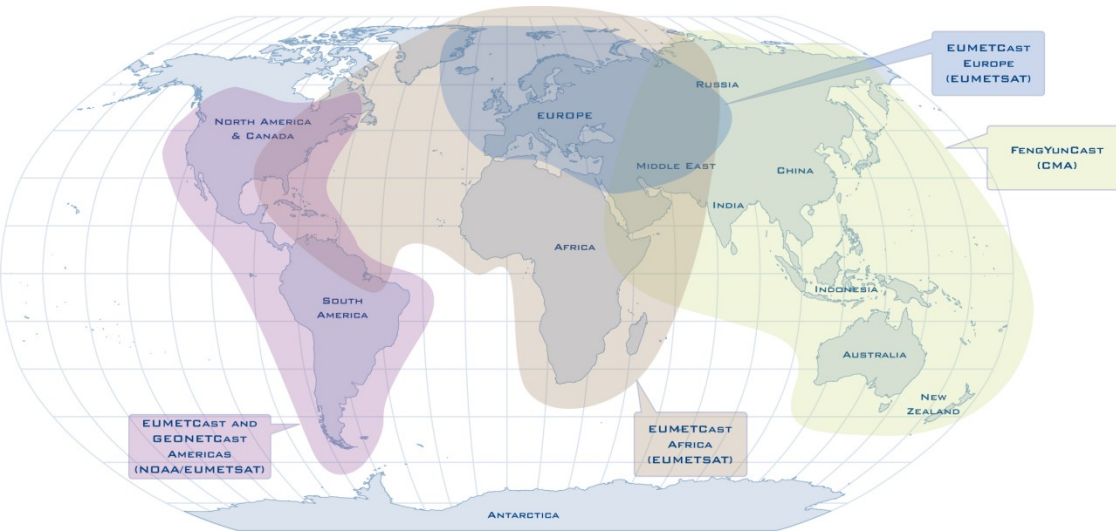
# Three prototype Portals

Compusult	<a href="http://www.geowebportal.org/web/guest/home"><u>http://www.geowebportal.org/web/guest/home</u></a>
ESA - FAO	<a href="http://www.geoportal.org/"><u>http://www.geoportal.org/</u></a>
ESRI	<a href="http://keel.esri.com/Portal/"><u>http://keel.esri.com/Portal/</u></a>

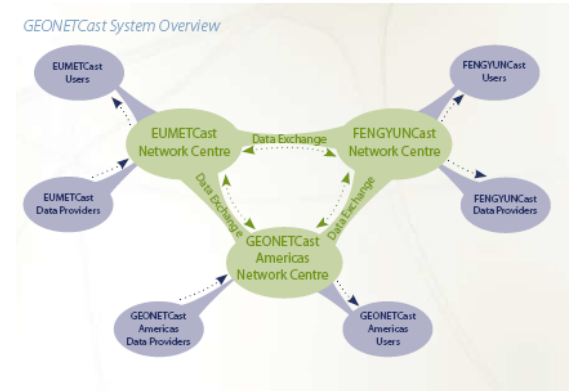


# GEONETCast

## USA, China, Russia and EUMETSAT



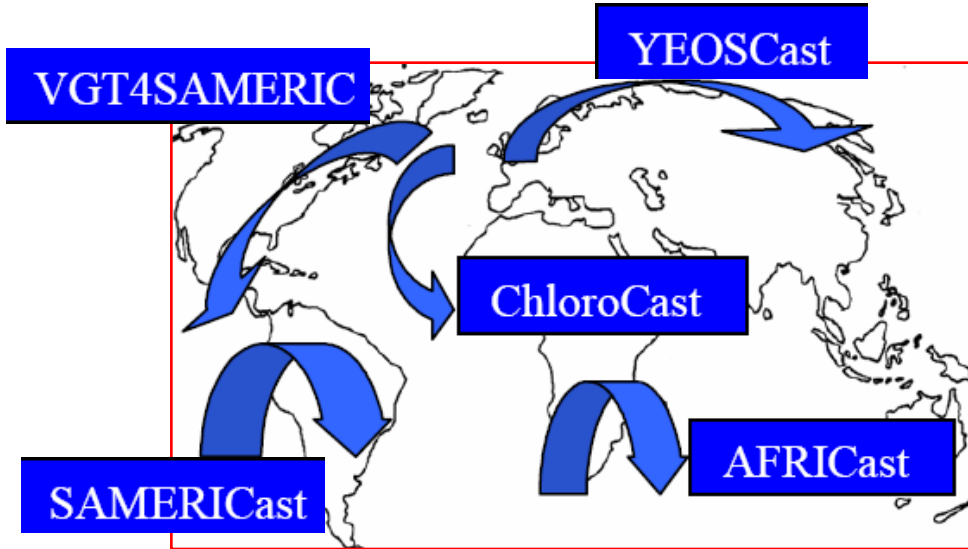
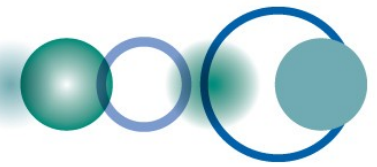
GEONETCast System Overview



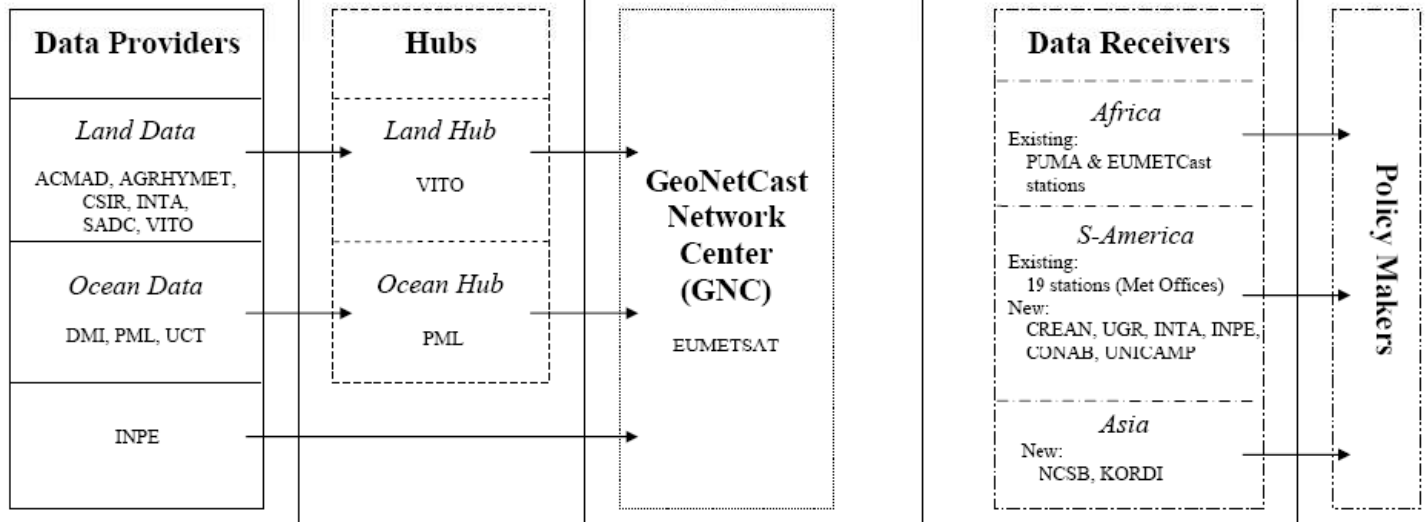
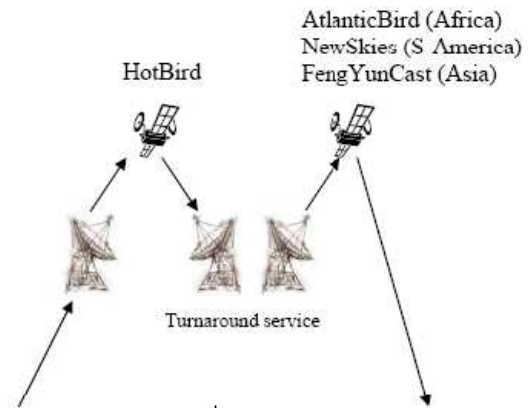
**Low cost, easy to operate user terminals**

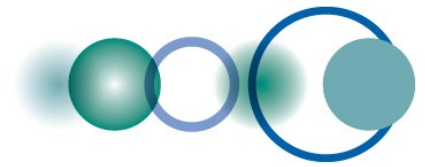
**Global Dissemination System to disseminate and provide easy access to space-based, air-borne and in situ data, metadata and products to Users from all Societal Benefit Areas.**

# GEONETCast concept implementation



## DevCoCast project-FP7

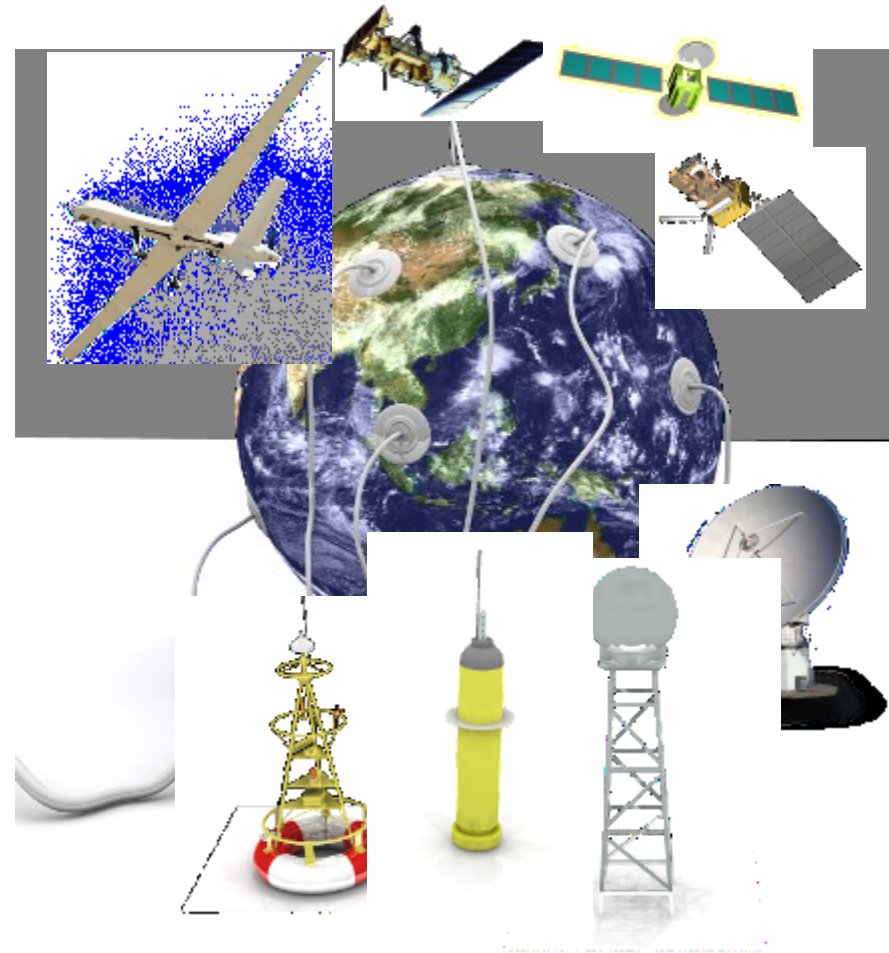




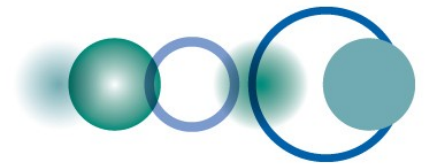
# GEO Data Sharing Principles

- Full and Open Exchange of Data, recognizing Relevant International Instruments and National Policies
- Data and Products at Minimum Time delay and Minimum Cost
- Free of Charge or minimal Cost for Research and Education

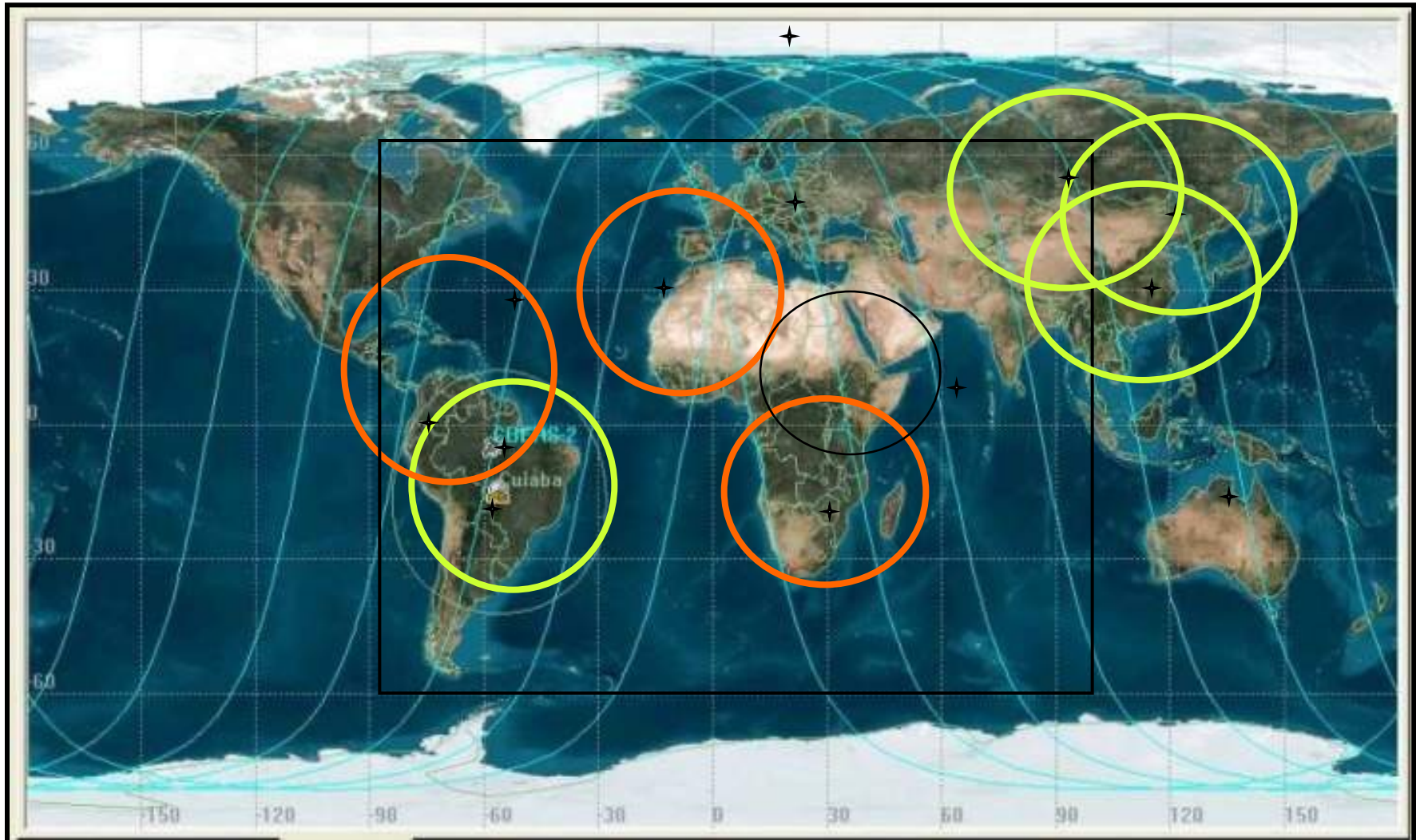
Data to be seen as an infrastructure, rather than a service

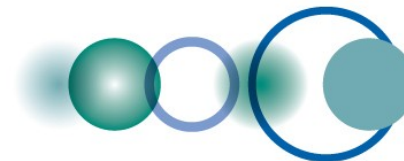






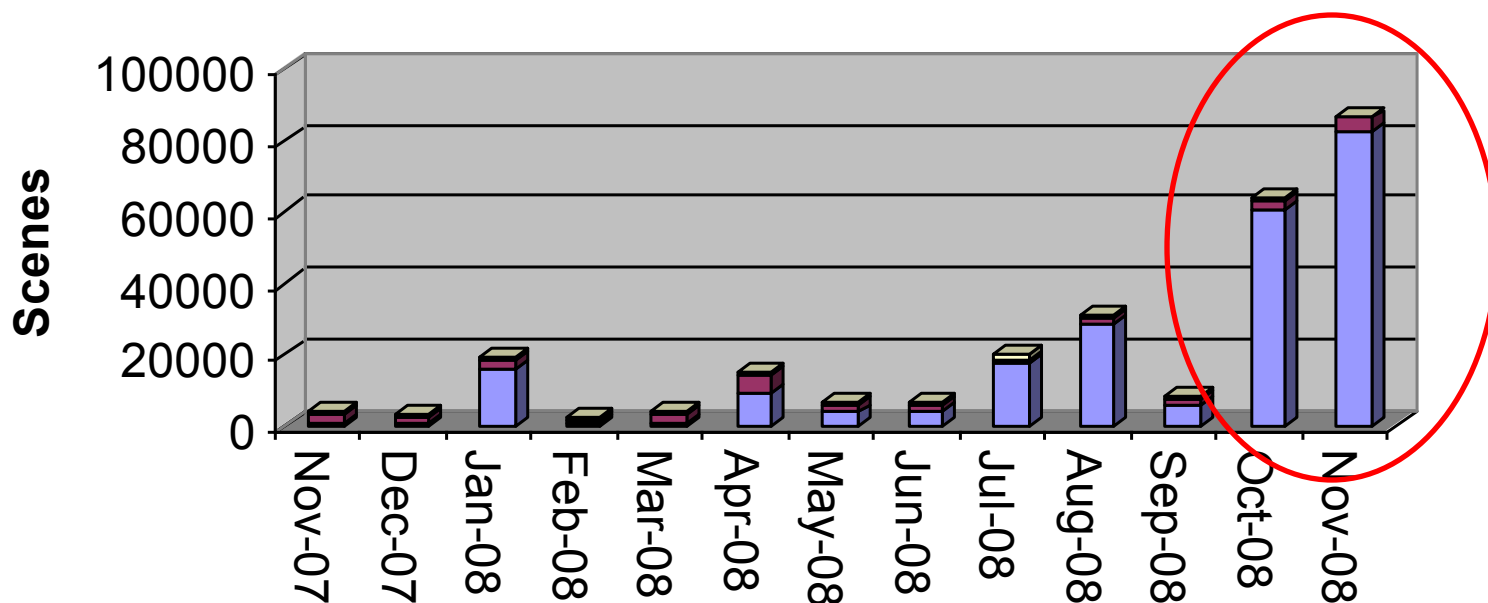
# CBERS-2B satellite data and products for Africa - Brazil and China



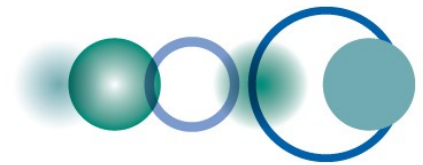


# Total Landsat Data Distribution

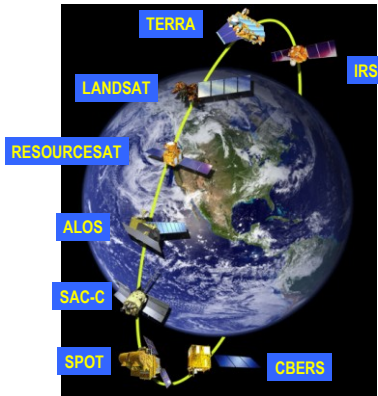
## Landsat Data Distribution



■ Landsat Free Downloads ■ Other Landsat Web-enabled Downloads ■ Landsat Products Sold



# Land Surface Imaging Constellation LSI



LSI Portal - Windows Internet Explorer

http://wgiss.ceos.org/lisp/satellites\_midres1.shtml

## CEOS Land Surface Imaging Constellation Portal

for  
Mid-Resolution Optical LSI Satellite System Information and Enhanced Data Access

Home CEOS LSI About LSIC About Portal Contact

**Overview**

- CEOS Agency Mid-Resolution Optical Satellite Systems

**Satellites**

- Satellites & Sensors
- Status & Launches
- Orbit Information

**Sensors**

- Band Information
- Visible & NIR Bands
  - SWIR Bands
- Thermal Bands
- Panchromatic Bands
- Hyperspectral Bands
  - Radiometric & Geometric Characteristics
  - Geographic Characteristics

**Data**

- Data Access
- Documentation

**CEOS Agency Current and Former Mid-Resolution Optical Satellites & Sensors**

Satellite	Sensors	Agencies
ADEOS-1	AVNIR-1	JAXA
ALOS	AVNIR-2	JAXA
CBERS-1	HRCC, IRMSS	CAST, INPE
CBERS-2	HRCC, IRMSS	CAST, INPE
CBERS-2B	HRCC	CAST, INPE
EO-1	ALI, Hyperion	NASA, USGS
IMS-1	MX-T	ISRO
IRS-1A	LISS-I, LISS-II	ISRO
IRS-1B	LISS-I, LISS-II	ISRO
IRS-1C	LISS-III A	ISRO
IRS-1D	LISS-III A	ISRO
IRS-P2	LISS-III A	ISRO
IRS-P6	LISS-III B, AWiFS	ISRO
JERS-1	OPS	JAXA
Landsat 1	MSS	NASA, USGS
Landsat 2	MSS	NASA, USGS
Landsat 3	MSS-B	NASA, USGS
Landsat 4	MSS, TM	NASA, USGS
Landsat 5	MSS, TM	NASA, USGS
Landsat 7	ETM+	NASA, USGS
SAC-C	HRTC	CONAE
SPOT-1	HRV	CNES
SPOT-2	HRV	CNES
SPOT-3	HRV	CNES
SPOT-4	HRVIR	CNES
SPOT-5	HRG	CNES
Terra	ASTER	METI, NASA
THEOS	MS	GISTDA

Start | G. Bryan Bailey - Inbox... | Data Availability & Acces... | Characteristics of LSI Sa... | LSI Portal - Windows... | 5:08 AM

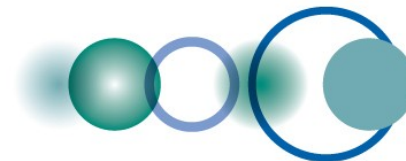




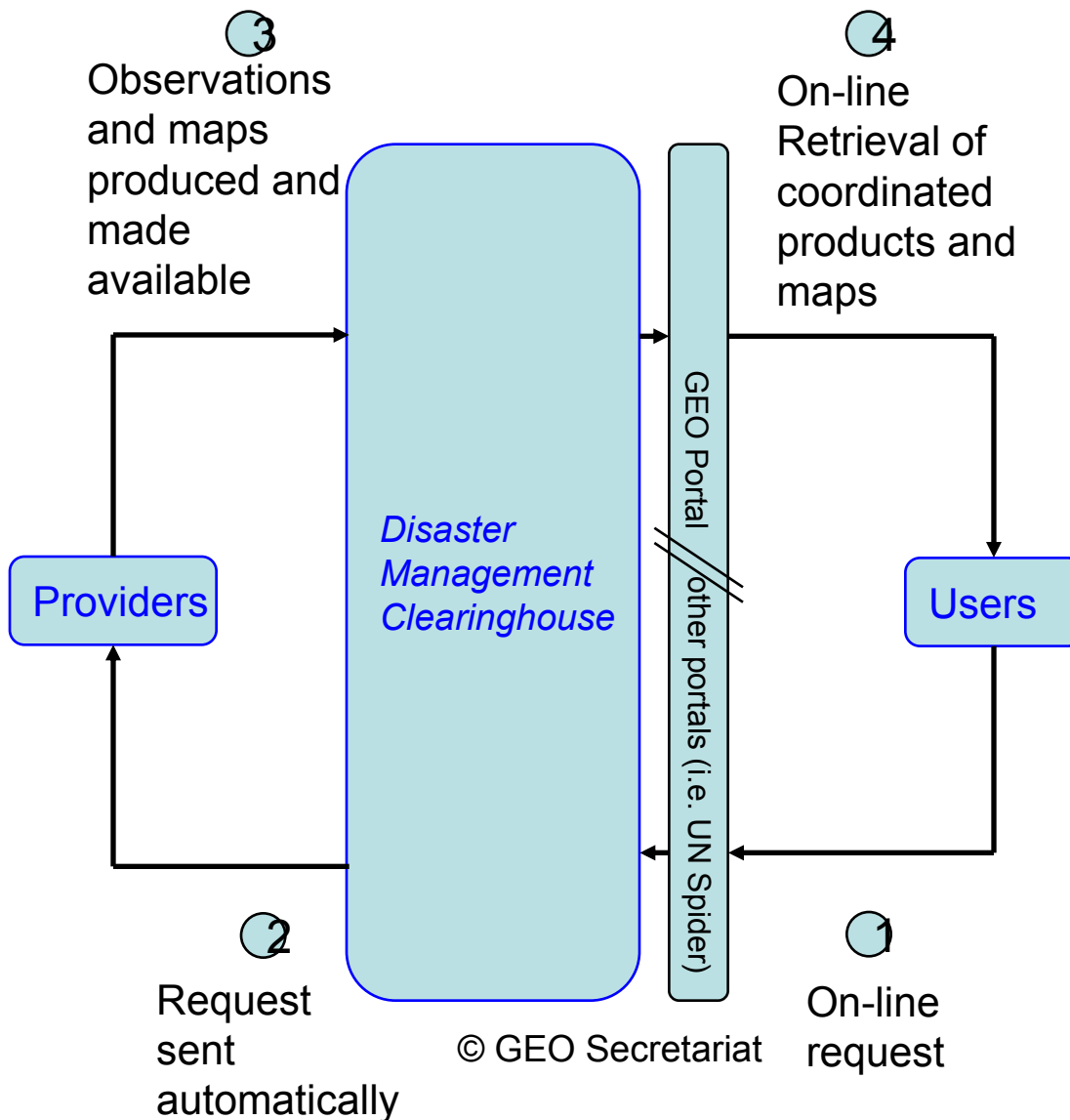
# Regional Data Set Compilation Areas

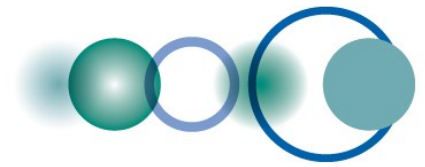




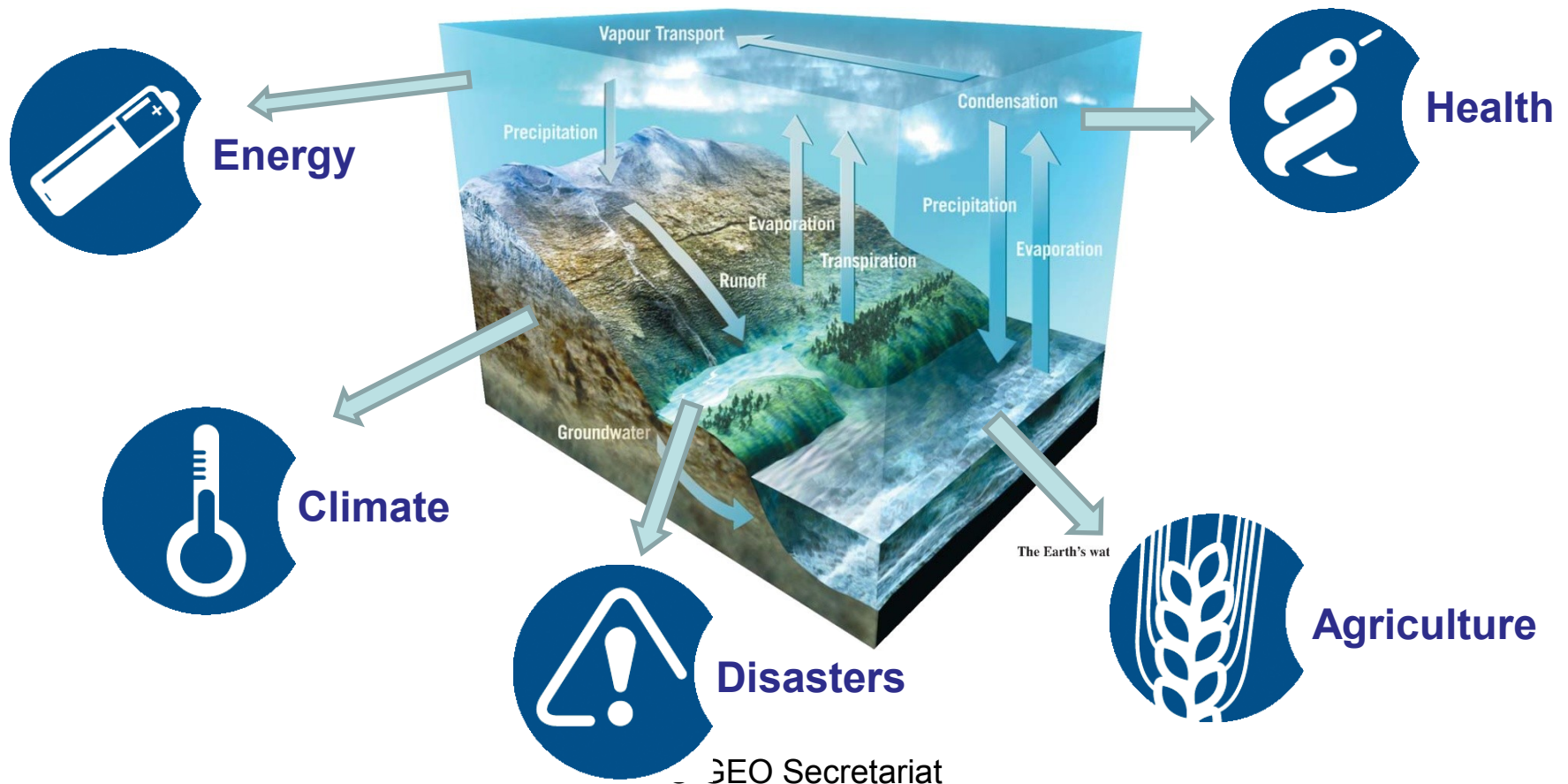


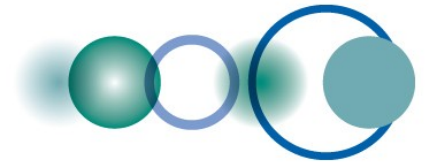
## Management Clearinghouse





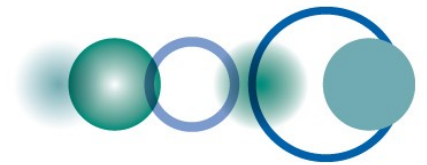
# Integrated Water Cycle Management: A cross-cutting issue.



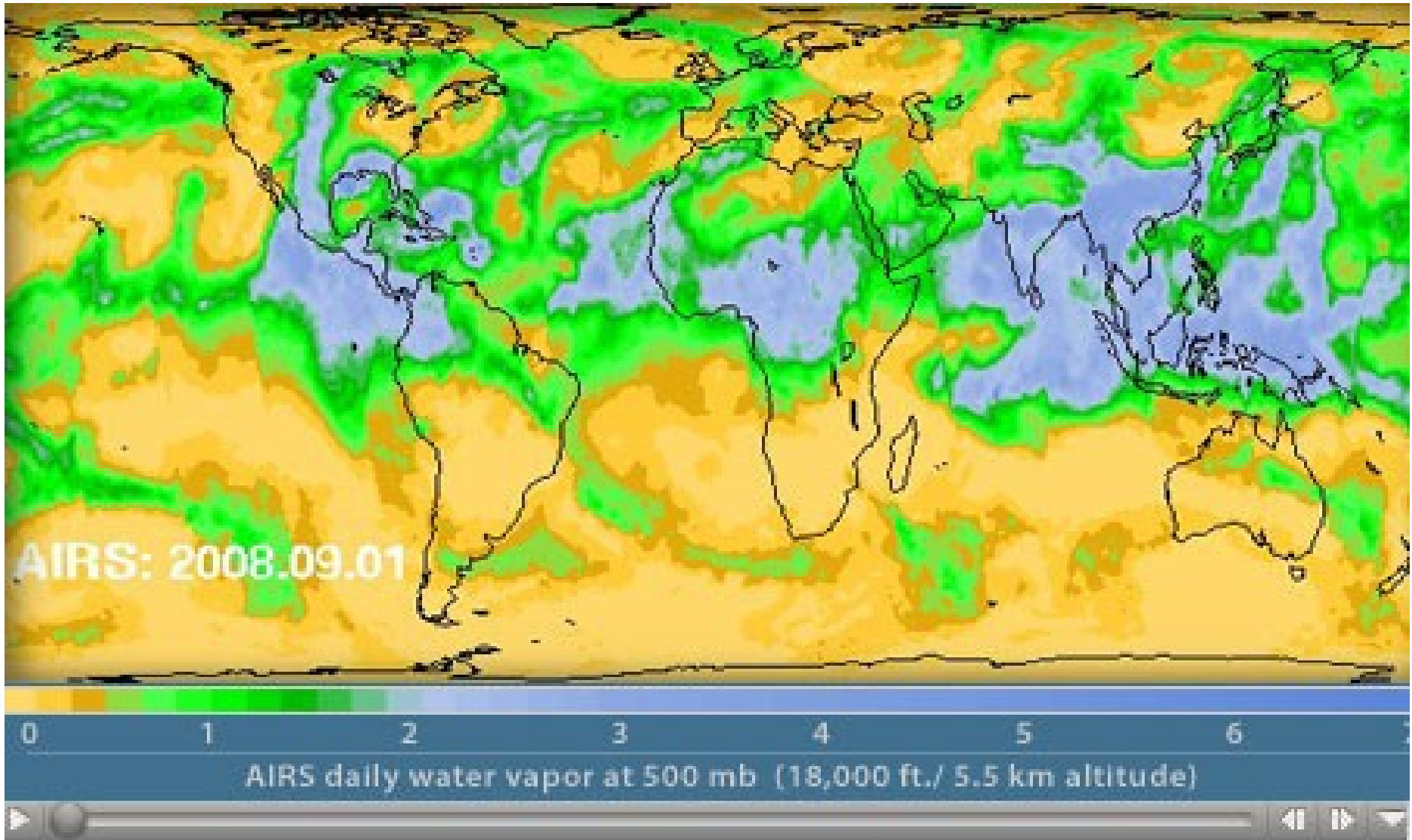


# Integrated observations for monitoring the water cycle

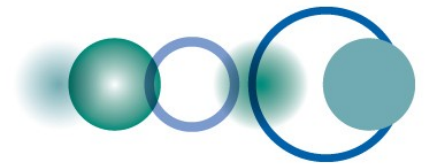
- Combining observations from various disciplines, nations and organizations such as:
- **water vapor (IASI, AIRS);**
- **precipitation (TRMM, GPM);**
- **gravity field** changes measured by the GRACE (NASA/DLR) satellite reflecting the redistribution of subsurface water masses stored on continents;
- level of lakes and rivers measured by **altimetry** satellites Jason (CNES/NASA/EUMETSAT/NOAA) and Envisat (ESA); and
- **observations** from networks of in-situ water discharge and run-off stations.



# AIRS daily atmospheric water vapor...

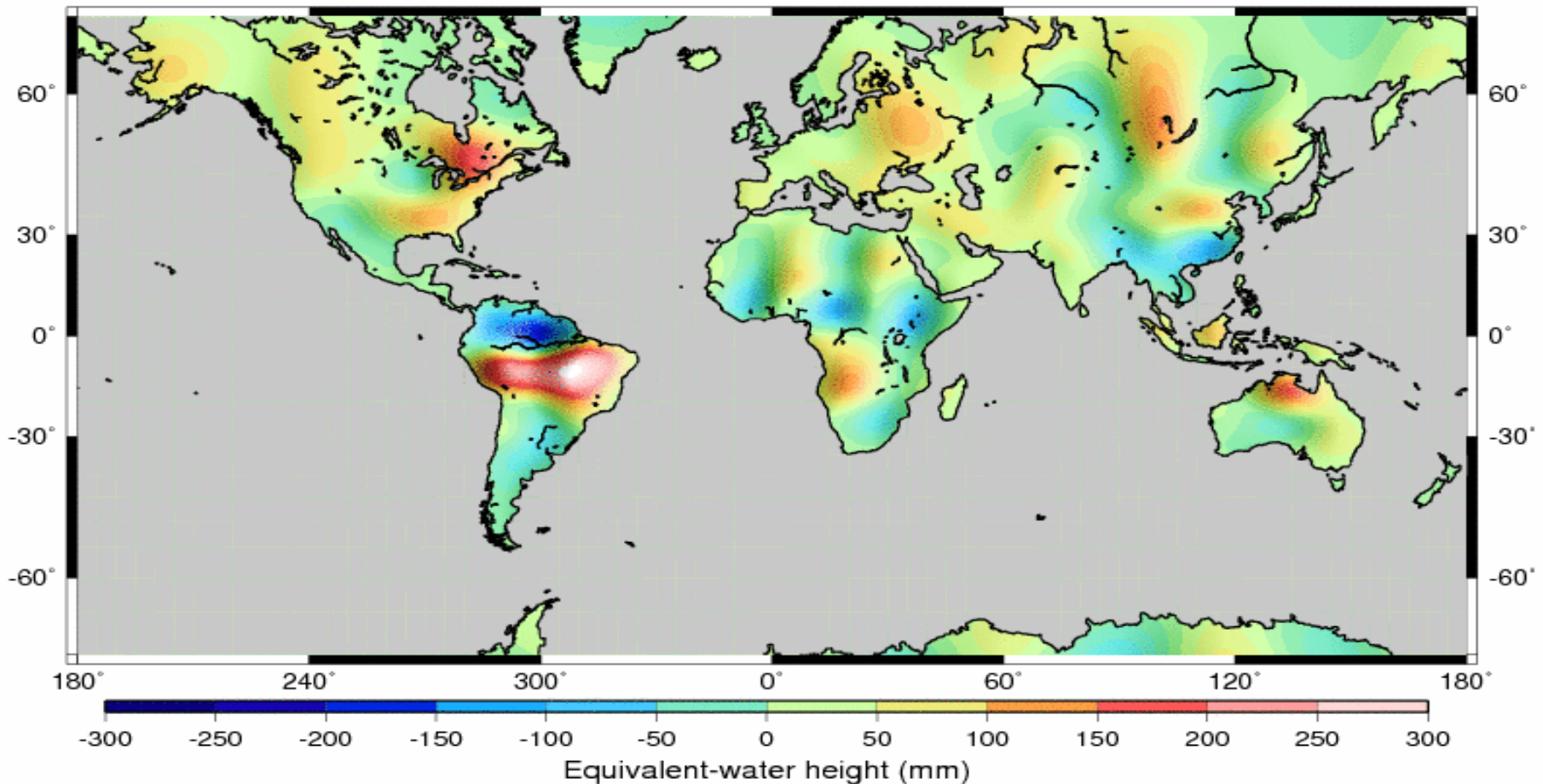






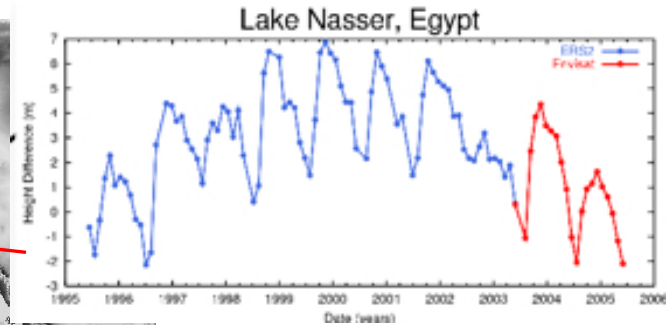
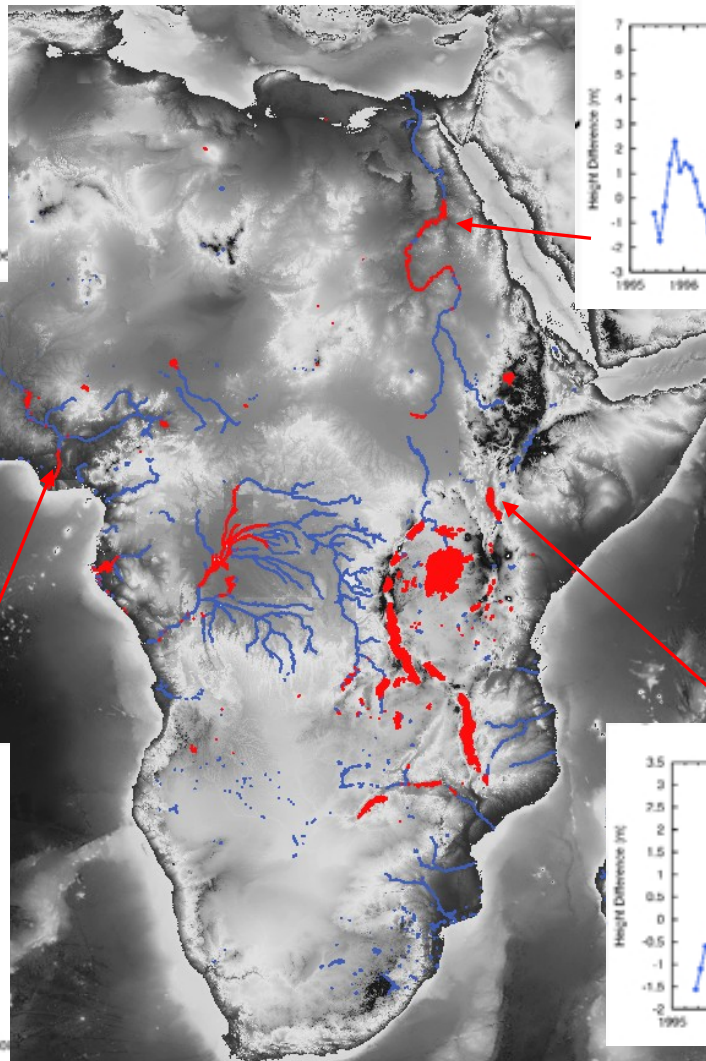
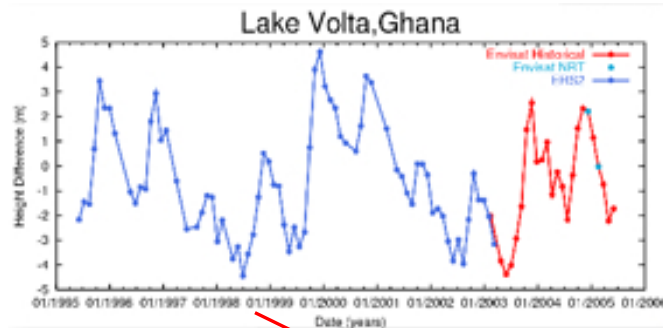
# ...plus GRACE subsurface water estimates...

GRACE LW SOLUTION --- FEB 2004 --- DEG=25-30 --- 5 ITERATIONS



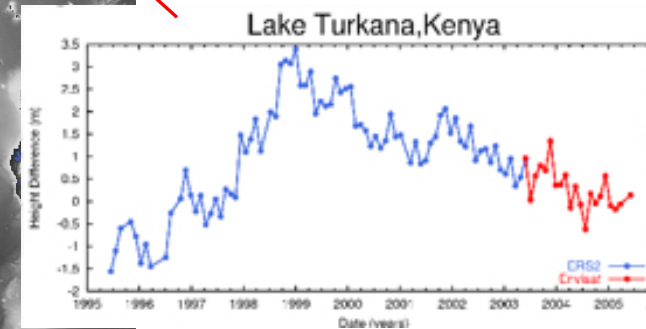
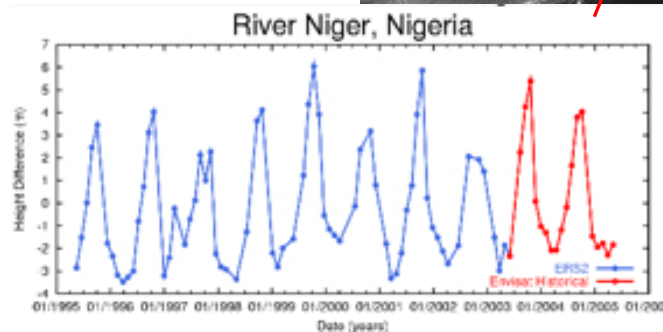


# ...together with space observations...



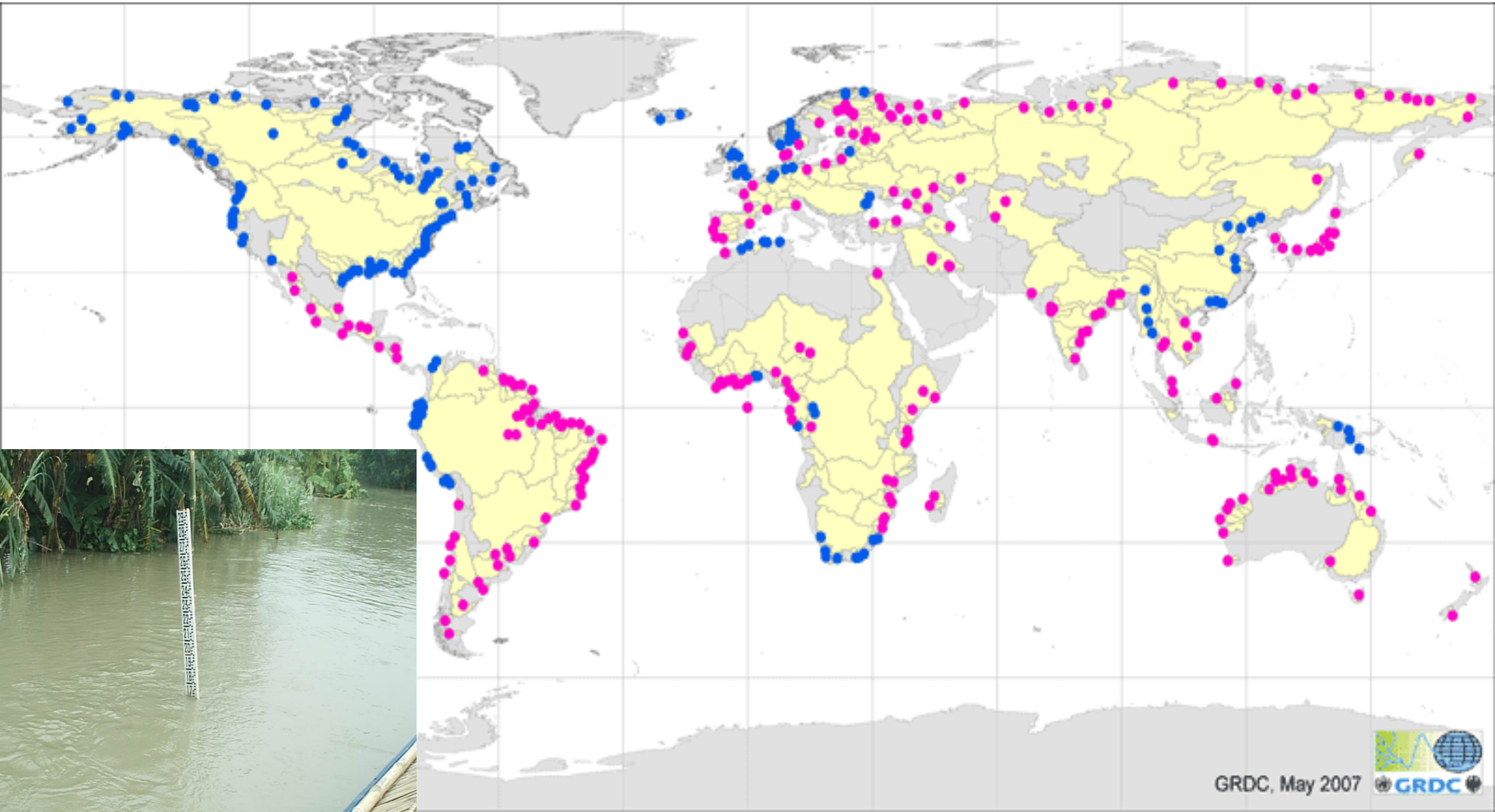
Red indicates area where NRT products are currently generated

Blue indicates area where products may be generated in the future.

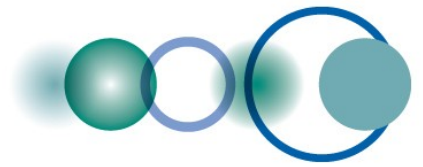




# ... integrated with upgraded in-situ stations (river discharge)



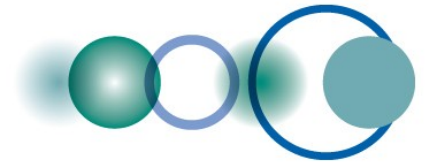




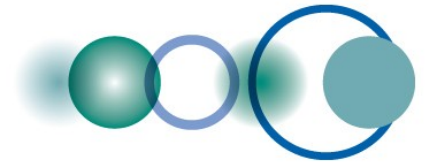
*Map of virtual stations over large rivers and wetlands in «Hydroweb»*







# **Develop GEOSS for AFRICA through the Coordination of International Initiatives**



- SERVIR – Africa, in cooperation with RCMRD
- Sand and Dust Storm Warning System
- Global Wildland Fire Early Warning System – African Component
- Puma, AMESD and GMES Africa
- GEOBON – GEO Biodiversity Observation Network
- AEGOS – Geological Resources for Africa
- GLOBE program, Capacity Building and Research
- TIGER - Towards an African Water Observation System
- SoDa - Solar Data for Developing Countries
- MERIT- Meningitis Environmental Risk Information Technologies
- Evaluating African Protected Areas
- ClimDev Africa - Climate for Development in Africa Programme
- ChlorOGIN Building a Chlorophyll Ocean Global Integrated Network
- GeoAFRICA

# SERVIR Africa (under development)

File Edit View History Bookmarks Tools Help

http://www.servir.net/africa/

BBC IHT Edicom igwco wmo wmo-portal GTN-R Google Translate

## SERVIR

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search...

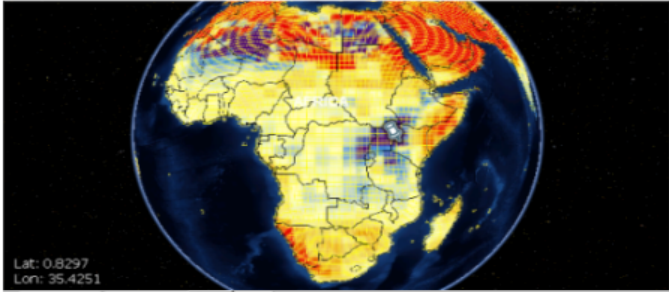
### The SERVIR-Africa website is under development.

Over the next few weeks, we will continue to add new content and functionality. Please check back soon, or [sign up](#) to receive notification of changes.

#### Coming Soon - Online Map Tools

Featured Map Viewer 2D Viewer 3D

Title: **SERVIR-Viz Climate Mapper** [More info...](#)  
Source: SERVIR  
Date: Future decadal scenarios



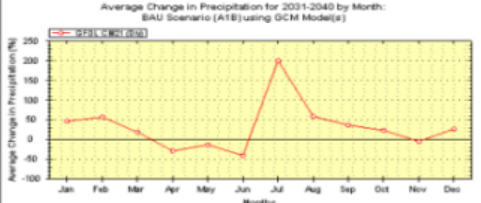
Lat: 0.8297  
Lon: 35.4251

Choose Theme | Set Parameters | Graph | Map

Location:  
Lat: 0.8297  
Lon: 35.4251

Average Annual Change in Precipitation (30Dy) = **+53.5**  
Average Annual Change in Precipitation (30Mid) = **-2.1**  
Average Annual Change in Precipitation (30Wet) = **+16.7**

Average Change in Precipitation for 2031-2040 by Month:  
BAU Scenario (A1B) using GCM Model(s)



Month	Average Change in Precipitation (%)
Jan	0
Feb	10
Mar	0
Apr	-10
May	0
Jun	-10
Jul	180
Aug	10
Sep	0
Oct	0
Nov	-10
Dec	0

Actions:  
Close Map  
Opacity: [Slider]  
--- OR ---  
Graph by XY Location  
Cancel  
Show Spatial Average Grid  
Show Country Boundaries  
Export Graph

#### SERVIR Mission

*Enabling the use of Earth observations and predictive models for timely decision making to benefit society*

#### Latest Community News

- [Latest SDI-Africa newsletter \(January 2009\)](#)
- [Launch of African Soil Information Service \(AfSIS\)](#)
- [Lake Chad Basin Commission advancing geospatial data infrastructure](#)
- [Artificial light causing night time stresses to coral reefs](#)
- [University Buea \(Cameroon\) Remote Sensing Centre goes operational](#)

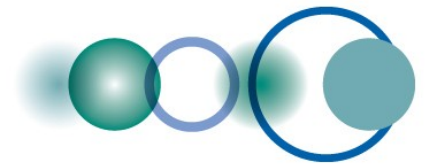
[More...](#)

#### Latest SERVIR News

- [Introductions to SERVIR-Africa facility](#)
- [SERVIR-Africa launches at RCMRD](#)
- [East and southern African Land Ministers put their support behind SERVIR-Africa](#)
- [Use of NASA satellite rainfall data for flood modeling](#)
- [SERVIR-Africa team members to attend AARSE 2008](#)

[More...](#)

Done



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Decision  
Makers

Media

Educators

Students

Private  
Industry

**SERVIC**

Your "one stop shop" for regional data, dynamic maps, decision support, and interactive visualizations

English

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**VIDEOS DE SERVIC**

**Pulsa sobre la imagen para ver el video.**

Video de SERVIC 2007

First 21 Named Storms of 2005, Atlantic Hurricane Season

Una visión del futuro (18.2 MB).

Video Tierra ceniza...o bosques saludables

**Welcome to SERVIC.net**

Mesoamerica Today, Tuesday, Apr. 22, 2008

[Go to SERVIC Realtime Image Viewer](#) | [View GOES Images of A Specific Country](#)

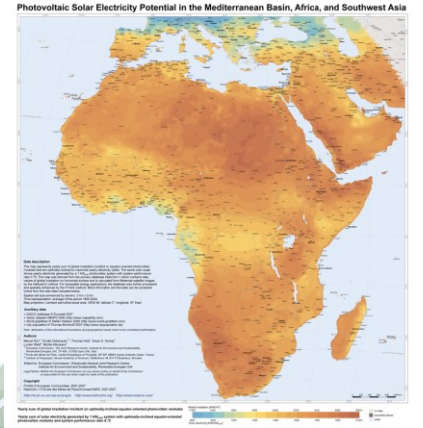
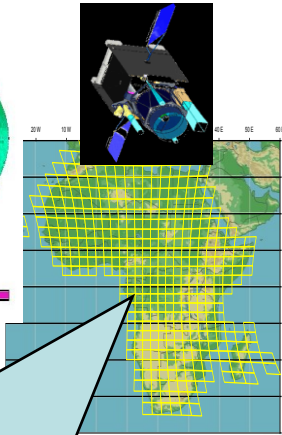
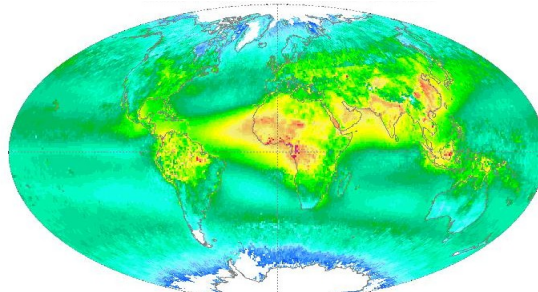
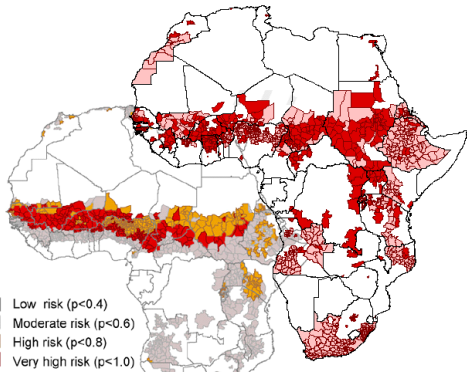
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**Last GOES image**

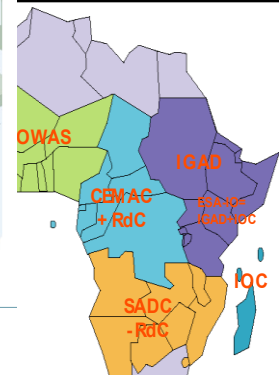
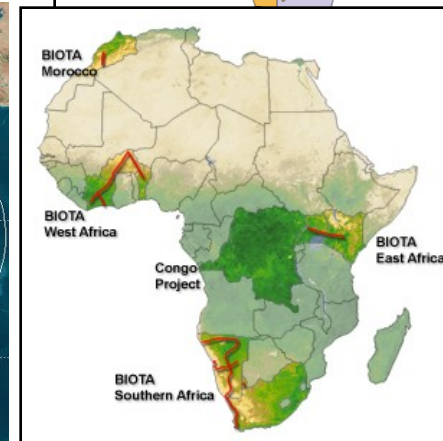
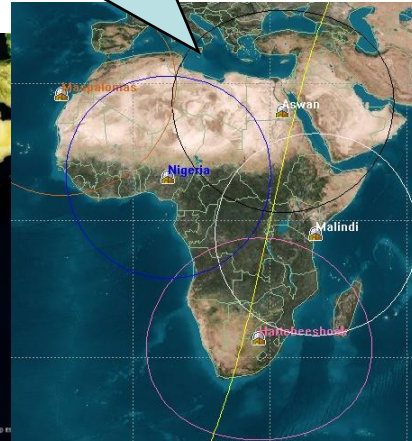
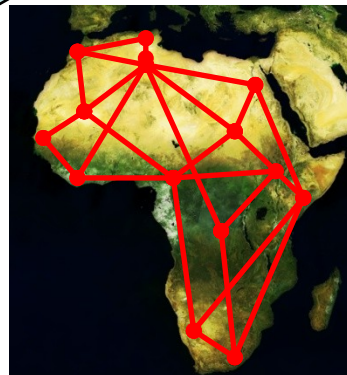
23 Apr 2008 01:15 UTC

**Partners:** NASA, CATRALAC, USAID, CCAD





THE GLOBAL EARTH OBSERVATION SYSTEM OF SYSTEMS



**Thank you!**

**Giovanni Rum**  
**[grum.geosec.org](http://grum.geosec.org)**

