

Report on the 1st GEO Forest Monitoring Symposium

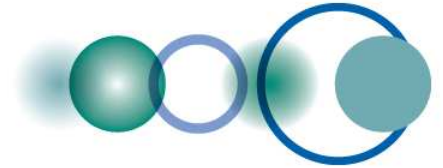
Giovanni Rum, GEO Secretariat

Douglas Muchoney, GEO Secretariat

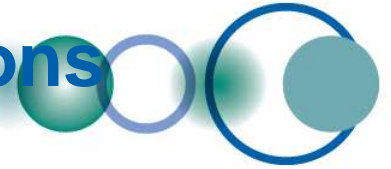
Michael Brady, NRCan

**2nd GEO Forest Monitoring Symposium
July 1-3, 2009 Chiang-Rai, Thailand**



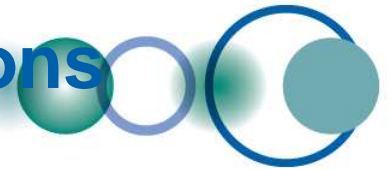


- **72 participants attended, representing 21 countries**
- **70 presentations were delivered on current status of, and requirements for critical forest characterization and monitoring, including: carbon and biomass, biodiversity, fire, water, fragmentation and degradation, and stress and damage**
- **Symposium summary presented at 2008 GEO Plenary**
- **Symposium report completed and available on the GEO website.**



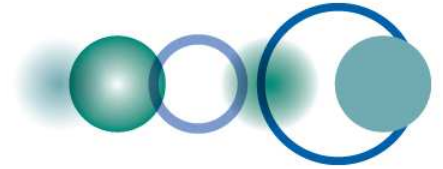
GEO Task US-06-01:

Establish a GEO process for identifying critical Earth observation priorities common to many GEOSS societal benefit areas, involving scientific and technical experts, taking account of socio-economic factors, and building on the results of existing systems' requirements development processes.

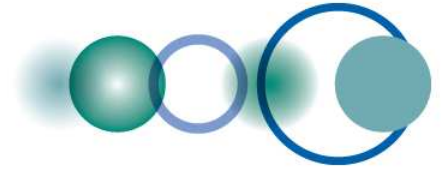


Current & Future States of Critical Earth Observation Priorities

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

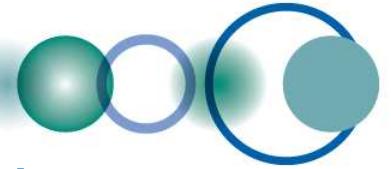


- Consolidate the GEOSS approach for a systematic and integrated Forest Monitoring System of Systems, which should ensure coordination, facilitate and promote data sharing, interoperability, and improve the ability of forest monitoring to address relevant issues.
- Promote communication and collaboration among various communities working on different forest related themes, and to strengthen the focus on forest observation world-wide.
- Provide a forum where GEO Task Teams and key Institutions worldwide can further their programmes of work as they relate to forest observation.
- Help participants achieve a greater understanding of the current status of, and requirements for, critical forest characterization and monitoring, including carbon and biomass, biodiversity, fire, water, fragmentation and degradation, and stress and damage.



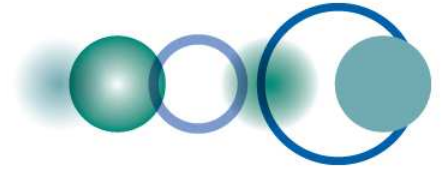
Symposium Format

1. Status:
 - Status of GEO Forest Related Tasks and Links to Ongoing Forest Observation Activities
 - Key Users of Forest Observations and Their Needs
2. Observation Priorities for GEO Tasks Related to:
 - Forest Biodiversity
 - Forest Biomass and Carbon
 - Forest and Land Cover Dynamics
3. Summary of Key Issues, Gaps and Priorities



1. Key Issues, Gaps and Priorities

- The Symposium concluded that several existing products clearly demonstrate the ability of Earth observations to improve global forest monitoring.
- However, creating sustained operational systems based on these capabilities will require considerable additional efforts and major investments in capabilities and capacity.
- These improvements in forest monitoring will be more widely realized with the adoption of stronger open-data policies.
- The collection of radar data in specified areas with high cloud frequencies also to complement optical data is specifically important.
- For many developing countries, significantly increased efforts in capacity building are needed to derive the full benefits of the data, especially at the community level.

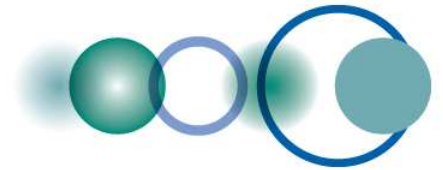


2. Recommendations

A set of synthesized, common outcomes and recommendations were developed for the GEOSS Transverse areas

Examples:

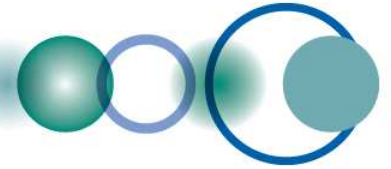
1. **User Interface:** Incorporate Forest Symposium results in user process (User Interface Committee, User Requirements Activity – US-06-01) to identify priority observations.
2. **Capacity and Capacity Building:** GEO members should strongly promote regional networks and strengthen mechanisms to support capacity building particularly in developing regions (e.g. success of fire networks in Latin America).
4. **Science and Technology:** LIDAR research in support of biomass and biodiversity should be actively promoted.
5. **Architecture and Data** (under Future Capabilities): GEO member countries nominate to establish large-area reference sites (linked to regional capacity-building activities, national forest agencies) for e.g. demonstration of capability, accuracy and rapid implementation, , and in the future incorporate evolving technologies (LIDAR, SAR interferometry) and regional capacity building programs [include future acquisition of selected airborne inSAR and LIDAR datasets for methodology development and verification].



3. Immediate Action Items

Activities were identified for several organizations as immediate actions needed to support and maintain Earth Observations for forest characterization and monitoring. Organizations include:

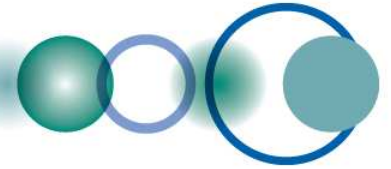
- Space Agencies: CEOS and LSI task team
- UN Agencies
- GEO National Members, Task Teams and Committees
- GOFC-GOLD
- NGOs
- GEO Forest Community of Practice
- Research Funding Organizations
- Commercial Providers



3. Immediate Action Items

Space Agencies: CEOS and LSI task team:

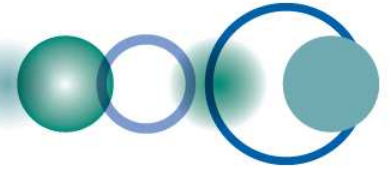
1. Maintain capabilities of research sensors such as MODIS; eg for fire. Frame in terms of requirements, not specific system
2. Encourage space agencies to coordinate SARs missions to provide broad range of datasets for demonstration sites. Sub tasks include:
 - Establish a radar sub-team for CEOS LSI Constellation in consultation with the GEO Virtual Constellation Task Team
 - Formulate an integrated acquisition strategy, and specific agencies' commitment for Optical and Radar in support of land cover change in the tropics (CEOS LSI Constellation Task Team)



3. Immediate Action Items

UN Agencies

- For land and forest cover, FAO should further promote the harmonisation of legends using the Land Cover Classification system (LCCS) among GEO members. (LC)



3. Immediate Action Items

GEO National Members, Task Teams and Committees

Data acquisition/access:

- Establish an initiative for global, open (free!) moderate-resolution data access. (LC)
- Strengthen global/regional data distribution mechanisms (e.g. GEONetcast, SERVIR, Sentinel Asia) for efficient delivery of medium resolution forest cover-change products in coordination with GEO members. (C)
- Facilitate annual free Landsat-like dataset (LC)
- Approach receiving stations and commercial data suppliers for open access to archival data, possibly through the Constellation Task Team. (LC)



3. Immediate Action Items

GEO National Members, Task Teams and Committees

Higher order products:

- Establishment of Regional Reference Test Sites, including shared datasets of validation and training data for selected sites representative of the forests being monitored. (GEO Carbon Tracking Task Team (coordination w/GEO members and donors) (C, LC)
- GEO should work with CEOS (CEOS Working Group on Calibration/Validation) and other relevant organizations to define a set of standards for all higher order products for pre-processing (including minimum geolocation accuracy). Similar requirements should be set for meta-data which need to be in standard format (compliant with international standards) and reflect the whole processing chain. (LC)



3. Immediate Action Items

GEO National Members, Task Teams and Committees

Higher order products:

- Support an effort on best practices for integration of SAR and optical data in support of land cover change monitoring in tropics, possibly coordinated through GOFCC-GOLD. (LC)
- Facilitate the worldwide availability of 30 m DEM. (LC)
- Initiate a Global Phenology Network as described in the GEO 2009-2011 Work Plan. (B)
- Compile existing datasets on species distributions through the GEO Biodiversity Observation Network. (B)

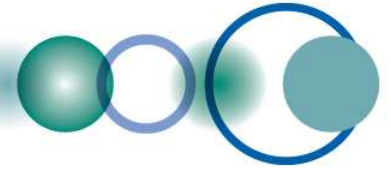


3. Immediate Action Items

GEO National Members, Task Teams and Committees

Interpreted products:

- Members to produce land cover change products at the final user application level are required to be produced on an annual basis, specifically for forested areas, with a resolution equal to or finer than 30 meters. These products should include burnt forest areas, afforestation, reforestation and deforestation estimates. (LC)
- Promote integrated GEO Pilots
- Initiate “Composite Analysis” demonstration projects at key, representative sites to demonstrate the benefits of conducting studies on carbon and biomass, biodiversity and water co-benefits simultaneously.

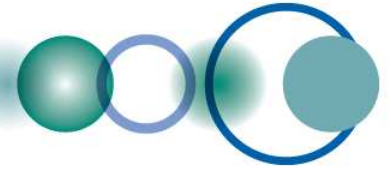


3. Immediate Action Items

GEO National Members, Task Teams and Committees

Capacity building:

- GEO members should strongly promote regional networks and strengthen mechanisms to support capacity building particularly in developing regions (e.g. success of fire networks in Latin America). GEO should re-emphasize importance of the existing Regional Network Task. (LC)
- Develop Intergovernmental, NGO, Governmental, Industry and Academia to provide hardware, software, data and training to critical sites globally



3. Immediate Action Items

GOFC-GOLD

- Observational Requirements for REDD (including radar) through the Working Groups on REDD (GOFC-GOLD and UN-REDD) in coordination with CEOS LSI. (C)
- Coordination of Analysis Tools and methodologies, including current accuracy and capabilities, limitations and uncertainties (Working Groups on REDD – GOFC-GOLD, UN-REDD) (C)
- Hold a Workshop on Ecosystem in Coordination with GEO, UNEP and IUCN. (B)
- Sponsor a biomass workshop and consider forming a Biomass working group to further develop biomass observations and mapping (LC)



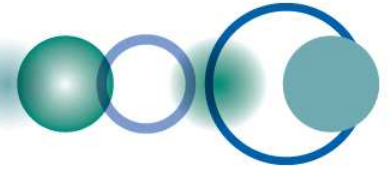
3. Immediate Action Items

NGOs

- IUCN – convene with WCMC in late '09 a protected areas workshop (B)
- Initiate the GEO Protected Areas Assessment and Monitoring programme.
- Use the GEO Ecosystem Map and the WDPA to conduct a global protected areas gap analysis.

GEO Forest Community of Practice

- Incorporate Forest Symposium results in user process to identify priority observations (B,C, LC)
- Initiate a Data Outreach Programme for Forests



3. Immediate Action Items

Research Funding Organizations

- Lidar research in support of biomass and biodiversity should be promoted.

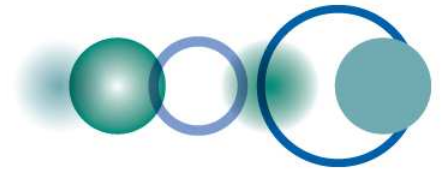
Commercial Providers

- Approach receiving stations and commercial data suppliers for open access to archival data perhaps through the Constellation Task Team. (LC)

Philanthropic Organizations

- Philanthropic Organizations should be included in all relevant activities.

Symposium Report and presentations



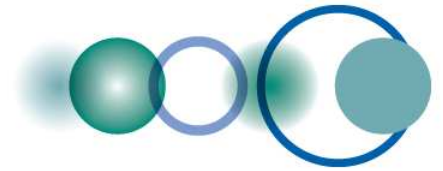
GEO 2008. Report of the First GEO Forest Monitoring Symposium, 4-7 November 2008, Foz do Iguaçu, Brazil. Edited by Doug Muchoney, GEO Secretariat and Michael Brady, NRCan.

Report available at:

http://earthobservations.org/meetings/20081104_07_forest_symposium_report.pdf

Report and presentations available at

<http://www.dpi.inpe.br/geoforest/>



Thank You!

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