

GROUP ON EARTH OBSERVATIONS

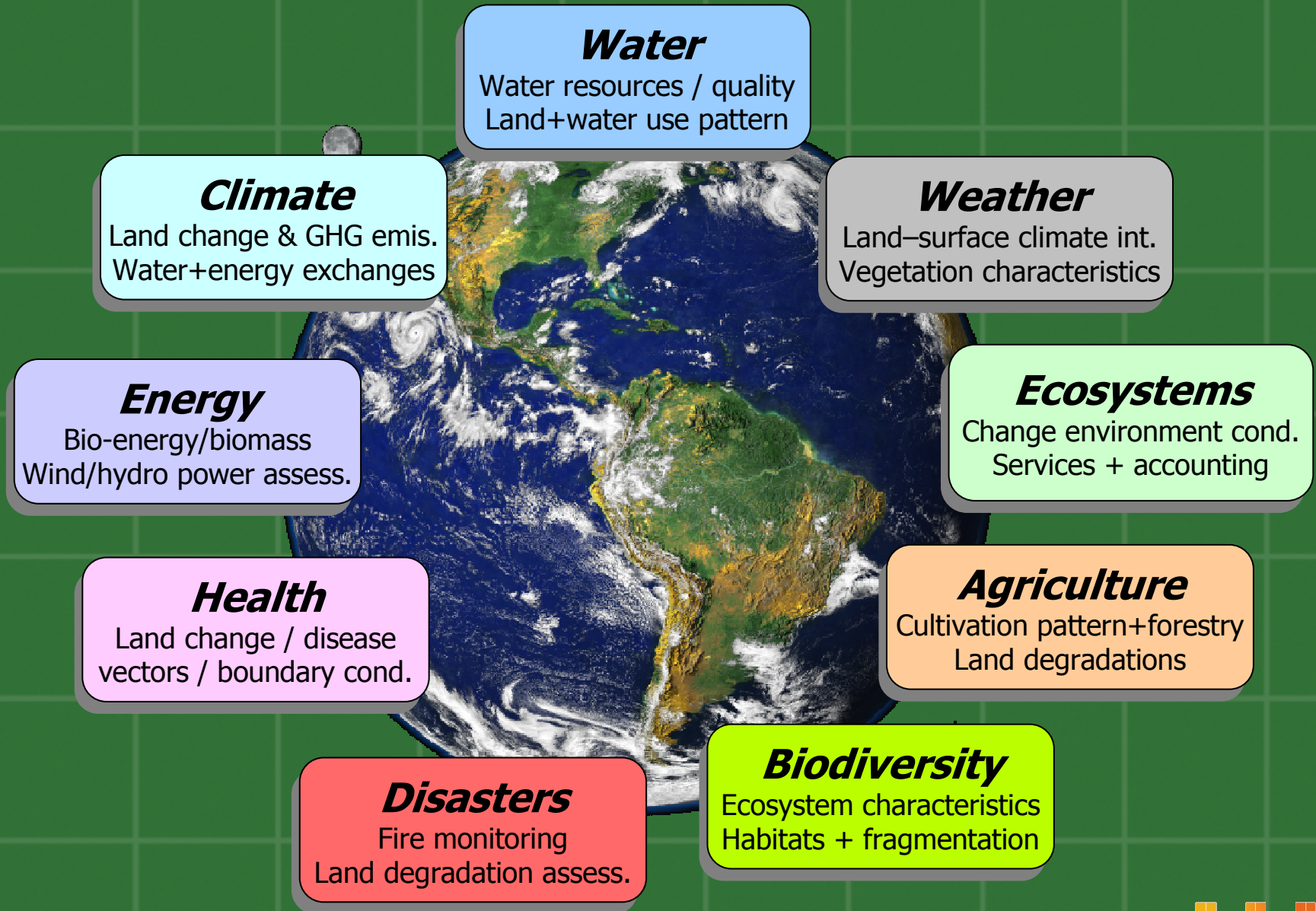


GEO Forest Observation Community of Practice: Identifying Critical Earth Observations



Michael Brady, Canadian Forest Service/GOFC-GOLD
GEO User Interface Committee 14th Meeting
2-4 March 2010, Reading, UK

All GEOSS societal benefits areas include land and forest observations



The GEOSS for forests is incomplete

- Combining remote and in situ / NFI type observations is under utilised
- Engage user communities and networks not yet involved in GEO and earth observation
- Lack of co-ordinated long term observation plans
- Earth observation challenges



8 main forest tasks

1. Forest Mapping and Change Monitoring (AC-09-01e)
2. Global Land Cover (DA-09-03a)
3. Virtual Constellations-Land Surface Imaging (AR-09-02a)
4. Global Fire Warning System (DI-09-03b)
5. Key Observations for Climate-terrestrial (CL-09-02a)
6. Regional Networks for Ecosystems (EC-09-01c)
7. Communities of Practice-Forest (US-09-01b)
8. Forest Carbon Tracking (CL-09-03b)





GEO Community of Practice for Forest Observations US-09-01

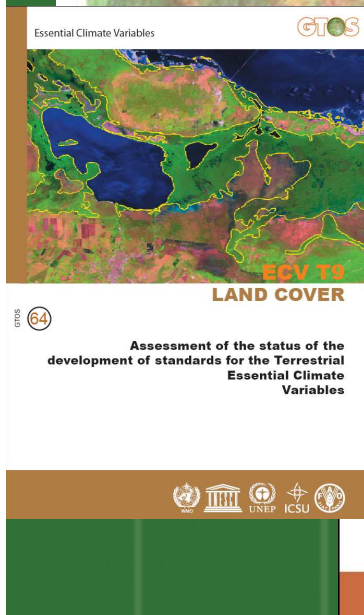
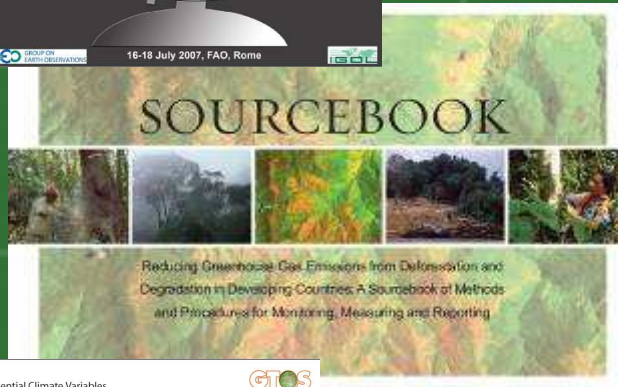
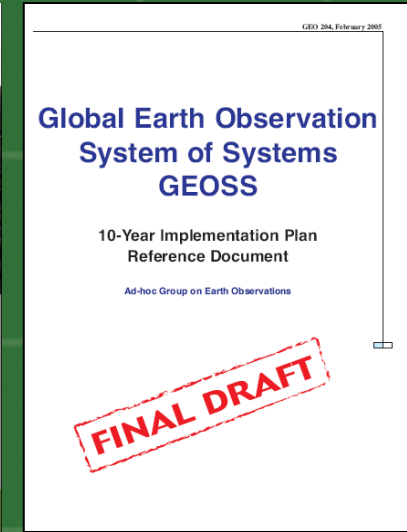
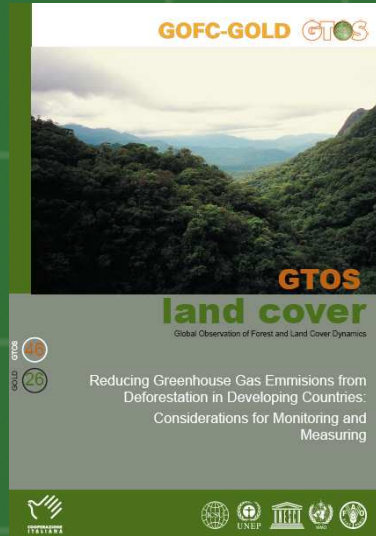
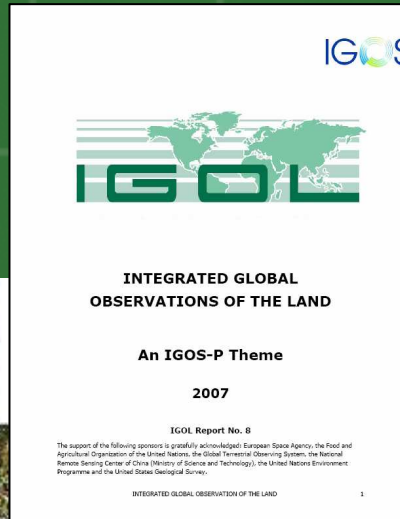
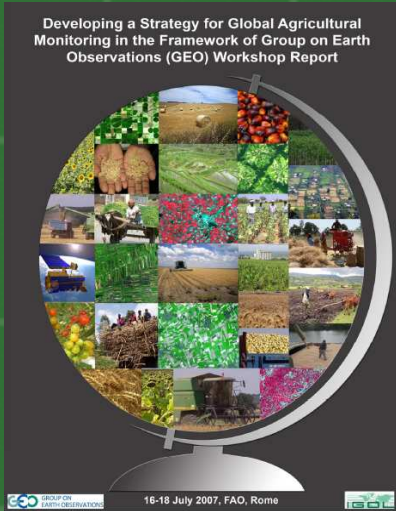
1. Provide a forum for communication and coordination of the teams involved in the GEO work plan tasks related to forest observations
2. Identify, gather, and seek agreement on user community requirements for forest observations, their present status and gaps to be filled
3. Advise the User Interface Committee, other CoPs and GEO on matters relating to forest observations and related societal benefits, and on cross-cutting issues of interest
4. Support the forest observation community with information about activities and plans in the GEO process

Forest Observation User Communities

- (1) Global Change Science*
- (2) Timber, Fuel and Fiber (incl. agro forestry)*
- (3) Watershed Protection*
- (4) Biodiversity and Conservation*
- (5) FCCC and other Environmental Agreements*
- (6) Recreation and Tourism*
- (7) Sustainable Forest Management*
- (8) Forest Perturbations and Protection (fire, insects, disease)*



Current & future states of critical forest observation priorities



Critical Earth Observation Priorities		Currently Available	
		Yes	No
Available in Future	Planned	Good situation	In waiting
	No Plan	Possible crisis	Major gap

Critical Observations

33rd International
Symposium on
Remote
Sensing of
Environment,
TS-5-3
4-8 May 2009,
Stresa, Italy

Identifying Critical Earth Observations for Forest Monitoring: A Role for GEO

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Abstract - Forest ecosystems are amongst the Earth's greatest natural resources. The current lack of globally consistent map products for forests, however, is significantly limiting efforts to understand trends in the world's forests. To help fill this gap and advance our knowledge of the status of and trends in the world's forest resources, the Forest Monitoring Community of Practice within the Group on Earth Observation (GEO) is completing several tasks related to forest observations in the 10-year plan towards a Global Earth Observing System of Systems (GEOSS). The Community of Practice is also engaged in the GEO user interface process to identify critical Earth observation priorities common to many GEOSS Societal Benefit Areas. The paper reports on the results of the process to date.

Keywords: forest monitoring, land cover, biodiversity, carbon, community of practice

1. INTRODUCTION

The Global Earth Observation System of Systems (GEOSS) consists of existing and future Earth observation systems around the world to observe the Earth and to gather the data needed for a better understanding of the Earth's processes. The GEOSS will provide the institutional mechanisms for ensuring the necessary level of coordination, for strengthening and supplementing existing Earth observation systems, and for reinforcing and supporting component systems in carrying out their mandates. The emphasis of GEOSS is on societal benefits, initially in nine key areas (SBA).

Forest ecosystems are amongst the Earth's greatest natural resources and are linked to all nine SBAs (Figure 1). The current lack of globally consistent map products for forests, however, is significantly limiting efforts to understand trends, climate impacts and trends in the world's forests. Filling this gap and advancing our knowledge of the status of, and trends in the world's forest resources and their long-term ability to support multiple societal benefit areas will require the coordinated development of Earth observation systems. This paper reports on several activities of the Group on Earth Observations (GEO) to consolidate the GEOSS approach for a systematic and integrated forest monitoring system of systems that should ensure coordination, facilitate and promote data sharing, inter-operability, and improve the ability of forest monitoring to address relevant issues.

1.1 Forest Observations in the GEO 10-Year Work Plan

The Group on Earth Observations (GEO) is attempting such coordinated development of the GEOSS through a 10-year work plan. The plan includes several tasks addressing forest-related observations in the general areas of: a) biodiversity, invasive species, forest ecology and protected areas; b) forest

and land cover dynamics, including effects of fire and agriculture, and c) forest biomass and carbon tracking. The tasks are listed in Appendix 1.

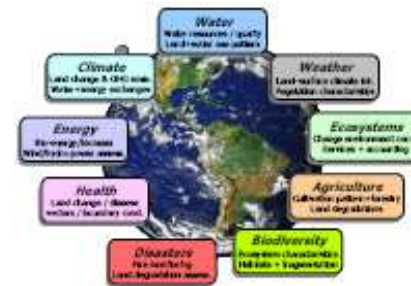


Figure 1. GEOSS societal benefit areas and associated land cover and forest observations (Source: M. Herold, GOFD-GOLD).

1.2 Forest Monitoring Community of Practice

The 2009-2011 work plan enhances the role of users and Communities of Practice for GEO. In 2006, the GEO Forest Monitoring Community of Practice (FMCP) was initiated. Its goals are to link existing and planned forest observation systems around the world, identify new systems where gaps currently exist, and improve access to, and use of, in situ, aerial and satellite Earth observations. The FMCP is comprised initially of the teams completing the tasks related to forest observations in the GEO work plan (Appendix 1). Members are from GEO member countries and participating international organizations. The FMCP membership is intended to represent user communities with a wide range of thematic interests, including:

- Global Change Science
- Timber, Fuel and Fiber (incl. agro forestry)
- Watershed Protection
- Biodiversity and Conservation
- UNFCCC and other Environmental Agreements
- Recreation and Tourism
- Sustainable Forest Management
- Forest Perturbations and Protection (fire, insects, disease)

In addition to their main role in work plan task implementation, FMCP members contribute to other GEO aspects such as: a)



GEO Task US-09-01a

Agriculture SBA

List sub-areas for analysis:

- Agriculture production monitoring
- Famine early warning
- Agriculture land cover change monitoring
- Seasonal/annual agriculture forecasting and risk reduction
- Data utilization in Aquaculture (AG-06-02)

- Forest - separate report is being prepared (combined GEO Agriculture and Ecosystems)

Preliminary Example Results

Assumes equal SBA weighting, with very little parameter cleaning

Parameter	Rank	Parameter	Rank
Land Cover	1	Net Primary Productivity (NPP)	13
Precipitation	2	Ambient Nitrogen Dioxide Concentration	14
Elevation	3	Ambient Particulate Matter Concentration (course)	15
Air Temperature	4	Ambient Sulfur Dioxide Concentration	16
Normalized Difference Vegetation Index (NDVI)	5	Direct Normal Irradiation (DNI)	17
Relative Humidity	6	Global Horizontal Irradation (GHI)	18
Soil Moisture	7	Bathymetry	19
Wind Speed	8	Pollen Counts	20
Ambient Ozone Concentration	9	Spore Counts	21
Ambient Particulate Matter Concentration (fine)	10	Soil Composition	22
Water run-off	11	Slope Angle	23
Land Surface Temperature	12	Cloud Cover (cloud index)	24



Forest CoP Next Steps

- Consolidate participation in Forest CoP amongst 8 forest related tasks
- Encourage registration of forest data, EO systems and users
- Support Call for Proposal process
- Consolidate GEO FCoP web page
- Continue with UIC process and reporting



Forest CoP participation at previous events

- *GEOSS in the Americas Symposium, Panama, Sep 08*
- *GOFC-GOLD Land Cover Symposium, Germany, Oct 08*
- *1st GEO Forest Symposium, Brazil, Nov 08*
- *Task meetings at CEOS SIT-23, USA, Feb 09*
- *Task workshop, Australia, Mar 09*
- *Forest workshop & papers at ISRSE, Italy, May 09*
- *Task contributions at UNFCCC SBSTA, Germany, Jun 09*
- *GOFC-GOLD Biomass Workshop, USA, Jun 09*
- *2nd GEO Forest Symposium, Thailand, Jul 09*
- *Meetings with Princes' Rainforest Project & Google, UK, Oct 09*
- *GEO Plenary, USA, Nov 09 - Global Forest Monitoring Facility*
- *UNFCCC CoP, Denmark, Dec 09*



Recent and upcoming forest events

- *Congo Basin Forest Carbon Workshop, R. Congo, Feb 10*
- *Meeting of the GEO Interim Working Group towards a Global Forest Monitoring System, USA, Feb 10*
- *4th GEOSS Asia-Pacific Symposium, Indonesia, March 10*
- *GOFC-GOLD Fire meeting, Italy, March 10*
- *Asia Pacific Forest Monitoring Network meeting, China, April 10*
- *Forest Carbon Tracking Data Summit, USA, Apr 10*
- *UN REDD-GEO FCT Workshop, Mexico, June 10*
- *REDD Sourcebook working group meeting, USA, July 10*
- *GOFC-GOLD Biomass meeting, IGARSS 2010, USA, July 10*
- *7th GEO Plenary and Ministerial Summit, China, November 10*
- *UNFCCC CoP 16, Mexico, December 10*





**Thank you,
Questions?**

GEO Forest Community of Practice

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