GOFC-GOLD Canada Friedrich-Schiller-Universität Jena esa

LAND COVER AND CHANGE

Newsletter of the GOFC-GOLD Land Cover Project Office

MAY 2008 **NUMBER 17**

Content

FAO FRA 2010 REMOTE SENSING

From 3-7 March 2008 the first technical meeting of the FAO Forest Resources Assessment 2010 (FRA-2010) took place at FAO in Rome, Italy. National Correspondents from 154 countries and representatives from 14 partner organizations of FRA 2010, met to officially launch the next assessment. It will for the first time include a global remote sensing survey to support the national country reporting (Read more on page 3).

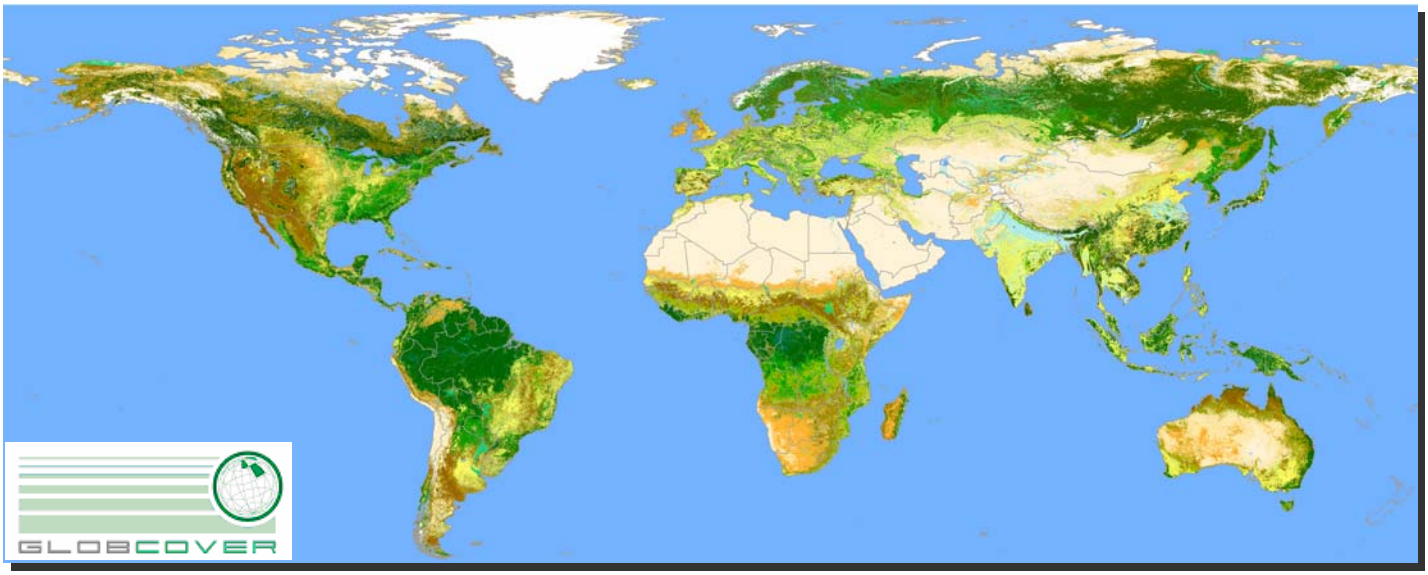
PARTNERS AND USERS PROVIDE FEEDBACK TO GLOBCOVER LAND COVER PRODUCT V.1

2ND USER CONSULTATION MEETING HELD IN MARCH

On the 10 March 2008, the 2nd GLOBCOVER User Meeting was held in Rome (Italy) to discuss the quality of the first version of the GlobCover Land Cover Product. This map is generated in the framework of the GlobCover project, an ESA funded initiative, using the data acquired between May 2005 and April 2006 by the MERIS sensor on-board the ENVISAT satellite. It is the first global land cover map at 300 m resolution and discriminates 22 land cover classes (fig. 1). It will be the first freely available global product at such resolution. The current map is a preliminary version and is available for viewing with a zooming possibility on POSTEL (http://postel.mediasfrance.org/) and ESA (http://www.esa.int/esaCP/SEMZ16L26DF_index_0.html) web sites.

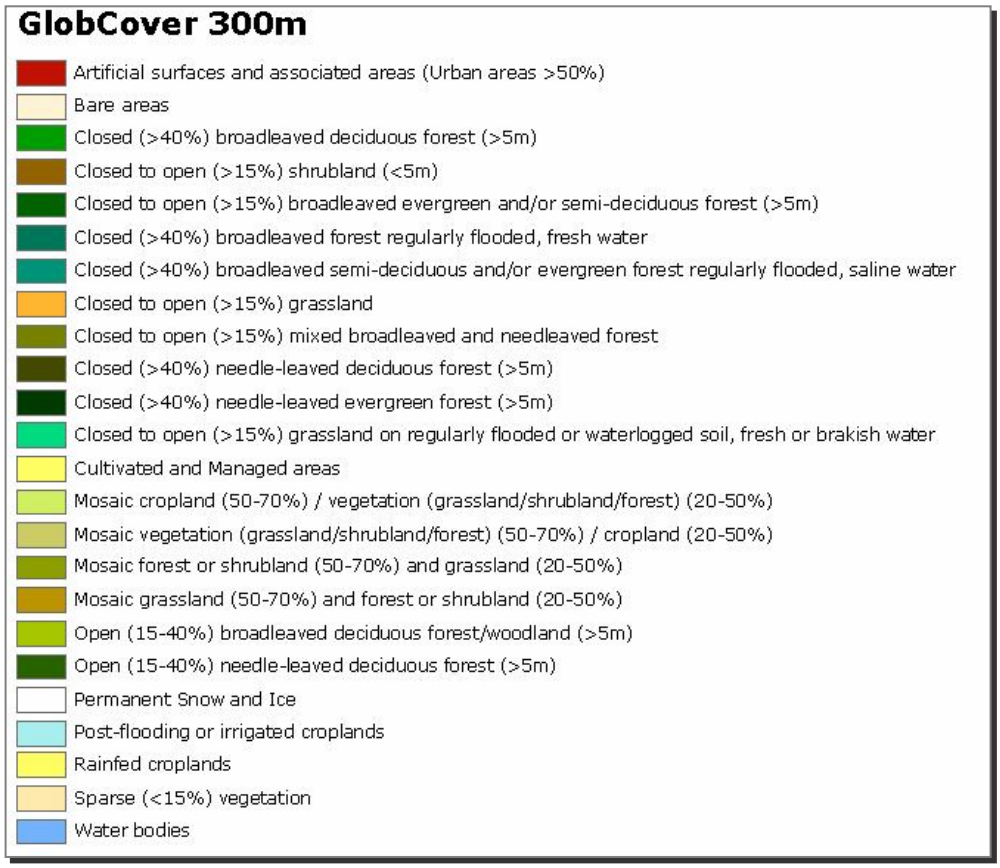
At the Consultation Meeting, the GlobCover partners (FAO, UNEP, JRC, EEA, GOFC-GOLD, IGBP) and expert users provided feedback on the product. The high spatial resolution leads to an improvement of thematic and spatial detail compared to other available global land cover maps. The participants highlighted the importance of the effort and marked it as “milestone”. As stated by F. Achard (JRC), "The GlobCover system is a great step forward in our capacities to automatically produce new global land cover

Fig. 1: GlobCover Land Cover Map V. 1 (2005/06) at 300 m resolution



products with a finer resolution and a more detailed thematic content than ever achieved in the past." According to a preliminary analysis by Medias France (responsible for software and production), the land cover types of the dichotomous phase are classified with an overall accuracy about 73 %. GlobCover better identifies small features and is more spatially consistent compared to GLC2000. Several artefacts were noted in the product, e.g. land/sea discrimination, snow detection, lines artefacts, e.g. too few images available in the composites lead to discontinuous borders of classes.

Fig. 2: GlobCover legend, comprising 22 land cover classes



Legend

The GlobCover legend comprises 22 land cover classes, including croplands, wetlands, forests, artificial surfaces, water bodies and permanent snow and ice (figure 2). To be consistent and comparable, the legend was developed using the FAO Land Cover Classification System LCCS (http://www.glcn-lccs.org/). All classes are therefore characterized through distinct and clearly defined classifiers based on pure land cover attributes.

Fig. 3: POSTEL and ESA website provides access to GlobCover Map V. 1 with zoom-in possibility

Perspectives for Version 2

For the second version of the product the following improvements are envisaged for the processing chain:

- Enhancement of MERIS data set by using 18 months of MERIS FR data and time series
- Modified strata limits
- Adjusted Look Up Tables
- Improved reference data set for labeling (from validation 1 and user feedback)
- Upgraded preprocessing on water bodies and snow, modified

The release of the GlobCover V.2 product is envisaged for July 2008.

Further information:
ESA DUP web site (includes presentations of the User Consultation meeting): http://dup.esrin.esa.it/projects/summaryp68.asp
Access to GlobCover Products: http://ionia1.esrin.esa.int/

FAO AND PARTNERS HAVE STARTED NEXT GLOBAL FOREST RESOURCES ASSESSMENT FOR 2010

OFFICIAL LAUNCH OF REMOTE SENSING SURVEY IN MARCH

Kick-Off Meeting

In the 60th anniversary year of the FAO Forest Resources Assessment, the next global survey for the year 2010 was officially launched during a technical meeting of national correspondents and partners in Rome. More than 250 forest experts attended this workshop, including representatives of the FRA-SAR partner organisations (CBD, EFI, JRC, GOFC-GOLD, ITTO, UNECE, UNEP, UNFCCC, World Bank, WRI, South Dakota State University USA and Jena University Germany) in order to discuss the assessment process, country reporting, special studies and the remote sensing survey. The meeting provided countries the opportunity to learn more about the FRA reporting tables and to ask questions about the reporting process. Furthermore, ten proposed special studies were presented at the meeting as potential work to be done as part of the FRA process. The meeting report and the presentations are available at the following FAO web page: http://www.fao.org/forestry/site/44376/en/.

Fig. 4: FRA-SAR Kick-Off Meeting at FAO, Rome *(picture: R. Knuth)*

FRA 2010

FAO undertakes forest assessments on the global scale since 1946, in 5 to 10 years intervals. The latest assessment was completed in 2005 (see box). The new assessment will be the most comprehensive global forest assessment undertaken to date and includes a number of new initiatives. FRA 2010 will also include information on forest laws, policies and institutions and thereby cover all the seven internationally agreed components of sustainable forest management.

WORLDS FORESTS

Forest Cover:

- Forest area: ~ 4 billion ha (**30.3 %** of total land area)
- More than half of the world's forest area is found in: Russian Federation, Brazil, Canada, USA and China

Deforestation:

- Deforestation rate: 13 million ha per year (rate of net forest loss is slowing down, due to new planting and natural expansion of existing forests)
- Net forest loss:
  1990 - 2000 **8.9 million ha** per year
  2000 - 2005 **7.3 million ha** per year
  (Equivalent to 200 km^2 per day)
- Primary forests are lost or modified at a rate of 6 million ha per year through deforestation or selective logging

(Source: FAO FRA-2005, http://www.fao.org/forestry/site/fra2005/en)

It includes for the first time a **global remote sensing survey** to produce global and regional tree-cover maps and a more consistent and detailed assessment of changes in forest areas over time (see GOFC Newsletter 12). The survey will primarily be based on the use of available Landsat imagery, but will incorporate auxiliary information including other remote sensing images (e.g. radar data), local knowledge and results from existing and past field inventories. A systematic sampling design will be used based on each longitude and latitude intersects. The assessment will cover the whole land surface of the Earth and will consist of about 13.500 samples, of which about 9.000 samples are outside deserts and areas with permanent ice. GOFC-GOLD is involved in FRA2010 through several LC-IT members and to give technical advice, in particular on validation issues.

Further information and documentation:

FRA-SAR 2010:
http://www.fao.org/forestry/site/fra/en/
Remote Sensing Survey:
http://www.fao.org/forestry/site/45355/en

FULL USGS LANDSAT ARCHIVE OPENS TO PUBLIC

BY FEBRUARY 2009 COMPLETE USGS LANDSAT IMAGERY WILL BE ACCESSIBLE FOR FREE

The USGS Landsat archive is an unequaled **35-year record** of the Earth's surface that is valuable for a broad range of uses, ranging from climate change science to forest management to emergency response, plus countless other user applications. Under a transition toward a National Land Imaging Program sponsored by the Secretary of the Interior, the USGS is pursuing an aggressive schedule to provide users with electronic access to any Landsat scene held in the USGS-managed national archive of global scenes dating back to Landsat 1, launched in 1972.

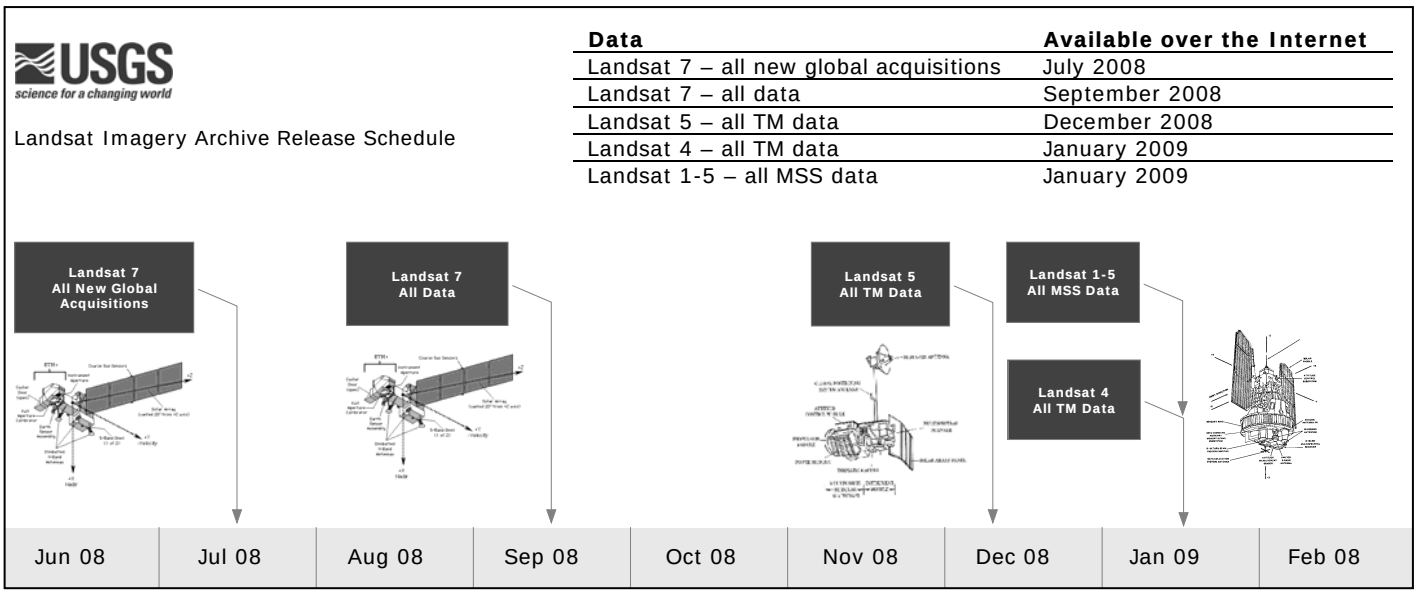
By **February 2009**, all archived scenes selected by a user – with no restriction on cloud cover – will be processed automatically to a standard product recipe, using such parameters as the Universe Transverse Mercator projection, and staged for electronic retrieval. In addition, newly acquired scenes meeting a cloud cover threshold of 20 % or below will be processed to the standard recipe and placed on line for at least six months, after which they will remain available for selection from the archive.

Newly acquired, minimally cloudy Landsat 7 Enhanced Thematic Mapper Plus (ETM+) data covering North America and Africa are already being distributed by the USGS over the Internet at no charge, with expansion to full global coverage of incoming Landsat 7 data to be completed by July 2008 (see timeline below). The full archive of historical Landsat 7 ETM+ data acquired by the USGS since launch in 1999 will become available for selection and downloading by the end of September 2008. At that time, all Landsat 7 data purchasing options from the USGS, wherein users pay for on-demand processing to various parameters will be discontinued. By the end of December of 2008, both incoming Landsat 5 Thematic Mapper (TM) data and all Landsat 5 TM data acquired by the USGS since launch (1984) will become available, with all Landsat 4 TM (1982-1985) and Landsat 1-5 Multi-Spectral Scanner (MSS) (1972-1994) data becoming available by the end of January 2009. All Landsat data purchasing options from the USGS will be discontinued by February 2009, once the entire Landsat archive can be accessed at no charge.

Landsat scenes can be previewed and downloaded using the USGS Global Visualization Viewer at http://glovis.usgs.gov [under "Select Collection" choose Landsat archive: L7 SLC-off (2003-present)]. Scenes can also be selected using the USGS Earth Explorer tool at http://earthexplorer.usgs.gov [under "Select Your Dataset" choose Landsat Archive: L7 SLC-off (2003-present)]. For further information on Landsat satellites and products, see http://landsat.usgs.gov. (Source: USGS press release)

GOFC-GOLD, namely Dr. Thomas Loveland, has been pushing this initiative since long time. The free access is a very important development for the land cover community and contributes directly to the GEO work plan.

Contact: Thomas Loveland (USGS, loveland@usgs.gov)



Data	Available over the Internet
Landsat 7 – all new global acquisitions	July 2008
Landsat 7 – all data	September 2008
Landsat 5 – all TM data	December 2008
Landsat 4 – all TM data	January 2009
Landsat 1-5 – all MSS data	January 2009

Fig. 5: USGS Landsat Archive Release Schedule (source: USGS, modified)

PROGRESS AND PROSPECTS OF INTERNATIONAL LAND COVER ACTIVITIES AS PART OF GEOSS

CONTRIBUTIONS TO THE GEO 2007-2009 WORK PLAN

Background

Land cover is one of the most important properties for observing, describing and studying the environment with crucial importance for climate change science and mitigation; sustainable development; natural resource management; conserving biodiversity and understanding of ecosystems and biogeochemical cycling. Despite this fundamental importance of land cover information and other land surface characteristics, land observations are not yet operational. Numerous satellites acquire data suitable for land cover monitoring, but large-scale regional and global mapping and monitoring programs have not reached operational status for delivering internationally accepted land cover and, in particular, land cover change data to serve the many uses and applications. The field of land cover observations is heterogeneous in many ways, i.e. in terms of the land surface itself, the approaches to acquire land cover data, and the users of such information. There are a number of global land cover mapping activities, evolved with the availability of continuous global moderate resolution satellite observations since the early 1990s. Related projects and programs have generally remained in the research domain and just recently started to evolve into operational programs.

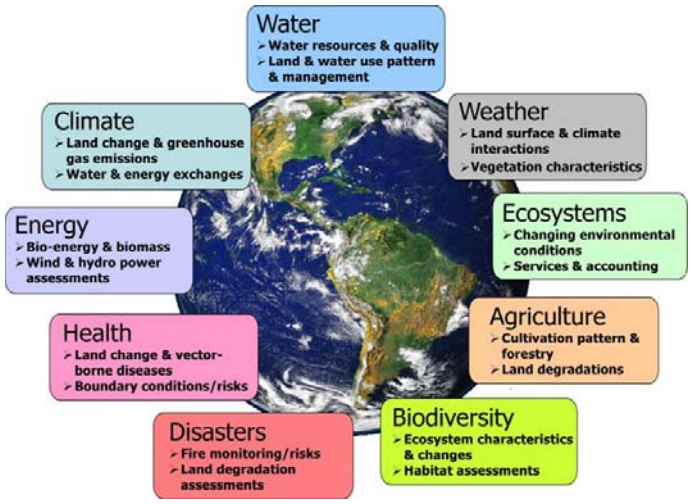


Fig. 6: In its 10-year reference document (www.earthobservations.org), GEO has highlighted the importance of land cover for all areas of societal benefits

Role for GEO

Building a sustained global land cover observing system requires international agreement and cooperation on:

(a) the continuity of global observations;

(b) the consistency in mapping and monitoring specifications and land cover assessment approaches; and

(c) sustained engagement and participation in mapping activities, regional networking and capacity building.

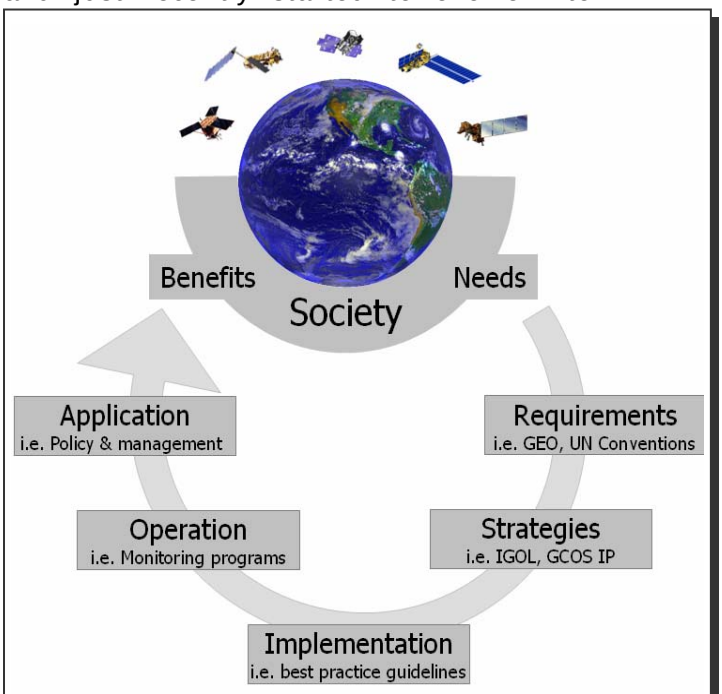


Fig. 7: Scheme for moving from societal needs to benefits through a series of steps from observations requirements, strategies, and implementation guidelines to monitoring operations and applications

Overall, the GEO contribution of the global land cover community is to ensure that technical capabilities are understood and adopted by high-level political processes. This involves an advocacy role for participating in an international coordination and cooperation mechanisms (led by GEO) specifying land observation strategies from existing user requirements, and putting them in operation. GEO activities and its secretariat have evolved considerably since its initiation in 2005. The first GEO 2006 work plan involved a large number of individual tasks. Early GEO activities focused on setting up appropriate instruments and committees, sorting of roles and responsibilities, and coordination of organizations leading or contributing to the GEO work plan. Given the large number of tasks and topics GEO aims to address, it

became obvious that GEO activities will have to become more focused and deliver distinct success stories.

GEO Work Plan 2007-2009

The 2007-2009 work plan was one important step to provide a consolidated plan for GEO implementation. As in the 2006 plan, a specific task in the GEO 2007-2009 work plan (DA-07-02) has been to advocate "global land cover". The overall goal of the task is to provide a suite of global land cover datasets, initially based on improved and validated moderate resolution land cover maps and eventually including land-cover change at high resolution. The task is lead by the US Geological Service (USGS) and the land cover team of Global Observations of Forest Cover and Land Dynamics and is under the auspices of the Architecture and Data committee (ADC). The detailed activities defined for this task are shown in Table 1. The main objective is to initiate regular analysis and reporting on land cover change and promulgate the use of the resulting mapping products and information, especially in developing countries.

Strategic progress

The Integrated Global Observation Strategy (IGOS) partnership was established in 1998 to provide a comprehensive framework to harmonize the common interests of the major space-based and in-situ systems for global earth observation. The new theme, **Integrated Global Observations of the Land** (IGOL), defines detailed observations requirements for different application areas such as agriculture, forestry, land degradation, ecosystem goods and services, biodiversity and conservation, human health, water resource management, disasters, energy, urbanization, and climate change. An IGOL report was prepared and approved by the IGOS Partnership. It is available online on the meetings website: http://www.ioc-goos.org/IGOS-P-14. The IGOL report represents

Table 1: Work items and descriptions of activities to be performed as part of GEO 2007-2009 work plan task DA-07-02 (source: Herold et al. 2008)

Work item	Details
1. Advocate existing **internationally-agreed approaches** to systematic land cover characterization (LCCS) and validation (CEOS protocols)	• Foster Land Cover Classification System (LCCS), its land cover classifier concept, evolvution, documentation and implementation activities (capacity building, translation) • Develop a formal mechanism for LCCS feedback and improvements such as a steering committee, and solicit input from a broad spectrum of users • Advocate the use of CEOS Validation protocol for global land cover maps • Specify validation protocols for high resolution land cover change and vegetation continuous fields (VCF)
2. Utilize and validate **moderate resolution** time series data and land cover data sets (i.e. GLOBCOVER, MODIS products) and earlier 1-km resolution maps (i.e. GLC2000, IGBP-DIS)	• Develop and maintain a reference database of sample sites for baseline global validation • Compile a "best available" multi-source land cover dataset as indicated by the validation dataset • Preserve and make available historic time series data
3. Formulate specifications and implement production of a global **high-resolution** land cover and land change data set and report	• Develop specifications and eventually complete a global high resolution land cover map at a minimum of every 5 years, beginning with mid decade (2005) and moving forward and backward in time as the archive of historical satellite imagery permits • Complete a global high resolution land cover change map, initially every five years and eventually on an annual basis
4. Set up **web-based access** to land cover data and associated input data	• Support GEO-NETCAST • Advocate existing data links to land cover information
5. Identify opportunities for applying land cover data in areas related to key **societal benefits**.	• Linking societal benefits, user needs with observation requirements (IGOL evolution) • Explore and communicate some early success stories, i.e. in the context of supporting the UNFCCC process of reducing emissions from deforestation and forest degradation (REDD)
6. Strengthen national level capacities to produce and use these products especially in **developing countries**	• GOFC-GOLD regional network activities, Global Land Cover Network, bilateral networks

the first comprehensive and integrated global observation strategy for the land domain. The IGOL requirements address a number of issues (land cover, land use, biodiversity, fire etc.).

Progress in implementation

On the level of moderate resolution observations, the ESA funded **GLOBCOVER** project will provide global land maps based on 2005/06 ENVISAT MERIS data and provide the highest resolution (300 m) consistent global land cover map (page 1). Global availability of basic observations data at coarse resolution is less of a challenge than for the fine scales.

NASA and the U.S. Geological Survey have been making progress acquiring fine-resolution imagery for the **Mid-decadal Global Land Survey** (http://mdgls.umd.edu/) that will provide a consistent, pre-processed, global, free-of charge Landsat data for circa 2005. This new dataset provides a major contribution of basic data support for global and regional land mapping activity at a time when nearly all user communities are asking for land change information at least every 5 years and many national programs already work with such data.

Several encouraging efforts are underway that improve the ability to monitor land cover at a global scale. The Indian Space Agency and the China-Brazil CBERS collaboration are committed to fine-scale earth observation missions in the coming years. The NASA-USGS partnership is working toward a mid-2011 launch of the **Landsat Data Continuity Mission** (LDCM, http://ldcm.nasa.gov/). It is also important to note that the continuity of Landsat-class earth observations is an important component of the recent U.S. Government decision to establish a National Land Imaging Program. Upcoming changes in global Landsat 7 pricing will also stimulated fine-scale global land cover assessments.

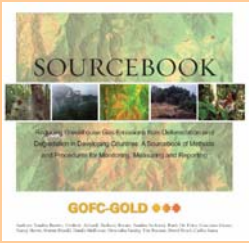
In addition, the GOFC/GOLD land cover team working with GEO has started to produce a **"best available" global land cover dataset** that could become the "GEO global land cover product". Starting with existing moderate resolution global land cover datasets, the aim is to validate and harmonize existing data from global, regional and national mapping efforts based on a robust and comparative accuracy assessment to derive the best land cover estimate for each location worldwide. The idea is to further develop this product including regional high-resolution products until a new high-resolution (change) product is being produced (the final goal of DA-07-02).

Conclusion & outlook

GEO provides the opportunity to specify how to best achieve sustained satellite-based land cover monitoring of global relevance and to stimulate countries to support its operational implementation. With consistency and continuity in observations, it is possible to engage user communities previously not, or less, involved in earth observation. Some activities, however, would need further GEO engagement, i.e. land use observations, the monitoring of human settlements and joint acquisition strategies for optical and Radar data (as advocated by IGOL). In addition, GEO should use its unique role to further strengthen the relationships between efforts of the global community and national level activities that, in perhaps 5 years time could lead to achieving the ultimate goal of task DA-07-02 on accomplishing a global land cover change assessment at Landsat-scale.

The article is a summary of the following paper: HEROLD, M., WOODCOCK, C.E., LOVELAND, T.R., TOWNSHEND, J., BRADY, M., STEENMANS, C. & C. C. SCHMULLIUS (2008): Land Cover Observations as part of a Global Earth Observation System of Systems (GEOSS): progress, activities, and prospects. IEEE Transactions on Remote Sensing (accepted).

GOFC-GOLD REDD SOURCEBOOK UPDATE



Info & Download: http://www.gofc-gold.uni-jena.de/redd/

The GOFC-GOLD Working Group on REDD will held a joint GOFC-GOLD/GTOS Side Event at the upcoming UNFCCC SBSTA in June, in Bonn (Germany) to inform about the status of the sourcebook that is currently in the review phase. New sections will include inventory methods, soil carbon, fire, emerging technologies and accuracy assessment.

28TH UNFCCC SBSTA IN BONN / GERMANY

GOFC-GOLD / GTOS Side Event on Thursday 5 June from 6-8 pm

Topics:

- Sourcebook background and progress (origins, content, review and update process)
- New sections and critical issues (fire, soil, accuracy assessment etc.)
- Sourcebook and the intergovernmental process (LULULCF background paper, need for further guidance)

ESTABLISHMENT OF AN AMAZON BASIN REGIONAL NETWORK

GOFC-GOLD PLANS A STRATEGIC WORKSHOP IN SEPTEMBER IN BRAZIL

GOFC-GOLD activities are largely implemented through Regional Networks and Implementation Teams. The RNs are voluntary groups of scientists within a specific geographic region, providing a forum for regional scientists, data providers and operational users to articulate their information requirements and improve data access and the use of observations. There are seven GOFC-GOLD RN in operation in several continents, including Africa (Miombo Network, OSFAC, SAFNet), the Boreal region (NERIN) and Asia (SEARRIN, East Asia). More recently, a Fire RN became operational in Latin America (RedLatif) and two RNs are being discussed, one in the Amazon Basin and another RN in West Africa.

The proposal for an Amazon Regional Network (RN) has emerged during the GOFC-GOLD Meeting 2006 in Jena (see GOFC-Newsletter 10). Since then, the GOFC-GOLD group discussed more in depth the RN proposal in Santa Cruz, Bolivia, in April 2007 and decided that a workshop with potential members of the RN from Amazonian countries is needed to evaluate whether there is support in the region to move this initiative forward.

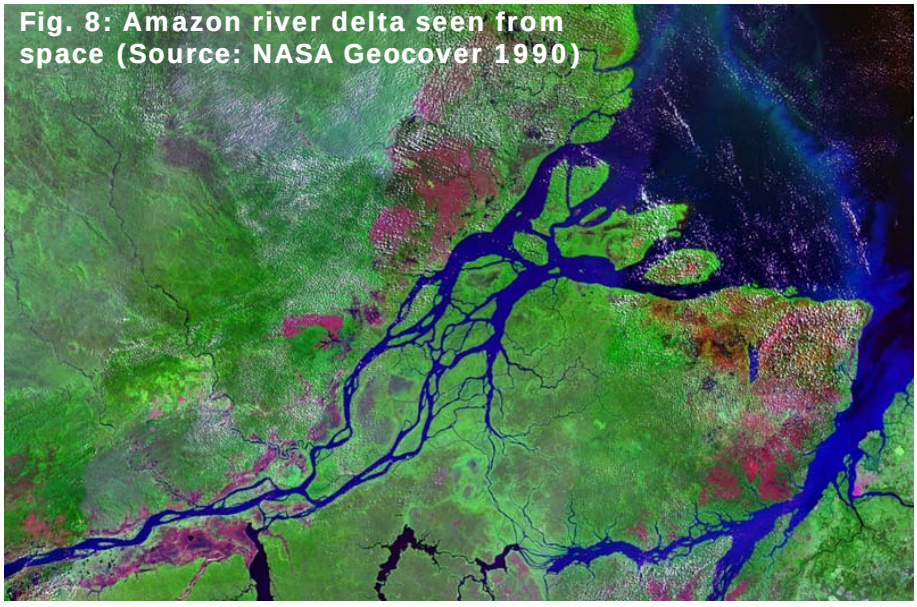


Fig. 8: Amazon river delta seen from space (Source: NASA Geocover 1990)

The goal of the proposed Amazon Basin RN is to facilitate access to data and information derived from Earth Observing Systems to support conservation and climate change policies and actions in the region.

The objective of the envisaged workshop is to assess whether a RN of Earth Observing Systems should be built for the Amazon Basin. Given the positive signal in preliminary surveys with individuals, institutions and potential donors to support the network activities, the launch of an Amazon Basin Regional Network seems promising.

The workshop is planned to be held from **15-18 September, in Belem, Brazil**. Expected outcomes are an Amazon Basin RN structure and administration strategy.

(Author: Carlos Souza)

For more information, please contact the workshop organizers: Michael Brady (GOFC-GOLD Project Office, Edmonton, MBrady@NRCan.gc.ca) and Carlos Souza (souzajr@imazon.org.br, new member of the LC-IT, see page 10).

Topics for discussion (preliminary):

1. Refine the Amazon Basin Regional Network **specific objectives**. Already defined needs**:**
   - Build capacity to map and monitor land cover dynamics in the region.
   - Transfer scientific and technological knowledge to extract information from Earth Observing Systems.
   - Compile, integrate and harmonize basin-wide land cover maps.
   - Define ground sites for validating regional and global Earth Observing Systems products.
   - Provide reliable information for national-based policies related to conservation and climate change policies.
2. Amazon Basin RN **principles**
3. Discuss preliminary **strategy** to implement the Amazon Basin RN based on GOFC-GOLD guidelines and experiences:
   - Coordination
   - Financial sustainability strategy
   - Communication strategy
   - Website development
   - Activities and products

3RD GOFC-GOLD LAND COVER SYMPOSIUM 2008

13-17 OCTOBER IN JENA, GERMANY

The Land Cover Implementation Team wishes to announce the 3rd GOFC-GOLD Land Cover Symposium to be held in October at University Jena, Germany. The Meeting is the continuation of the international meetings in 2004 and 2006. The objectives are to inform and present about the recent progress that was made in the various LC-IT activities (e.g. relating to the Group on Observation (GEO), UNFCCC, GCOS Implementation Plan, the development of IGOL, GLOBCOVER and FRA-2010) and to further discuss strategy and planning for the individual activities (see box). Reflecting these goals the one-week meeting will comprise a more general plenary session and several workshops focusing on specific topics, as illustrated in the table.

The workshops and symposia especially address the GOFC-GOLD Executive Committee, Land Cover Implementation Team members, GOFC-GOLD Regional Network representatives and the Science and Technical Board, but it is furthermore open to interested researchers and scientists in the field of land cover observation.

Tab. 2: Workshop Agenda

Monday 13 October	***Tuesday 14 October***	***Wednesday 15 October***	***Thursday 16 October***	***Friday 17 October***
Workshop on Monitoring Tropical Deforestation and Degradation (REDD)	GOFC-GOLD/CEOS Workshop on Land Cover Change Accuracy Assessment	Land Cover Symposium	Land Cover Symposium - Break out group discussions	LCCS and harmonization workshop
Workshop on Monitoring Boreal Forests	GOFC-GOLD Strategic Meeting - Review		Land Cover IT Meeting (internal)	Regional Network Meeting
			GOFC-GOLD Strategic Meeting - Conclusion	

The GOFC-GOLD Project Office in Edmonton, Canada and the LC-IT Project Office in Jena organize the meeting jointly. The following website: http://www.gofc-gold.uni-jena.de/sites/Jena08.php provides further information, including updates concerning the agenda and logistic information for participants.

If you have further questions or you wish to attend the symposium, please contact Martin Herold (m.h@uni-jena.de) or Michael Brady (MBradyd@NRCan.gc.ca).

Objectives of the Land Cover Symposium:

1. Present and assess GOFC-GOLD ***progress*** in various areas and activities,
2. Review the overall GOFC-GOLD ***strategy*** and defined future priorities and areas of activity including interactions with political and policy processes,
3. Engage the global community of forest and land cover monitoring experts to ***develop technical consensus*** in critical areas such as:
   - Reducing emissions from deforestation and degradation (REDD)
   - Boreal forest monitoring
   - Development of standards and reporting guidelines
   - Assessment and validation of forest and land cover change
   - Linking global and regional land mapping and monitoring initiatives
4. Formulate ***action plan*** for the land cover team and its partners

GOFC-GOLD LAND COVER IMPLEMENTATION TEAM WELCOMES NEW MEMBERS

Dr. Carlos Souza is working as senior researcher and executive secretary at the Institute for People and Environment of the Amazon (IMAZON). After graduation from Pennsylvania State University with a MSc in Soil Sciences with emphasis on remote sensing, he received a Ph.D. from University of California, Santa Barbara. His research focused on remote sensing techniques for extracting biophysical properties of degraded forests in the Amazon region. Since 2005 his is engaged in the GOFC-GOLD working group on tropical deforestation and one of the lead authors of the REDD sourcebook. Currently, Carlos Souza is developing an Amazon Remote Sensing Regional Network (Contact: souzajr@imazon.org.br).

Dr. Devendra Pandey is the General Director of the Forest Survey of India. He graduated with a M.Sc. in Statistics from Allahabad University (India) and received a Ph.D. in Forestry from the Swedish University of Agricultural sciences with specialisation in 'Forest Resources Assessment'. Dr. Pandey published national and international publications and monographs and has been a team leader and consultant in important forest related studies at the international level. He has contributed to the GOFC-GOLD REDD working group Contact: dpandeyifs@rediffmail.com).

UPCOMING LAND COVER EVENTS

EVENTS / CONFERENCES / WORKSHOPS

May

UN Convention on Biological Diversity COP 9
Venue: Bonn, Germany
Date: 19-30 May
Info: http://www.cbd.int/cop9/

ESA will be present with stand and organize the Side Event: “Space Supporting the Rio (UNCBD, UNCCD, UNFCCC), Worlds Heritage and Ramsar Conventions”, on 26 May, 13:15-14:45

June

NEESPI Science Team Meeting
Venue: Helsinki, Finland
Date: 2-4 June
Info: http://neespi.org/

GOFC-GOLD Executive Committee Meeting
Venue: Helsinki, Finland
Date: 5-6 June (proposed)
Info: http://www.fao.org/gtos/gofc-gold/index.html

UNFCCC Workshop on methodological issues relating to REDD
Venue: Tokyo, Japan
Date: 25-27 June 2008
Info: http://unfccc.int/

UNFCCC 28th Session of the Subsidiary Body for Scientific and Technical Advice
Venue: Bonn, Germany
Date: 2-13 June
Info: http://unfccc.int/

The GOFC-GOLD REDD Working group will held a joint GTOS/GOFC side event: "GOFC-GOLD sourcebook as technical guidance for REDD implementation: update and prospects", on 5 June, 18:00-20:00

July

XXI ISPRS Congress
Venue: Bejing, China
Date: 3-11 July
Info: http://www.isprs2008-beijing.org/

IEEE International Geoscience & Remote Sensing Symposium – IGARSS 2008
Venue: Boston, USA
Date: 6-11 July
Info: http://www.igarss08.org/

Land cover mapping at high-latitudes - Symposium and GOFC-GOLD workshop for NERIN
Venue: Syktyvkar, Russia
Date: 9-11 July
Further information: Dr. Olga Krankina (olga.krankina@oregonstate.edu), Dr. Vladimir V. Elsakov (elsakov@ib.komisc.ru)

Fire danger rating workshop & WMO Meeting
Venue: Edmonton, Canada
Date: 14-18 July
Contact: Michael Brady (MBrady@NRCan.gc.ca)

September

2nd MERIS/(A)ATSR User Workshop
Venue: ESA/ESRIN, Frascati, Italy
Date: 22-26 September
Info: http://earth.esa.int/meris_aatsr_2008/

Australian & SE Asia MODIS validation workshop at the 14th Australian Remote Sensing & Photogrammetry Conference
Venue: Darwin, Australia
Date: 29 September-3 October
Info: http://14arspc.com/

October

3rd GOFC-GOLD Land Cover Symposium
Venue: Jena, Germany
Date: to be confirmed
Info: http://www.gofc-gold.uni-jena.de
The symposium will include the GOFC-GOLD Executive Committee Meeting.

International Scientific Conference on Tropical Rainforests and Agroforests under Global Change
Venue: Bali, Indonesia
Date: 5-9 October
Info: http://www.globalchange-2008.org/

November & December

Southeast Asia Regional Research and Information Network (SEARRIN) – Land Cover Land Use Change Meeting
Venue: Thailand
Date: 17-21 November
Info: http://www.eoc.ukm.my/searrin/

Group on Earth Observation (GEO) 5th Plenary Meeting
Venue: Beijing, China
Date: to be defined
Info: http://www.earthobservations.org

UNFCCC COP 14
Venue: Poznan, Poland
Date: 1-12 December
Info: UNFCCC Calendar (http://unfccc.int/meetings/unfccc_calendar/items/2655.php?year=2008)

Newsletter archives of related projects

GLOBCOVER Newsletter: http://dup.esrin.esa.it/projects/summaryp68.aspT

GLCN Newsletter (Global Land Cover Network): http://www.glcn.org/news/

The ESA GOFC GOLD Land Cover Project Office Newsletter:

The Newsletter is distributed free of charge to all members listed in the ESA Land Cover Project Office database. To update your information, to subscribe or to be removed from our database, please contact us or visit the newsletter website:

http://www.gofc-gold.uni-jena.de/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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