Mapové zdroje
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1. GEO a GEOSS

2. Global Map – Globální mapování

3. Geospatial Data Infrastructure – Geoprostorová datová infrastruktura

4. Digital Earth – Digitální (planeta) Země

5. Future Earth - Budoucí Země

6. Naše projekty

GEO, GEOSS

Milan KONECNY

Introduction: responding to global challenges

Scientific understanding of the Earth system and its physical, chemical and biological components continues to improve every year. But ***more data is urgently needed for monitoring trends and predicting*** **how physical and ecological systems will evolve.**

As humanity places ever greater demands on the Earth's resources over the coming years and decades, a greater ability to understand global change and predict how natural systems will respond to human activities and policies becomes ever more vital.

Recognizing the need for better environmental information, political leaders at the 2002 World Summit on Sustainable Development in Johannesburg called for urgent action on **Earth observation**.

Earth observation summits in Washington, Tokyo and Brussels and declarations by three of the annual Group of Eight (G8) summits built on this momentum.

Acting on a clear international consensus, **Ministers established GEO in 2005 with a mandate to build a Global Earth Observation System of Systems, or GEOSS.**

The **cross-cutting data, decision-support products and end-to-end information services**

that are increasingly available through GEOSS are improving the ability of governments to promote "green" economic growth, manage natural ecosystems and resources, ensure food security for a global population that may reach nine billion people by mid-century,

respond more effectively to disasters, and address climate change, biodiversity loss and other global challenges.

GEOSS
10-Year Implementation Plan

Agriculture.

Over the past three years, the Global Agriculture Monitoring Community of Practice has attempt to establish a **Global Agricultural Monitoring System of Systems.**

The GEO Joint Experiment on Crop Assessment and Monitoring (JECAM) has established seven pilot sites around the world to assess common data standards, cropland modeling methods, and future Earth observation requirements.

The Societal Applications in Fisheries & Aquaculture using Remotely Sensed Imagery (SAFARI) project has identified and promoted urgent actions to strengthen the application of satellite information to fisheries and aquaculture research and management.

Biodiversity.

Established in 2007, **the GEO Biodiversity Observation Network (GEO BON)** consists of dozens of government agencies and intergovernmental and international organizations.

Based on a regularly updated implementation plan, GEO BON coordinates the gathering of data and the delivery of information. One of
the first products was the Continuous Plankton Recorder Survey.

Other information Products based on GeoBon:

visualization tool for African protected areas and a number of directories of global datasets on freshwater biodiversity and ecosystems.

GEO BON’s role and importance have been recognized by the Convention on Biological Diversity, which has also requested that it prepare an evaluation of existing observation capabilities relevant to the targets contained in the Convention’s Strategic Plan for 2011-2020.

Climate.

The GEO Global Carbon Observation and Analysis System is now bringing together systems and experts that monitor carbon flows on land, in the oceans and in the atmosphere.

Particular progress has been made on establishing a Forest Carbon Tracking system, which has established at least 10 national or regional “demonstrators” with support from a coalition of governments and institutions.

Other important progress includes continued outputs by major data-reanalysis projects based in Europe, Japan and the USA; reinvigoration of efforts to reprocess various data, especially from space, into climate data records;

The 2010 update of the Global Climate Observation System (GCOS) Implementation Plan; the World Climate Research Programme's (WCRP) launch of two major modeling experiments (CMIP5 and CORDEX) to provide decade- and century-long climate predictions on global and regional scales; outputs from an intensive research programme to improve seasonal prediction worldwide; and the invigoration of the ClimDev Africa project with a $30 million grant from the African Development Bank.

Disasters.

A number of operational systems for supporting disaster response have made steady to strong progress. Collaborative ‘***’Supersites”*** have been established so that the scientific community can monitor and analyze volcanoes and earthquakes more rapidly and effectively; for example, Supersites have improved assessments of recent earthquakes in Haiti, China and Chile. SERVIR provides mapping and for disaster response and has assisted countries in Central America and the Caribbean to respond to hurricanes, earthquakes and other extreme events;

SERVIR is now in the process of expanding its support to other regions, notably Africa and the Himalayas.

Other advances include the **development and contribution to GEOSS of global, regional and national early-warning and detection systems for forest fires;**

improved access for GEO Members to the International Charter on Space and Major Disasters and the satellite data it provides for countries of South East Asia and Latin America and, soon, Africa; and ongoing observations and reports on floods, landslides and other disasters by Sentinel Asia.

Showcase: Better knowledge about geohazards

The Geohazard Supersites initiative is a global scientific collaboration that aims to improve scientific understanding of the risks of earthquakes and volcanic events in selected regions. The Supersites currently being addressed are L'Aquila, Chile, Etna, Haiti, Istanbul, Los Angeles, Naples (Vesuvius), Seattle/Vancouver and Tokyo.

The geohazard community is also working on establishing an earthquake Supersite for the disastrous 2008 earthquake in Wenchuan, China, to better understand China's worst disaster in the last 30 years.

The Supersites partnership consists of the providers of ground-based geophysical data, such as seismic and GPS data; space agencies, which provide satellite radar and other Earth observation data; along with scientists and decision makers who use and analyze these data.

The initiative provides a **cyber-infrastructure platform with a single web entry point that allows fast, easy and free-of-charge access to a complete satellite and ground-based geophysical data set derived from diverse sources and geophysical disciplines.**

The Supersites complement the International Charter on Space and Major Disasters, which provides imagery for search and rescue operations.

Ecosystems

- **Ecosystems. GEO has made important progress on developing a standardized, robust and practical classifica**tion and map of global ecosystems for terrestrial, marine, and freshwater environments.
- Ecosystem maps for South America, the US and Sub-Saharan Africa have been completed and are available as a framework for both researchers and managers. Global tree cover maps at 250m resolution are under development, and nearly
- 14,000 Landsat samples from 1990, 2000, and 2005 are being analyzed to detect changes in forested area
- for the benefit of forest resource managers.

Other ecosystem mapping projects continue to advance, such as

one on **ecosystem vulnerability to climate change, which includes the vulnerability of sea basins**

(notably the EnviroGRIDS project on the Black Sea) and of mountain regions.

Energy

- A number of data bases providing information on solar resources have been developed, including

  the European Solar Radiation Atlas, SoDa and Envisolar; efforts are ongoing to make these data bases fully comparable.

A service for siting solar power plants has been established to provide data on time-averaged values

of solar irradiance from which basic economic assessments can be made; in particular, the service supports the site selection process for large solar energy systems such as photovoltaic installations placed on open land.

The EnerGEO project is using satellite data and environment and energy models to make a global assessment

Of the current and future impact of the exploitation of energy resources on the environment and on ecosystems.

Other energy initiatives, such as those for wind power and carbon-capture-and-storage, have been launched.

Health

- Working through local, regional, and international partners, the GEO community is developing a

portfolio of services to help decision-makers use Earth observation data and information to prevent diseases and improve public health.

Some of these services involve supporting a meningitis vaccination and control effort in Africa (MERIT) by linking forecasts of an extended dry season in the Sahel with disease outbreaks;

monitoring global atmospheric mercury to establish a forecasting and alert system on health problems
Related to mercury;

providing air-quality forecasts using on-the-ground monitoring stations, currently for 300 US cities, Shanghai (China), and soon for other cities; and using open-source software and space imagery to track potential outbreaks of epidemics.

Water

- GEO has advanced the integration of observations from satellites and in-situ instruments, strengthened collaboration within and between the water research and management communities, and promoted capacity building.
- The **Asian Water Cycle Initiative** has boosted regional cooperation on water monitoring, and the model is now being extended to Africa. The Latin American & Caribbean Community has launched a capacity building program to demonstrate the value of Earth observations in water resource management and to
- develop tools for applying remote sensing data.

The North American Drought Monitor has generated improved regional drought assessments.
The United States and Canada have inaugurated pilot drought monitoring test bed projects as a first step towards a Global Drought Early Warning System.

The TIGER program is realizing improvements in the use of Earth observation data for water-resources management in Africa. The Coordinated Energy and water cycle Observations Project has improved access to integrated observational and model data through 50 reference sites around the world.

Weather

Weather monitoring and forecasting, which is traditionally the most mature sector for operational information based on Earth observations, continues to make important advances under the leadership of WMO.

Collaboration through **GEO has focused on improving the prediction of severe weather conditions**. In particular the THORPEX Interactive Grand Global Ensemble, or TIGGE, has advanced its goals of improving the accuracy of high-impact weather prediction.

Based on ensembles containing more than 100 model outputs, TIGGE aims to make predictions available to decision makers in user-friendly formats with minimum time delay.

The next step is to develop a common toolbox that can be used to develop probabilistic tropical-cyclone warning
services, extreme-precipitation forecasts and other products.

Critical next steps for seeing GEOSS through to the end of the GEOSS 10-Year Implementation Plan for2005 – 2015 and beyond are:

- **Continue to engage policymakers and managers in using and guiding GEOSS. The true value** of GEOSS :
- is its ability to support decision-making. As a key user group, senior policymakers can help to
- ensure that GEOSS addresses the UN's Millennium Development Goals and other priority issues facing
- the global community.

- **Ensure that environmental experts come to consider GEOSS and its Common Infrastructure**
- **as a unique and essential tool for accessing Earth observations. Strong, high-level support from**
- governments and leading organizations is vital for maintaining the momentum generated by GEO and
- ensuring that GEOSS becomes recognized as a **vital infrastructure that serves the global public good.**
- Building the capacity of users to exploit GEOSS is also essential.

- **Develop a longer term strategy for sustaining GEOSS by attracting resources from public and**
- **private sources, supporting capacity-building, strengthening national Earth observation programs,**
- maintaining the GEOSS shared architectural and information infrastructure components, and nurturing
- the collective spirit.

- **Establish a governance structure for the post-2015 period. Early guidance in Beijing will help to**
- ensure a smooth transition to a longer-term approach to global cooperation on Earth observation.

Operational View

How users access GEOSS data and information via the GEO Portal

- **The “GEOSS Common Infrastructure” consists of a dedicated web portal, a clearinghouse for**
- **searching data, information and services, and a registry containing information about GEOSS. It**
- **provides a “one-stop shopping” portal to help the users of Earth observations access and search**
- **for information more easily. After almost two years of development, in July of this year the GEO**
- **community formalized the arrangements by which leading institutions will operate and sustain**
- **the GEO Portal and its underlying clearinghouse and registry.**

Making the System of Systems interoperable

- **The observing, modelling and other systems that contribute to GEOSS must be interoperable so that the data and information they generate can be used effectively. The Committee on Earth Observation Satellites is promoting interoperability through the Virtual Constellations concept.**

- **Another initiative seeks to integrate via the Sensor Web approach, while yet another aims to facilitate model interoperability and access via the Model Web concept. The World Meteorological Organization Information System (WIS) uses interoperability standards that are also specified in the GEOSS 10-Year Implementation Plan; this enables GEOSS and WIS to leverage each other's components to their mutual benefit.**

Advocating for sustained global observing systems

- **To achieve its goal of providing integrated information on the entire Earth system, GEOSS depends**
- **on the health and vitality of major global observing systems. For this reason, GEO actively advocates**
- **for sustaining major observing systems for climate, oceans, land, weather and polar regions.**

Four major UN-sponsored global observing systems provide a critical underpinning for GEOSS. They are the:
Global Climate Observing System (GCOS), the Global Ocean Observing System (GOOS), the Global Terrestrial Observing System (GTOS) and the WMO Global Observing System (GOS). Their work is complemented by the International Polar Year 2007-2008 (IPY) legacy project, with a focus on the cryosphere,
and the Global Geodetic Observing System (GGOS).

Strengthening the linkages amongst these systems and raising their overall visibility will support the efforts of researchers and decision makers in all nine of the GEOSS societal benefit areas.

Establishing the GEONETCast Global Data Dissemination System

- **Reliable access to environmental data is critical for decision making. GEONETCast assures this**
- **access by broadcasting data from dozens of leading data providers to decision makers around the**
- **world. The data are transmitted via advanced communications satellites to thousands of low-cost,**
- **off-the-shelf receivers. GEONETCast also provides dedicated training and alert channels for capacity**
- **building and risk reduction, particularly in developing countries.**

Protecting radio frequencies for Earth observations

- **Growing demand on radio spectrum by telecommunications, the automotive industry and other**
- **users of radio frequencies has raised the specter of competition over limited bandwidth. GEO**
- **members are therefore continuously working through national and international bodies in charge**
- **of frequency management to ensure the long-term availability of frequencies for terrestrial, oceanic,**
- **air-borne and space-based observations. This is absolutely vital to the success of GEOSS.**

Implementing the GEOSS Data Sharing Principles

Recognizing the importance that full and open access to data has for the success of GEOSS, the GEOSS 10-year Implementation Plan established a visionary set of Data Sharing Principles.

These Principles aim to ensure that the data and information developed and disseminated through GEOSS yield significant benefits for a broad range of users around the world.

Over the past five years,
substantial progress has been made, not only in reaching a consensus on how best to implement the Data Sharing Principles, but also in demonstrating how full and open data sharing can help the GEO community to achieve its goals in the nine societal benefit areas.

From observations to information products and services

Observation data provide great value, but combining data from different sources and then analyzing and modelling them can greatly enhance their usefulness for decision making.

GEO has made significant progress in bringing together many diverse datasets and engaging scientific and technical experts to generate this added value.

Continuing progress will require more and more

agencies and organizations to work together to adopt common standards for integrating and

analyzing all types of data.

Promoting “data democracy” around the world

The term ‘data democracy’ was coined in 2008 by the South African Council for Scientific and Industrial Research (CSIR) as the title of a special project during its year as Chair of the Committee on Earth Observation Satellites (CEOS).

It has since become a mantra among research and development communities in the Earth observation domain.

In 2009, Data Democracy was approved as a new GEO Task in the framework of GEO’s work on capacity building, infrastructure development and technology transfer.

The data democracy theme calls for:

- Unhindered access to Earth observation information;
- Reliance on Open Source Software and open systems;
- Recognition of the realities of bandwidth limitations in many developing countries; and
- Promotion of locally initiated cross-border collaborative projects and intensive capacity building and training programs.

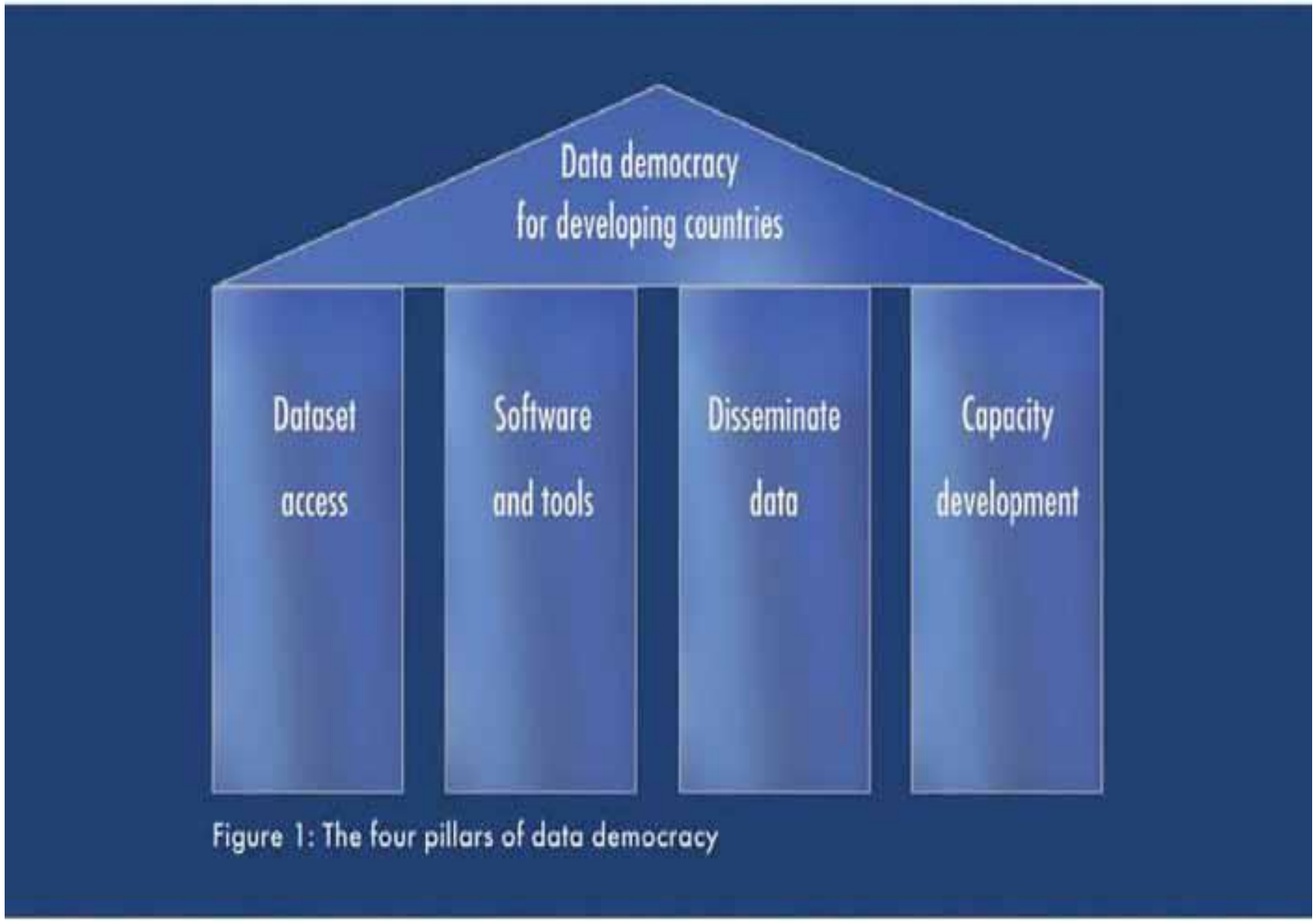


Figure 1: The four pillars of data democracy

Building a Global Earth Observation System of Systems (GEOSS)

5th Jubilee International Conference on Cartography & GIS

Barbara J. Ryan
Director, GEO Secretariat

16 June 2014
Varna, Bulgaria

A Global, Coordinated, Comprehensive and Sustained System of Observing Systems

GEO Objectives

- Improve and Coordinate Observation Systems
- Advance Broad Open Data Policies/Practices
- Foster Increased Use of EO Data and Information
- Build Capacity

Created in 2005, to develop a coordinated and sustained Global Earth Observation System of Systems (GEOSS) to enhance decision making in nine Societal Benefit Areas (SBAs)

GEO today:

91 Members

77 Participating

Organizations

77 Participating Organizations

A broad Commercial Sector spans the entire information value chain

Data providers





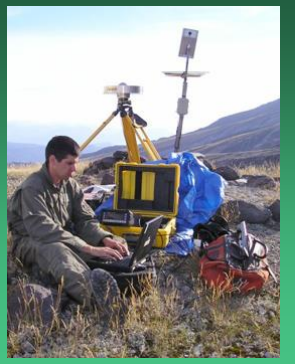
Value-Added providers



Downstream users

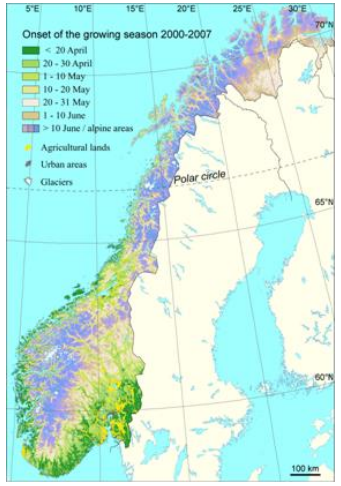


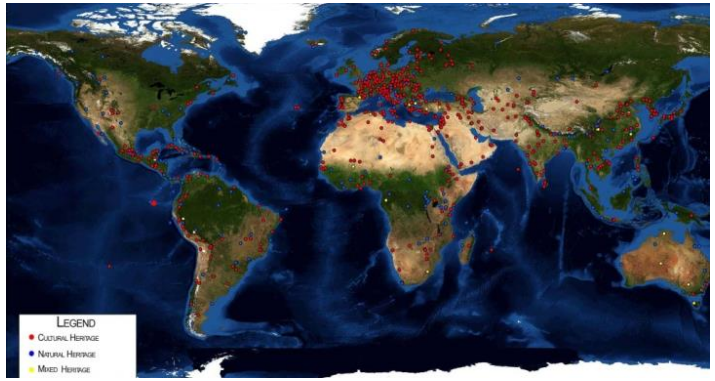




Ecosystem Classification & Mapping

(Australia, Austria, Brazil, Canada, China, EC, Italy, Paraguay, USA, RCMRD, UNESCO)





UNESCO

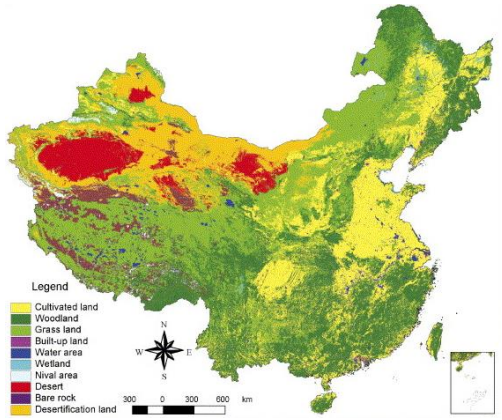
USGS
science for a changing world

ABCC

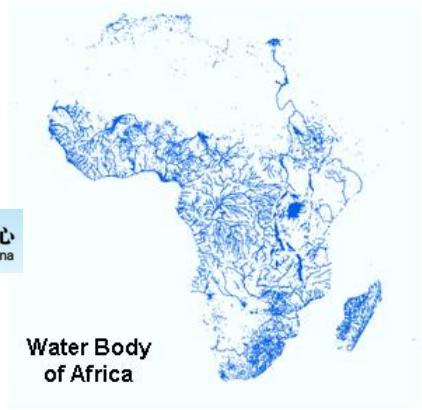
* SHARE mountain stations operational
* All ecosystem mapping data available; DataCORE
* New maps of growing season
* Atlas of 40 Chinese World Heritage Sites
* Decision-making support: ABCC program

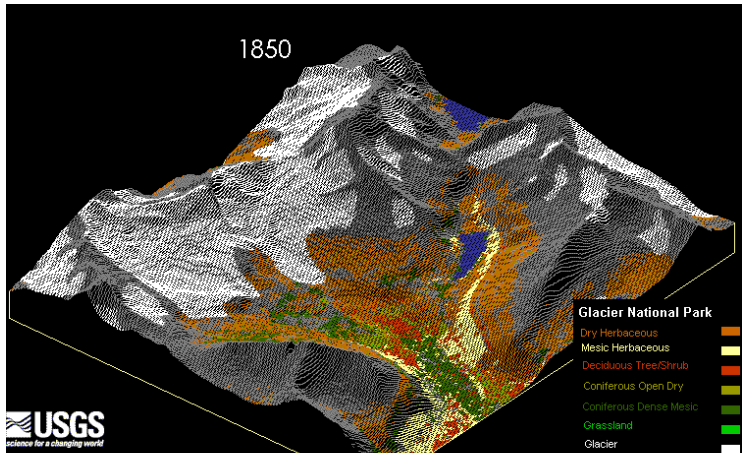
Advanced Land-Cover Products

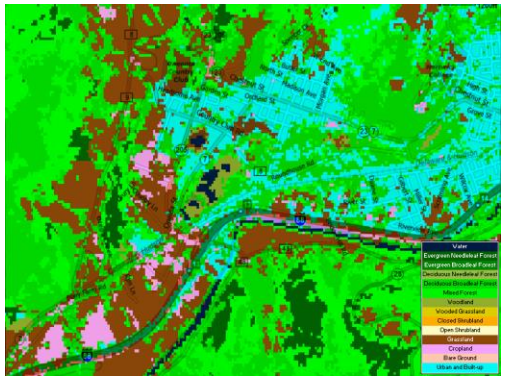
(Canada, China, EC, Greece, Japan, Netherlands, Nigeria, Spain, Sweden, UK, USA, Spain, EEA, ESA, GTOS, ISPRS)



国家基础地理信息中心
NGCC National Geomatics Center of China







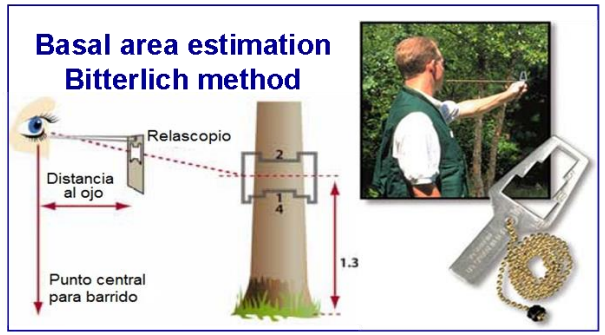
* Global 30m products
* Major land cover types (eg. wetland)
* Independent validation databases
* Global Land Cover Portal
* Growing int'l consensus

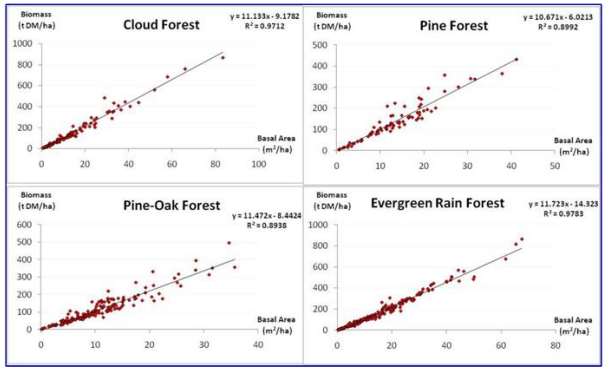
GOFC-GOLD GLOBAL OBSERVATION OF FOREST AND LAND COVER DYNAMICS

Global Forest Information System

(Australia, Canada, Japan, Norway, USA, CEOS, FAO)

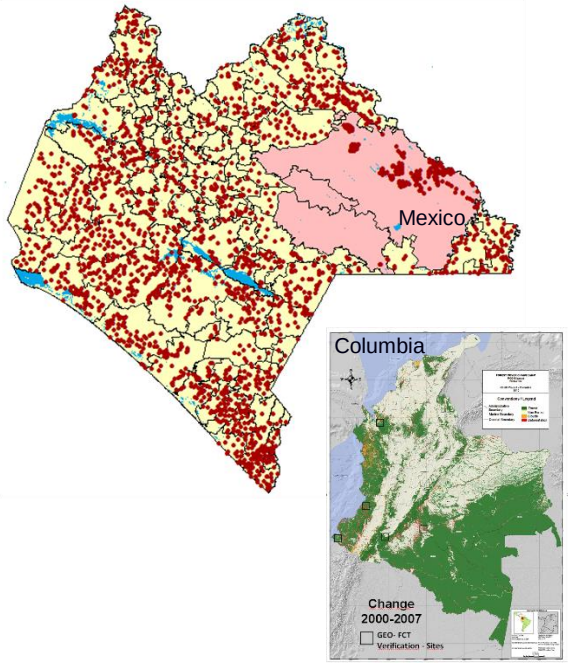
Rapid Carbon Appraisal Inventories





In-situ forest measurements

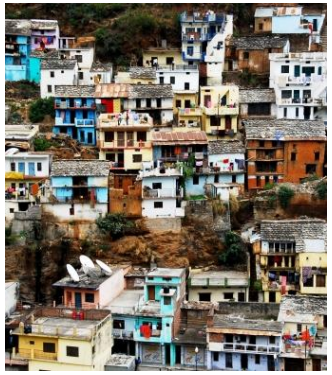
2011 field campaign: 3,000 samples

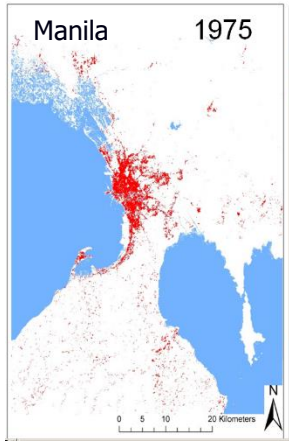


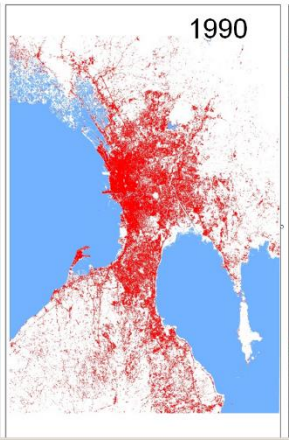
* Forest Carbon Tracking ongoing
* Demo in 12 countries (Congo)
* Coordinated space data acquisition
* In-situ validation
* Regional capacity building growing (US Silvacarbon)

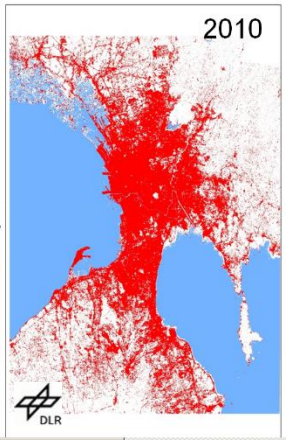
Global & Local Urban Footprints

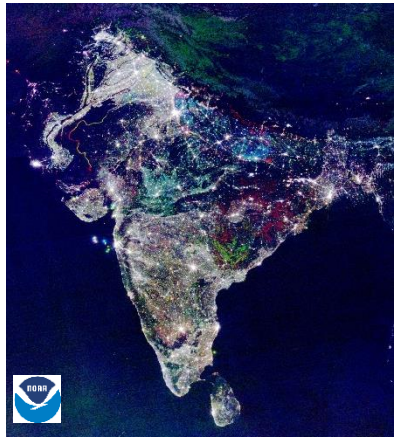
(China, EC, Germany, Greece, Italy, Pakistan, USA)





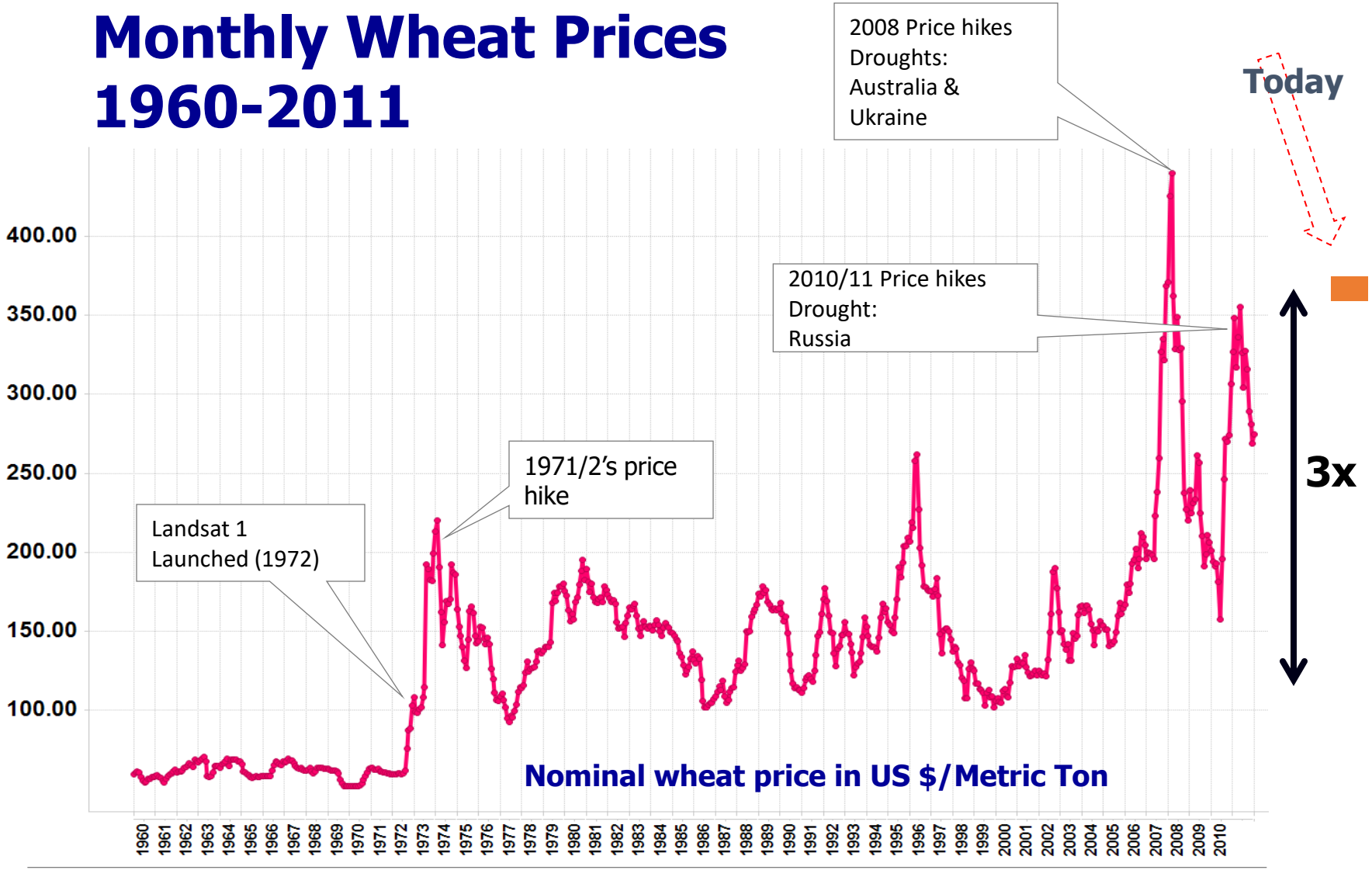






* 35-yr evolution of 26 mega-cities
* Global night-time lights for 2012
* Urban Heat Island patterns
* Over 3’700 cities mapped using ASTER (15m)

Monthly Wheat Prices 1960-2011

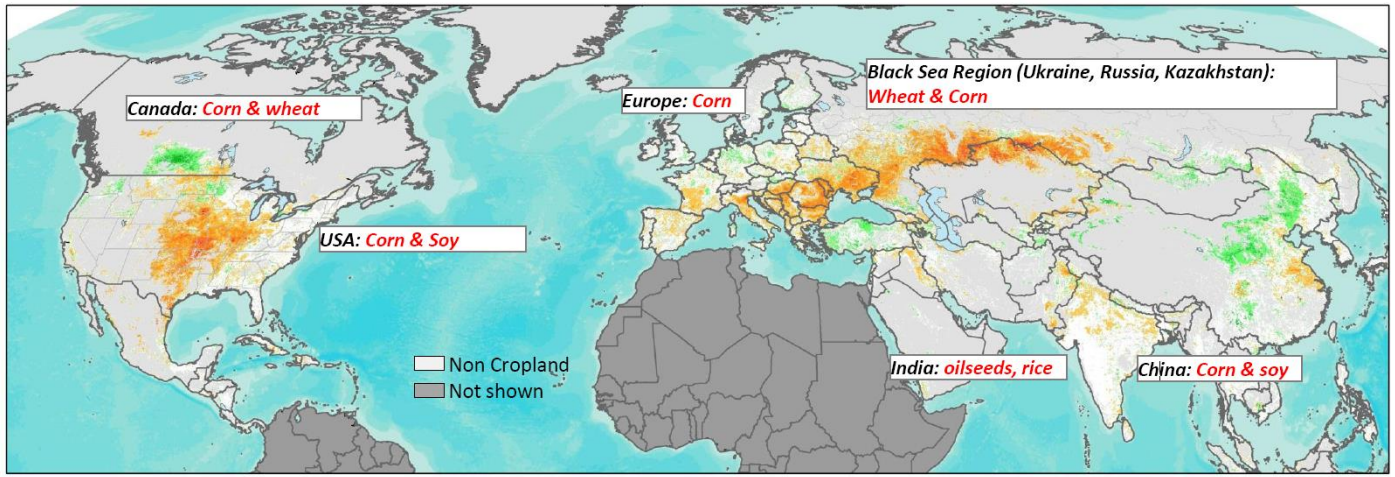


Source: World Bank

Crop Information for Decision-Making

(Canada, China, EC, France, Japan, Kazakhstan, India, Mexico, Russia, USA, CEOS, FAO)

Northern Hemisphere NDVI Crop Anomaly, August 13th, 2012



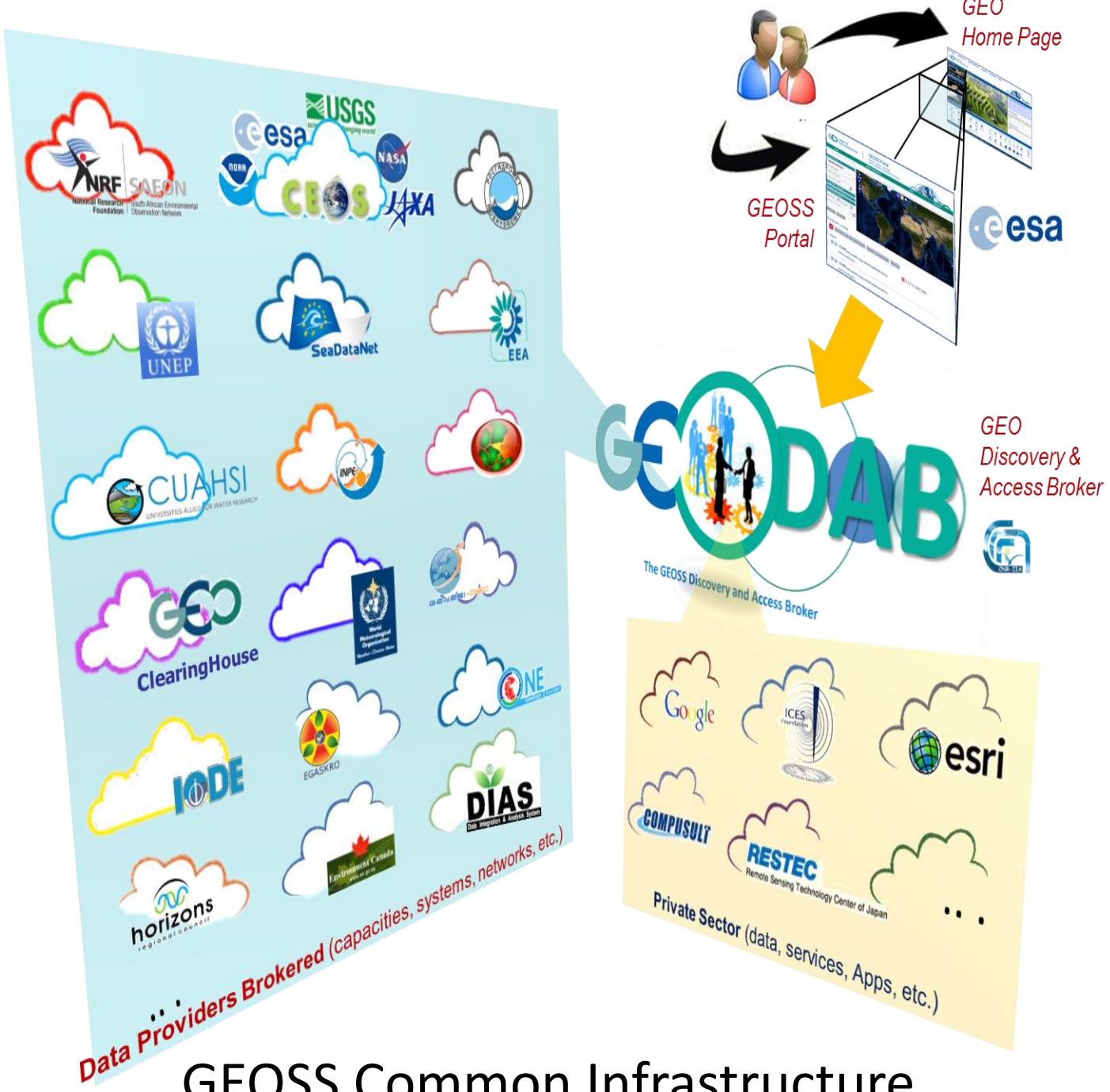
Crop NDVI Anomaly

-0.4 Worse than normal | 0 normal | 0.4 Better than normal

Observed highlights:

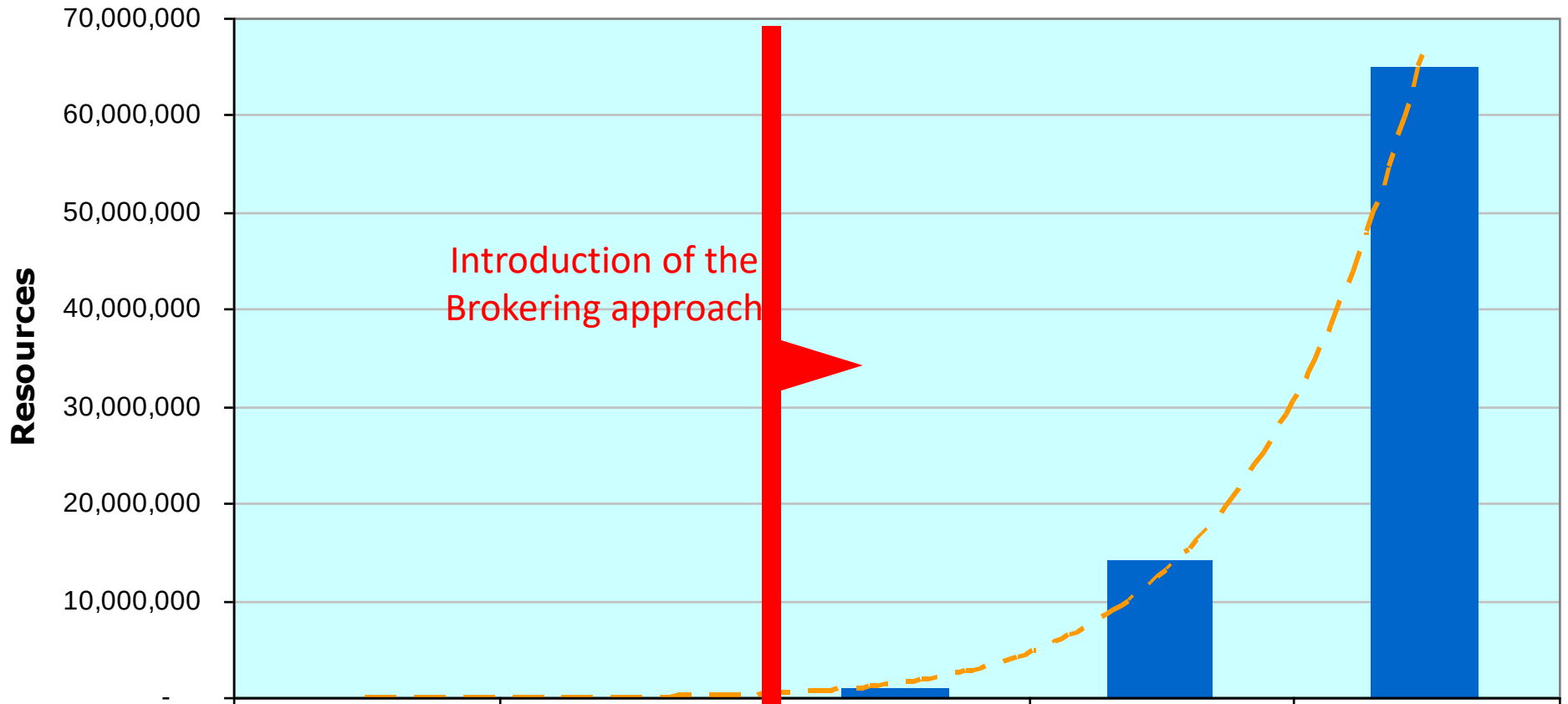
- Drought conditions persist in US, south eastern Ukraine, Russia, and Kazakhstan, with slight improvement in some areas in northern Kazakhstan
- Rains in India mitigate dry conditions

* GEOGLAM part of G20 Action Plan on Food Price Volatility
* New crop outlook
* Rice crop monitoring
* Draft space strategy



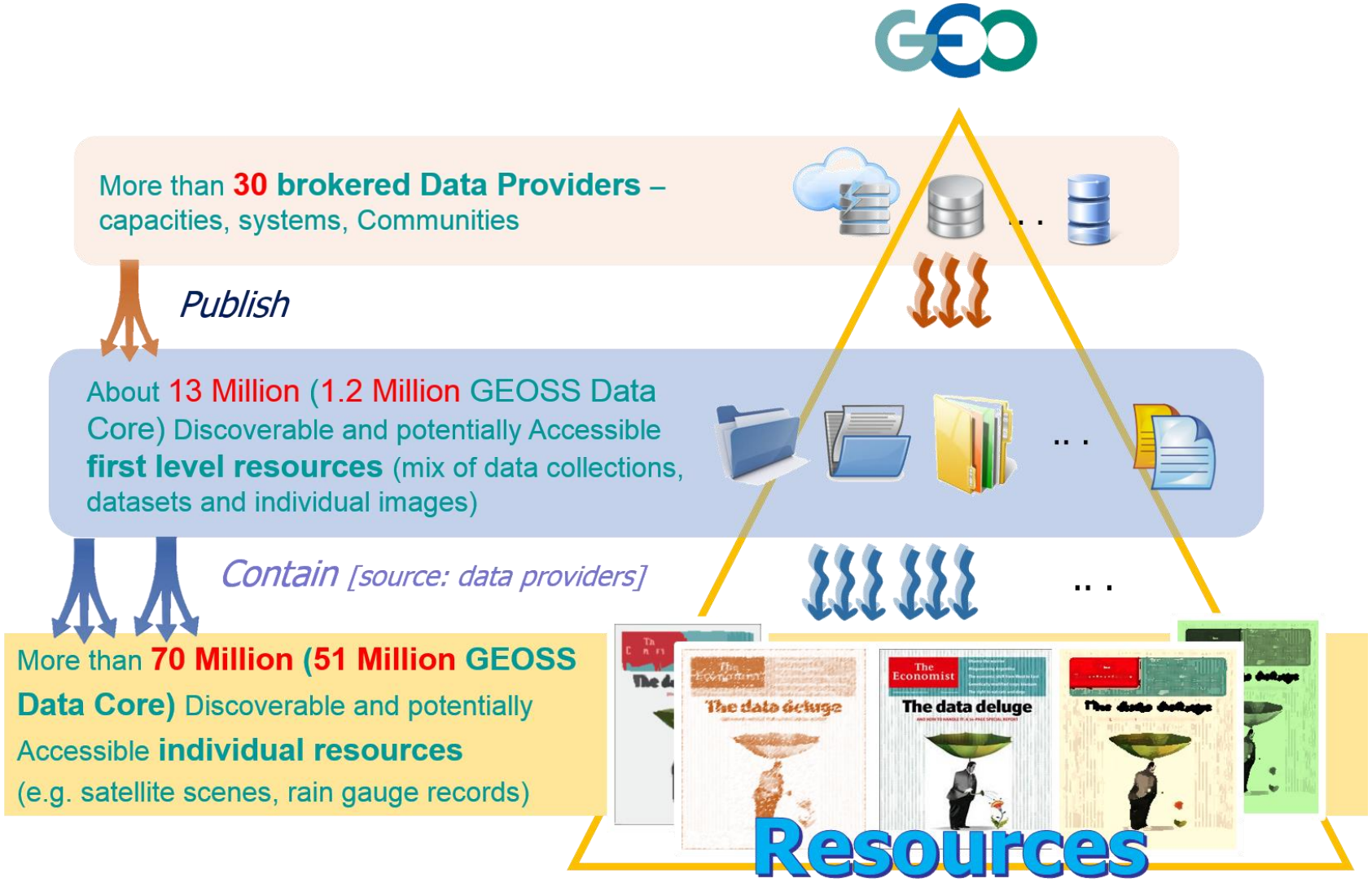
GEOSS Common Infrastructure

GEOSS Resources

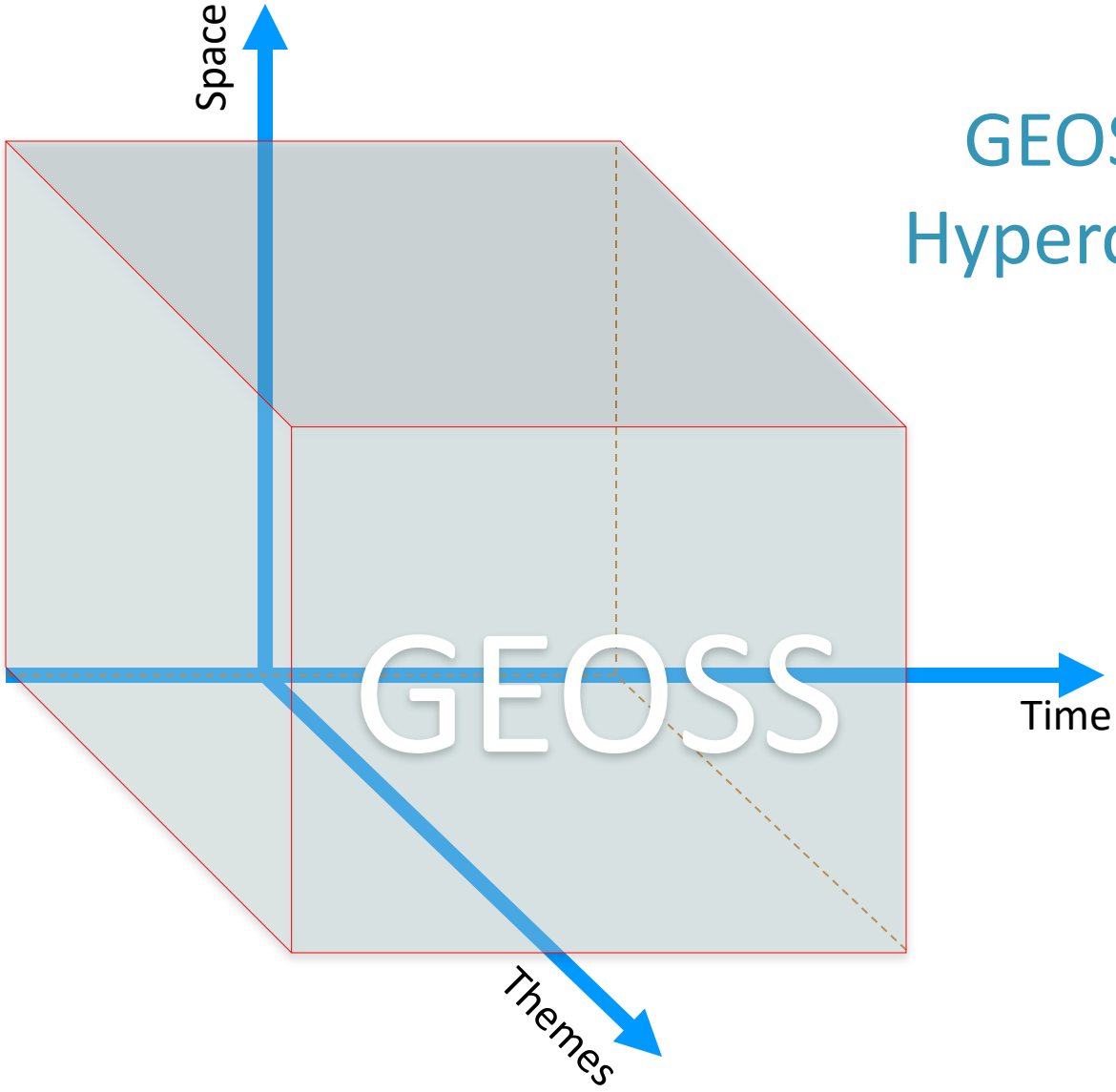


	2010	2011 (Sep)	2011 (Nov)	2012 (Nov)	2014 (Apr)
Resources	300	100,000	1,002,000	14,000,000	65,000,000

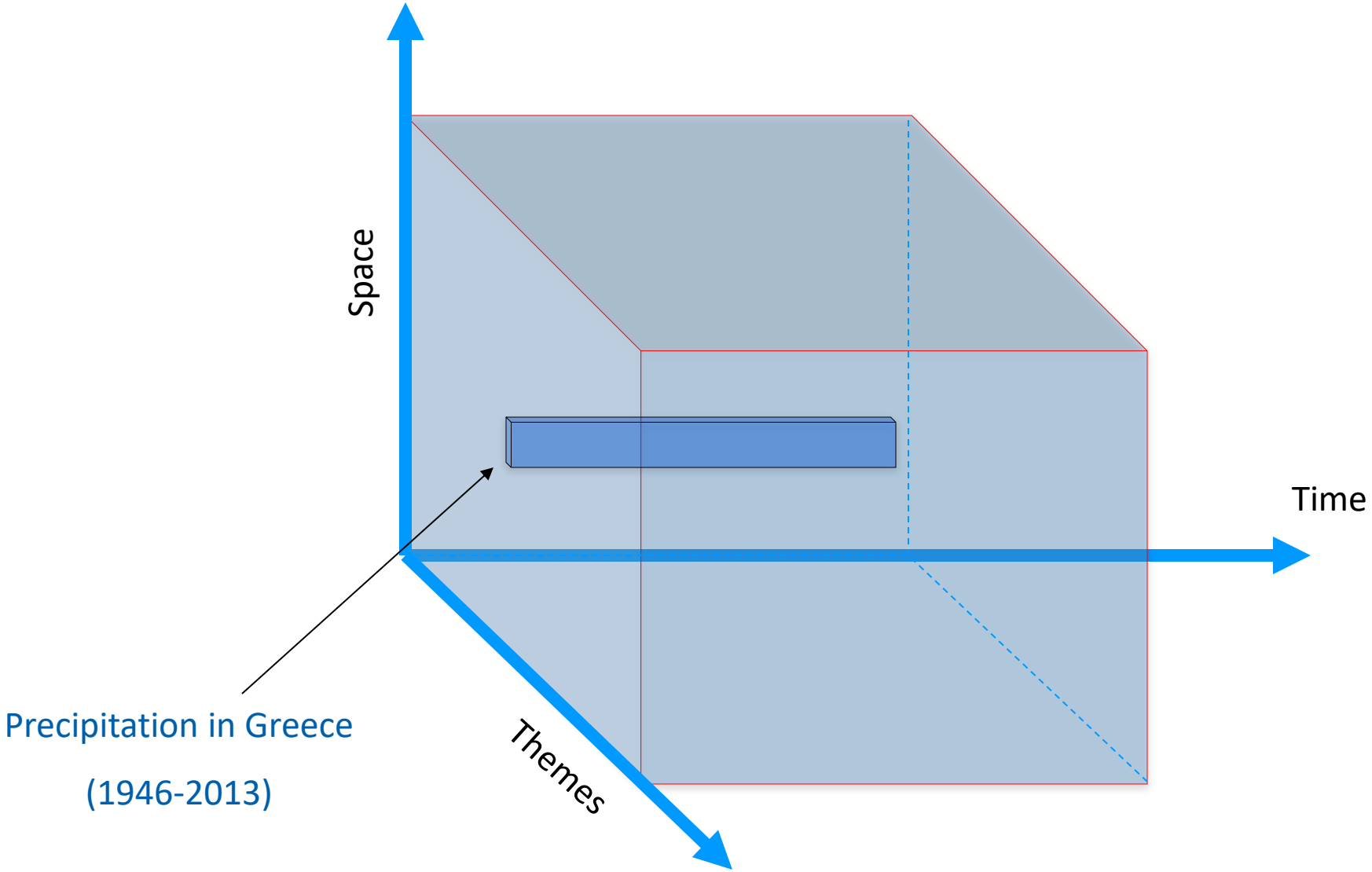
GEOSS Current Assets (May 2014)



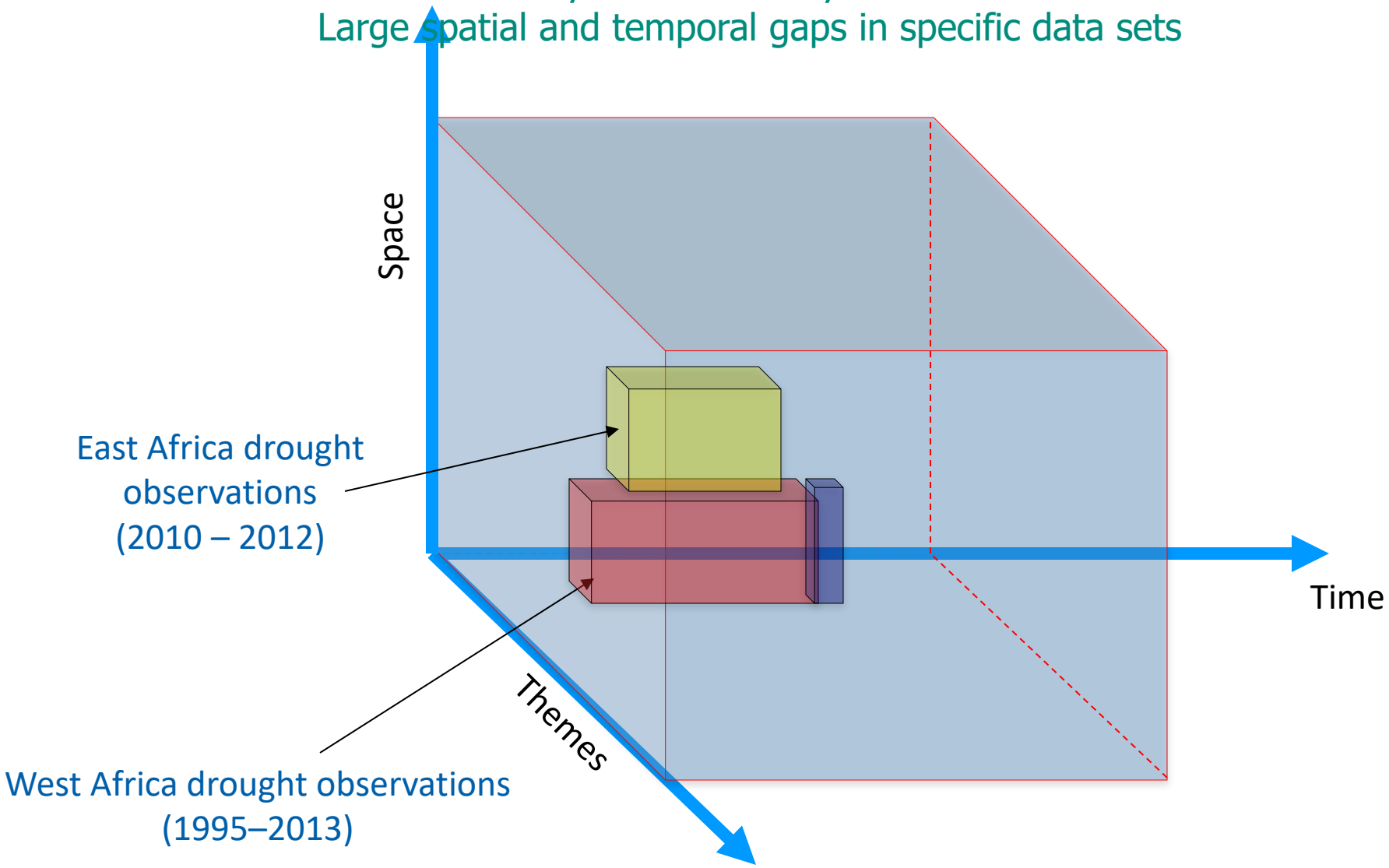
GEOSS Hypercube



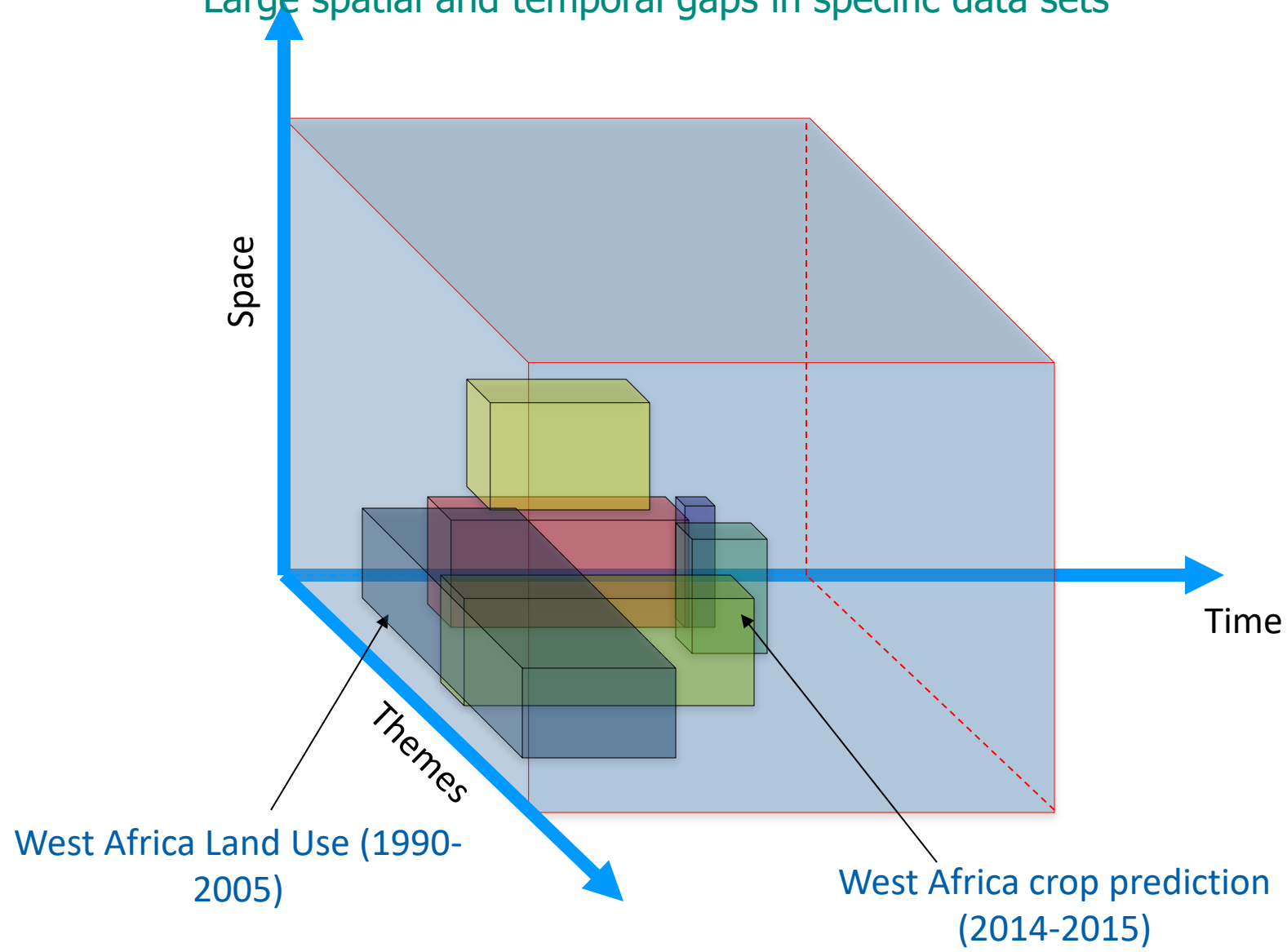
GEOSS Targeted Gaps
Large spatial and temporal gaps in specific data sets



GEOSS Targeted Gaps
Uncertainty over continuity of observations
Large spatial and temporal gaps in specific data sets

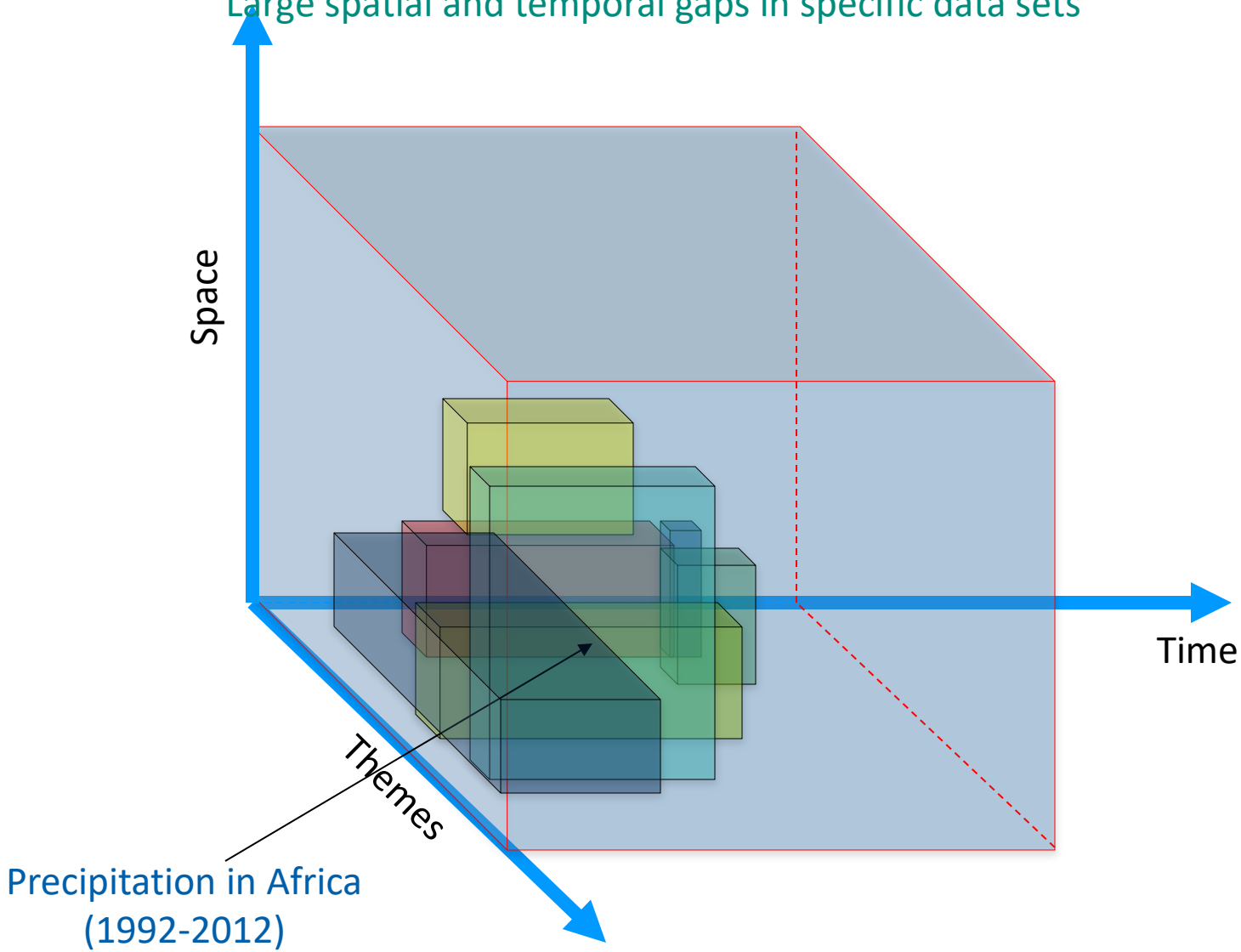


GEOSS Targeted Gaps
Large spatial and temporal gaps in specific data sets

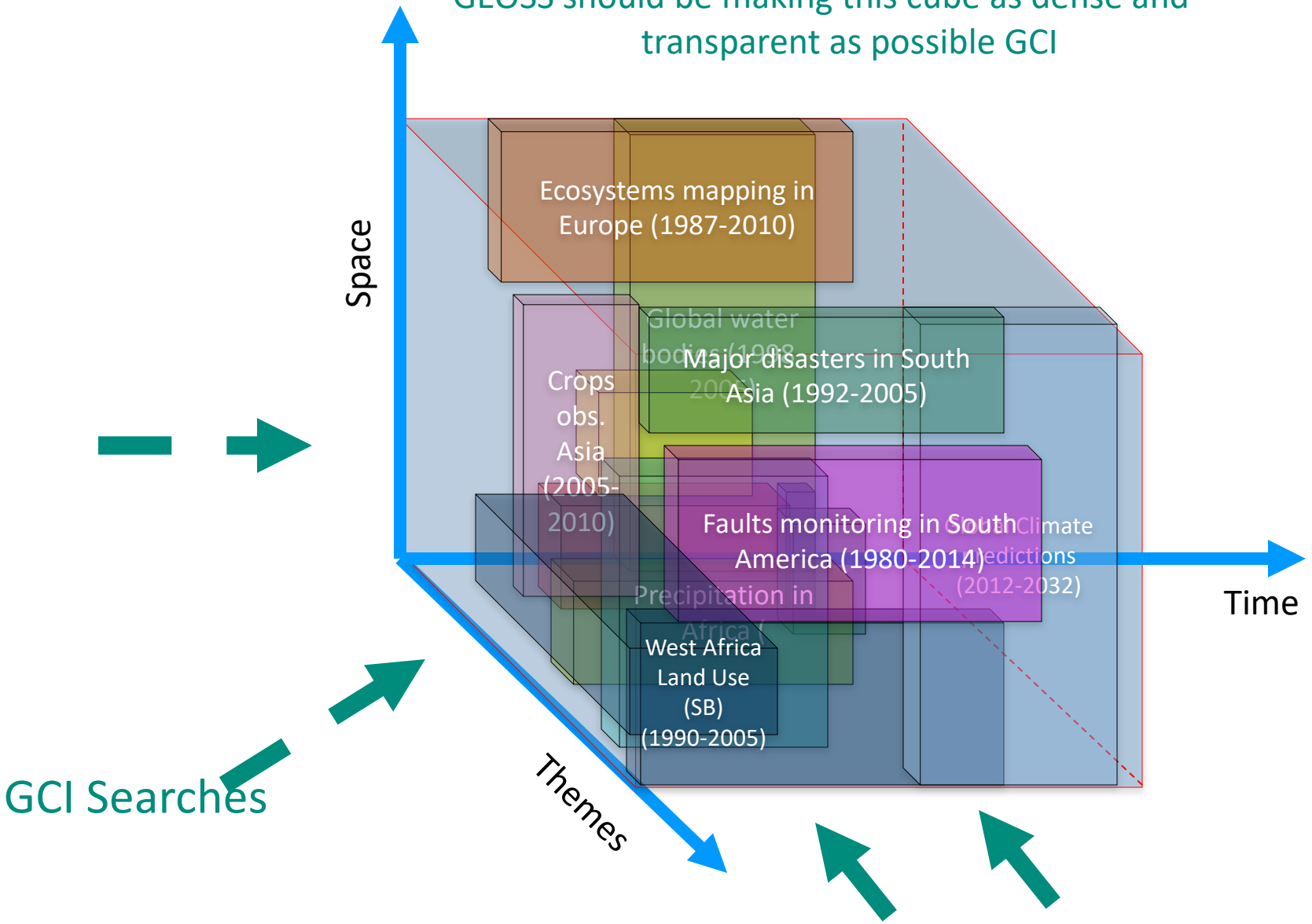


GEOSS Targeted Gaps

Large spatial and temporal gaps in specific data sets



GEOSS should be making this cube as dense and transparent as possible GCI

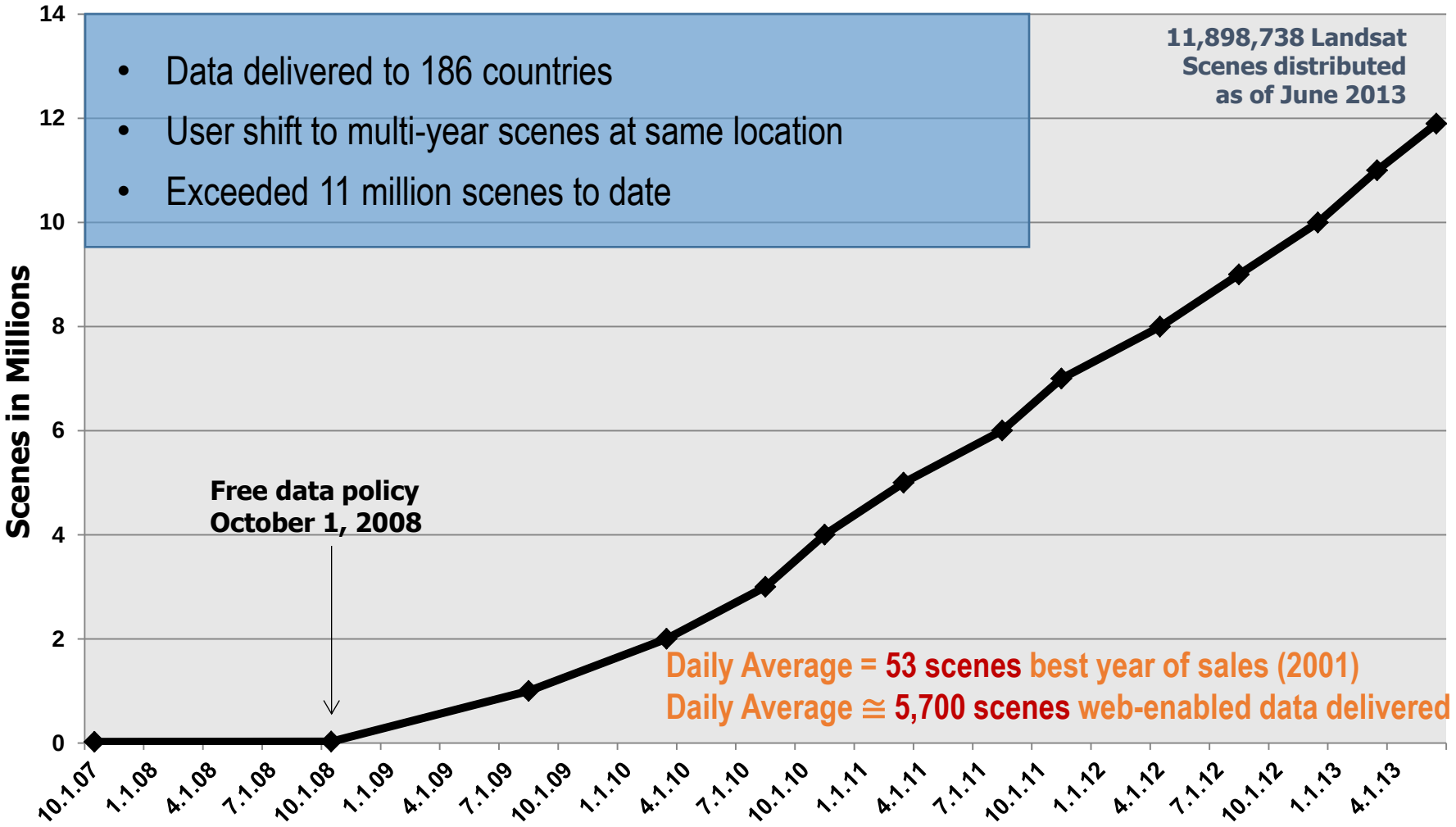


GCI Searches

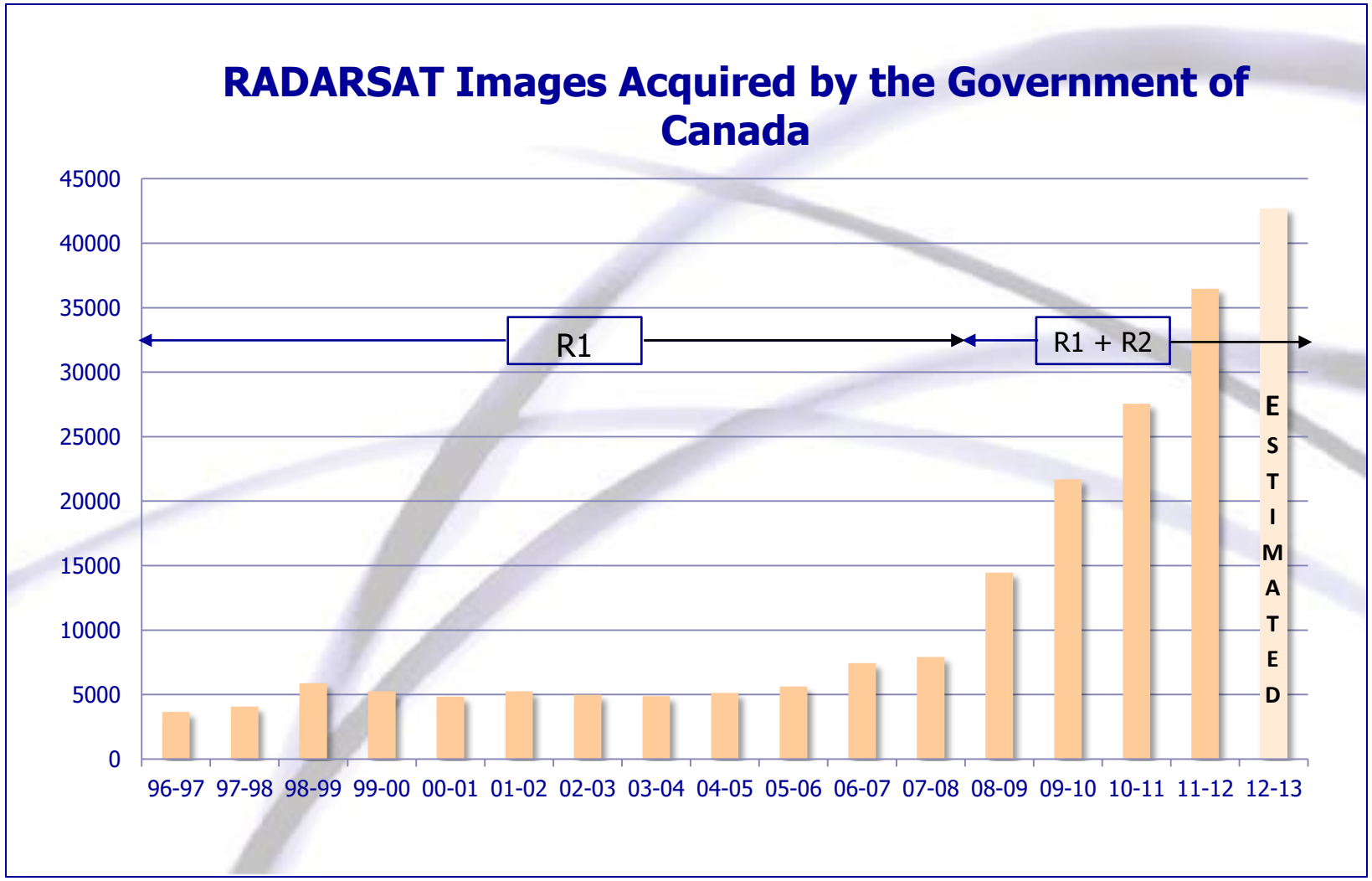
GEOSS Implementation Requires: *Data Sharing Principles*

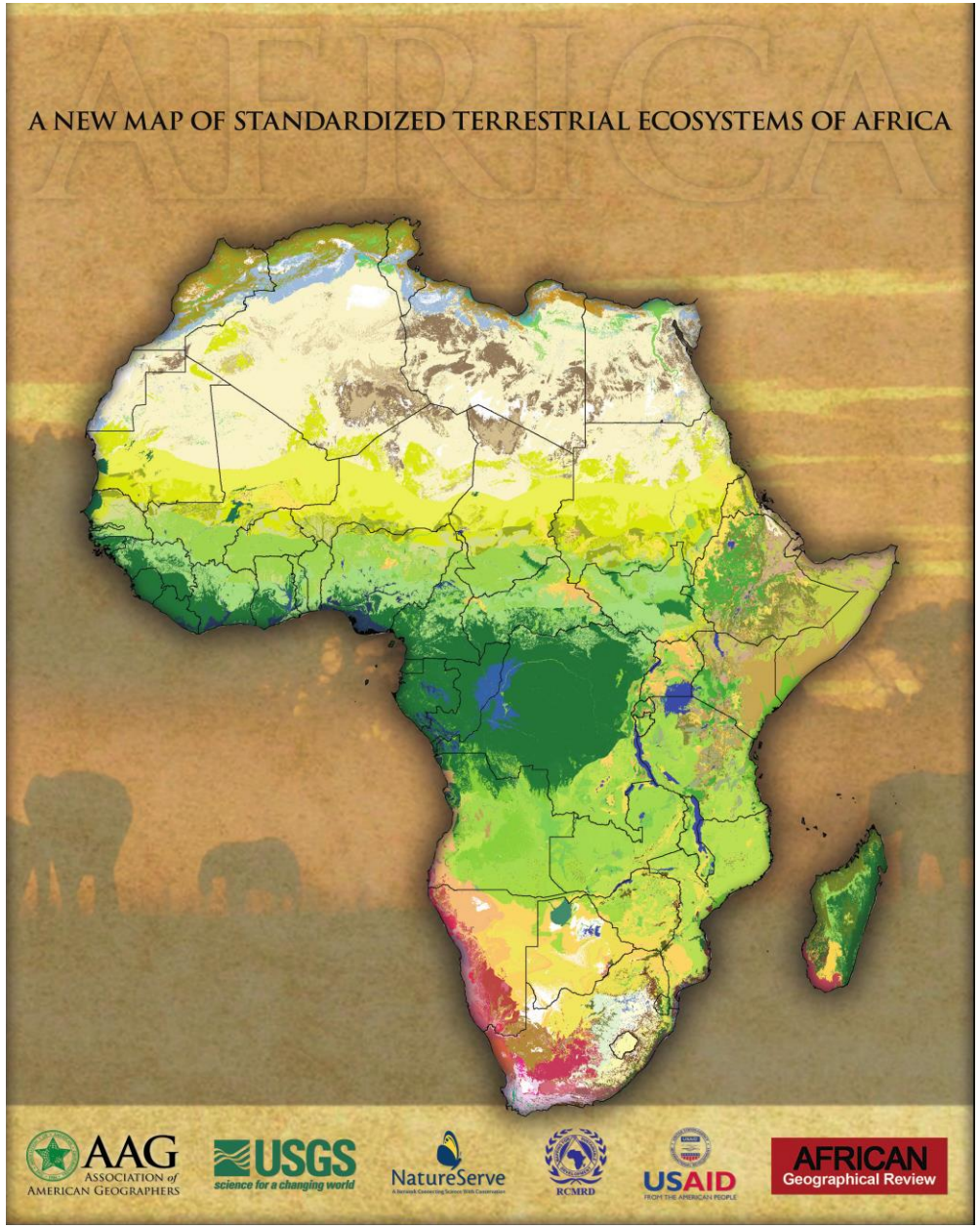
- Full and Open Exchange of Data
- Data and Products at Minimum Time Delay and at Minimum Cost
- Free of Charge or Cost of Reproduction

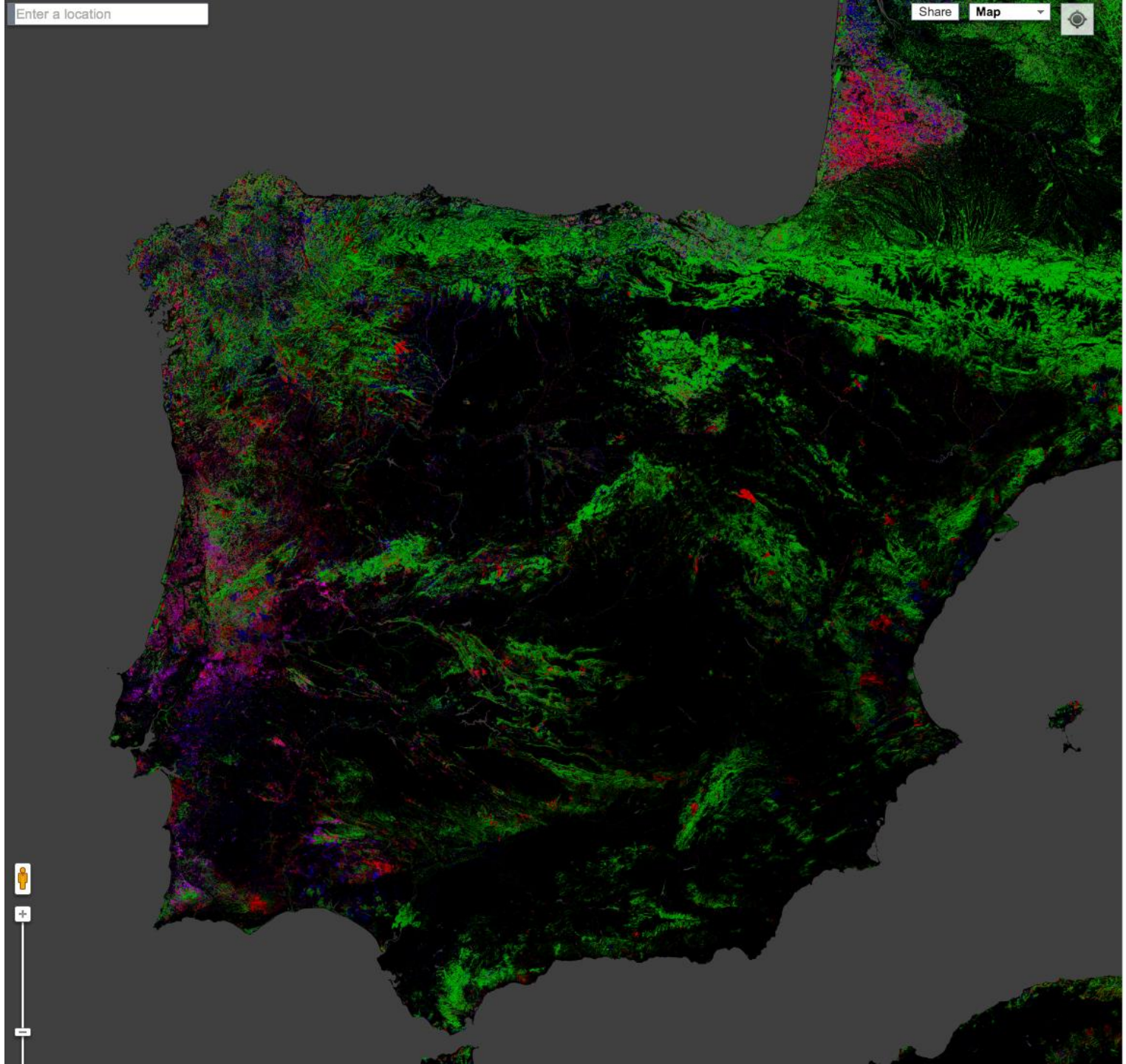
Increasing Demand for Free Landsat Data



Canada's Experience




AFRICA
A NEW MAP OF STANDARDIZED TERRESTRIAL ECOSYSTEMS OF AFRICA
AAG
ASSOCIATION of AMERICAN GEOGRAPHERS
USGS
science for a changing world
NatureServe
RCMRD
USAID
FROM THE AMERICAN PEOPLE
AFRICAN
Geographical Review



Global Forest Change

Published by Hansen, Potapov, Moore, Hancher et al.

UNIVERSITY OF MARYLAND
DEPARTMENT OF GEOGRAPHICAL SCIENCES

Results from time-series analysis of 654,178 Landsat images in characterizing forest extent and change, 2000–2012.

Trees are defined as all vegetation taller than 5m in height and are expressed as a percentage per output grid cell as '2000 Percent Tree Cover'. 'Forest Loss' is defined as a stand-replacement disturbance, or a change from a forest to non-forest state. 'Forest Gain' is defined as the inverse of loss, or a non-forest to forest change entirely within the study period. 'Forest Loss Year' is a disaggregation of total 'Forest Loss' to annual time scales.

Reference 2000 and 2012 imagery are median observations from a set of quality assessment-passed growing season observations.

Reset to default view

Data Products

Loss/Extent/Gain (Red/Green/Blue)

Legend
- Forest Loss 2000–2012
- Forest Gain 2000–2012
- Both Loss and Gain
- Forest Extent

Background Imagery

Year 2000 Bands 5/4/3

Example Locations

Forestry and Tornado in Alabama

Zoom to area

The trail of destruction from the April 27 2011 Tuscaloosa-Birmingham tornado is clearly visible in this location. This was one of 358 recorded tornadoes during the April 25-28, 2011 tornado outbreak, the most severe in US history.

Zoom out to spot tracks from other tornadoes nearby.


EXPLANATION
Corn
Soybeans
Small grains / Hay
Alfalfa
Fallow / Idle Cropland
Grass / Pasture / Non-ag
Woodland
Urban / Developed
NLCD-Developed/Low Intensity
NLCD-Developed-Open Space
NLCD-Developed/Medium Intensity
NLCD-Developed/High Intensity
NLCD-Barren
NLCD- Grassland, Herbaceous
NLCD-Deciduous Forest
NLCD-Pasture/Hay
NLCD-Woody Wetlands
N
0 0.5 1 2 KILOMETERS
0 0.5 1 2 MILES
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Waterloo

Ministerial Guidance

- Continue improving Earth observations worldwide
- Urge the adoption and implementation of data sharing principles globally
- Advance the GEOSS information system
- Develop a comprehensive interdisciplinary knowledge base
- Cultivate global initiatives

Summary

- Broad open data policies/practices essential for publically funded collections & must be strengthened
- Economic value in downstream elements – value-added products and services
- Broader stakeholder engagement needed, including the private sector
- Strengthen policy linkages/mandates
- National, Regional and International collaboration is essential

GEO Appathon 2014

UNLEASH THE POWER OF EARTH OBSERVATION DATA

Open worldwide to any non-commercial entity, individual or team (students, scientists and developers) wanting to unleash the power of Earth Observation data
to allow us all to make smarter decisions.

Be inspired, unleash the power and win cash prizes ($20,000 USD).

Register by Thursday, 31 July 2014 and submit Apps by Sunday, August 31 2014.

Join in www.geoappathon.org

@geosec2025 #geoappathon

GROUP ON EARTH OBSERVATIONS

GEO-XI Plenary
13-14 November 2014
Libreville, Gabon

Barbara J. Ryan
bryan@geosec.org

http://www.earthobservations.org

Projekt

GLOBAL MAPPING

GLOBÁLNÍ MAPOVÁNÍ

2. Twenty Year Journey in Global Mapping

ISCGM Secretariat made a presentation about the history of Global Mapping Project and the proposal on the conclusion of ISCGM, at 23rd ISCGM meeting in New York on August 2, 2016.

Chapter 2 reprints this presentation material.

Reliance on Open Source Software
and open systems

Twenty Year Journey in Global Mapping

Toru Nagayama
ISCGM Secretariat
23rd ISCGM Meeting
New York, 2 August 2016

Contents

1. Introduction of Global Mapping Project

Global Mapping Project

- Develop reliable geospatial information (Global Map)
- Provide a tool to solve global scale problems
- Steered by ISCGM (International Steering Committee for global mapping)
- Participated by National Geospatial Info. Authorities.

Global Map: Digital geospatial info. at a scale of 1:1 million

National/Regional version: Vector (Boundary, Transport, Drainage, Population centers), Raster (Elevation, Land use, Land cover, Vegetation)

Global version: Elevation, Land cover, Vegetation

2. History of Global Mapping Project

History of Global Mapping Project

- 1992-1996: Establishment of ISCGM
- 1996-2000: Toward Global Map
- Data Release 2000-2007:
- Promotion of Data Development
- 2008-2013: Development and Release of
- Version 2 2013-2016: Facilitate the Use of Geospatial Information 2016: Conclusion of the Project

1992-1996: Establishment of ISCGM

1992

Earth Summit "Agenda21"

Proposal of "Global Mapping Concept"

1993

International Workshop

"Resolution of Izumo

Conference"

Start of JICA group training course "Environment

Seminar"

Establishment of ISCGM at the Second

International Workshop on Global Mapping

First meeting of ISCGM

Agenda21 – Earth Summit (1992)

Chapter 40: Information for Decision-Making

*Various types of data which indicate the status and trends of global environment need to be collected.

Earth Summit in June 1992: From Ministry of Environment web site (https://www.env.go.jp/)

Global Mapping Concept (1992)

"In order to solve global environmental problems,
what should surveying and mapping community do? "

Global Mapping Concept

Develop geospatial information (Global Map)
that covers the entire globe
at a scale of 1: 1 million
through international cooperation

The First International Workshop on Global Mapping 1994
The Second International Workshop on Global Mapping 1996

- To develop and update Global Map and widely release the data
- To provide technical and economic assistance to promote developing Global Map
- To recommend establishment of International Steering Committee for Global Mapping (ISCGM)

Second Workshop in February 1996

First Meeting of ISCGM (1996)

NMOs should actively release their own geographic data sets that are necessary and effective for developing global scale data equivalent to the scale of Global Map.

- Investigate the existence of global scale data
- Assist undeveloped areas
- Investigate data specifications
- Agenda 21 follow up
- Start strategy planning

1st Meeting of ISCGM in February, 1996

1996-2000: Toward Global Map data release

1996	Interregional Seminar on Global Mapping for the Implementation of Multinational Environmental Agreements
1997	***19th Special Session of UN General Assembly (Rio + 5)***
	Invitation letter was sent from UN to Member States
1998	**Adoption of Global Map Specifications**
1999	Meeting of the Global Map Development in Asia
	Declaration of release of Version 1 at Global Map Forum

Global Mapping initiative had been introduced to many people through various activities

- International Global Mapping seminars and forums
- Promotion campaigns at relevant international academic meetings and international conferences
- Coordination with international organizations

UN Special Session of the General Assembly to Review and Appraise the Implementation of Agenda 21 (Rio+5) (1997)

"Programme for Further Implementation of Agenda 21"

Necessity of global mapping was mentioned.

UN Letter of Invitation to Join Global Mapping Project (1998)

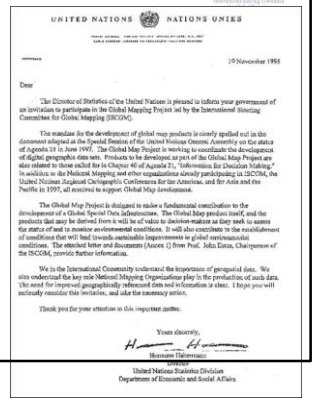
plus

Various activities of promoting the Global Mapping Project

resulted in

Rapid increase in GM Participation

12 countries (1998)→**81** countries（2000）



UNITED NATIONS NATIONS UNIES

19 November 1998

Dear

The Director of Statistics of the United Nations is pleased to inform your government of an invitation to participate in the Global Mapping Project led by the International Steering Committee for Global Mapping (ISCGM).

The mandate for the development of global map products is clearly spelled out in the document adopted at the Special Session of the United Nations General Assembly on the status of Agenda 21 in June 1997. The Global Map Project is working to coordinate the development of digital geographic data sets. Products to be developed as part of the Global Map Project are also related to those called for in Chapter 40 of Agenda 21, "Information for Decision Making." In addition to the National Mapping and other organizations already participating in ISCGM, the United Nations Regional Cartographic Conferences for the Americas, and for Asia and the Pacific in 1997, all received to support Global Map development.

The Global Map Project is designed to make a fundamental contribution to the development of a Global Spatial Data Infrastructure. The Global Map product itself, and the products that may be derived from it will be of value to decision-makers as they seek to assess the status of and to monitor environmental conditions. It will also contribute to the establishment of conditions that will lead towards sustainable improvements in global environmental conditions. The attached letter and documents (Annex 1) from Prof. John Estes, Chairperson of the ISCGM, provide further information.

We in the International Community understand the importance of geospatial data. We also understand the key role National Mapping Organizations play in the production of such data. The need for improved geographically referenced data and information is clear. I hope you will seriously consider this invitation, and take the necessary action.

Thank you for your attention in this important matter.

Yours sincerely,

Hamanou Taberamaro
Director
United Nations Statistics Division
Department of Economic and Social Affairs

Release of Global Map Version 1 (2000)

- Global Map Forum 2000
  Hiroshima, Japan November 2000
  - ➢Declaration of Release of GM Version 1
    - Japan
    - Laos
    - Nepal
    - Sri Lanka
    - Thailand
  - ➢Adoption of Hiroshima GM Declaration

Chairperson declaring first GM release in Nov. 2000

2001-2007: Promotion of data development

2001	Death of Prof. John E. Estes, Chair of ISCGM
2002	Prof. D. R. Fraser Taylor assumed chair 1st Global Mapping Seminar in Kenya ***Johannesburg Summit (Rio+10)*** Esri Grant programs started.
2005	Intergraph Grant programs started. 1st Global Mapping Seminar in Senegal
2006	Global Mapping Workshop “Use of geospatial information for mitigating large scale disasters and attaining sustainable development”
2007	Achieved releasing the data of 47 countries/regions **(about 50% of the land area)**

World Summit on Sustainable Development (Johannesburg Summit, Rio+10) (2002)

- The Adopted " Johannesburg Implementation Plan" mentions **"Promotion of Initiative and Partnership for global mapping"**
- A symposium "Global Mapping Partnership –Sustainable Development and Geographic Information" organized as a side event.

Johannesburg Summit in 2002
Web site of Ministry of Foreign Affairs
(http://www.mofa.go.jp/mofaj/index.html)

Global Mapping Seminars in Africa (2002-2008)

- **Nairobi** (**Kenya**)
  2002/2003/2004
  58 people from **25** countries participated.
- **Dakar** (**Senegal**)
  2005/2006/2008
  28 people from **11** countries participated.

A scene from the Third GM Seminar in Dakar, 2008

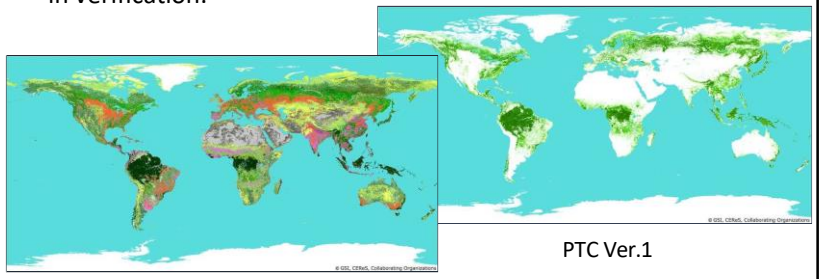
26 countries / regions participated to the Project
18 countries / regions released Global Map data

2008-2013: Development and Release of version 2

2008	Global Mapping Forum 2008/Global Map Tokyo Declaration "Global Map Global Version"ver.1 was released.
2009	Global Map Specifications (ver.2) was adopted.
2010	First release of Global Map ver. 2 (national / regional).
2011	**1st UNCE-GGIM**
2012	***UN Conference on Sustainable Development (Rio+20)***
2013	"Global Map Global Version"ver.2 was released.

Release of Global Map Global Version (2008)

- Land Cover (GLCNMO) / Percent Tree Cover (PTC) data
- WG4/ISCGM has mainly developed and 40 countries cooperated in verification.



GLCNMO Ver.1

PTC Ver.1

Revision of Global Map Specifications (2009)

- Innovation in geospatial information field
- Increase of Global Map data users and a change in user base
- Revision work of Global Map Specification was carried out from 2007 to 2009.

Major changes between Global Map ver.1 and ver.2

- Modification of Data Dictionary
- VPF → GML (vector data)
- Correspondence of metadata with International Standards

A scene of discussion at a workshop

Establishment of UNCE-GGIM (2011)

- UNCE-GGIM was launched as a forum for Member States and international organizations to discuss promotion of cooperation, improve interoperability, and technical transfer on global geospatial information.
- ISCGM also joined UNCE-GGIM as it had carried out the Global Mapping Project in collaboration with NGIAs of the world.
- ISCGM Advocated the GM4SD concept.

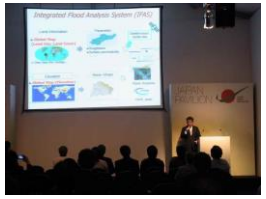
1st UNCE-GGIM, October 2011

UN Conference on Sustainable Development (Rio+20)

- A conference to follow up the Earth Summit after 20 years

> 274. We recognize the importance of space-technology-based data... In this context, we note the relevance of **global mapping** and…
>
> From "the Future We Want" adopted at Rio+20

Rio+20, June 2012

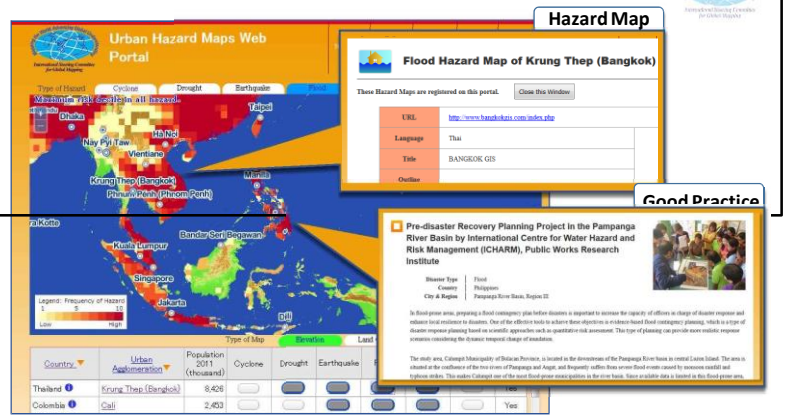


Rio+20 side event "Global Mapping Seminar"

2013-2016: Facilitate the use of geospatial information

2013	Over the 30 countries released Global Map data as EuroGlobalMap became OpenData. Professor Paul Cheung assumed new Chair
2014	Hazard Maps Web Portal site and Catalogue Service were released.
2015	***The 3rd WCDRR*** Symposium "Application of Geospatial Technology in Urban Disaster Management"
2016	Global Land Cover NMO Version ver.3 was released. **23rd Meeting of ISCGM / Data transfer ceremony**

Release of Hazard Maps Web Portal (2014)



The 3rd WCDRR (2015)

- A conference to make disaster risk reduction strategies of the world
- Adopted Sendai Framework for Disaster Risk Reduction 2015-2030.
- Proposed the use of ISCGM portal site as an index to measure achievement of Sendai Framework for Disaster Risk Reduction 2015-2030.
- Organized a disaster risk reduction symposium as a pre-event.

3rd WCDRR

Symposium on Application of Geospatial Information Technology In Urban Disaster Management

3. Outcome of Global Mapping Project

Outcome 1 : Provide a global forum for discussion on geospatial information

Prof. John E. Estes

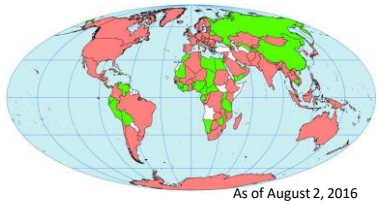
Taylor

Prof. D. R. Fraser

Prof. Paul Cheung

Under the strong leadership of three chairs, a total of 23 meetings were held to have provided a forum to discuss issues on geospatial information for collective contribution of NGIAs to the global society.

Outcome 2: Developing Global Map data in cooperation with NGIAs



As of August 2, 2016

Project participating and data releasing countries

Project participating countries

Participation: **184** countries and regions
（About **96%** of global land area）

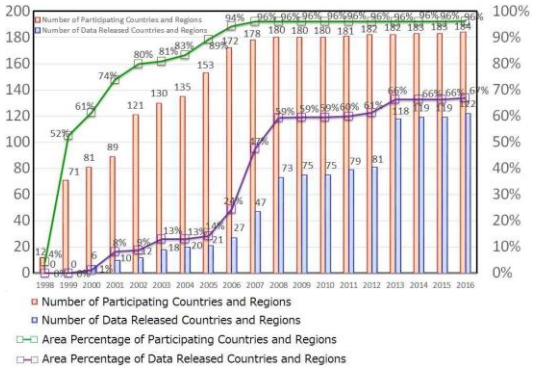
Data release: **122** countries and regions
（About **67%** of global land area）

Global version: Land cover and Percent Tree Cover collaborating with NGIAs of respective countries.

Open data; ISCGM has promoted open data policy from the start of the project in 1990's.

Outcome 2: Developing Global Map data in cooperation with NGIAs

Participation and Data release Status 1998-2016



53,329 users registered

275,413 Global Map data downloaded

From Nov. 2000 to Jul. 2016

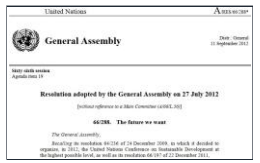
Outcome 3: Data dissemination

Outcome 4: Capacity building

- **112** people from **60** countries joined Global Map training in Japan (1994-2012)
- Global Mapping Seminars in Kenya and Senegal had **86** people from **36** countries
- Supported the development of Global Map data by providing three kinds of tools for supporting Global Map data development, and manuals.
- ESRI/INTERGRAPH grant programs

JICA Training Course on Global Mapping in 1995

Outcome 5: Facilitate the development and use of geospatial information


United Nations A/RES/66/288

General Assembly

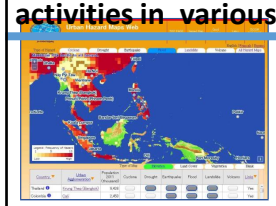
Resolution adopted by the General Assembly on 27 July 2012

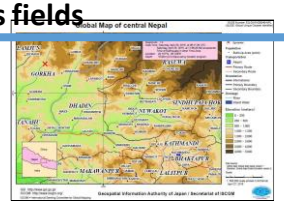
66/288. The future we want

- Global Mapping project: facilitating develop and use of geospatial information.
- Reference to geospatial information in post-Rio conference documents.
- Calling for geospatial information in other processes such as GGIM, WCDRR

ISCGM: advocator of geospatial information for more than 20 years.

Outcome 6: Supporting international activities in various fields




Global Map of central Nepal

- Developping Hazard Maps web portal as a voluntary commitment of WCDRR3
- Application to calculating emission and removal of green house gases
- Provision of disaster status maps to UNOCHA (ReliefWeb) at the time of disasters
- Material for children's international exchange education
- Application to Global Flood Alert System（GFAS）, etc….

Summary of the outcomes

・Twenty-four years have passed since the Earth Summit, which triggered starting the Global Mapping Project, and Twenty years have passed since the establishment of ISCGM.

・122 countries and regions, covering 67% of whole land areas released Global Map data as well as Global version data.

・ISCGM contributed to building capacity of digital mapping technology of NGIAs, particularly in developing world.

・ISCGM and all the participating members contributed to the world through promoting geospatial information including Global Map data.

4. Resolution and Global Map Transfer Plan

Scheme for Implementation of Global Map Data Transfer

The resolution of the 23rd meeting of the ISCGM

↓ It refers to conducting the Global Map transfer Plan.

The Global Map transfer Plan (by ISCGM)

↓ It refers to the agreement for detailed term of use.

The agreement between ISCGM and UNGIS

- Basically no restriction within UN operations.
- No attributes in products derived from or using Global Map data.
- Global Map data cannot be released outside the physical control of UN personnel.
- The UNGIS can enrich its databases with Global Map data or merge Global Map data with its own databases.

Resolution of the 23rd Meeting of the ISCGM

1. Under the understanding that the Global Mapping project is going to conclude in the end of March 2017, ISCGM agrees not to gather anymore after the 23rd meeting.

2. ISCGM acknowledges the Global Map transfer Plan and instructs the secretariat to conduct it.

3. ISCGM instructs the secretariat to register the contents of the Urban Hazard Maps Web Portal to the Knowledge Base of UNCE-GGIM.

ISCGM Secretariat will keep its minimum function until Mar. 2017 for carrying out the Global Map transfer Plan, not continuing the following.

a) Update of the Internet site except the matters related to the report of the 23rd meeting.
b) Administrating works related to the participation to the project, developing and updating Global Map data, and so on.

Urban Hazard Maps Web Portal will be closed after completion of registering to Knowledge Base.

Global Map Transfer Plan

1. The secretariat of ISCGM sends the Global Map data to UNGIS on behalf of the organization.

2.Global Map data can be used within the United Nations System without any restriction including mandatory attribution. The detailed terms of use are described in the agreement titled "Dissemination and handling in the use of the Global Map data provided from the International Steering Committee for Global Mapping (ISCGM) to the United Nations Geospatial Information Section (UNGIS) in support of the United Nations operations."

3.In order to ensure availability of Global Map data on the Web, the secretariat will work to provide the availability of the data if they are not yet released from the participating organization. In this case, any user authentication or access logging are not provided.

This plan is 'opt-in': this plan is applied according to the agreement by respective participating organizations. Otherwise the Global Map data of the organization stays its own.
ISCGM Secretariat will carry out the actual transfer of Global Map data no later than Mar. 2016.

Agreement between ISCGM and UNGIS

1.The International Steering Committee for Global Mapping (ISCGM), representing all its participating members, provides a copy of its Global Map data to the United Nations Geospatial Information Section (UNGIS), free of charge, and authorises perpetually its use in support of the United Nations operations without any restriction except the ones enumerated below.

2.The Chief of the Geospatial Information Section, Department of Field Support, United Nations (UNGIS) will act as the central repository and dissemination point for all Global Map data for its use in support of the United Nations operations and will assure that users are fully aware of the dissemination, handling and use condition of the Global Map data.

3.Global Map data shall only be used for the official purpose of supporting United Nations operations. Any other use beyond the scope of this official purpose is not authorized.

4.Global Map data cannot be released outside the physical control of United Nations personnel directly involved in supporting United Nations operations.

Agreement between ISCGM and UNGIS

5.Global Map data shall not be displayed, stored or distributed on publicly accessible networks or systems, nor be posted to or transmitted over the internetsystem.

6.Cartographic products using Global Map data can be disseminated by the United Nations with no restriction as is useful to support its operations at the sole opinion of the United Nations.

7.The UNGIS can enrich its databases with Global Map data or merge Global Map data with its own databases and use the result with no restriction as is useful to support its operations at the sole opinion of the United Nations.
All products derived from or using the Global Map data are exempt from the need toprovide attribution to the Global Mapping Project.

ISCGM Secretariat keeps its Internet site until the necessary measures are taken for the accessibility and availability to Global Map data onward.
Please contact to sec@iscgm.org if you have question about the transfer of Global Map data.

Thank you for your attention

GLOBAL SPATIAL DATA INFRASTRUCTURES

GLOBÁLNÍ PROSTOROVÉ DATOVÉ INFRATSRUKTURTY

GSDI základy a produkty

Milan Konečný

http://gsdiassociation.org/

"The Global Spatial Data Infrastructure Association - Advancing a Location Enabled World"

The GSDI Association is an inclusive organization of academic and research institutions, government agencies, commercial firms, NGOs and individuals from around the world.
The purpose of the organization is to promote international cooperation and collaboration in support of local, national and international ***Spatial Data Infrastructure*** research, education, capacity building and implementation challenges, issues and good practice from around the globe that will allow nations to better address social, economic, and environmental issues of pressing importance.

***Our Vision** is a world where everyone can readily discover, access and apply geographic information to improve their daily lives.*

***Our Purpose** is to encourage international cooperation that stimulates the implementation and development of national, regional and local spatial data infrastructures.*

***Our Mission** is to advance geo-information best practices, knowledge sharing and capacity building for the improved sharing and application of geographic information.*

For students:

GSDI SDI Small Grants Program Award Winners Announced

Each of the award winners will receive cash support for their proposed projects of US$ 2,500.

Please contact: smallgrants@gsdi.org

SDI Cookbooks and Guides

English

Spatial Data Infrastructure Cookbook 2012 Update (PDF)

Spatial Data Infrastructure Cookbook 2009 (PDF)

Spatial Data Infrastructure Cookbook - (Wiki - in progress)

Spatial Data Infrastructure Cookbook v2.0 (PDF) January 2004

Spatial Data Infrastructure Cookbook v1.0 (HTML Version) July 2000

Also in Spanish, Chinese, Polish, Albanian,

From The SDI Cookbook

Welcome to the SDI Cookbook

The following contains the text of the book, broken down by chapter.

Each chapter is then broken into subsections.

Chapter 1: The Cookbook Approach
Chapter 2: Geospatial Data Development: Building data for multiple uses
Chapter 3: Metadata: Describing geospatial data
Chapter 4: Geospatial Data Catalogue: Making data discoverable
Chapter 5: Geospatial Data Visualization: Online Mapping
Chapter 6: Geospatial Data Access and Delivery: Open access to data

Chapter 7: Other Services
Chapter 8: Legal Issues and Economic Policy
Chapter 9: Outreach and Capacity Building: Creating a community
Chapter 10: Standards Suites for Spatial Data Infrastructure
Chapter 11: Case Studies
Chapter 12: Terminology
Annex A. Abbreviations and Terminology used in the GSDI Cookbook
Retrieved from "http://www.gsdidocs.org/GSDIWiki/index.php/Main_Page"

1.8.3 Chapter 4: Geospatial Data Catalogue: Making data discoverable
1.8.4 Chapter 5: Geospatial Data Visualization: Online Mapping
1.8.5 Chapter 6: Geospatial Access and Delivery: Open access to data
1.8.6 Chapter 7: Other Services
1.8.7 Chapter 8: Legal Issues and Economic Policy
1.8.8 Chapter 9: Outreach and Capacity Building: Creating a community
1.8.9 Chapter 10: Case Studies
1.8.10 Chapter 11: Terminology

1 Chapter Two: Geospatial Data Development: Building data for multiple uses

1.1 Context and Rationale

1.1.1 Achieving Benefits

1.2 Organisational Approach

1.2.1 Framework Leverages the Development of Needed Data

1.2.2 Who are the actors in framework data development?

1.3 Implementation Approach

1.3.1 Common Identities of Real World Objects

1.3.2 Candidate National Framework Categories

1.3.3 Candidate Global Data Categories

1.4 Recommendations

1.5 References and Linkages