



GEOSS Climate Societal Benefit Area: Building a User-driven GEOSS

The 2nd Asia/Oceania Meterological Satellite Users' Conference 6-9 December 2011, Tokyo, Japan





The Vision for GEOSS...

...a world where decisions and actions are informed by coordinated, comprehensive and sustained Earth observations.

(10 Year Implementation Plan)





Who are the "Users"...?

- GEOSS will provide the overall conceptual and organizational framework to build towards integrated global Earth observations to meet user needs.
- User communities include managers and policy makers in the targeted SBAs, scientific researchers and engineers, civil society, governmental and non-governmental organizations and international bodies, such as those assisting with the implementation of multilateral environmental agreements.
- Engagement of users in developing countries

(10 Year Implementation Plan)



GEO Task US-09-01a Critical Earth Observation Priorities

Summary of Results • October 2010



Identifying Priority Earth Observations across many SBAs

- A cross-SBA analysis was undertaken showing that the 20
 highest-ranked observations are common to, at least, four SBAs.
- The 3 highest-ranked observations were precipitation, soil moisture and surface air temperature.

http://sbageotask.larc.nasa.gov/Final_SBA_Report_US0901a_Apr2011.pdf





User Requirements Registry

http://www.scgcorp.com/urr/Questionnaire.aspx			🗘 - 🚷 - User R
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User Types Applications Requirements Research	h Needs 🛛 Links	References	Lexicon Search
User Information Questions 1. How would you classify yourself professionally? C Earth observation data and/or service provider Scientist/Researcher C Technology and data product developer C Governmental agency employee Private company employee Policy maker or support team member Public or private media person Academic representative Other-Please explain.			
 In what area(s) do you have experience with Earth observations? Ma Raw data processing and product generation Use of Earth observation products and services Integration of different Earth observation products Use of Earth observation products for GIS applications 	rk all that apply		

Data/product assimilation in models and analysis

🗆 None

🗖 Other–Please explain.

3. What best describes your level of experience in using Earth observation?

URR is part of the **GEOSS** Registries allows users to publish their needs in terms of Earth information, and it enables users and providers to analyze the value chains from Earth observations to end users.





GEOSS Common Infrastructure

* About 500 components registered (eg. datasets, systems, portals)

* Access to about 100'000 resource descriptions

* "Sprint to Plenary" to increase usability

* 4th GEOSS Architecture **Implementation Pilot**







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GEOSS Data-CORE



- * Data Collection of Open Resources for Everyone (Data-CORE)
- * Over 120 datasets contributed (thousands of resources)
- * Legal options for data exchange and liability issues explored
- * Integration in GEOSS Common Infrastructure

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The 2012-2015 Work Plan

1. INFRASTRUCTURE

(Architecture and Data Management)

- **2. INSTITUTIONS AND DEVELOPMENT** (Capacity Building, Science and Technology, User Engagement)
- **3. INFORMATION FOR SOCIETAL BENEFITS** (Contribution to End-to-end Services)





1. INFRASTRUCTURE

- IN-01 Earth Observing Systems
- IN-02 Earth Data Sets
- IN-03 GEOSS Common Infrastructure
- IN-04 GEOSS Communication Networks
- IN-05 GEOSS Design and Interoperability





2. INSTITUTIONS AND DEVELOPMENT

- ID-01 Advancing GEOSS Data Sharing Principles
- ID-02 Developing Institutional and Individual Capacity
- ID-03 Science and Technology in GEOSS
- ID-04 Building a User-Driven GEOSS
- ID-05 Catalyzing Resources for GEOSS Implementation



3. INFORMATION FOR SOCIETAL BENEFITS

- SB-01 Oceans and Society: Blue Planet
- SB-02 Global Land Cover
- SB-03 Global Forest Observation
- SB-04 Global Urban Observation and Information
- SB-05 Impact Assessment of Human Activities
- DI-01 Informing Risk Management and Disaster Reduction (DISASTERS)
- HE-01 Tools and Information for Health Decision-Making (HEALTH)
- HE-02 Tracking Pollutants (HEALTH)
- EN-01 Energy and Geo-Resources Management (ENERGY)
- CL-01 Climate Information for Adaptation (CLIMATE)
- CL-02 Global Carbon Observation and Analysis (CLIMATE)
- WA-01 Integrated Water Information (inl. Floods and Drought) (WATER)
- WE-01 High-Impact Weather Prediction and information (WEATHER)
- EC-01 Global Ecosystem Monitoring (ECOSYSTEMS)
- AG-01 Global Agricultural Monitoring and early Warning (AGRICULTURE)
- BI-01 Global Biodiversity Observation (GEO BON)





Climate Change Detection (EC, Japan, USA, ECMWF, GCOS, WCRP)



Numerous reanalysis projects underway:

- * JRA-55 (1958-2012)
- * ERA-Interim (1979-1988)
- * MACC (2003-2010)
- * ERA-CLIM (20th century)
- * NCEP Reanalysis-Lite (1948-2010)
- Most datasets available online (e.g. ERA-Interim)





Tools for Seasonal Prediction Research (USA, WCRP, WMO)



- * Year of Tropical Convection (2008-2010)
- * New web-based tools
- * Visualize/download remote-sensing data
- * High-res analysis, forecasts
- * Data freely available
- * Crucial to research on seasonal forecasting





Global Ocean Observing System (GOOS, IOC, POGO, WMO)



- * Overall completion rate over 60%
- * In-situ networks over 60%
- * Argo float and ship measurement at 100%
- * Stagnant in past yrs
- * Need to demonstrate value across Societal Benefit Areas





Multi-Model Products for Extreme Weather Prediction (TIGGE provider countries, WMO)

Cyclone Yasi (Feb 2011)

Occurrence probability of extreme 24-hr precipitation Valid: 2011012912UTC +4-5days





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TIGGE Data Resources:

- * 500 global forecasts/day
- * 10 forecasting centres
- * User-friendly
- * Open for research
- * Over 750 users worldwide
- * Prototype products for tropical cyclone prediction





Forest Carbon Tracking (Australia, Canada, Japan, Norway, USA, CEOS, FAO)





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bs-T	52,2	35.494.992
bh-T	130,4	6.239.655.586
bmh-T	82,0	372.958.761
<mark>bр</mark> -Т	98,6	17.840.009
bs-PM	54,1	186.625
bh-PM	87,7	71.600.181
bmh-PM	95,2	215.562.351
bp-PM	109,1	64.189.074
bh-MB	130,6	191.959.757
bmh-MB	132,2	199.404.296
bmh-M	79,8	50.910.691

* Ongoing in-situ measurements, processing, product development

- * CEOS satellite data acquisition extended to Nepal
- * Implementation Plandeveloped for GlobalForest ObservationsInitiative (GFOI)

FOUNDATION



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Forest Carbon Tracking (Australia, Canada, Japan, Norway, USA, CEOS, FAO)

Network of National Demonstrators



- From 2009:
- Brazil
- Guyana
- Mexico
- Indonesia (Borneo)
- Australia (Tasmania)
- Cameroon
- Tanzania

- From 2010/2011:
- Colombia
- Congo
- Peru
- Indonesia (Sumatra)
- Nepal (2011)

New projects contributed:

- * US SilvaCarbon
- * European FP7 RECOVER, REDDAF, REDD-FLAME, REDDINESS

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Annual multi-sensors time series Acquisitions coordinated by CEOS



Borneo, L-band SAR 1994-2010 (JERS-1 and ALOS PALSAR)



Tasmania, Landsat 2007, ALOS PALSAR 2007 and ENVISAT ASAR 2009





FCT Portal for Sharing Data







- A platform to link national needs with the providers of observations, technical and scientific knowledge as well as of financial resources.
- Mission: To support countries in the implementation of the monitoring component of national Monitoring, Reporting and Verification (MRV) systems for REDD+.







GFOI: Key components (1/2)

GFOI's scope and expected activities are outlined in the GFOI Implementation Plan:

1. Observations Supply and Use.

GFOI will:

- define requirements for data in support of national forest monitoring systems;
- coordinate the global acquisition of observations and measurements to ensure the necessary supply of data;
- make linkages between suitable data suppliers and national governments if requested; and,
- ensure a clear understanding by users as to the availability of suitable data and appropriate methods for the data use in national forest monitoring systems.





GFOI: Key components (2/2)

- 2. Guidance and Applications Development GFOI will:
 - inform countries on how to acquire, process and analyze data, making sure that the GFOI R&D programs are operated in an open intellectual property environment;
 - make available to countries methods that have been rigorously developed, tested at the FCT National Demonstrations countries, reviewed and vetted, via GFOI document review and acceptance process; and,
 - promote FCT's research and development activities through workshops and forums.

GFOI will operate by coordinating the "supply side (providers)" and by facilitating the flow of data, information and resources to countries. GFOI will work through its many partners, organized in a worldwide network, and coordinated by a GFOI Project Office.





More Carbon Information (Australia, China, EC, France, Italy, Japan, Netherlands, UK, USA, CEOS, ESA, GTOS, WMO)



* Ground-based Carbon datasets released (FLUXNET, TCCON)

- * Essential for calibration/ validation of satellite data
- * New European projects launched for estimating regional CO2 and CH4 sources & sinks
- * GEO Carbon Strategy



Integrated Global Carbon Observations

- Provide long-term observations required to improve the understanding of the present state and future behavior of the global carbon cycle
- Monitor and assess the effectiveness of carbon sequestration and/or emission reduction activities on global atmospheric CO₂ levels
- Establish data architecture to ensure interoperability of the carbon observing system of systems



http://www.globalcarbonproject.org/global/pdf/GEO_CARBONS TRATEGY_20101020.pdf







Conclusions

- GEOSS provides the overall conceptual and organizational framework to build towards integrated global Earth observations to meet user needs.
- GFOI is to support countries in the implementation of the monitoring component of national Monitoring, Reporting and Verification (MRV) systems for REDD+.
- Synergy with GCOS and other Climate initiatives



Thank you

http://www.earthobservations.org