



The GEO User Requirements Approach to Achieving Societal Benefits

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Building Global Political Momentum

- UN Conference on Environment and Development (Earth Summit)
- June 1992; Rio de Janeiro
- Millennium Development Goals - September 2000; UN General Assembly
- World Summit on Sustainable Development (Rio + 10) - August 2002; Johannesburg
- G8 Summit – June 2003; Evian
- Earth Observation Summit - July 2003; Washington D.C.
- Earth Observation Summit III – February 2005; Brussels





Group on Earth Observation (GEO)

- At the Ministerial level Earth Observation Summit (EOS-1), July 2003 the *ad hoc* GEO was created & tasked with the development of the 10 Year Implementation plan (TYIP) for Global Earth Observation System of Systems (**GEOSS**).
- The TYIP is a negotiated document that was endorsed at EOS-III, February, 2005
- It is supported by the GEOSS 10-Year Implementation Plan Reference Document, a living document containing the **2, 6 and 10 year targets** (developed by science and technology experts) to deliver on GEOSS.





Global Earth Observation System of Systems (GEOSS)

The **vision** for GEOSS is to realize a future wherein decision and action for the **benefit of humankind** are informed by coordinated, comprehensive and **sustained Earth observations and information**.

EO-enabled society

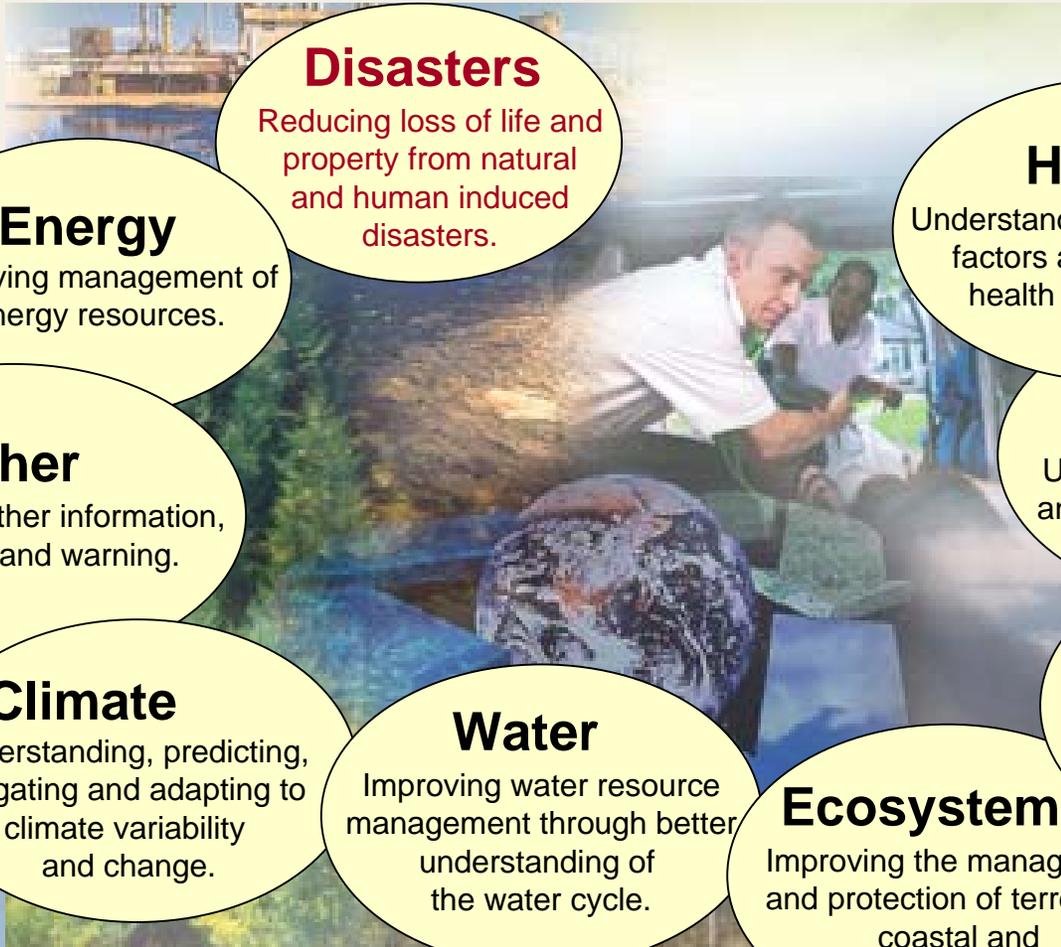
The **purpose** of GEOSS is to **achieve comprehensive, coordinated & sustained observations of the Earth system**, in order to **improve monitoring of the state of the Earth, increasing understanding of Earth processes, & enhance prediction of the behaviour of the Earth system**. GEOSS will meet the need for timely, quality long-term **global information** as a basis for sound **decision making**, & will ...

Source: The GEOSS 10-Year Implementation Plan (Feb. 16, 2005)





...enhance delivery of benefits to society in the following initial areas



Energy

Improving management of energy resources.

Disasters

Reducing loss of life and property from natural and human induced disasters.

Health

Understanding environmental factors affecting human health and well being.

Weather

Improving weather information, forecasting and warning.

Biodiversity

Understanding, monitoring and conserving biodiversity.

Climate

Understanding, predicting, mitigating and adapting to climate variability and change.

Water

Improving water resource management through better understanding of the water cycle.

Agriculture

Supporting sustainable agriculture and combating desertification.

Ecosystems

Improving the management and protection of terrestrial, coastal and marine ecosystems.





SCOPE of GEOSS (1)

GEOSS will provide the overall conceptual and organizational framework to build towards integrated global Earth observations **to meet user needs**. GEOSS will be a “system of systems” consisting of existing and future Earth observation systems. *...framework to meet user needs*

GEOSS will capture the success of Earth observation research programs, and facilitate their transition to sustained operational use.

...transition to ... operational use

The contributing systems will range across the processing cycle, from primary observation to information production. Through GEOSS, they will share observations and products with the system as a whole, and will take the necessary steps to ensure that the shared observations and products are accessible, comparable, and understandable, by supporting common standards and **adaptation to users needs**. *...common standards and adaptation to user needs*

...shared observations

Source: The GEOSS 10-Year Implementation Plan (Feb. 16, 2005)





SCOPE of GEOSS (2)

(negotiated text)

- GEOSS aspires to encompass **all areas of the world**, and to cover ***in situ*, airborne, and space-based observations**.
- GEOSS will be primarily focused on **issues of regional and global scale and cross-sectoral applications**.
- GEOSS will **promote capacity building** in Earth observation, building on existing local, national, regional, and international initiatives.

Source: The GEOSS 10-Year Implementation Plan (Feb. 16, 2005)

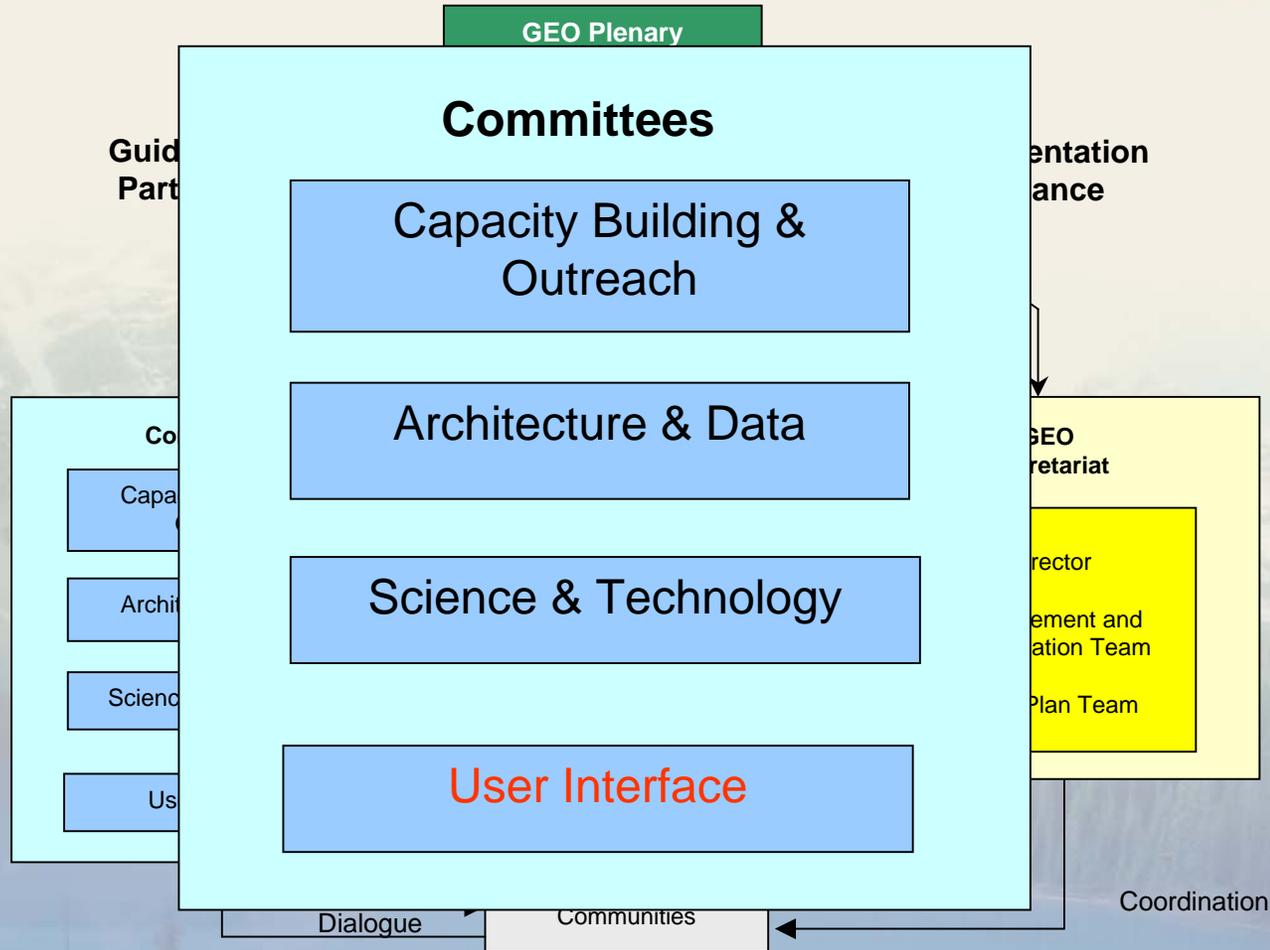




GEO Governance



Draft June 10, 2005 under negotiation





Ad hoc User Interface Workgroup

(July 2005)

AARSE

Canada (Co-Chair)

ECWMF

EEA

EUMETSAT

France

GEO Secretariat

Germany

IAG

IEEE

Italy (Co-Chair)

Japan

Korea

Malaysia

Netherlands

Norway

POGO

Russian Federation

South Africa

Sweden

UNESCO

UNEP

UNITAR

United Kingdom (Co-Chair)

United States

WMO





More about GEO and the User Interface Mechanism

- <http://earthobservations.org/>
- Co-chairs of *ad hoc* User Interface Working Group

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User Interface Mechanism

(GEO-I, May 3-4, 2005)

To engage Users it was agreed at GEO-I to use a **two tiered approach**;

1. A standing User Interface Committee
2. Communities of Practice





Proposed July, 2005

User Interface Standing Committee

To Enable GEO:

1. to address in a systematic, targeted, focused and comprehensive way, the needs and concerns of a **broad range of user communities in developing and developed countries**, across issues and trans disciplinary needs, with a particular focus emphasis on fostering new or less organized communities.
2. to engage a **continuum of users from producers to the beneficiaries** of the data and information
3. To **facilitate linkages and partnerships** between established CP's and new groups or organizations interested in collaborating.





Proposed July, 2005

Communities of Practice (CP)

A user-led community of stakeholders, from providers to the final beneficiaries of Earth observation data and information, with a **common interest in specific aspects of societal benefits** to be realized by GEOSS implementation.

The **Communities of Practice will be self organized** and will include stakeholders required to achieve benefits.





Proposed July, 2005

Communities of Practice

Objectives:

Each CP will have slightly different objectives but of necessity there will be common objectives such as:

- To provide a **forum for discussion** and to identify, gather, and seek agreement on their particular user community requirements;
- To **identify** linkages and opportunities for collaborative strategic and **technical projects**.
- **Coordinate** the target delivery to enable the realization of **societal benefits**
- To **advise the User Interface Committee, GEO Plenary** and all other CPs on matters relating to their particular area of interest or societal benefit.





Development of GEO Communities of Practice

- Concepts for pilot GEO Communities of Practice
 - **Health and Air Quality** (USA and Netherlands) will co-lead further development of concept by Dec/05.
 - **Wind Energy or Renewable Energy**: interest expressed by group but a lead or co-leads need to be identified.
 - **Coastal ecosystems**: IGOS-P will lead further development of the concept by Dec/05.
 - **Possible Water Related Disasters:**
 - **Protecting and Restoring Water Resources**
- The success and usefulness of the CPs will be evaluated at the end of the first year and improvements made if required.
- Next meeting User Interface Work Group, at GEO-II,

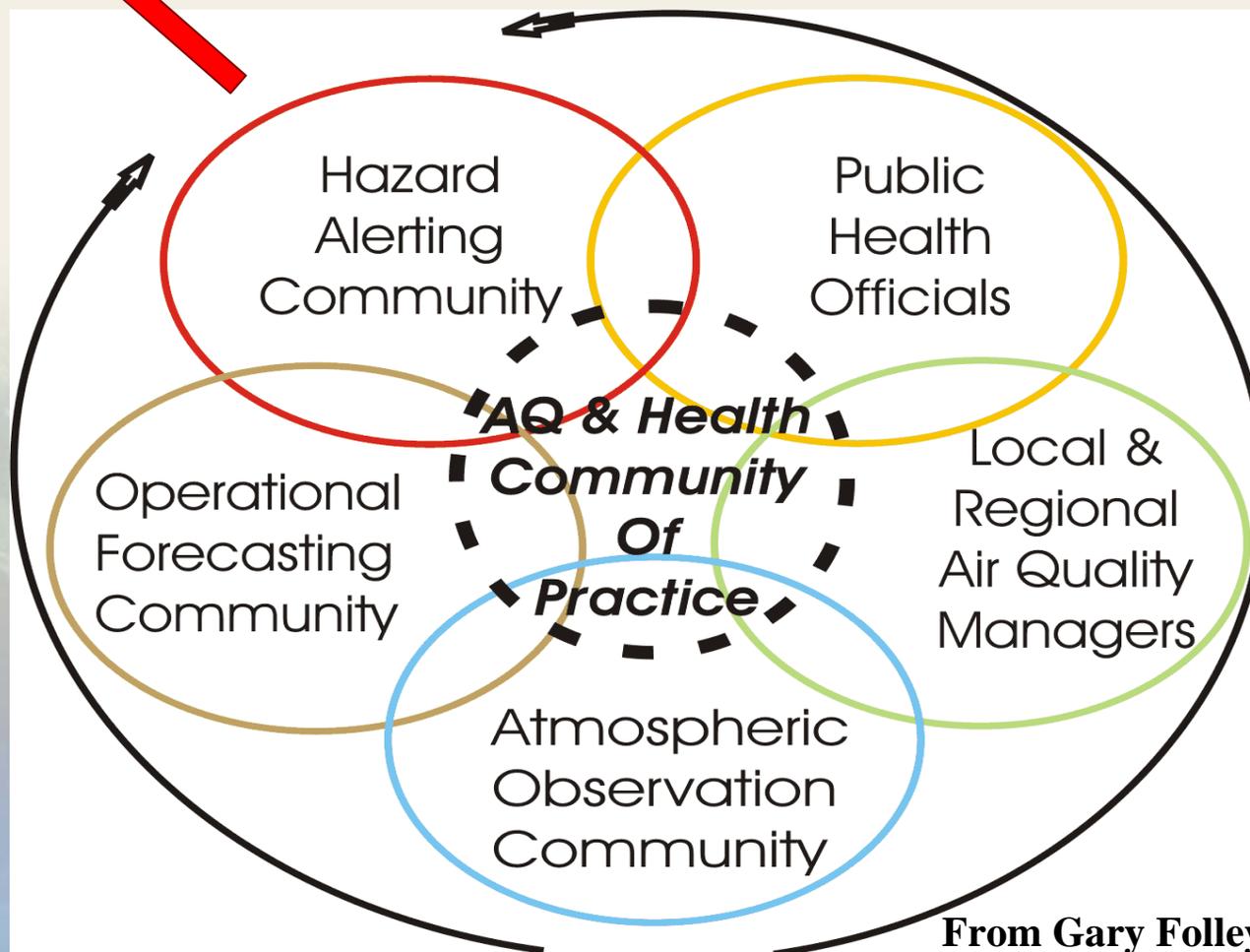
December 16, 2005





Air Quality & Health Community of Practice

The Public



From Gary Folley





Georgetown, Guyana

Flooding in February 2005

as seen by RADARSAT-1



Date: RADARSAT-1 Fine Mode Beam 5 near
 Ascending orbit
 Acquired February 3, 2005
 Original pixel spacing: 6.25 m
 processed at CCRS, Canada
 © Canadian Space Agency

Photos:
 taken on January 17, 20 and February 3, 2005
<http://www.bryanmarx.com>
 © Bryan Mackintosh, Mike Charles

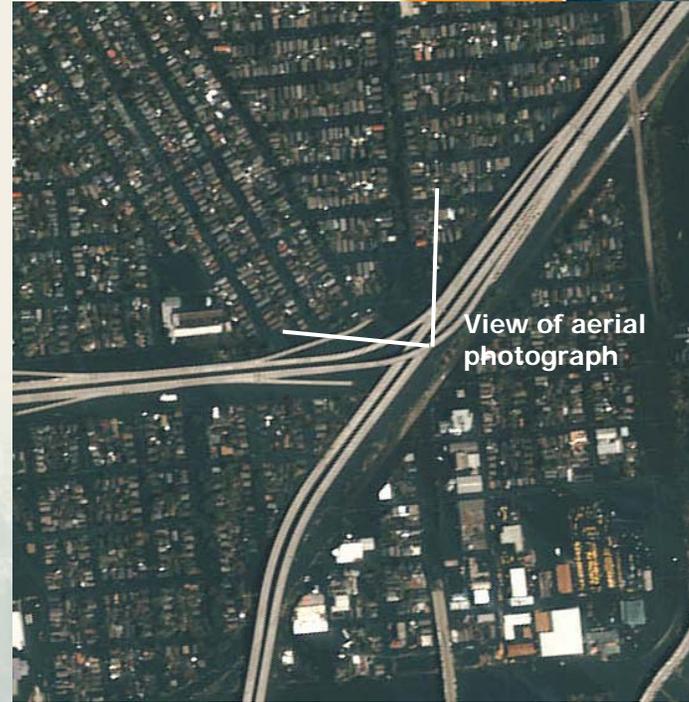




Before

March 9, 2004

View of aerial photograph



After

August 31, 2005

View of aerial photograph

Quickbird Imagery Applied to Flood Monitoring Damage caused by hurricane Katrina in New Orleans August 2005

Image: DigitalGlobe



Image: CNN

(c)2004 DigitalGlobe



Rainfall triggered Debris Flow: Coastal, Venezuela





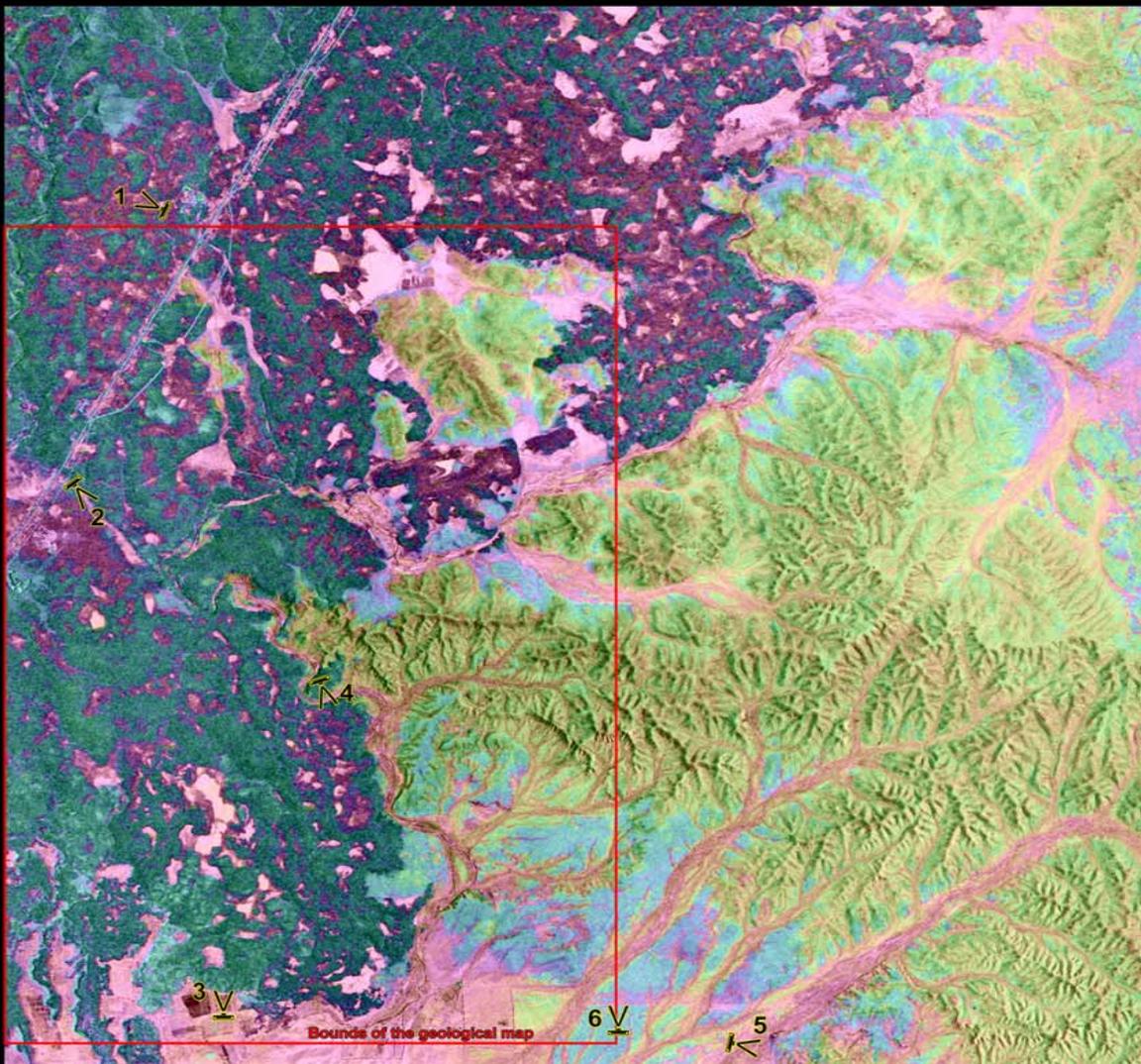
Water Harvesting: Jordan

- Mapping
Wadis and
Playas

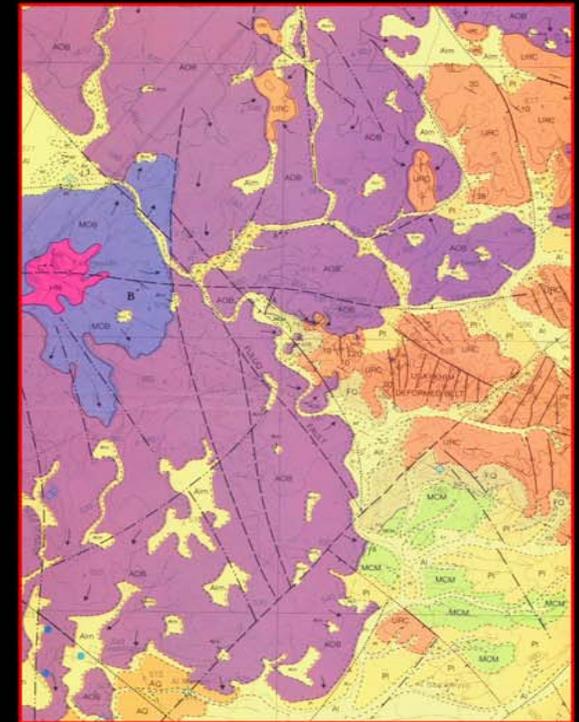


Hydrogeological SAR-VIR Image-Map

Al Azraq - Jordan



C-HH SAR acquired Dec. 8, 1993
 Landsat TM acquired Aug. 28, 1992
 Datasets were merged using the IHS technique



Geology from 1 : 50 000 geological map
 Natural Resources Authority of Jordan



Image Map	Geol. Map	Legend
	Alm	Eolian sediments
	PI, AI	Wadi sediments, Alluvium High water potential!
	FO, MCM	Porcellanite, Chalk marl
	URC	Chert, Limestone High groundwater recharge rates
	ACB	Basalts High permeability, Very high water potential

Data obtained through the GlobeSAR program, Jordan project



Potential Performance Measurements

- Building the community of practice
 - # workshops
 - # of users
 - Recruitment (# and geographic distribution)
- Impact assessment
 - # increased EO use / data sharing
 - integration of data into management / reporting practices
 - Improved risk assessments approaches
- Policy and Political impact





Conclusions



GEOSS User Involvement

- The benefits of GEOSS will be realized globally by a **broad range of user communities**
- **Engagement of users in developing countries** will maximize their opportunities to derive benefits from GEOSS.





For Success



- User needs must drive Architecture, Data Dissemination, **Capacity Building**, etc.
- GEOSS needs to move from **planning to delivering** to meet both the needs of users & continue to engage the interest & support of the political levels of our governments.
- **Metrics** are being developed **to measure the success** of the both the User Interface Mechanism & GEOSS in general (2-year targets)



Member Governments

- Algeria
- Argentina
- Australia
- Belgium
- Belize
- Brazil
- Cameroon
- Canada
- Central African Republic
- Chile
- China
- Croatia
- Cyprus
- Denmark
- Egypt
- Finland
- France
- Germany
- Greece
- Guinea-Bissau
- Honduras
- Iceland
- India
- Indonesia
- Iran
- Ireland
- Israel
- Italy
- Japan
- Kazakhstan
- Luxembourg
- Malaysia
- Mauritius
- Mexico
- Morocco
- Nepal
- Netherlands
- New Zealand
- Niger
- Nigeria
- Norway
- Portugal
- Republic of Korea
- Republic of the Congo
- Russian Federation
- Slovak Republic
- South Africa
- Spain
- Sudan
- Sweden
- Switzerland
- Thailand
- Tunisia
- Ukraine
- United Kingdom
- United States
- And the European Commission





Participating International Organizations

(as of April 30, 05)

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
 CEOS: Committee on Earth Observation Satellites
 ECMWF: European Centre for Medium-Range Weather Forecasts
 EEA: European Environmental Agency
 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
 FDSN: Federation of Digital Broad-Band Seismograph Networks
 GCOS: Global Climate Observing System
 GDSI: 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 Electronic Engineers
 IGBP: International Geosphere-Biosphere Program

IGFA: International Group of Funding Agencies for Global Change Research
 IGOS-P: Integrated Global Observing Strategy Partnership
 IISL: International Institute for Space Law
 INCOSE: International Council on Systems Engineering
 IOC: Intergovernmental Oceanographic Commission
 ISCGM: International Steering Committee for Global Mapping
 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
 WCRP: World Climate Research Programme
 WMO: World Meteorological Organization

