GROUP ON EARTH OBSERVATIONS

Progress in GEOSS Implementation

Giovanni Rum,
GEO Secretariat

COPUOS

Scientific and Technical Subcommittee,

45th Session – Vienna

11-22 February 2008

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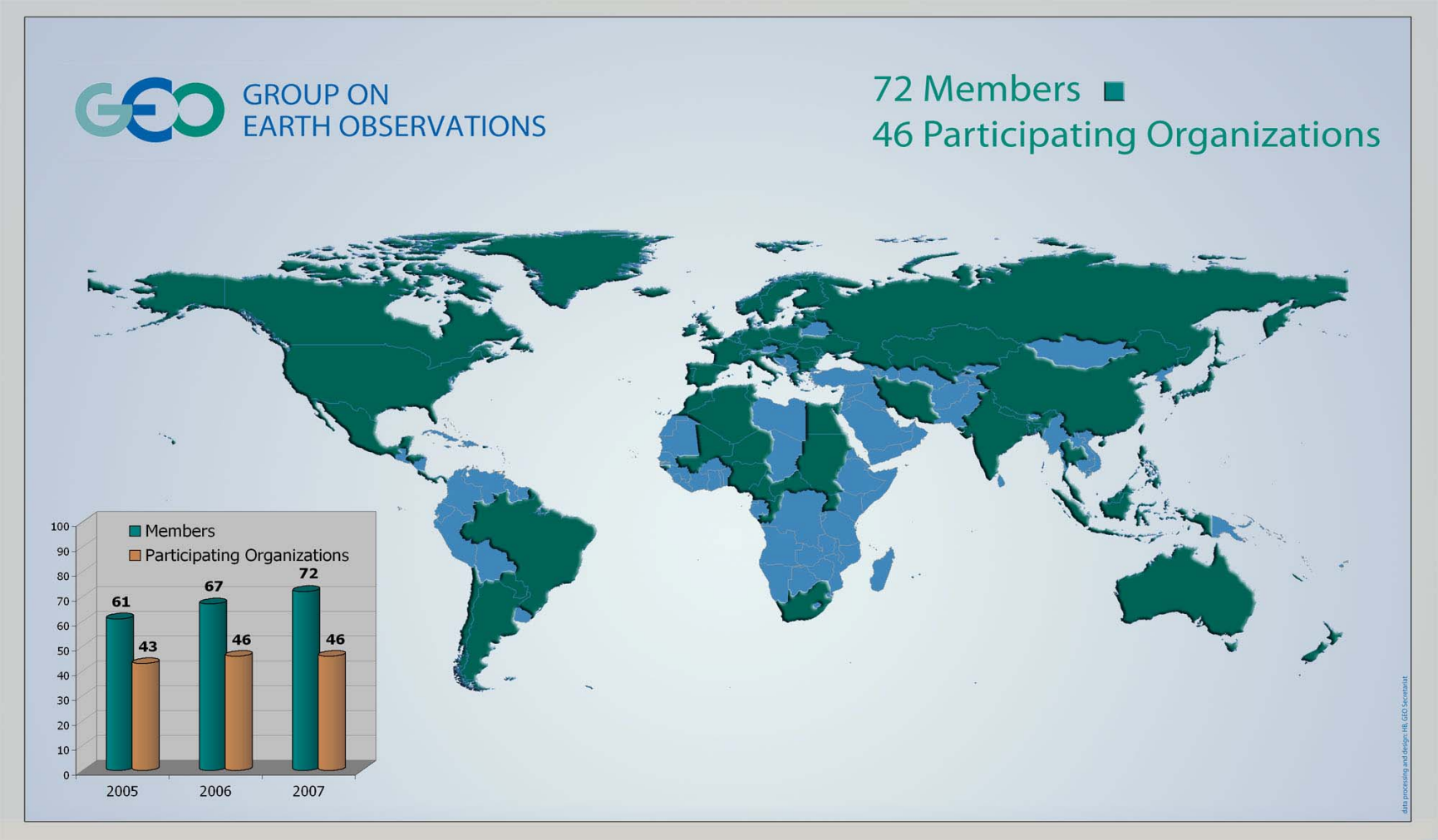
GEO, the Group on Earth Observations

An Intergovernmental Organization with 72 Member Countries, the European Commission and 52 Participating Organizations

U.S. Department of State, Washington DC July 31, 2003

GEO Membership evolution (as at november 2007)



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GEO today

The Group on Earth Observations, was established in 2005, with a major objective: to establish a coordinated and sustained Global Earth Observation System of Systems – GEOSS.

It is an Intergovernmental Organization and today has 73 Members (72 Countries and the European Commission) & 52 Participating Organizations, including:

- **UN Organizations and Programs, such as FAO, IOC, ISDR, UNEP, UNESCO, UNFCCC, UNITAR/UNOSAT, UNOOSA,WMO**
- **other leading international Organizations in different domains, such as CEOS, ESA, EUMETSAT, FDSN, IAG, ICSU, OGC**

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

GEOSS will be built from the expansion and interlinking of existing observation and information systems and the investments of Members and Participating Organizations in new systems

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GEOSS addresses Nine Societal Benefit Areas

1. Reduction and Prevention of Disasters

2. Human Health and Epidemiology

3. Energy Management

4. Climate Variability & Change

5. Water Management

6. Weather Forecasting

7. Ecosystems

8. Agriculture

9. Biodiversity

GEO Governance

- 10-Year Plan Endorsed by 2005 Ministerial Summit
- Plenary (co-chaired by RSA, EC, USA and PRC)
- Executive Committee

  (12 Members)
- Four Standing Committees
- Executive Secretariat (Geneva)

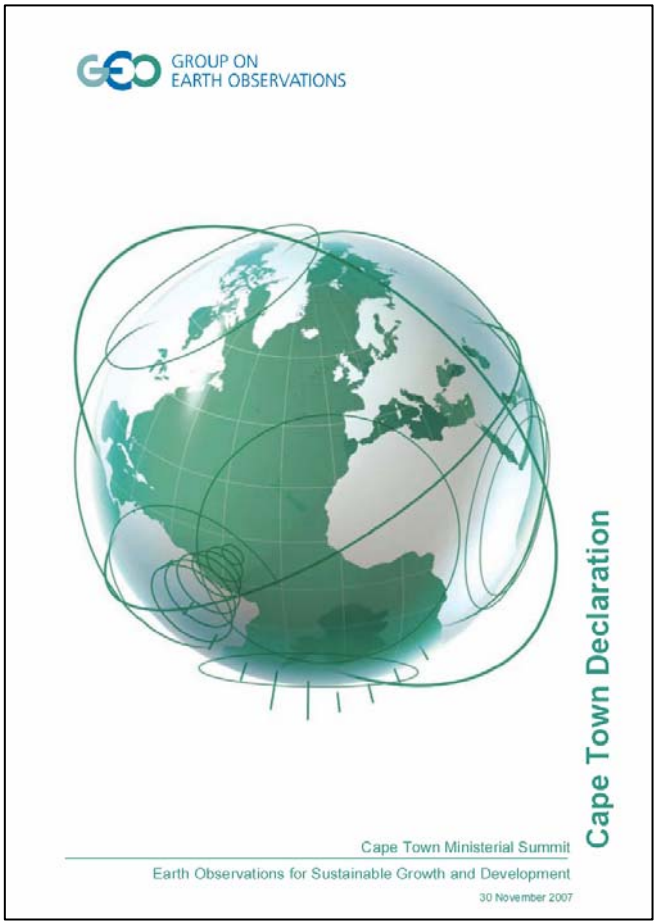
The Cape Town Ministerial Summit 2007

Earth Observation for Sustainable Growth and Development

The Summit was the opportunity to:

- **Highlight early progress and key achievements of GEO/GEOSS;**
- **Bring emerging priorities to the attention of the Ministers;**
- **Engage the commitment of Ministers through the Cape Town Declaration.**

Cape Town Summit and Declaration



Noted with satisfaction the progress made, as documented in the Report on Progress and in its Annex “Early Achievements”

Reaffirmed a strong commitment to GEOSS implementation and sustained operations

Focused some key issues, some of them, like data sharing and spectrum allocation for remote sensing, highly relevant to COPUOS

Resolved to meet before the end of 2007

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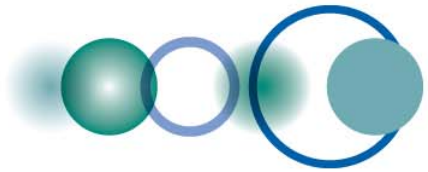

Data Sharing principles

The GEOSS 10-Year Implementation Plan explicitly acknowledges the importance of data sharing in achieving the GEOSS vision and anticipated societal benefits. The Plan, endorsed by nearly 60 governments and the European Commission at the 2005 Third Earth Observation Summit in Brussels, highlights the following GEOSS Data Sharing Principles:

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

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Radiocommunication spectrum allocation for Remote Sensing

"Recognizing the important contribution GEO can make through collaboration with the International Telecommunication Union to promote, by the appropriate alerting authorities, the implementation of the international standard for all-media public warning across all disaster and emergency situations;

We welcome the resolution of the World Radio Conference-07 on radio communication use for Earth observation applications and the support it provides for the international protection and long term availability of frequencies for terrestrial, oceanic, air-borne, and space-based observations, including passive measurements;"

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Radiocommunication spectrum allocation for Remote Sensing

A framework agreement has been signed between ITU and the GEO Secretariat aimed at strengthening cooperation on remote sensing of the Earth, particularly in the field of disaster preparedness and response. Expected benefits that this collaboration will provide to the global community include

- allocation and protection for the dedicated radio frequencies that remote-sensing satellites and Earth-based monitors use for gathering high-quality data on the global environment,
- the improved application of Earth observations to disaster management, and
- increased capacity building in developing Countries for the effective use of Earth observations in decision-making.

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Some Achievements of relevance to COPUOS

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Global DEM – 30 m. resolution

November 22, 2007

Joint Response
to
Invitation to Contribute ASTER GDEM to GEOSS

Dear Prof. Achache:

Thank you for your letter dated July 11, 2007, in which you invited the Ministry of Economy, Trade and Industry (METI) of Japan and the U.S. National Aeronautics and Space Administration (NASA) to contribute a global digital elevation model (GDEM) to the world's scientific and applications communities under the auspices of the Global Earth Observation System of Systems (GEOSS). METI and NASA, in conjunction with the Earth Remote Sensing Data Analysis Center (ERSDAC) and the U.S. Geological Survey (USGS), are producing the GDEM with data acquired by the METI Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) aboard the NASA Terra satellite.

We agree with your observation that a 30 m global DEM will be an exciting and essential advancement for the broad user community, and we believe the ASTER GDEM will be widely used in many applications that bring important benefits to society. It is in this spirit and with a desire to benefit society to the maximum extent possible through the broadest application of this product that we are pleased to accept your invitation to contribute the ASTER GDEM to GEOSS.

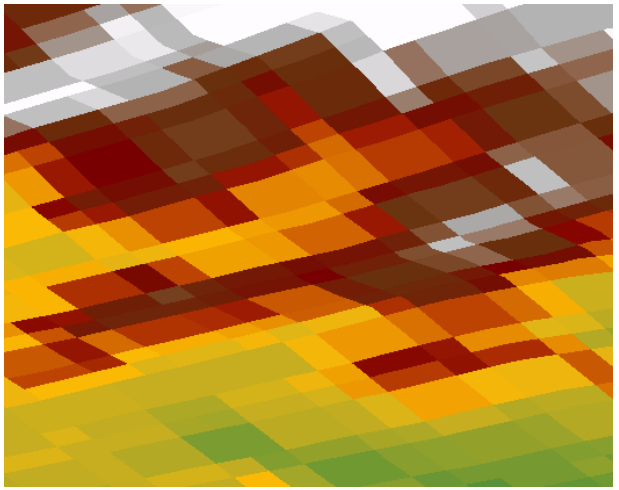
We anticipate that the ASTER GDEM will be available to the worldwide user community early in calendar year 2009 as an ASTER data product. Through an agreement between METI and NASA, the ASTER GDEM will be available to all users at no cost. Other policies affecting the availability of the ASTER GDEM will be consistent with GEOSS data sharing principles, which recognize relevant international instruments, legislation, and national security policies.

Sincerely,

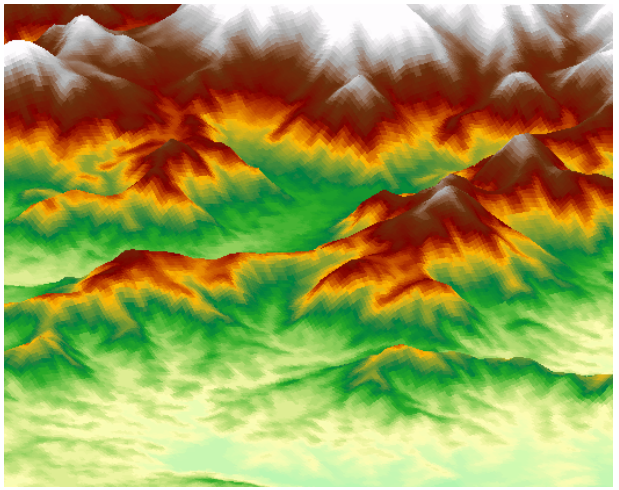
飯田陽一 — Teresa Fryberger

Yoichi Iida
Director, Space Industry Office
Manufacturing Industries Bureau
Ministry of Economy, Trade and Industry

Teresa Fryberger
Director, Applied Sciences
Earth Science Division
Science Mission Directorate
NASA Headquarters



90 m



30 m

Comparison courtesy of V. Gorokhovich, CIESIN

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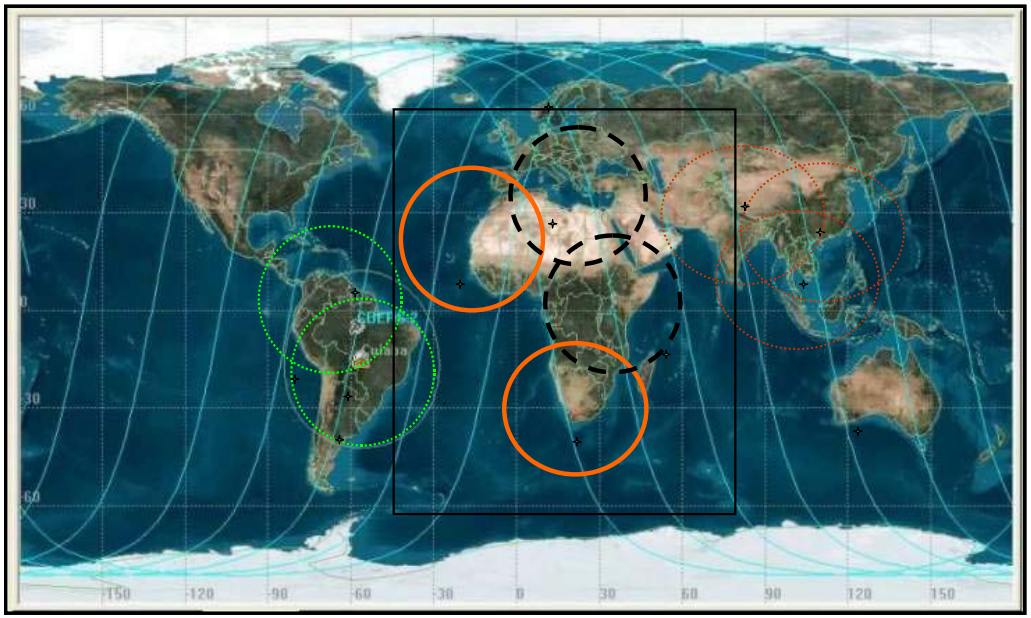
CBERS-2B satellite data and products for Africa (announced at GEO Summit in Cape Town)



Running (Green for Brazil, red for China) and planed Ground Stations for Africa. The locations of the ground stations are Canary Islands (Spain), Hartebeesthoek (South Africa), Malindi (Kenya) and Matera (Italy).

China and Brazil will grant free downlink licenses and upgrades of the ground stations, which receive, process, store and distribute the imagery free of charge.

China and Brazil are working with South Africa, Spain and Italy to sign three parties Memorandum of Understanding for distribution of CBERS satellites imagery.

Downlink to South Africa station has been successfully tested

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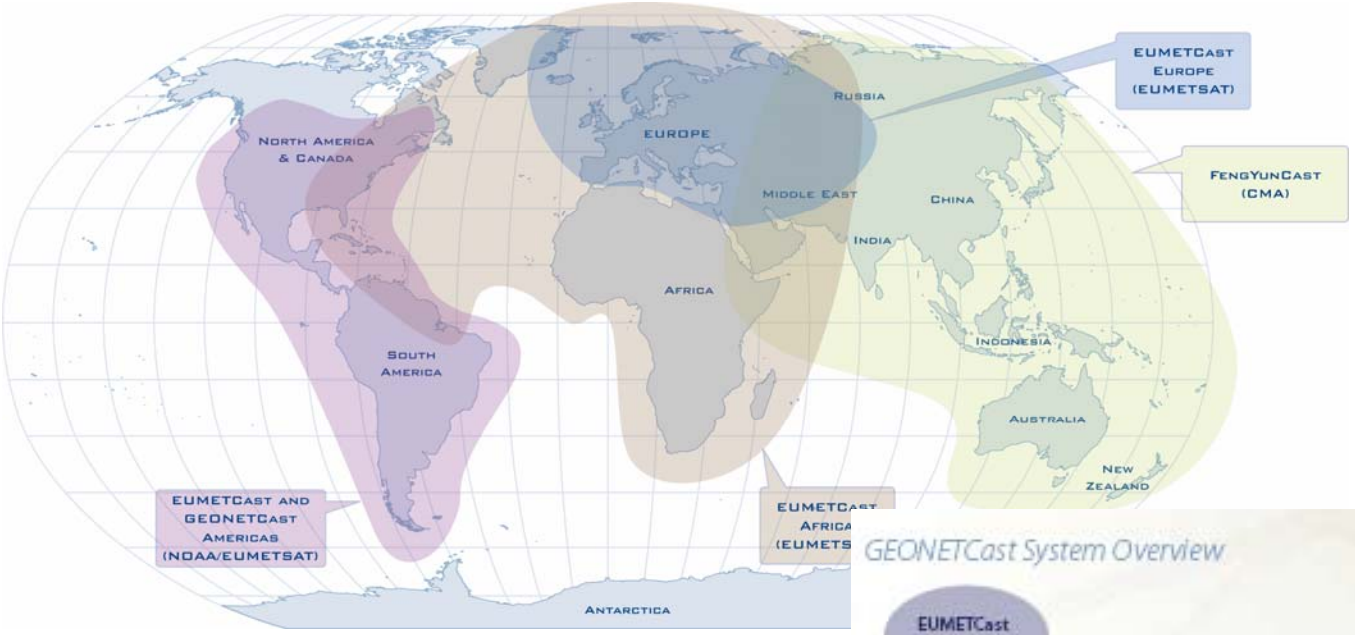
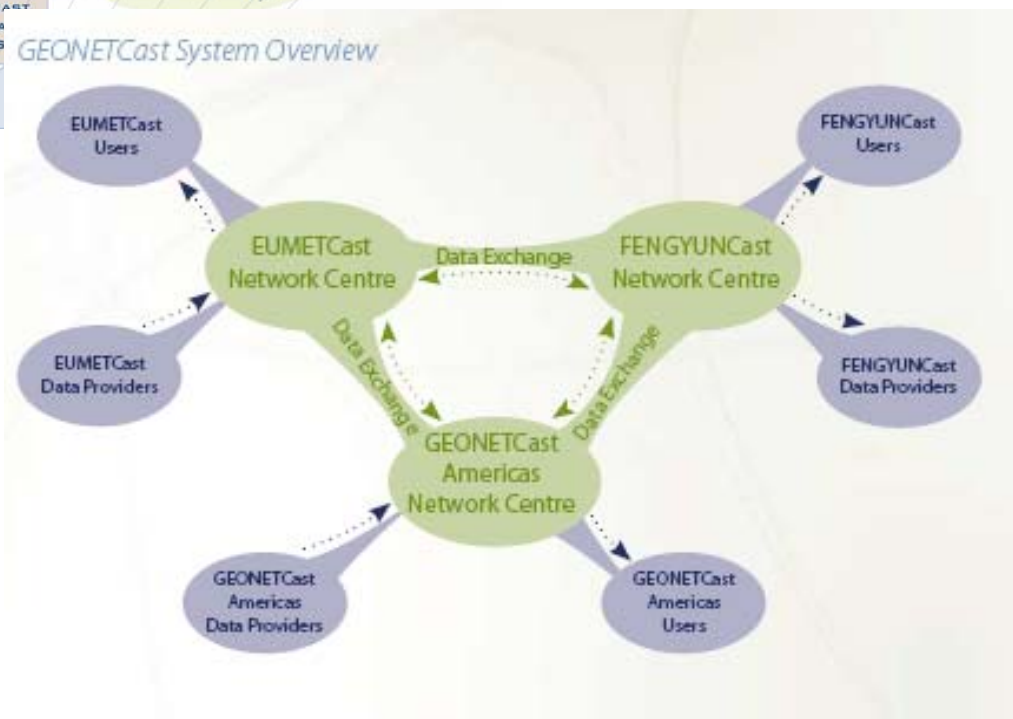
GEONETCast



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
Status of implementation

Global Coverage

- NOAA's GEONETCast Americas acceptance is nearly finalised;
- EUMETCast – FENGYUNCast data exchange is operational;
- Dissemination of exchanged data to start this year;
- Inclusion of Russia's MITRA system to be initiated at the technical level.

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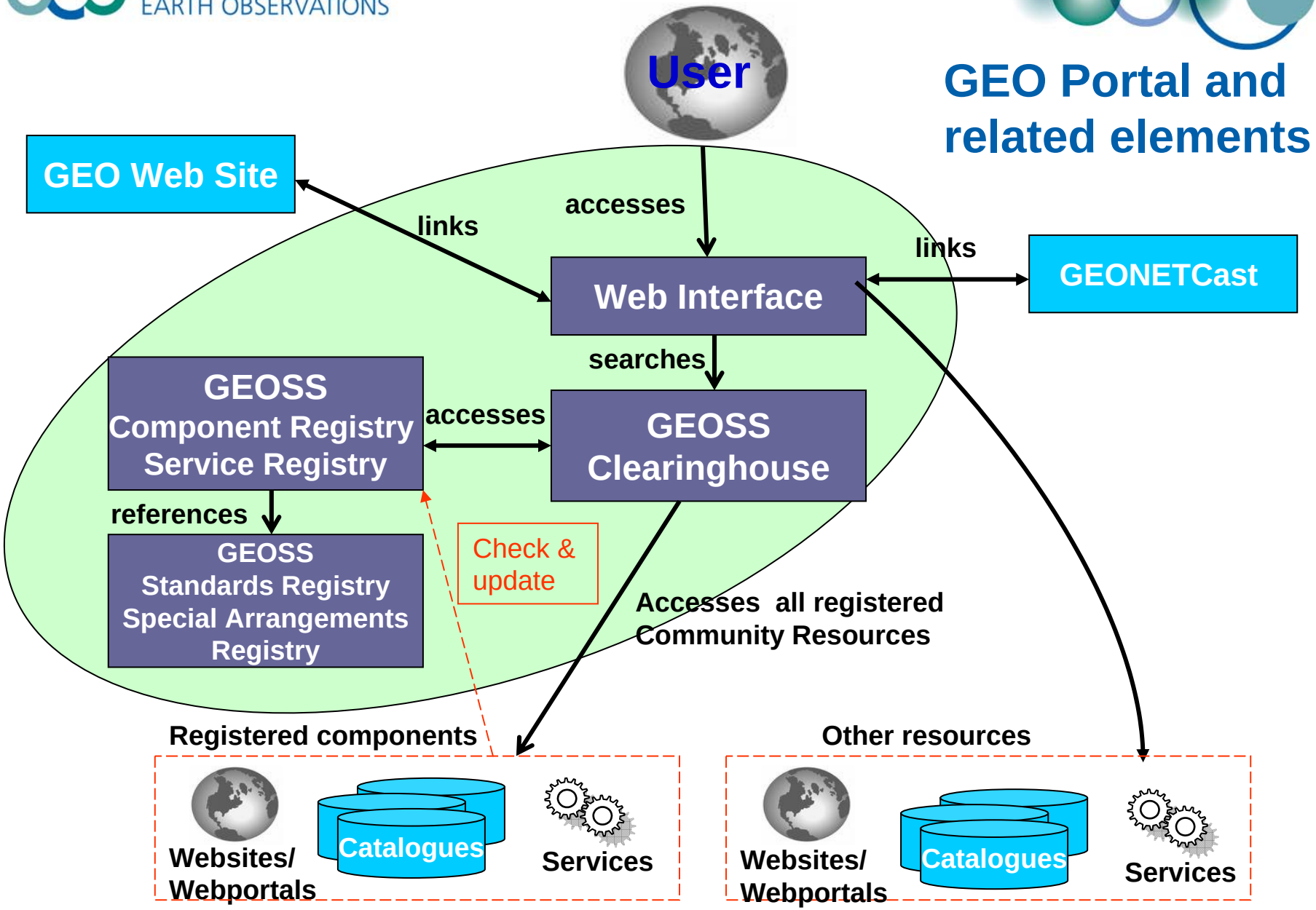
GEO Portal and related elements



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GEO Portal

Sample pages

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Three prototype Portals

Compusult	http://www.geowebportal.org/web/guest/home
ESA - FAO	http://www.geoportal.org/
ESRI	http://keel.esri.com/Portal/

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GEO interactions with the Charter on Space and major Disasters

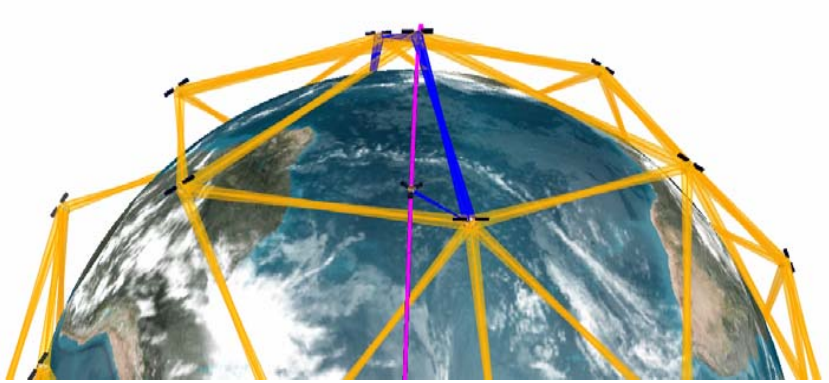
A dialogue has been initiated on the basis of the request made by GEO to the Charter to consider putting in place the necessary provisions and proper mechanisms to enable GEO Members to:

- Authorized access to Charter during emergencies
- Access to the archive of previous interventions

IRIDIUM NEXT

During the last year an Unique Opportunity for Space Observations has emerged and is being assessed within GEO partnership and within the global User Communities :

The concrete possibility to embark up to 66 Earth observation payloads on Iridium (R) NEXT constellation, and this would really help to revolutionize Earth observations.
The launches will start in 2013 and the constellation's operational life will extend beyond 2030. Guest sensors will utilize the real-time communication backbone of Iridium and, along with the constellation approach to sensing, will enable, among others, key climate related observations and services such as now-casting and disaster early warning.



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IRIDIUM NEXT

Latest step of this continuous assessment was meeting at the Royal Society in London on January 22, 2008. The meeting, "Exploiting the New Earth Observation Paradigm," organized by Trident Sensors Ltd., was a follow-up to the GEO IV Plenary and Ministerial Summit in Cape Town last November. The meeting was successful and brought together over 120 representatives from the international environment and climate science communities, leading U.S. and European weather and space agencies, and aerospace industry representatives to explore plans to host Earth observation payloads on Iridium's NEXT constellation.

Activity will now turn to working with the national weather and space agencies and the science community to identify critical missions and find appropriate funding mechanisms for this program.

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Back-up slides

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GEO Members – January 2008

Algeria	Denmark	Kazakhstan	Paraguay
Argentina	Egypt	Korea, Republic of	Philippines
Australia	European Commission	Latvia	Portugal
Bahrain	Finland	Luxembourg	Romania
Bangladesh	France	Malaysia	Russian Federation
Belgium	Germany	Mali	Slovakia
Belize	Greece	Mauritius	Slovenia
Brazil	Guinea-Bissau	Mexico	South Africa
Cameroon	Honduras	Moldova	Spain
Canada	Hungary	Morocco	Sudan
Central African Republic	Iceland	Nepal	Sweden
Chile	India	Netherlands	Switzerland
China	Indonesia	New Zealand	Thailand
Congo, Republic of the	Iran	Niger	Tunisia
Costa Rica	Ireland	Nigeria	Uganda
Croatia	Israel	Norway	Ukraine
Cyprus	Italy	Pakistan	United Kingdom
Czech Republic	Japan	Panama	United States
			Uzbekistan

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GEO Participating Organizations – January 2008

AARSE: African Association of Remote Sensing of the Environment
ADIE: Association for the Development of Environmental Information
APN: Asia-Pacific Network for Global Change Research
CATHALAC: Water Center for the Humid Tropics of Latin America and the Caribbean

CEOS: Committee on Earth Observation Satellites
CGMS: Coordination Group for Meteorological Satellites
CMO: Caribbean Meteorological Organization
COSPAR: Committee on Space Research
DIVERSITAS
ECMWF: European Centre for Medium-Range Weather Forecasts
EEA: European Environmental Agency
EIS-AFRICA: Environmental Information Systems - AFRICA
ESA: European Space Agency
ESEAS: European Sea Level Service
EUMETNET: Network of European Meteorological Services/Composite Observing System
EUMETSAT: European Organization for the Exploitation of Meteorological Satellites
EuroGeoSurveys: The Association of the Geological Surveys of the European Union
FAO: Food and Agriculture Organization of the United Nations

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GEO Participating Organizations – January 2008

FDSN: Federation of Digital Broad-Band Seismograph Networks
GBIF: Global Biodiversity Information Facility
GCOS: Global Climate Observing System
GSDI: Global Spatial Data Infrastructure
GOOS: Global Ocean Observing System
GTOS: Global Terrestrial Observing System
IAG: International Association of Geodesy
ICSU: International Council for Science
IEEE: Institute of Electrical and Electronics Engineers
IGBP: International Geosphere-Biosphere Program
IGFA: International Group of Funding Agencies for Global Change Research
IGOS-P: Integrated Global Observing Strategy Partnership
IHO: International Hydrographic Organization
IISL: International Institute for Space Law
INCOSE: International Council on Systems Engineering
IO3C: International Ozone Commission
IOC: Intergovernmental Oceanographic Commission
ISCGM: International Steering Committee for Global Mapping

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GEO Participating Organizations – January 2008

ISDR: International Strategy for Disaster Reduction
ISPRS: International Society for Photogrammetry and Remote Sensing
OGC: Open Geospatial Consortium
POGO: Partnership for Observation of the Global Ocean
SICA/CCAD: Central American Commission for the Environment and Development
SOPAC: South Pacific Applied Geoscience Commission
UNCBD: United Nations Convention on Biodiversity
UNEP: United Nations Environment Programme
UNESCO: United Nations Educational, Scientific and Cultural Organization
UNFCCC: United Nations Framework Convention on Climate Change
UNITAR: United Nations Institute for Training and Research
UNOOSA: United Nations Office for Outer Space Affairs
UNU-EHS: United Nations University, Institute for Environment and Human Security
WCRP: World Climate Research Programme
WFPHA: World Federation of Public Health Associations
WMO: World Meteorological Organization

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GEO Governance

Executive Committee 12 Members

Regional representation

Africa(2)	**:**	**South Africa, Uganda**
Americas(3)	**:**	**Argentina, Panama, USA**
CIS(1)	**:**	**Russia**
Asia(3)	**:**	**Australia, China, Japan**
Europe(3)	**:**	**EC, Germany, Norway**

4 co-Chairs **:** **EC, USA, China and South Africa**