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LAND COVER AND CHANGE

Newsletter of the GOFC-GOLD Land Cover Project Office

Outcomes of the Third GOFC-GOLD Symposium

The GOFC-GOLD Land Cover Implementation Team (IT) organised in coordination with the GOFC-GOLD Fire IT, the REDD Working Group and the Regional Networks, the Third GOFC-GOLD Symposium last April on the campus of Wageningen University, The Netherlands. More than 150 persons participated in 12 sessions. The Plenary session was an opportunity for GOFC-GOLD to hear the views of the main sponsors and key stake-



holders in land cover monitoring on the future of GOFC-GOLD. See page 3 for more information.

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REDD+ MRV activities in Guyana with RapidEye imagery

The Guyana Forestry Commission (GFC) together with Indufor Asia Pacific Ltd aimed at creating a REDD+ Measurement, Reporting and Verification (MRV) system for the detection and reporting of national forest change in Guyana mainly based on RapidEye high-resolution imagery.

In 2009, the Governments of Norway and Guyana embarked on one of the first national-scale REDD+ initiatives to preserve Guyana's forests. The bilateral agreement sets out how the two countries would work together to achieve the objective of Guyana conserving its forest stocks and helping reduce global carbon emissions. The aim was to create a REDD+ MRV system with a solid methodology for the detection and reporting of national forest change. Potentially, the methods employed could serve as model that could assist other

countries to progress their REDD+ MRV initiatives off the ground. Until 2009, the only cost-effective and reliable source of imagery to accomplish the goals of this project was Landsat. Forest degradation was impossible to assess from the first year (2010) dataset due to the low resolution of the Landsat imagery. As a result, the degradation estimates for the first measurement year were based on the assumption that forest degradation radiates from deforested sites for a distance of 500 meters.

The GFC and Indufor team decided that

high resolution imagery from RapidEye would improve the detection of small-scale degradation events. A methodology was developed using five meter RapidEye imagery. The method adopted considered the visual characteristics of degradation includ-



RapidEye false color composite image of forested area (5 m spatial resolution)

ing, size, proximity and its spectral characteristics. In 2011, the RapidEye constellation was tasked over a four month period to collect approximately 12 million hectares (120,000 km²) of new imagery. In 2012, this was expanded to the entire country. Guyana has established an annual, nation-wide MRV system. The historical analysis (1990-2009) has shown that the country lost about 0.02% of its forest area every year. Whereas Landsat overestimated deforestation, RapidEye could provide a more accurate result. The incorporation of RapidEye imagery and improved forest change routines into the MRV system have resulted in improved detection and classification of both deforestation and degradation events.

Since 2010 an independent in-country validation of the forest change es-

timates has been conducted by the University of Durham, England. The review process evaluates the accuracy of the mapping by scrutinizing the methodology and developing a statistical sampling approach to verify the results. The University of Durham attributed the extremely high overall accuracy rate of 99.2% to the manual multi-stage methods when validating forest loss, the five meter high resolution RapidEye imagery and the meticulous work of the GFC and Indufor team.

As part of its effort to assist participating countries in becoming "REDD-ready", RapidEye offers an extensive and very recent archive of imagery, which can provide users with a wealth of information to identify which areas are forested or tracking the change of forested land over mul-

iple years. Wall-to-wall coverages of most REDD+ countries are available in the RapidEye archive for National REDD+ initiatives. Contact red@rapideye.com for more information.

RapidEye Advantages	Contribution to REDD+
High Resolution Imagery (Five Meter Pixel Size)	Ideal for identifying both deforestation and forest degradation. Five meter pixel size suitable for a Minimum Mapping Unit (MMU) of 0.5 ha
Largest High Resolution Collection Capacity From a Constellation of Five Identical Satellites	Wall-to-wall national coverages in short time frames; allowing for multi-temporal datasets over large areas
Multi Temporal	Multiple imaging opportunities due to daily revisit possibilities over the same point on earth. This allows for base and reference mapping and change detection based on various coverages over large areas
Multi-spectral Sensor With Five Bands (including Red Edge)	RapidEye's sensors were built with the visible bands of Blue, Green and Red as well as Near-Infrared and the Red Edge band, which provides improved vegetation monitoring and analysis
Multiple Country Coverages Are Available	EyeFind makes it easy to find out quickly! Visit eyefind.rapideye.com
Proven Track Record in Global REDD Efforts	Several current REDD projects rely on RapidEye for monitoring including Mexico, Guyana, Nepal, Costa Rica, Panama and more.
Guaranteed Data Continuity	RapidEye is committed to providing a long-term data source. While it is assumed RapidEye's constellation will be operational into 2019 or beyond, plans for a second generation are currently underway

Table 1: RapidEye advantages for REDD+ monitoring

Miombo Regional Network workshop

The Miombo Network, which is one of the 11 GOFC-GOLD Regional Networks, organised a workshop in Maputo, Mozambique on July 23-25.

The objectives of the workshop were:

1. Review the current GOFC-GOLD Miombo Network goals,
2. Review and update the Miombo Network Science Plan
3. 2012 GOFC-GOLD Data Training Initiative: Distribution of Landsat data,
4. Explore the role of the network in developing regional monitoring and research expertise for REDD+ monitoring,
5. Discuss the GOFC-GOLD network governance.

Several land cover and land cover change mapping initiatives were presented by participants coming from South Africa, Mozambique, Malawi,



Panelists of session on Miombo Woodlands Country Status

Democratic Republic of Congo, Angola, and Zimbabwe. Academic researchers from North America, Europe, Japan, and persons from international bodies attended the workshop as well. Fire monitoring and biomass estimation activities were presented and discussed.

A total of 6 focal areas were identified as priority for the Science Plan:

1. Patterns and rates of land cover change

2. Land use change integrated analysis: Process and drivers of land use change
3. Carbon and biomass in the Miombo region
4. Ecology of the Miombo ecosystem
5. Miombo ecosystem management and adaptation to climate change
6. Human dimensions of the Miombo ecosystem

The Executive Committee of the Miombo Regional Network has been renewed and will release in the coming weeks a synthesis off the discussions and outcomes of the workshop.

For more information, contact [Dr. Natasha Ribeiro](mailto:Dr.Natasha.Ribeiro@fao.org), or visit: <http://www.fao.org/gtos/gofc-gold/net-Miombo.html>

Outcomes of 3rd GOFC-GOLD Symposium, Wageningen

The Third GOFC-GOLD Symposium was organised on April 15-19 on the campus of Wageningen university. More than 150 persons participated in the event.

The objective of the Symposium was to review the recent research accomplishments in the global land cover and forest monitoring in the arenas of research, implementation, support of international assessments, and capacity development in developing countries. Specific activities from GOFC-GOLD and its partners was reported. The Symposium outlined the specific research, applications and development needs that should be targeted by GOFC-GOLD in the future.

The Symposium was an opportunity for GOFC-GOLD to communicate on its advancements and on its contributions to a series of international initiatives notably those that aim at standardizing and harmonizing GLC mapping procedures. In addition the Symposium enabled the members of the GOFC-GOLD to meet other international experts. Therefore the

Symposium was an opportunity to present state-of-the-art research and provide recommendations for future work based on identified research gaps. The outcomes of the meeting enabled GOFC-GOLD to provide its sponsors (Food and Agriculture Organization, United Nations Educational, Scientific and Cultural Organization, World Meteorological Service, International

Council for Science and United Nations Environment Programme) with updated scientific and technical information to support internationally coordinated initiatives like the COP events, those from the Global Terrestrial Observing System, and those from the Group on Earth Observations. Gathering the GOFC-GOLD members permitted the update of the long-



Morning participants of the Plenary Session

term objectives of the organization and strengthen its leading role in the GLC and forest mapping community. Invited panelists during the Plenary session pointed out notably the necessity for GOFC-GOLD to:

- Keep serving as a complement to the IPCC guidelines and provide practical, hands-on guidance and technical support for REDD+.
- Develop and strengthen the GOFC-GOLD Regional Networks providing a better institutional frame and search for additional financial resources.
- Develop relations with other pol-

icy networks in need for land cover information (e.g., biodiversity).

- Keep working and advocating for joint validation efforts for global land cover mapping activities.
- Keep advocating for free and open access to remotely-sensed data and to products of higher level (pre-processing).

Access to the presentations (pdf format), the video recording of the Plenary session and the detailed summary of presentations and discussions is possible from this page: http://www.gofcgold.wur.nl/sites/Gofcgold_Symposium2013.php



Prof. Curtis Woodcock presenting the Land Cover IT activities during the Plenary Session

REDD+ Web Platform by UNFCCC

The United Nations Framework Convention on Climate Change updated its platform on REDD+ for the last Conference Of Parties (Doha, Qatar, November 2012). The platform enables Parties, relevant organizations and stakeholders to support on-going efforts on capacity building, demonstration activities and mobilization of resources relating to reducing emissions from deforestation and forest degradation in developing countries.



The platform enables the REDD+ community to share the outcomes of these efforts with the Subsidiary Body for Scientific and Technological Advice (SBSTA) by providing corresponding information to the secretariat. Several documents produced by the GOFC-GOLD Land Cover Office can be found on the platform. Link to the platform: http://unfccc.int/methods/redd/redd_web_platform/items/4531.php

Global Geo-Referenced Field Photo Library

The University of Oklahoma, U.S.A., has released to the public a Global Geo-Referenced Field Photo Library.

The objective of this website is to develop a citizen-based Global Geo-Referenced Field Photos Library. Registered users have the possibility to upload data, query the database and download geo-referenced field photos. The data can subsequently be used for land use and land cover analysis in a geographical information system. Photo providers can control the access policy of their data. A registered user that uploads photos into the library will be granted the access to more field photos in the library than a guest user. The portal now hosts more than 50,000 geo-referenced field photos.

Validation of regional/global land cover mapping activities can benefit from this initiative.

Access to the portal: <http://www.eomf.ou.edu/photos/>



Interface of the web-portal with spatial distribution of the pictures

ISPRS / GEO Workshop on High Resolution Global Land Cover Mapping

The Third International Workshop on High Resolution Global Land Cover Mapping was held in Beijing, China (April 27-28). The objectives of the workshop were : present latest developments of higher resolution GLC mapping projects, discuss technical and organizational issues related to GLC data validation, and collaborations within the GEO framework, and explore the concepts and methods of Service-Oriented Computing-based

dynamic GLC information services. Among other initiatives, the GOFC-GOLD Land Cover Project Office presented the *beta* version of the global land cover reference data portal under development. Tsinghua University (Beijing) and the National Geomatics Centre of China presented different 30m-resolution GLC products and on-going initiatives. The development of a GLC data portal hosted by the GEO data core has been discussed.



Participants of the workshop

GOFC-GOLD LC PO - WWF workshop on REDD+ Measuring, Reporting and Verification - science solutions to policy challenges

A workshop on “REDD+ MRV – science solution to policy challenges”, hosted by the WWF Forest and Climate Initiative, WWF Netherlands and Wageningen University REDD@WUR network was carried out from 10-12 June 2013 in Zeist, The Netherlands. The purpose of this workshop was to assess the status and development of monitoring approaches in light of the evolving REDD+ needs from different actors such as policy makers, national REDD+ experts, from local implementers, from donors and the private sector. The workshop involved 31 participants from scientific, public and private stakeholders.

Evolving REDD+ monitoring requirements and challenges from each stakeholder’s perspective were shared in presentation and discussion panels among participants. The most important gaps were identified and led to the development of research priorities with focus on better linking local and national REDD+ efforts on five themes namely:

- Monitoring and Measurement
- Reporting and Verification
- Reference levels
- MRV of Safeguards
- Benefit sharing

These issues were also discussed



in the context of the outcomes of UN-FCCC SBSTA 38 agenda item 4 draft text that was negotiated in parallel. The workshop output was a roadmap proposed by the working groups on solving the key requirements specified under the five main themes. Recommendations were made on what to do next, how to approach the issues, when to execute actions, and

who to involve in the process. The participants took the commitment to take on the most critical tasks under the leadership of a WWF – WU partnership. This partnership will help to bridge dedicated research, local and national implementation, and the policy and political level that is essential to address the objectives in comprehensive manner. Further communications, including a detailed workshop report and executive summary are being prepared and will be published with all presentations and workshop documents soon at the WWF REDD+ community(reddcommunity.org).

A summary report of the workshop along with the presentations are accessible on the website of the GOFC-GOLD LC PO (gofcgold.wur.nl/sites/wwf-workshop2013.php).



Participants of the workshop

Calendar of upcoming events for 2013

Event	Date	Venue	Contact
GEO Work Plan Symposium	4-6 June	Geneva, Switzerland	www.earthobservations.org
WWF Netherlands workshop on REDD+ MRV - Science solutions to policy challenges	10-12 June	Zeist, The Netherlands	
UNFCCC SBSTA session	3-14 June	Bonn, Germany	unfccc.int/meetings/bonn_jun_2013/meeting/7431.php
Trans-Atlantic training on LCLUC-related topics	17-22 June	Prague, Czech Republic	Garik Gutman
IEEE IGARSS Conference	21-26 July	Melbourne, Australia	www.igarss2013.org/
Miombo workshop	23-25 July	Maputo, Mozambique	Natasha Ribeiro
ESA Living Planet Symposium	9-13 September	Edinburgh, Scotland	www.livingplanet2013.org/
CARIN Regional Network workshop	October	Tashkent, Uzbekistan	Olga Krankina
UNFCCC Conference Of Parties 19	11-22 November	Warsaw, Poland	http://www.cop19.org/

Table 2: Upcoming events

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<http://www.gofcgold.wur.nl/sites/letter.php>

If you have any suggestions or recommendations for future contributions to this newsletter please feel free to contact us.



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