

Newsletter N° 30 | November 14

# LAND COVER AND CHANGE

Newsletter of the GOFC-GOLD Land Cover Project Office

## Release of the ESA CCI Land Cover products, and next Phase

In the framework of the Climate Change Initiative (CCI) supported by the European Space Agency, the CCI Land Cover team made of 8 satellite remote sensing labs and of 3 major climate modelling centres delivers a suite of 5 products particularly relevant for the climate and land research communities.

The phase 2 of the project has started already and is aimed to provide additional map products. Go to page 2 for more information.

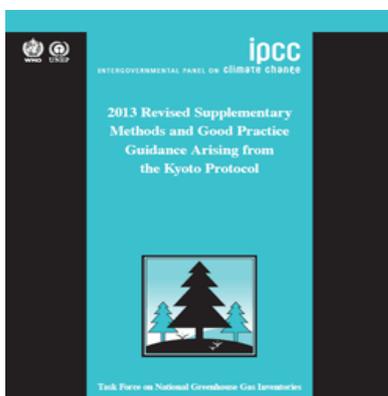


Figure 1: The three land cover state products of the LC-CCI Phase 1

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## 2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol



In 2012 the GOFC-GOLD Land Cover Project Office was invited by the Task Force on National Greenhouse Gas Inventories of

the Intergovernmental Panel on Climate Change (IPCC) to review and update methods and good practice guidance for estimating anthropogenic greenhouse gas emissions by sources and removals by sinks resulting from land use, land-use change and forestry (LULUCF) activities. Work on the production of the report was carried out in 2012-13 over four Lead Author meetings and two rounds of reviews followed by a round of written comments by governments. The 2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol (KP Supplement) report was released by the IPCC earlier this year. The report

revises and updates Chapter 4 of the Good Practice Guidance for Land Use, Land-Use Change and Forestry (GPG-LULUCF) which provides supplementary methods and good practice guidance related to LULUCF activities based on the general greenhouse gas inventory guidance provided in its other chapters and the rules governing the treatment of LULUCF activities in the first commitment period of the Kyoto Protocol. The document can be accessed from this page: <http://www.ipcc-nggip.iges.or.jp/public/kpsug/>

# Development of a REDD+ Curriculum with the World Bank FCPF

The GOFC-GOLD LC Project Office (LC PO) has been developing a REDD+ curriculum on monitoring and reporting, in partnership with the World Bank Forest Carbon Partnership Facility (FCPF). The training material is aimed to provide learning and teaching material to enable countries to develop capacities and implement REDD+ monitoring and reporting.

The external review of the modules is now achieved. The GOFC-GOLD

LC PO is waiting for the World Bank's final approval to release the materials. We expect the modules to be available online early 2015, free of charge, on the GOFC-GOLD LC PO and FCPF websites.

You can follow us on Twitter (@gofcgold\_lc) and Facebook (gofc-gold.lc.po) to be among the first to be informed on the release.

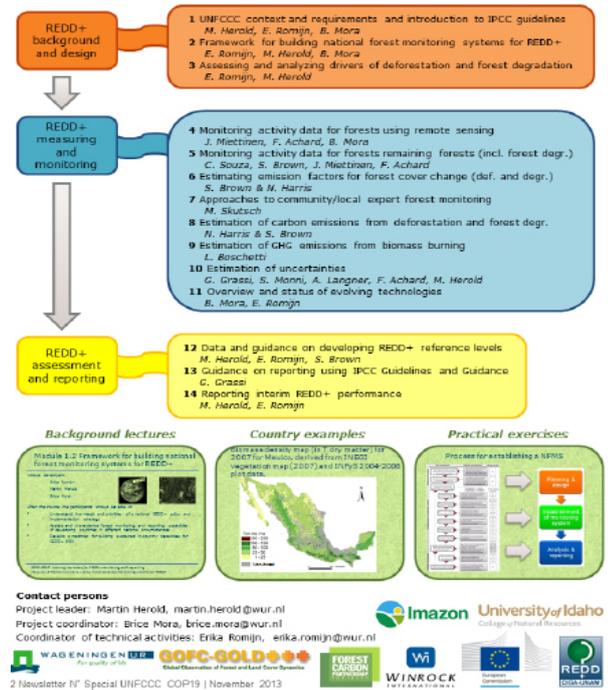


Figure 2: Modules of the REDD+ curriculum



# Release of the ESA CCI Land Cover products, and next Phase



In the framework of the Climate Change Initiative (CCI) supported by the European Space Agency in response to the Essential Climate Variables listed by the Global Climate Observing System, the CCI Land Cover team made of 8 satellite remote sensing labs and of 3 major climate modelling centres delivers a suite of 5 products particularly relevant for the climate and land research communities:

1) **Three 300m global land cover maps** including 22 classes for the

1998-2002, 2003-2007 and 2008-2012 epochs. Maps were produced using multi-year and multi-sensor strategy (full archives of MERIS 300m and 1000m, SPOT-Vegetation 1000m) in order to exploit all the observations and maximize product consistency over the whole 15-year period (1998-2012).

2) **Three global land cover seasonal products** about vegetation greenness, snow and burned areas. Use of consistent climatological time series reflecting along the year, on a per-pixel and weekly basis, the average dynamics and the inter-annual variability of the vegetation greenness (NDVI), the snow cover and the burned areas for 1998-2012.

3) **7-day surface reflectance time series of the MERIS Full & Reduced resolution** for the whole archive

(2003-2012). Use of time series of 13 surface reflectance channels at 300m and 1000m obtained after radiometric calibration, geometric correction, pixel identification and atmospheric correction with aerosol retrieval.

4) a **300m global map of open permanent water bodies**, derived from the full ASAR dataset between 2005 and 2010. Water bodies classification using very high dense acquisitions (ASAR Wide Swath Mode with local gap fillers



Figure 3: Web interface to access the datasets

from Image Mode and Global Monitoring Mode) was performed for the interpretation of multi-temporal SAR metrics and auxiliary datasets.

5) the **associated user tool** for the climate modelling community. The tool allows fitting land cover products to climate models by sub-setting, re-projecting and re-sampling and by converting land cover classes into Plant Functional Types according to default or user-defined cross-walking tables.

For visualisation and download : <http://maps.elie.ucl.ac.be/CCI/viewer/index.php>

#### CCI Land Cover Phase 2

The second phase (2014-2016) of the CCI Land Cover project will aim to:

- 1) improve the Phase 1 (2011-2014) achievements in terms of products, systems, and validation,
- 2) cover the 1980's, 1990's and the 2013-2016 periods with AVHRR, Sentinel-3 and Proba-V,
- 3) demonstrate the feasibility of a higher resolution global land cover product

by generating a 10-20m land cover map, over Africa, using Sentinel-2 supplemented by Landsat 8 datasets, 4) extend the climate impact assessment of a better land surface description for climate modelling.

The ESA CCI Land Cover team is led by the [Université Catholique de Louvain](http://www.uclouvain.be), Belgium.

## Global Observing Systems Information Center

The Global Observing Systems Information Center (GOSIC) is hosted at the National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC), located in Asheville, NC, United States of America. The GOSIC aims to facilitate the search of and access to data, data products, metadata and information for the Global Climate Observing System (GCOS), Global Ocean Observing System (GOOS) and the Global Terrestrial Observing System (GTOS) and their partner programs such as the Global Atmosphere Watch (GAW) and the regional observing systems such as the GOOS Regional Alliances. Since 2008, the GOSIC is a registered component of the Global Earth Observation System of Systems (GEOSS) and functions as a community portal for the global observing system community.

The portal does not hold data but maintains information about the data sets and points to the centers holding them. The portal can be accessed here: <http://gosic.org/>.

In general the GOSIC Portal:

- provides for searches for data and information across all participating data centers,
- returns results regardless of the data format, or where the data are located,
- provides results back in a standard easy-to-read, easy-to-understand format,
- allows users to determine the type and quality of the data through documentation provided by the participating data centers,
- allows users to obtain datasets,
- provides unique data access tools,
- provides flexibility to search by observing system, program, variable,

theme, topic, key word, metadata and more.

The GOSIC portal is updated regularly and provides notably an access to some data sets related to the Essential Climate Variables (ECVs) from the Global Climate Observing System (GCOS) via a matrix that lists the different ECVs (<http://gosic.org/ios/MATRICES/ECV/ECV-matrix.htm>). The ECVs are required to support the work of the United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC).

For more information on the GOSIC portal and activities, please contact Christina Leif ([christina.lief@noaa.gov](mailto:christina.lief@noaa.gov)).

## GCOS Workshop on Observations for Climate Change Mitigation

The Global Climate Observing System (GCOS) and the Global Observations for Forest Cover and Land Dynamics (GOFC-GOLD) held a joint workshop on Observations for Climate Change Mitigation at the Headquarters of the World Meteorological Organization (WMO) in Geneva, Switzerland, from 5-7 May 2014. The goals of the workshop were: (1) develop a statement on the general adequacy of the observations coordinated by the GCOS to support climate change mitigation and iden-

tify of further work that may need to be undertaken in preparation for the next GCOS status report on the Global Observing Systems for Climate, (2) identify requirements needed for observations and their use in monitoring to support climate services addressing mitigation needs (especially in regard to the Agriculture, Forestry and other Land Uses (AFOLU) sector), (3) discuss strategic guidance on what steps both GCOS and GOFC-GOLD should take, and (4) provide guidance for technical communities, data producers and data users.

In her opening remarks, Carolin Richter (GCOS) outlined the need for improved observations to support mitigation, and anticipated that in future greater availability and higher resolution of observations would increase utility for mitigation purposes. Subsequent presentations and discussions addressed observational needs from different sectors, and regional perspectives. During deliberations, the Chairman Stephen Briggs highlighted the following mitigation issues that are likely to require the attention of the GCOS in future:

- review existing and consider new Essential Climate Variables (ECVs) that are related to climate change mitigation;
- identify and address gaps and requirements for observations to support their use in monitoring to support research into mitigation;
- provide guidance for technical communities to advise data producers (e.g., space agencies, observation networks) and data users (those involved in mitigation, and climate science community).

The meeting considered that GCOS

and GOF-C-GOLD should:

**Action 1:** consider the relationship between ECVs (especially those related to biomass, land cover, fire, and soil carbon) and the IPCC greenhouse gas inventory guidance AFOLU, and suggest any revision to the ECV list in time for the next Implementation Plan.

**Action 2:** consider how ECVs relate to the remote sensing product list identified by the Space Data Coordination Group to support the Global Forest Observations Initiative (GFOI), and make any suggestions to revise the ECV list.

**Action 3:** investigate the possibility of generating a full global map of land use

changes, tracking reported emissions data under the IPCC land use categories. The first step could focus on forest land and forest land changes.

**Action 4:** better coordinate with information important for mitigation (not covered within the current ECV context) on:

- land management within the land use categories of IPCC, especially forest, agriculture, and livestock.
- drivers and agents of change.
- economic indicators (e.g., infrastructure, settlements, GDP).

[You can access the report here.](#)

## GEO GFOI Workshop on Sensor Interoperability

The Global Forest Observation Initiative (GFOI) of the Group on Earth Observations (GEO) organized last June an expert workshop on sensor interoperability for land cover mapping, change detection, and above-ground biomass estimation. The meeting was held at the Woods Hole Research centre, MA, United States of America.

The objectives of the workshop were:

- Assessment of existing approaches to sensor synergy, i.e., interoperability and complementarity for forestry,
- Identification of obstacles to reach operational use (widespread use),
- Development of an action plan to progress development,
- Input/recommendations to CEOS SDCG strategy for R&D.

Participants presented their ap-



proaches to sensor interoperability/complementarity. The presentations and discussions provided an overview of current state-of-the-art methods of sensor synergy, identified limitations, obstacles, and data/R&D needs relevant to each participating organization. Major obstacles identified were: funding, limited availability of data (SAR, Lidar, VHSR optical data notably), field data sharing, complexity of processing and

interpreting data, software availability. Research and development topics to be considered in priority in the future will be: determination of optimal observation strategies for C-band SAR data, assessment of cost/benefit of some metrics, further development of data fusion methods, transferability of some methods to tropical biome, identify infrastructure needs in countries for data procurement and access, software development and training.

For more information on the workshop you can download the summary report. ([http://www.gfoi.org/sites/default/files/GFOI\\_RDExpertWS1\\_Report\\_final.pdf](http://www.gfoi.org/sites/default/files/GFOI_RDExpertWS1_Report_final.pdf))

For more information on the GEO GFOI activities, visit: [www.gfoi.org](http://www.gfoi.org)

## Sourcebook for Biodiversity Monitoring with Remote Sensing

### GEO BON

In May 2014, the GOF-C-GOLD Land Cover Office (LC PO), and the Biodiversity Observation Network (BON) of the Group on Earth Observations (GEO), with a financial support from START, organized a workshop for the development of a sourcebook for biodiversity monitoring in tropical forests

with remote sensing, in London, UK.

We provide the key discussion points of the workshop:

- Purpose: To guide biodiversity monitoring (including proxies and pressures) via remote sensing (RS) to inform national and sub-national policy and decisions, convention commitments and targets (largely focusing on ecosystem health and function),
- Target Users: Project managers and

technical level practitioners in national, sub-national government agencies, academic institutions, NGOs, large FSC certified logging operators, large companies assuming the audience has a background on RS,

- Focus: RS techniques that have been calibrated and validated (and can be applied in other areas), integration of in situ and RS observations, present and discuss sampling approaches (e.g. upscaling from ground data),

Should consider evolving technologies but in a shorter section. Should list available datasets (in situ and RS), field based-only methods out of the scope, tropical forests should include following ecosystems: rain forests, dry forests, mangroves, wetlands, peat swamps, savannah including miombo woodlands,

- Approach: Feasible, sustainable operational peer-reviewed method options focusing on a few key variables with simple methods that can be easily implemented (but with more ambitious, robust options also presented), multi-scale, include what sensors can and cannot tell you, include training opportunities/sources, taking a hierarchical, decision-tree approach, discuss pros and cons (including costs), structured around relevant Essential Biodiversity Variables (EBVs), Bottom-up approach: GEO BON's BON (Biodiversity Observation Network) in a box concept (sourcebook to be a tool in the box),
- Other points: Include glossary (tropical forests, biodiversity), clearly articulate purpose and focus and definition of biodiversity (e.g. EBVs) in introduction (noting that most EBVs are not covered by RS), using concrete peer reviewed examples, include expert con-



tact list, have an Executive Summary for senior officials/decision-makers (indicating how the sourcebook will lead to better information to make decisions (e.g. Aichi Targets), foster regional collaboration, colocation of field campaigns biodiversity/carbon monitoring (e.g., West Africa case), list regional biodiversity networks, provide information on stakeholders (practitioners, donors, international local networks) for each EBV; consider how to target main users (e.g. engagement strategy); need to consider how to link to carbon monitoring activities and how to connect to land managers (e.g. large logging FSC certified concession operators).

- Medium/format: Live document available on the internet that can be printed and translated (French, Spanish, English).

The call for contribution to the sourcebook has been made and the first draft versions of the chapters are expected to be ready by mid-December. An in-

ternal review will be carried out during winter 2015 and the authors are planning to meet at the next ISRSE conference to discuss issues that will arise during the first development phase (consistency, level of detail, ...). An external review process is scheduled later in 2015 with a release of the first version in 2016. We will report on the progress of this initiative in the next newsletters of the GOFC-GOLD LC PO.

Julia Latham (Zoological Society of London) presented the joint project with GIZ GmbH, Germany, of a sourcebook for biodiversity monitoring for REDD+ and allowed us to identify the good complementarity between the proposed sourcebook (EBVs, remote-sensing oriented, beyond REDD+) and the ZSL-GIZ sourcebook (REDD+, framework oriented). The ZSL-GIZ Sourcebook for biodiversity monitoring for REDD+ proposes a cross-scale framework to help setting up a monitoring system (objective definition, indicator selection, implementation, information). See the news article on the [release of the ZSL-GIZ sourcebook](#) in the article below.

## ZSL & GIZ Sourcebook on Monitoring Biodiversity for REDD+

### A SOURCEBOOK

### BIODIVERSITY MONITORING FOR REDD+



ZSL



giz

The Zoological Society of London (ZSL) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) are pleased to announce the publication of a Sourcebook on

#### Monitoring Biodiversity for REDD+.

Contributing to the goal of achieving multiple benefits through REDD+, the Sourcebook seeks to answer three key questions: Why monitor biodiversity for REDD+? What to monitor? How to monitor? Drawing on the literature and contributions from a wide range of experts, the Sourcebook provides a simple framework for answering these questions. Summaries of key monitoring methods are presented with best practice guidance and practical case studies drawn from REDD+ and forest projects around the world. REDD+ is complex, as is biodiversity. Hence, the Sourcebook seeks to bring clarity to the challenge of monitoring biodiversity for REDD+ while acknowledging the need to avoid adding further complexity. The Sourcebook emphasises a phased approach to monitoring based on availability of resources, and highlights that monitoring biodiversity as part of

REDD+ can help countries to achieve both their biodiversity and climate commitments more cost-effectively. The Sourcebook is [available for download from ZSL's website here](#).

# Calendar of Upcoming Events

Event	Date	Venue	Information
UNFCCC COP 20	1-12 December 2014	Lima, Peru	<a href="http://unfccc.int/meetings/lima_dec_2014/meeting/8141.php">http://unfccc.int/meetings/lima_dec_2014/meeting/8141.php</a>
ESA POLinSAR 2015 - 1st BIOMASS Science Workshop	26-30 January 2015	Frascati, Italy	<a href="http://seom.esa.int/polinsar-biomass2015/">http://seom.esa.int/polinsar-biomass2015/</a>
GOFC-GOLD Biomass WG / GFOI Expert meeting (closed)	24-26 February 2015	Brisbane, Australia	
ESA Mapping Water bodies from Space Conference	18-19 March	Frascati, Italy	<a href="http://due.esrin.esa.int/mwbs2015/">http://due.esrin.esa.int/mwbs2015/</a>
36th International Symposium on Remote Sensing of Environment	11-15 May 2015	Berlin, Germany	<a href="http://www.isrse36.org/">http://www.isrse36.org/</a>

Table 1: Upcoming events

## Acknowledgements

The GOFC-GOLD LC PO wishes to thank Julia Latham for providing the material for the ZSL/GIZ sourcebook on biodiversity monitoring, the team from UC Louvain for providing the material on the ESA CCI-LC data sets, and Christina Leif for providing information on the GOSIC data portal.

### IMPRINT

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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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Global Observation of Forest Cover and Land Dynamics



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