GEO Secretariat Update

UIC / CBC Meeting
Boulder, CO
September 22, 2008

Michael Tanner
Senior Program Officer
GEO Secretariat
Geneva, Switzerland
GEOSS Imperative

• Some 30% of our economy is tied to the environment

• Scientific understanding and ongoing knowledge of the Earth system is fundamental for well informed economic decision making

• Sustained Earth observations are critical in understanding the Earth

• A global approach to Earth observation is required
GEOSS 10-Year Implementation Plan

- GEOSS is “to realize a future wherein decisions and actions for the benefit of humankind are informed via coordinated, comprehensive and sustained Earth observations and information.”
- GEOSS is an important contribution to meeting the United Nations Millennium Development Goals
- Furthering the implementation of international treaty obligations.
- Encompass all areas of the Earth, with a particular emphasis on addressing the needs of developing country users
- Incorporate *in situ*, seaborne, airborne, and space-based observations
- Address the integration of observations with models to support early warning and prediction and other “societal benefit areas.”
Environment and Climate Change

To respond to the growing demand for Earth observation data, we will accelerate efforts within the Global Earth Observation System of Systems (GEOSS), which builds on the work of UN specialized agencies and programs, in priority areas, inter alia, climate change and water resources management, by strengthening observation, prediction and data sharing. We also support capacity building for developing countries in earth observations and promote interoperability and linkage with other partners.
75 Members
51 Participation Organizations
75TH member of GEO….

• Government of Estonia
  – Estonia's Minister of the Environment informed the Secretariat of his government's decision on 17 July

• Total GEO membership to 74 countries
  – Plus the European Commission

• Currently 51 Participating Organizations in GEO
Secretariat Staffing

• Seconded to Secretariat
  – Michael Tanner - US
  – Fernando Ramos - Brazil
  – Michael Obersteiner - Austria
  – Water Expert - Netherlands

• Returning to home institutions
  – Doug Muchoney – US
  – Doug Cripe – Water expert
  – Giovanni Rum - Italy
  – Osamu Ochai - Japan
  – Imraan Saloojee – South Africa

• Left this summer
  – Michael Rast - ESA
  – Nicki Parker - Communications
  – Emily Firth - Scientific contractor
GEO Launches...

The Global Earth Observation System of Systems (GEOSS)

GEOSS themes:
- Disasters
- Health
- Energy
- Climate
- Water
- Weather
- Ecosystems
- Agriculture
- Biodiversity

What's new?

GEO joins forces with Biodiversity Convention

The member governments of the Convention on Biological Diversity adopted a decision last May formally recognizing the role that GEOSS can play in achieving the Convention's goals. In an effort to enhance their collaboration on meeting governments' expectations, the heads of the GEO and CBD Secretariats signed a Memorandum of Understanding on 8 September. The MOU is posted here.

Estonia becomes the 75th member of GEO

The Government of Estonia has joined the Group on Earth Observations, bringing the total GEO membership to 74 countries plus the EC. Estonia's Minister of the Environment informed the Secretariat of his government's...
GEO 2009-2011 WORK PLAN

Version 2

Submitted for Official Review
(comments to be sent by 3 October 2008 to secretariat@geosec.org)

1 September 2008
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
Space Observation Systems
Virtual Constellations

Participants
Australia, Germany, Japan, USA, CEOS, ESA, NASA, GCOS, GTOS, IEEE, WMO.

The French-Indian MEGHA-Tropiques mission, planned for flight in 2009, is proposed as part of the Global Precipitation Constellation.

- Atmospheric Composition
- Land Imaging
- Precipitation
- Ocean Surface Topography
IRIDIUM Secondary Payload Opportunity

- Constellation Comprises 66 Satellites In A Near-polar Low Earth Orbit (LEO) At 780 Km (485 Mi) Altitude

- 6 Planes Of 11 Vehicles In Nearly Circular Polar Orbits (86.4° Inclination) Provide Global Coverage
GEO joins forces with Biodiversity Convention

- Convention on Biological Diversity member governments
  - Adopted a decision last May

- Formally recognizing the role that GEOSS can play in achieving the Convention's goals

- Director of GEO and CBD Secretariats signed a Memorandum of Understanding on 8 September
  - In an effort to enhance their collaboration on meeting governments' expectations
Home page of GEO BON

GEO BON stands for the Group on Earth Observations Biodiversity Observation Network. By facilitating and linking efforts of countries, international organizations, and individuals, GEO BON will contribute to the collection, management, sharing, and analysis of data on the status and trends of the world’s biodiversity. Read more about GEO BON....

Highlights

GEO BON is growing

GEO BON’s different partners and participants are building the implementation plan that will be presented at the next GEO plenary. In the meantime, GEO BON is becoming more visible and a recent article in Science (vol 321, 1044-45) is now available.

This article is describing GEOSS, GEO BON and its contribution to Biodiversity observation and conservation. This is an important step forward to ensure GEO BON recognition and its development over next months will be important. For more information, please contact GEO Secretariat.

African Elephant (Loxodonta africana)

African elephant is the largest living land animals. Its population had been decimated during the 00s by systematic poaching. Its status varies across Africa. Some populations remain endangered due to poaching for meat and ivory, habitat loss, and conflict with humans, while others are secure and expanding. Population is estimated between 450,000 and 700,000. [photo: Bruno Walther]
Forrest Monitoring and Carbon Tracking

- Symposium on Forest Monitoring 4-7 November
- June 2008 meeting to develop a plan of action on Forest and carbon tracking
  - Australia, Finland, Japan, Norway, Korea, EC
  - FAO, GOFC-GOLD, CEOS, GTOS, Woods hole Institute
Venue
- co-location with GEO-VI (2 days before)

Organization Committee
- GEO Secretariat
- Former IGOS Partners
- Local Organizers

Program Committee
- Chair: Greg Whitee (USGEO)
- Former IGOS Partners
- Theme Leaders and CoP leads
- GEO Secretariat
- GEO User Interface and Science and Technology Committees

Draft agenda already being designed

Publication – various possibilities aired
Atlas of Africa’s Changing Environment

- Demonstrates power of Earth observations

  - Highlights how modern Earth observation systems can support action to address humanity’s growing impact on the natural environment.

- Compares satellite images and ground photos of specific locations
  - Taken 30 years ago and then again today,
  - Atlas makes it possible to truly comprehend the decade-scale changes occurring in the African environment.

- UNEP has presented the Atlas,
  - Released on 10 June
  - As a contribution to the Global Earth Observation System of Systems.
WMO / GEO / WCRP IPY Legacy Workshop: Sustaining Projects’ Contributions to WMO Global Cryosphere Watch and GEOSS

• WMO’s Global Cryosphere Watch (GCW)
  • Initiative welcomed by the Fifteenth World Meteorological Congress in May 2007
• GCW will provide authoritative cryospheric data and information to a wide range of users
  • Leading to a broad range of societal benefits
  • Constituting a valuable contribution to GEOSS
• Workshop will identify relevant activities, review and prioritize IPY projects related to cryosphere, continuation of which is “vital”.
  • It will identify potential sponsors per priority activity.
• Supports GEO 2007-2009 WP Climate Task CL-06-05
  • GEOSS IPY Contribution
• Accepted concept of granting direct access to GEO Members (end of May)

• Activated for GEO Member Ukraine during flooding
  – Through the intervention of GEO upon request of support from Ministry of Environment (31 July request - activation 1 August)

• Discussion is ongoing to consolidate framework for allowing practical implementation of concept
  – Identification of sub-regional centers
GEO-V in Bucharest
19-20 Nov 2009

- Palace of the Parliament in Bucharest
- Registration
  - On-line registration
  - Each individual delegate must complete the GEO-V online registration form online
  - Registration will open on 20 October and close on 7 November 2008.
  - To register, please go to the following web site:
  - Delegates should confirm their attendance with their GEO leadership before registering
- On-site registration
  - The Registration Desk will be open from 08h30 on 18, 19 and 20 November.
- Security & badges
  - On your arrival at the Palace of Parliament will undergo a security check
  - Have to provide an identification document with a photograph
  - Be issued an “entry 3 permit” which you are requested to wear at all times while in the meeting areas, in addition to your GEO registration badge.
GEO-V Virtual Exhibit

- Show GEO Principles the GEOSS data access capability
- Rough ideas
  - 3 GEO Portals + various SBA sub-portals
  - Showing the many components will contribute to develop GEOSS and there are so many components around the world.
  - 3 main screens for GEO Portals, and several independent screens for sub-portals demonstration for data access and use demonstration.
GEO 2009-2011 Work Plan
Towards a New Phase of GEOSS Implementation
Work Plan – What is it?


Set of practical Tasks carried out by various GEO Members and Participating Organizations.

Living Document – Annually updated
# GEO Work Plan History

## Cape Town Summit

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Summit

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Work Plan – How did it come about?

• Followed recommendations from GEO-IV Plenary & Cape Town Ministerial Summit
• Built upon 2007-2009 Work Plan
• Included proposals & comments made by GEO community and Committees
• Synthesis proposed by the GEO Secretariat
Recommendations - Contents

• Build upon the cross-cutting dimension of GEOSS across:
  – Societal Benefit Areas
    • Disasters, Health, Energy, …,
  – Transverse Areas
    • Architecture, Data, User, Capacity Building
  – System-type
    • Observing, data-assimilation, modelling, dissemination, information

• Enhance data sharing & distribution
• Take benefit of IGOS Themes transition into GEO
• Realize the potential of the Communities of Practice
• Foster the development of GEOSS information (products, services) and the delivery of benefits to society
Recommendations - *Structure*

Consolidate 2007-2009 Work Plan Tasks into *overarching strategic tasks* to:

- Improve *coordination* and *integration* of similar functions
- Foster *linkages* between related Tasks
- Ensure *continuity* of relevant GEO activities
2009-2011 Work Plan V2

(1) A Governance Section (Committees, Process)
(2) Two-part structure
(3) Major consolidation of activities
(4) Stronger « user-driven » approach

+ Overview of Task cross-cutting dimension
  (spider-web diagrams)
(1) Governance

1  THE NEW WORK PLAN
From 2007-09 to 2009-11

2  EVOLVING ROLE OF COMMITTEES
(i) GUIDING THE WORK PLAN
(ii) GCI & DATA SHARING
(iii) ENGAGING THE COMMUNITY
(iv) COORDINATION AND PLANNING

3  TASK MANAGEMENT
HOW? WHO?
LEAD? PoC? CONTRIBUTOR? TASK SHEETS?
Evolving Role of Committees:
Committees’ Role In WP Implementation

This Section responds to...

The need expressed by Executive Committee to have role of Committees revised and updated - and overall Committee efficiency improved
Key Message

Committees and individual members will need to maintain the momentum of their existing efforts while tackling new challenges.

While working within their existing terms of reference, Committee will need to take additional measures to ensure that GEOSS progresses to the next level and that this progress is recognized by Ministers at the next GEO Summit.
(i) Guiding the Work Plan – Task Allocation

ADC to oversee construction of GEOSS architecture & focus on specific Tasks

CBC to promote capacity of both providers & users to engage in GEOSS; focuses on certain Tasks but also confirms more broadly that all Tasks contribute to CB

STC & UIC to have more cross-cutting mandates ie. review Work Plan to ensure that GEOSS fully reflects user needs and best S&T available.

Together with CBC, STC & UIC periodically assess how the Work Plan is progressing from their unique vantage points, possibly defining a set of priority Tasks.
Committees rely on interactions with Task Leads, reviews of Task Sheets and progress reports issued periodically by the Secretariat.

They then provide recommendations for corrective actions when needed. Each Committee also plays an important role in helping identify Leads and contributors for all Work Plan Tasks. They provide expertise, ideas, contacts, recommendations and practical support to the Task teams.
(i) Guiding the Work Plan - UIC

UIC helps ensure that **user needs are reflected** in the Work Plan Tasks deliverables.

These diverse user groups need to be engaged actively in the design and construction of GEOSS so that it delivers what they truly need.
(ii) GCI and Data Sharing: the Two Cornerstones of the 2009-2011 Work Plan

The 4 Committees need to make essential contribution to advancing two GEOSS cornerstones:

- GEOSS Common Infrastructure (GCI)
- Implementation of GEOSS Data Sharing Principles

ADC plays a key role in guiding the construction of these two cornerstones, while other Committees provide additional oversight from their particular perspectives.
(ii) GEOSS Common Infrastructure (GCI)

Including web-based portal, clearinghouse for searching data, information and services, registries of GEOSS components, standards and best practices.

Contributions from each Committee made via GCI Initial Operating Capacity (IOC) Task Force:

CBC on proper development of GEOPortal CB component
STC on best scientific knowledge & technol.
UIC on data set, product and tool specifications
(ii) Data Sharing

Development and implementation of GEO Data Sharing Principles key priority for all Committees
To build consensus for adoption of the Principles at the GEO-VII Plenary and Ministerial Summit in 2010.
(iii) Engaging the GEO Community

CBC, STC & UIC to contribute to Work Plan implementation by engaging users & producers of Earth observations and reaching out to resource providers and other interested groups.
Communities of Practice and Partnership Development
- CoPs are a priority mechanism for engaging users
- Deserve particular attention because they provide Leads and participants for many Task teams, offer strategic insights and fresh ideas, and promote dialogue between the users & providers of Earth observations.
- UIC members directly interact with CoPs as a way of identifying user needs, in particular for cross-cutting issues.
- Obtain and analyze information provided by national, regional and project-level surveys
(iii) Engaging the GEO Community - UIC

Identifying Synergies between Societal Benefit Areas
- UIC to identify cross-cutting issues and data sets that could strengthen synergies between societal benefit areas.
- Develop and maintain processes for identifying critical Earth observation needs common to more than one societal benefit area by interacting with scientific and technical experts
(iv) Coordination and Planning

- **C4** takes responsibility for ensuring that Co-Chairs of various committees share information and ideas.

- Committees’ work kept in synch by master schedule adopted at GEO Plenary meetings.

- Under current schedule, each Committee to **meet twice a year within two general time slots**.
  -- Exact dates to be chosen in a way that best supports the yearly Work Plan process and feeds into meetings of Executive Committee and GEO Plenary.

- **Meetings to be co-located** when possible.
(2) Two-Part Structure

1 A TRANSVERSE GEOSS *(GEOSS fundamentals)*
- GEOSS COMMON INFRASTRUCTURE
- COORDINATED OBSERVATION SYSTEMS
- CROSS-CUTTING DATA SETS
- CAPACITY BUILDING

2 THE 9 GEOSS SOCIETAL BENEFIT AREAS *(GEOSS for Society)*
- DISASTERS
- HEALTH
- ENERGY
- CLIMATE
- WATER
- WEATHER
- ECOSYSTEMS
- AGRICULTURE
- BIODIVERSITY
(3) Major Consolidation of Tasks

The 2009-2011 Work Plan:

- Introduces strategic **overarching objectives**
- **Links** relevant 2007-2009 activities
- Ensures **continuity**

This leads to **36 overarching Tasks**
(compared with **73 Tasks** in the 2007-2009 Work Plan)
36 overarching Tasks including...

Part I : A TRANSVERSE GEOSS

1.1 GEOSS COMMON INFRASTRUCTURE
AR-09-01: GEOSS Common Infrastructure (GCI)
CB-06-04: GEONETCast
CB-09-01: Infrastructure Development and Technology Transfer
DA-09-01: Data Management

1.2 COORDINATED OBSERVATION SYSTEMS
AR-06-01: Radio Frequency Protection
AR-09-02: Connecting Observation Systems for GEOSS
AR-09-03: Advocating for Sustained Observing Systems

1.3 CROSS-CUTTING DATA SETS
DA-09-02: Data Integration and Analysis
DA-09-03: Global Data Sets
DA-09-04: Socio-Economic Indicators
DA-09-05: Global Carbon Observation & Analysis System

1.4 CAPACITY BUILDING
CB-09-02: Building Individual Capacity in Earth Observations
CB-09-03: Building Institutional Capacity to Use Earth Observations
CB-09-04: Capacity Building Needs/Gap Assessment
36 overarching Tasks including...

Part II: THE 9 GEOSS SBAs

2.1 DISASTERS
DI-06-09: Use of Satellites for Risk Management
DI-09-01: Systematic Monitoring to Support Geohazards Risk
DI-09-02: Implementation of Multi-Risk Management Approach
DI-09-03: Warning Systems for Disasters

2.2 HEALTH
HE-09-01: Information Systems for Health
HE-09-02: Monitoring and Prediction Systems for Health
HE-09-03: End to End Projects for Health

2.3 ENERGY
EN-07-01: Management of Energy Sources
EN-07-02: Energy Environmental Impact Monitoring
EN-07-03: Energy Policy Planning

2.4 CLIMATE
CL-06-01: Sustained Reprocessing and Reanalysis of Climate Data
CL-09-01: Information for Decision-making & Risk Management
36 overarching Tasks including...

2.5 WATER
WA-06-02: Droughts, Floods and Water Resource Management
WA-06-07: Capacity Building for Water Resource Management
WA-08-01: Integrated Products for Water Research

2.6 WEATHER
WE-06-03: TIGGE & Global Interactive Forecast System
WE-09-01: Capacity Building for High-Impact Weather Prediction

2.7 ECOSYSTEMS
EC-09-01: Ecosystem Observation and Monitoring Network (EcoNet)
EC-09-02: Human Dimension of Ecosystem Utilization

2.8 AGRICULTURE
AG-06-02: Data Utilization in Fisheries and Aquaculture
AG-07-03: Global Agricultural Monitoring Risk Management

2.9 BIODIVERSITY
BI-07-01: Biodiversity Observation Network (GEOBON)
(4) User-Driven Approach

Work Plan takes full account of IGOS transition into GEO:
• Atmospheric Chemistry, Carbon, Geohazards, Coastal, Cryosphere, Land, Ocean and Water
• Themes evolved into Communities of Practice (see p.43)

Transition marks start of a reinvigorated effort to ensure that:
• Users are engaged with GEO
• Strongly involved in implementation
Overview of Task X-cutting Dimension

CL-09-01: Environmental Information for Decision-making, Risk Management and Adaptation

![Spider diagram with categories: Disasters, Biodiv., Agric., Ecosys, Weather, Water, Energy, Health, Climate. Each category is rated on a scale from 0 to 5. The diagram highlights the most important aspect as Disasters rated 5, and the least as Water rated 0.](image)
Implementation Guidelines for GEOSS Data Sharing Principles
GEOSS 10-Year Implementation Plan: Data Sharing in Achieving GEOSS

• Explicitly acknowledges the importance of data sharing

• Achieving the GEOSS vision and anticipated societal benefits

• Endorsed at 2005 Third Earth Observation Summit in Brussels

• Highlights the GEOSS Data Sharing Principles
GEOSS 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 Sharing Implementation

• DA-06-01 lead by Committee on Data for Science and Technology (CODATA)
  – Recommend implementation guidelines and background white paper

• Guidelines proposed for further consideration by GEO
  – Based on the Task Group’s analysis of the GEOSS 10-Year Implementation Plan
  – Applicable international agreements and practice
  – Extensive consultation with experts on data policy from around the world
Data Sharing Implementation Guidelines

- Promote implementation of GEOSS Data Sharing Principles through the full and open exchange of data.
- Encourage GEOSS users to reuse and re-disseminate shared data.
- Ensure consistency with other national laws and policies and international agreements.
- Implement pricing policies consistent with GEOSS Data Sharing Principles.
- Reduce time delays for making data available through GEOSS.
- Promote research and education uses of GEOSS data.
- Develop metrics and indicators for GEOSS data sharing activities.
- Develop effective coordination and outreach mechanisms for implementing the GEOSS Data Sharing Principles.
GEOSS Data Sharing Principles Milestones

• Current GEOSS activities begin to develop working data sharing policies and procedures consistent with the GEOSS Data Sharing Principles

• Both providers and users of GEOSS data products and services need to understand responsibilities with regard to data dissemination, access, use, and reuse

• Major GEO initiatives such as GEONetcast, GEO Biodiversity Observation Network (GEO BON), Global Agricultural Monitoring (GAM), and others need to begin formalizing their data sharing policies and procedures, taking into account the proposed data sharing guidelines.
  – Ensure consistency in data sharing policies and procedures across GEOSS communities
  – Enable cross-disciplinary, cross-community data use
  – Avoid development of a confusing patchwork of inconsistent policies and procedures

• GEOSS Common Infrastructure (GCI) and Initial Operating Capability (IOC) should also begin to incorporate tools to implement data sharing policies and procedures,
  – For digital rights management, development of metrics, and acknowledgement of data provider and user rights and responsibilities
  – Early experience in these activities will provide important feedback from GEOSS elements and users on practical implementation approaches for GEOSS data sharing policies and procedures.
GEOSS Data Sharing Principles
Near-term Milestones

• Architecture and Data Committee (ADC), the User Interface Committee (UIC), and the Science and Technology Committee (STC) take an active role
• Data Policy Workshop in Quebec City, Canada
  – 15 September in coordination with IEEE, OGC, OES, ISPRS
• Data Sharing session at the Architecture Implementation Pilot (AIP) Kick-off
  – 25-26 September in Boulder, CO
• Data Sharing session at the CODATA Conference
  – 7 October in Kiev, Ukraine
• Data sharing guidelines side event at the GEO-V Plenary
  – 20 November in Bucharest, Romania
Reality of GEOSS

• GEOSS is envisioned as a “system of systems”
  – Built upon existing observational systems
  – Incorporating new systems for Earth observation and modeling
  – Offered as GEOSS components by Member countries and Participating Organizations

• Developing technical interoperability between such diverse systems is clearly a major challenge

• Equally important challenge is the coordination and harmonization of data policies and procedures
  – Facilitate the sharing and use of GEOSS data to maximize societal benefits for the widest possible range of users

• Inconsistent or vague data policies and procedures could hamper the rapid dissemination and flexible use of data and information
  – Needed for mission-critical and/or life-threatening GEOSS applications

• Restrictive policies on data reuse and re-dissemination could significantly reduce the net return on investment of public funds in Earth observations
  – Lead to unnecessary and wasteful duplication of effort.

• Excessive charges for data would pose substantial barriers to many users
  – Especially those in developing countries
  – Who may have no or few alternative sources for data.
GEOSS Data Sharing Principles

• Success of GEOSS is contingent upon
  – Manner in which the GEOSS Data Sharing Principles are implemented
  – Both by the individual elements of GEOSS and by GEO Members

• No single set of rules will apply to all types, sources, and uses of data
  – Clear set of guidelines, definitions, and minimum expectations will help to improve the sharing of data within GEOSS

• GEOSS Data Sharing Principles
  – Facilitate the application of data by diverse users in the key societal benefit areas
  – Establish overarching strategic policy goals
  – For data access and use

• Implementation Guidelines for GEOSS Data Sharing Principles
  – Designed to facilitate the development of clear, balanced, and workable data sharing policies and procedures
  – Consistent with the GEOSS Data Sharing Principles

• Policies and procedures will be vital to the effective and efficient operation of GEOSS and its long-term sustainability
GEOSS Future Directions

• Develop GEO Data Policy Principles

• Begin Global Earth Observing Systems Inventory

• Assess global observation gaps

• Implement operational tools, e.g., GEOPORTAL, GEONETCAST

• Demonstrate national, regional, global Earth observation programs in support of health, agriculture, water, capacity building

• Promote use of Earth observations in modeling, data assimilation efforts

• Explore ways to sustain successful R & D observations

• Engage academic and industrial partners
Summary

• GEOSS is a global coordinated network of sustained, comprehensive, earth observation systems

• Goal of GEOSS to provide better information for decision making to achieve societal and economic benefits

• User community engagement is critical to the success of GEOSS

• Cross-cutting approach, involving many communities, with International Dimension

• Tremendous Global mobilization and Interest in GEO from all Disciplines and Communities

• Process is always open to New Participants

• Climate Change: Focus on Adaptation (Forecast, Nowcast, Monitoring)

• Demonstrate Earth Observations value in Energy Efficiency and Water Management

• Develop new mechanisms for Funding and Implementation
Thank you!

Michael D. Tanner
Senior Program Officer
GEO Secretariat

7bis, avenue de la Paix
Casale postale 2300
Ch-1211 Geneva 2, Suisse

phone: (41) 22 730 8324
e-mail: mtanner@geosec.org

www.earthobservations.org
On 30 May 2008, the 190 member governments of the Convention on Biological Diversity (CBD) adopted Decision IX/15 on the “Follow-up to the Millennium Ecosystem Assessment”. Paragraphs 10 and 11 recognize the importance of the Group on Earth Observations Biodiversity Observation Network (GEO BON) and read as follows:

[The Conference of the Parties,]

10. Notes the initiation of a Biodiversity Observation Network, established under the Group on Earth Observations, and the development of an implementation plan for the network, as part of the implementation of the Societal Benefit Area on Biodiversity of the Global Earth Observation System of Systems, and invites Parties, other Governments, relevant organizations, scientists and other relevant stakeholders to support this endeavour;

11. Requests the [CBD] Executive Secretary to continue collaborating with the Biodiversity Observation Network with a view to promoting coherent biodiversity observation with regard to data architecture, scales and standards, observatory network planning and strategic planning for its implementation.
ARGO Buoy Observation System

17th July 2007
2877 Profilers

- Argentina (12)
- Australia (136)
- Brazil (2)
- Canada (98)
- Chile (8)
- China (12)
- Costa Rica (1)
- European Union (31)
- France (172)
- Germany (126)
- India (77)
- Ireland (1)
- Japan (378)
- Korea, Rep. of (102)
- Mauritius (4)
- Mexico (1)
- Netherlands (10)
- New Zealand (7)
- Norway (8)
- Russian Federation (3)
- Spain (3)
- United Kingdom (92)
- United States (1593)
Global In-Situ Observation Systems
Applications and End-users

- Agriculture and Forestry
- Water resources Managers
- Land Use Planners
- Disasters (Floods, Spills)
- Geological Mapping
- Fisheries

Image source CBERS/INPE
Wildland Fire: A Global Source of Multiple Hazards

Significant Ecosystem damage
- Degradation in forest/grassland health due to uncontrolled burning
- Agriculture and land degradation with losses in production
- Hydrological changes resulting in desertification and flooding

Significant loss of life, including negative societal impact and economic losses
- Losses and vulnerability at urban-rural interface increasing
- Global health impact due to smoke and emissions
- Disruption of transport due to changes in visibility
- Costly fire suppression programs

Potential impact on climate change
- Global carbon cycle impact
High Resolution Mediterranean Sea Surface Temperature from 4 different satellites

The Medspiration project combines SST data measured independently by different satellites into a set of products that represent the best measure of SST, presented in a form that can be assimilated into numerical ocean forecasting models.
Hurricane Katrina

Gulf of Mexico – Tropical cyclone heat potential (TCHP) 08/28/2005

Altimetry data from ESA Envisat, NASA/CNES Topex/Poseidon & Jason-1, US Navy GFO

Figures courtesy of Gustavo Goni, NOAA/OAR/AOML
GEOCoast: Integration of ChloroGIN, HARON and drainage basin biosphere characteristics
GLOBALEmerging DISEASES*

*Modified from Morens et al. 2004 Nature 430:242
Ensure the Transition from Research to Operations and the Continuity of Observing Systems
GEOSS Implementation Requires Interoperability of Systems

- Technical Specifications for Collecting, Processing, Storing, and Disseminating Data and Products
- Based on Non-proprietary Standards
- Define System Standards to Contribute to GEOSS
Global monitoring of runoff and lake storage:
- important elements of Integrated Global Observing Systems
- integral parts of water resources management including prevention of water-induced disasters
HARON Project: Raison d’être

integral parts of water resources management
including prevention of water-induced disasters

Application of new in-situ and remote sensing sensors for water cycle measurements

• Near real-time regional and global computation of the water balance, as input for climate models and seasonal forecasting

• Validation of large-area precipitation fields against basin-wide hydrological records to validate GCMs

• Detection of climate variability signal in changing hydrological patterns of river runoff on seasonal and inter-annual scales
Work Plan
(i) Guiding the Work Plan - ADC

*ADC* oversees the Tasks that are dedicated to building a transverse GEOSS (see Chapters 1.1, 1.2 and 1.3).

ADC members are responsible for addressing all issues involving infrastructure, coordinated observation systems and cross-cutting data sets. ADC has a particularly important role in guiding the Tasks relating to the GEOSS Common Infrastructure and to Data Sharing Principles.
(i) Guiding the Work Plan - CBC

CBC helps define and continuously review the five Tasks dedicated to building capacity for a transverse GEOSS (see chapters 1.1 and 1.4).

CBC members also review capacity-building components in all other Tasks (see CB “box” in Task Sheets) in order to promote synergies, reduce duplication, and address gaps.
(i) Guiding the Work Plan - STC

STC ensures that Work Plan Tasks reflect the most up-to-date S&T understanding of Earth systems and Earth observation tools. This responsibility includes developing, reviewing and periodically updating the GEOSS Science and Technology Roadmap.

The Roadmap describes major scientific and technological gaps to be addressed so that GEOSS can achieve its full potential.

STC members interact with the GEO Communities of Practice and other expert fora.
(iii) Engaging the GEO Community - CBC

**Resource Mobilization**

CBC responsible for implementing Seville Roadmap on Resource Mobilization.

Road map to support the GEO Capacity Building Strategy by positioning GEO as a coordinated mechanism and broker for mobilizing resources.

Committee members individually and collectively to identify priorities and resource needs for addressing human, institutional and infrastructural capacity in Earth observation. Then seek to identify and engage donors and other providers of resources.
(iii) Engaging the GEO Community - CBC

A Coordinated and Effective Approach to Capacity Building

More broadly, CBC members to ensure that GEO community maintains a **coordinated and effective approach to CB and resource mobilization**.

Analyze national strategies for CB and proactively seek to ensure that they are coordinated and mutually supportive.

Ultimate aim to ensure that all countries have the capacity to use Earth observation data and products and to contribute observations and systems to GEOSS.
Engaging the Research Community in GEO

STC members to reach out to S&T communities and make GEOSS more visible and attractive to them.

Organize a GEO presence at major symposia and other meetings, e.g. through plenary presentations or side events.

Contact universities and laboratories to involve them in GEOSS activities, form links with major scientific research enterprises in each SBA, and actively encourage experts to contribute to GEOSS; see “The Role of S&T in GEOSS”
(iii) Engaging the GEO Community - STC

Catalyzing R&D Funding for GEOSS

Committee members to contact national governments & international organizations and encourage them to integrate GEOSS S&T needs into national, regional and international R&D programmes.

Develop proposals and guidelines to assist R&D agencies to respond to GEO needs and dialogue with key decision makers & funding entities.

Identify programmes relevant to GEO’s scientific and technological priorities and encourage them to collaborate with one another.
C-4 Update
Committee reports

- Committee reports generally positive – good progress
- Some issues to be resolved (inter Committee co-ordination, specific issues for S&T + UIC)
- CBC: pragmatic approach needed for participation from various GEO regions (caucuses) through co-Chairs and with support from GEOSec Experts
- ADC work of a different nature and well on track
Committee reports ctd

UIC

- 3 overarching themes (water, land, health)
- CoP establishment represents a major effort
- End-to-end projects needed
- Breakouts during Committee meetings covering more items

S&T

- Role to be re-established
- Task Clustering for meetings
- Strategic (horizontal) and thematic (vertical) activities for Work Plan
- Sherpa Approach for UIC and S&T to be considered (as in ADC)
Key Issues for the Work Plan

- All Committees should define key issues (5-8 Work Plan elements) out of SBAs and Transverse Areas (kind of priority setting)
- Orphan tasks to be removed, logical merging of tasks and account of newly proposed tasks only in context of targets of the 10-yr IP
- Target Task Team (T3) formed on Excom’s request, TOR for T3 tbd
- 2 T3-meetings foreseen, review and update of targets in line with WP development. Meetings in June and September, C4 involvement?
- Query if all 9 SBAs are represented in T3 membership (Health?)
Advice on T3 and WP 09/11

- **At that point in time (prior to WP V1 available)**
  The C4 gave only general advice to the Executive Committee:
  - Reasonable reduction of tasks recommended (not to lose support!)
  - Revision of WP structure (cutting tasks) to be seen as process, may not be done all at this time - voluntary support must be maintained as much as possible
  - Strong PoCs, Leads/co-Leads and resource availability must be ensured
  - Recommendations (by UIC and S&T):
    > Reconfirmation of Committee membership by GEO Members and Pos, (core membership to be strongly committed).
    > 2 kinds of tasks to be defined: strategic (overarching), i.e. building system of systems and thematic (“vertical”), i.e. end-to-end.
Initial Operating Capability (IOC)

- List of elements of draft TF TOR (mainly evaluate IOC) to be revisited by TF itself - (already done, rev. draft TOR available after email exchange)
- Role of C4 in IOC TF process is missing!!
- TF reports to ExCom on a regular basis before Excom meetings including recommendations enabling decisions
- List of members possibly to be supported by additional experts
- Potential conflict of interest to be considered (IEEE, ESA members and providers)? - already taken care of in draft rev.TOR
- Immediate start of work recommended (with telecon)
- Quality and reliability of the GCI need to be reflected under key technical issues, complementing ADC efforts.
- To be added with focus:
  - Quality assurance, User satisfaction
- Recommendation: Communiquée by Excom Co-Chairs emphasising importance of GCI-IOC
IGOS Transition of Themes

- IGOS theme transition successful - Themes working very well in GEO
- Theme integrity kept
- Stronger integration with CoPs through UIC
- Broaden scope from scientific requirements to also operational implementation
- Letter from UIC (and possibly from GeO Sec. Dir.) to theme Leaders after ExCom asking for sustained activities and ongoing contributions to GEOSS
Performance Indicators

• Two sets of Performance Indicators
  – Secretariat Performance Indicators (draft available)
  – Assessment of achievements in the WP

• WP Perf. Ind. Workshop meeting Paris, 10-12 September

• New WP must contain performance assessment
Cost - Benefit Considerations

• C4 enjoyed a GEOSS cost benefit analysis presentation by IIASA with various case studies.
• GEOBENE (EU FP6 project) needs to be more visible
• Similar studies (spec. sectors) are available and must be considered by GEO
• New WP should have a relevant task (already done)
Meeting Schedule

- General view to have only two committee meetings per year (shortage of resources, time pressure in light of voluntary participation)
- C4 meetings continue to follow a suite of Committee meetings in April/May (non-clustered) and September (clustered), additional Committee meetings may happen in February.
- Proposal to Committees for scheduling 2009 meetings well in advance
Improved Committee Co-Ordination

• Improved committee cross co-ordination possibly through all-committee conference once a year (open for public?)??
• For outreach of GEO jointly organised sessions at major earth observation events such as AGU or EGU as special side session on GEOSS another possibility??
• Improved access and flow of information amongst committees through document zones for each Committee on the GEO website, containing all relevant docs (presentations and reports)
  
  This has already started!!

• ExCom representation at Committees to be re-confirmed (who of Excom members serves on what Committee?)
EXCOM-13 Update
Discussion Paper - Actual Situation

- **The work plan**
- The WP 07/09 contains 73 tasks, allocated to the 4 Committees. After roughly 4 years of experience with GEOSS activities it shows that some tasks
  - Are not active at all ("Orphans")
  - Make no real progress
  - Proper management by the Committees gets difficult because of great the number of tasks and lack support by volunteers.
Discussion Paper - Actual Situation

- **The work plan**
- Reasons for that are
  - Some tasks are very demanding in S&T terms
  - Scientific / technical / institutional support needs additional funding / staffing that GEO cannot provide
  - Lack of staff power in GeoSec and/or tasks members as well as funding (voluntary basis!).
- As a result only up to 50 tasks are showing reasonable progress so far. Only a few tasks with excellent developments in terms of adding value.
Discussion Paper - Actual Situation

- **Committees work**
  Presentations and discussions during ExCom13 showed that the work of the Committees can be improved.

  With the exception of ADC, the other Committees are still discussing their role within GEO, have difficulties in managing their (numerous) tasks and attracting volunteers.

  In some disciplines a lack of support by Committee members was reported (too many meetings, special interest limited to the own task only).
Discussion Paper - Actual Situation

• **Resources of GEO**
  ExCom13 considered a funding of CHF 4.5 million p/a in cash and CHF 1.5 million p/a “in-kind” (mostly secondments) and a total staff power of 20 (Secretariat members and seconded experts) as adequate for stable operations of GeoSec.

  The year 2008 shows rather critical shortfalls in both areas, funding (approx. CHF 1 million less in contributions than foreseen) and staffing, which will have repercussions on the progress in building GEOSS.
Discussion Paper on the Strategic Direction of GEO in building GEOSS

Prepared by Udo Gärtner, C4 Co-Chair

For discussion at the C4 meeting in Boulder on 25-26 Sept.
Discussion Paper - Reinforcing GEO’s role in EO by consolidating the 2009-2001 Work Plan, changing the way of management & increasing GEO visibility

GEO was formed to “add value“ to existing EO systems by filling gaps, reducing deficiencies, building the system of systems (interoperability) and introducing multi-disciplinary approaches for a better understanding of the earth system.

While the 73 tasks of the WP 07/09 reflect to a large degree the start-up phase of GEO, where great expectations and ideas were listed and work started enthusiastically, it is now time to prepare the mid-term review of GEO’s activities and achievements.

After some 4 years of activities GEO must show the promised “added value” in order to maintain it’s credibility and get sustained support by it’s Members and PO’s.
• **Balance between support and work load**
  With special regard to capacities of and funding for:
  – the GeoSec,
  – the need of sustained GEO involvement in EO
  and in light of the discussions in the Committees and ExCom-13, a balance must be achieved between (financial and operational) support by Members and PO’s and the level of activities foreseen in the work plan 09/11.
Discussion Paper - Reinforcing GEO’s role in EO

• **Balance between support and work load**

  All Committees are in favour of reducing the number of tasks.

  Discussions should result in a consolidated work plan.

  The simple merging of tasks and the conduct of committee meetings as simple reporting exercises are not a solution.
Discussion Paper - Reinforcing GEO’s role in EO

• Setting Priorities in the work plan

The Work Plan 09/11 - V2 (1st Sept) shows a new two-fold structure with cross cutting tasks and SBA-related tasks, which is a thematic differentiation and improves the understanding of the GEO activities.

In updating and further improving the new work plan and with a view to balance between available resources and the volume of tasks the question of the potential role of GEO within individual tasks must be answered and should allow for a priority-setting.
Discussion Paper - Reinforcing GEO’s role in EO

• **Setting Priorities in the work plan**
  In order not to disappoint volunteers it is proposed to develop - in addition to the two-fold thematic structure - two types of tasks:

• **GEO tasks**, where GEO - according to it’s targets - is instrumental, directly involved, actually and actively will and can add value in enabling and facilitating progress in building the “system of systems”

• **Other tasks** showing activities of Members and PO’s which were started without GEO and will go on (for some time) without GEO, but having strong relevance to GEOSS in forming the foundation / background of the GEO tasks, but do not need specific actions of GEO and it’s Coms.
Discussion Paper - Reinforcing GEO’s role in EO

• **Setting Priorities in the work plan**
  In setting priorities in existing tasks and in the acceptance / selection of new tasks (if any) with relevance to GEOSS the following criteria for GEO tasks in the new work plan are suggested:
  
  • High relevance to the actual S&T and political agenda;
  • Strong commitment by key players / stakeholders to specifically support GEO in the execution of the task;
  • Well founded expectations to achieve results (added value) in a projected timeframe and in line with the actual build up phase of GEOSS;
  • Potential for show cases for GEO Plenaries;
  • No tasks which will go on (or going on) without GEO.
Discussion Paper - Reinforcing GEO’s role in EO

• **Setting Priorities in the work plan**

The other tasks (so far “offered” to GEO to be in the work plan and also listed in the “Early Achievements” document for the GEO IV) will form the comprehensive global archive of relevant earth observation activities where GEO’s role is to monitor the progress and decide on a case by case basis to be more directly involved.
Discussion Paper - Reinforcing GEO’s role in EO

• Development of a GEOSS Master Plan

The distinction of tasks once introduced with reference to the timeliness of activities and progress in building GEOSS must be reconsidered in establishing the future 3-year work plans according to an overall Master Plan of action. There is a first attempt developed by our Japanese colleague to establish a timeline sequence of developments in order to build GEOSS with its multi-disciplinary facets. This needs to be discussed in context with the basic documents of GEO, co-ordinated with the “owners of the systems” and upgraded to the GEOSS reference scheme.
Discussion Paper - Reinforcing GEO’s role in EO

• **Changing the Committee’s mode of work**

The GEOSS Master Plan will provide “strategic guidance” for the Committees. They will be able to give inputs and well co-ordinated advise to the relevant committee members, communities and teams working on tasks and monitor the progress.

With less tasks a more in depth activity will develop and (hopefully) increase support of members.

It seems to be sufficient to have only one committee meeting per year, whereas C4 may meet more frequently in order to develop the overall guidance for the committees in close contact with ExCom.
Discussion Paper - Reinforcing GEO’s role in EO

- **Increasing the visibility of GEO**

The Earth Observation community is confronted with very complex discussions on Climate Change, environmental issues, energy supply and their socio-economic consequences.

GEO and it’s structure of 9 SBA’s reflect these questions quite well.

However the discussions on achievements in building GEOSS do need more public outreach.
Discussion Paper - Reinforcing GEO’s role in EO

- **Increasing the visibility of GEO**

After about 4 years of activities GEO should present its work in technical conferences, symposia, workshops. The practise of regional symposia is a good starting point, needs to be expanded globally.

There are a number of conceptual possibilities for technical events:

- Each GEO SBA may form a theme
- Each Committee may plan for an event (as was practised by CBC)
Discussion Paper - Reinforcing GEO’s role in EO

• **Increasing the visibility of GEO**

In future GEO should also report directly to G-8, taking into account the fact that GEO was formed following a G-8 discussion on Climate Change.

In addition the idea of having from time to time a technical / scientific audit of GEO and it’s work (by ICCP?) may help to support GEO.
Short-term objectives to be achieved over a one-year horizon:

- Consolidate observation requirements (both remote sensing and in situ) and reference products, together with preliminary plans for systematic observation;
- Coordinate the provision of remote-sensing data and integrate data from different sources in order to ensure operational observations and relevant products (including optical and multiband SAR); and
- Define and activate a limited number of test sites for pilot projects focused on in-situ observation, the validation of methodologies and tools, and capacity building.