GOFC-GOLD GLOBAL OBSERVATION OF FOREST AND LAND COVER DYNAMICS

Report of the 1st Meeting of the Science and Technical Board of Global Observation of Forest Cover

Ottawa, Canada

21 - 23 June 2000

Ahern, F.

GTOS

GOFC-GOLD Report No. 8

Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD) is a coordinated international effort to ensure a continuous program of space-based and in situ forest and other land cover observations to better understand global change, to support international assessments and environmental treaties and to contribute to natural resources management.

GOFC-GOLD encourages countries to increase their ability to measure and track forest and land cover dynamics by promoting and supporting participation on implementation teams and in regional networks. Through these forums, data users and providers share information to improve understanding of user requirements and product quality.

GOFC-GOLD is a Panel of the Global Terrestrial Observing System (GTOS), sponsored by FAO, UNESCO, WMO, ICSU and UNEP. The GOFC-GOLD Secretariat is hosted by Canada and supported by the Canadian Space Agency and Natural Resources Canada. Other contributing agencies include NASA, ESA, START and JRC. Further information can be obtained at
http://www.fao.org/gtos/gofc-gold

GLOBAL OBSERVATION OF FOREST COVER

SCIENCE AND TECHNICAL BOARD MEETING REPORT

June 21-23, 2000
Ottawa, Canada

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Executive Summary

The first meeting of the GOFC Scientific and Technical Board (STB) was held in Ottawa, Canada, June 21 – 23, 2000. Thirty-four participants attended, representing a mix of key space agencies, international organizations, and national governments.

The STB recognized the desirability of expanding the scope of GOFC to all land cover incrementally, while retaining an emphasis on forest cover. This will be done without compromising primary objectives, or the commitment to GOFC user communities.

A formal organization structure was adopted which will enable GOFC to work effectively. This structure includes an Executive Committee, which will meet monthly by telecon to support progress towards GOFC objectives and to ensure that the STB remains fully engaged between its annual meetings. GOFC has now become a panel of GTOS, through which it will maintain its linkages with CEOS and the IGOS-Partnership.

There has been tremendous international buy-in to GOFC since its inception, as reflected in the activities and commitments of the agencies represented at the meeting. There are still numerous obstacles to be overcome, however, in the production and utilization of global forest information products on a sustained long-term basis. The support provided by the CEOS Working Groups on Information Systems and Services (WGISS) and Calibration and Validation (WGCV) was recognized and will be essential to GOFC's implementation.

The STB received with appreciation the reports of the Fire and Land Cover Implementation Teams, and recognized the importance of identifying leadership for the Biophysical Processes Implementation Team. The members also expressed their appreciation for the work of the GOFC Project Office. The role and importance of the Regional Networks within GOFC was recognized, and the Board noted with interest recent and planned meetings in several regions.

This inaugural meeting marked the transition of GOFC from its start-up phase to implementation. The Board members endorsed the mission and objectives of GOFC, and expressed their desire to be active participants in its implementation.

Report of the 1st Meeting of the Science and Technical Board of Global Observations of Forest Cover

Ottawa, Ontario, Canada

21st - 23rd June 2000

Item 1 Opening Remarks

The meeting was opened by Dr. Florian Guertin of the Canada Centre for Remote Sensing (CCRS), who welcomed the attendees on behalf of CCRS and the Canadian Space Agency (CSA). The meeting was then chaired throughout by Dr. Alan Belward (Vice-Chair, STB) who acted in the stead of Dr. John Townshend (Chair, STB) who was indisposed.

Item 2 Introductions

A list of the meeting participants is given in Annex 1.

Item 3 Agreement on agenda

The draft agenda was agreed to in principle. Subsequently, modifications were made to this agenda and the final version is given in Annex 2.

Item 4 Work and goals of GOFC

4.1 Review of current objectives/products/activities

Frank Ahern (Executive Director, GOFC Project Office) presented an overview of GOFC's history and progress to date and showed a timeline of planned earth observation satellite missions (a copy of this presentation can be found at http://www.gofc.org/gofc/stb2000/ahern_(4.1)/index.html). He stressed the need for more cross-linkages with different agencies and programs, as well as the need for GOFC to focus on information products, rather than just data. He pointed out the need for understanding the dynamics of the earth's vegetation, providing this knowledge to policy makers and resource managers, and communicating to the public. Noting that the Board included excellent representation from space agencies, international users, and national representatives, he posed a number of challenges for this meeting, specifically:

- establishing effective governance for GOFC;
- providing support for the Implementation Teams;
- responding to the IGOS-P carbon cycle theme;
- deciding on the possible expansion of GOFC's role from forests to all land cover;
- articulating incentives for participation in GOFC; and,
- acquiring resources for future activities.

4.2 Recommended revisions

Members of the Board agreed that GOFC should increase its scope to include all land cover, and that this was implicit in its original design. However, they stressed that the initial focus must be on forests.

4.3 Comments by Board members

There was debate over the need to concentrate on carbon issues; although it was recognized that these issues are of great importance, it was also stressed that there are many other issues which are equally important to the forest community. The Board felt that it was important to begin demonstrating tangible progress on a limited range of activities, especially those for which considerable planning has already taken place, before undertaking new initiatives. It was pointed out that by satisfying the information needs for carbon accounting, many other requirements would also be met. It was finally agreed that GOFC would expand its sphere of interests, but in an incremental fashion. It was also decided not to modify the name of GOFC, in part because of the considerable commitment of identified user groups associated with forests.

Validation of GOFC products was recognized to be important, but in many cases initial release of the products will precede full validation. The importance of focussing on long-term systematic observations, rather than research and development projects with a limited time frame, was emphasized.

Item 5. Proposed organizational structure

Frank Ahern presented a draft document which described a proposed organizational structure for GOFC, including identification of components, linkages between the components, and linkages with external organizations. (A presentation on this topic can be found at http://www.gofc.org/gofc/stb2000/townshend-ahern_(5.0)/index.html). Members of the Board made a number of comments on the draft, principally:

- the role of regional networks was insufficiently explained;
- it appeared that GOFC's programme was being determined to an undue extent by GTOS (based on the specific wording);
- mechanisms for funding from the sponsors and user communities needed further clarification;
- the relationship between GOFC and CEOS was unclear (it was pointed out that GOFC, like the other original IGOS projects, now had no direct formal linkage with CEOS; and,
- the relationship with IGBP was also unclear.

In response to these issues, the following conclusions were reached:

- the organization plan should better define the role of the GOFC components, including the Regional Networks, as well as the inter-relationships between them;
- the STB should define the overall strategy and goals of GOFC, in consultation with GTOS;
- initially, some funding will come from research bodies but eventually this will become the responsibility of operational agencies; other sources of funds will need to be found initially to ensure the success of GOFC;

- GOFC will continue to have a formal relationship with CEOS through GTOS, which is an affiliate member of CEOS and a member of the IGOS-Partnership together with CEOS. GOFC is expected to continue to work with the CEOS Working Groups; and,
- in terms of IGBP relationships, it was agreed that this should be better established as should the relationship between GTOS and IGBP. Relationships with other organizations will continue to evolve where these are deemed beneficial to GOFC.

Item 6 Agency Presentations

Individual Board members presented reviews on the various roles their respective agencies were playing, or planned to play, within GOFC. These reviews included current and planned observational programs, anticipated production and use of GOFC products, and planned or potential contributions to GOFC. The agencies represented included CEOS members (EC, NASA, NASDA, ESA, CNES, FAO, CCRS/CSA, GTOS, IGBP, UNEP), non-CEOS agencies (NGOs, IUFRO, ITC/FLAME) and several national agencies (Russia, Zimbabwe, India, Argentina, Brazil, Canada). Copies of these presentations can be found at http://www.gofc.org/gofc/stb2000/stb2000a.html.

In addition, members of the STB identified the potential participation of other agencies and countries in GOFC-related activities, including:

- China through GLC2000;
- USGS through GLC2000 and other activities;
- NOAA through the application of its AVHRR data for many activities as well as its other satellite and in situ data sets; and,
- Eumetsat through the provision of geostationary satellite data for purposes such as fire monitoring.

Item 7 GOFC Status

Frank Ahern presented a preliminary table showing the status of GOFC observations and products, based on the user requirements identified within the GOFC planning documents as well as the programs currently being carried out (or firmly funded) by the observational agencies (see Annex 3). The STB recognized the value of such a table as a communication tool to highlight the current status of GOFC's implementation, but felt that it needed to be expanded. It was suggested that the table should show whether products were actually being used (perhaps identifying the principal constraints on users, such as product costs or lack of staff resources), and indicate whether the products could be considered fully operational (including the extent to which they met user needs in terms of frequency, scale, accuracy, etc...). It was agreed that the scope and layout of the table may need to be re-examined periodically.

Item 8 Data and information systems and services

8.1 Development and prototyping – WGISS Test facility (WTF).

A presentation was made by Yonsook Enloe, on behalf of the CEOS Working Group on Information Systems and Services (WGISS), about the WGISS Test Facility which is being developed in cooperation with GOFC scientists (a copy of this presentation can be found at http://www.gofc.org/gofc/stb2000/fisher-enloe_(8.1)/index.html). The STB

warmly welcomed this initiative and look forward to continuing collaboration between WGISS and GOFC. Alan Belward stressed again that the formal context for this relationship was to be found in the relationship between GOFC and GTOS and between GTOS and CEOS. It was agreed that the Implementation Team leaders should be the points of contact with the WGISS team.

8.2 GOFC Data Site

Frank Ahern made a presentation on a prototype Web site developed at CCRS to highlight data sets of relevance to GOFC (a copy of this presentation can be found at http://www.gofc.org/gofc/stb2000/ahern_(8.2)/index.html). The Board expressed their appreciation for this effort, but agreed that further development of this site should not be a priority. Rather, it was felt that emphasis should be given to collaborative work with the WGISS Test Facility.

8.3 DISS Issues

The STB stated that there should not be a separate Implementation Team for dealing with DISS issues, but rather these should included as part of the existing Implementation Teams' roles. GOFC's DISS should be distributed and the emphasis should be on the development of tools.

Item 9 Product Validation

Alan Belward introduced the role of the CEOS Working Group on Calibration and Validation (WGCV) and reported on a new subgroup being formed to address the validation of land products (a copy of this presentation can be found at http://www.gofc.org/gofc/stb2000/belward_(9.0)/index.html). This subgroup held its inaugural meeting in May 2000 and has agreed to concentrate their initial activities on the validation of coarse resolution GOFC products. The Board expressed its gratitude and support for this endeavour, which it considered essential. The need to work closely with the GTOS NPP project was also noted.

Item 10 Report of Fire Implementation Team

Alan Belward presented the report of the Fire Implementation Team, on behalf of the team leader, Chris Justice, who was unable to attend the meeting (a copy of this presentation can be found at http://www.gofc.org/gofc/stb2000/belward_(10.1)/index.html). Minutes from the GOFC Fire workshop held in November 1999 were also distributed. The presentation identified general requirements and principles as well as specific activities that are ongoing or proposed for the GOFC-Fire component. A request was made to the Board for help in identifying and securing resources needed for implementation, including continued provision of data and products and the participation of user agencies in developing and utilizing fire products. The Board noted the accomplishments that had already been realized and expressed its thanks to the team leader.

Item 11 Report of Land Cover Characteristics and Changes Implementation Team

David Skole gave a presentation on the Forest Cover Implementation Team, prepared in collaboration with his team co-leader, Iwan Gunawan (a copy of this presentation can be

found at http://www.gofc.org/gofc/stb2000/skole-gunawan_(11.1)/index.html). The presentation described the conceptual approach which is visualized for this theme, along with examples of relevant information products. The importance of regional networks and data access issues were emphasized. The Board's assistance was requested in developing partnerships and coordinating activities between participants, as well as securing resources for future projects. There was a good discussion of various related issues and the Board thanked the two co-leaders for their efforts to date.

Item 12 Discussion concerning the Forest Biophysical Processes component

12.1 Objectives and planned activities

Frank Ahern gave a presentation on the status of the Forest Biophysical Processes component, which is the least developed of the three GOFC themes (a copy of this presentation can be found at http://www.gofc.org/gofc/stb2000/ahern_(12.1)/index.html). He identified a number of challenges and proposed a strategy for advancing this component, beginning by identifying Implementation Team leaders and working with existing international teams.

12.2 Other related programs

Dr. Josef Cihlar gave a presentation on the Terrestrial Carbon Observation (TCO) Initiative, which was conceived by the IGOS-Partnership (a copy of this presentation can be found at http://www.gofc.org/gofc/stb2000/cihlar_(12.2)/index.html). He identified similarities and differences between GOFC and TCO, and suggested ways in which the two programs might work together

12.3 Discussion

The Board members agreed on the need to identify Implementation Team leaders, and asked the Chair and Vice-Chair to take on this task. It was also suggested that a better definition of products for this component may be needed.

Item 13 Review GOFC Project Office plans

Tim Perrott gave a presentation on the roles and responsibilities of the GOFC Project Office (a copy of this presentation can be found at http://www.gofc.org/gofc/stb2000/perrott_(13.0)/index.html). The Board expressed its thanks to CCRS for hosting and staffing this facility, and to CSA for providing financial support.

Item 14 Scientific presentation

Wenjun Chen, a research scientist at CCRS, gave a presentation entitled "An Integrated Analysis of Canada's National Forest Carbon Budget" (a copy of this presentation can be found at http://www.gofc.org/gofc/stb2000/chen_(14.0)/index.html). The Board thanked Dr. Chen for his interesting and informative presentation.

Item 15 Reports on recent/planned GOFC meetings

15.1 Tropical network organizing meeting

Frank Ahern gave a presentation on this meeting which was held in Washington DC in March 1999, and which led to the development of regional networks within GOFC (a copy of this presentation can be found at http://www.gofc.org/gofc/stb2000/ahern_(15.1)/index.html).

15.2 SE Asian network

Iwan Gunawan gave a presentation on the initial meeting of the SE Asian GOFC network, held in Bogor, Indonesia from January 31 – February 2, 2000 (a copy of this presentation can be found at http://www.gofc.org/gofc/stb2000/gunawan_(15.2)/index.html). A follow-on meeting is planned for November 2000 in Bangkok, Thailand.

15.3 Central Africa network

Tim Perrott gave a presentation on a workshop held in Libreville, Gabon in February 2000 (a copy of this presentation can be found at http://www.gofc.org/gofc/stb2000/perrott_(15.3)/index.html).

15.4 Miombo network

Tim Perrott described the objectives of a meeting planned for July 2000 in Maputo, Mozambique, to establish a GOFC regional network in Southern Africa.

15.5 Boreal workshop

Tim Perrott described the objectives of a workshop planned for August/September 2000 in Novosibirsk, Russia, to address GOFC-related issues in boreal forests.

Item 16 Revised STB Terms of Reference

[Note: at this point, it was agreed to divert from the initial agenda and to concentrate discussions on high priority items which needed to be resolved before the end of the meeting. A revised agenda for the final day was subsequently distributed and approved.]

The Board agreed on some specific changes to the draft STB Terms of Reference. There was agreement on the substance of the final portion of the text, with instructions given to the GOFC Executive Committee to develop suitable wording. The document as agreed upon is presented in Annex 4.

Item 17 Organizational Structure

There was further discussion regarding the draft Organization Plan. The Board agreed that Regional Networks should be included in this document, although the networks themselves should be self-organizing and self-governing, and should therefore develop their own terms of reference. The Board requested the Executive Committee to draft appropriate wording to reflect this, and to show a reporting relationship from the networks to the STB. The Executive Committee was also asked to develop guidelines for STB membership and to submit these guidelines to GTOS for review, along with a proposal of how GOFC should fit within the existing GTOS structure. The Board felt that it was unnecessary to identify the Implementation Team leaders as 'non-voting' members, since it is not expected that any issues will be resolved on a voting basis. Finally, the Board agreed that the NASA Liaison Officer to the GOFC Project Office should be a member of the Executive Committee. The Organization Plan as agreed upon is presented in Annex 5.

Item 18 Support for Implementation

The Board discussed in general terms ways in which it could support GOFC's implementation. One aspect would involve isolating the Implementation Teams from political issues, which are often an obstacle in international projects. It was suggested that the Board focus on problems identified in the Status Table (Annex 3) and work to find solutions for these. The Board could play an advocacy role where necessary, for example, to lobby for the long-term continuity of satellite and in-situ programs. In turn, the Board should document benefits for information providers participating in GOFC; for example, having access to GOFC's regional networks should result in better products, which would then be more widely used. It was suggested that the Board might want to develop an overall Strategic Plan, although no decision was made on this suggestion.

Item 19 Criteria for inclusion of activities

The Board recognized the necessity of establishing criteria for projects to be included within GOFC (for example, validation and metadata standards). The Executive Committee was requested to develop appropriate 'high level' project criteria. It was felt that GOFC should actively invite participation from interested parties, and that the Executive Committee should seek out contributions from potential contributors. Tony Janetos suggested that an article in a magazine such as Science or Nature would help to raise awareness of GOFC, and offered to put together an initial draft, although the entire Board should eventually be identified as co-authors. It was agreed that offers of products or projects to GOFC should be directed to the Chair of the STB, who would in turn forward them to the Implementation Team leaders.

Item 20 Points of consensus

The following points of consensus were unanimously agreed upon:

1. STB endorses the current mission and objectives of GOFC and recognizes the progress which has been made to date in the development of the GOFC Strategic Design, the engagement of user communities, and the initial implementation of GOFC.
2. STB members wish to be active participants in the continued implementation of GOFC, and recognize this inaugural meeting as marking the transition from the start up phase to implementation.
3. The STB recognizes the desirability of expanding the scope of GOFC to all land cover incrementally, while retaining an emphasis on vegetation cover in general and forest cover in particular. It is the intention of STB to administer the transition of GOFC to embrace the expanded mandate. This will be done without compromising primary objectives, or commitments to our user communities. The implementation of the expanded mandate may involve additional implementation teams, for example to deal with agricultural lands. It is also the intention to make use of the existing regional networks by asking them to expand their scope, where appropriate.
4. STB members confirm the function and membership of the Executive Committee.
5. STB members accept the draft organizational plan for GOFC and Terms of Reference for the STB, subject to the enhancements requested by the STB for action by the Executive Committee.

6. The regional networks perform an essential cross-cutting role in the implementation of the existing three GOFC components, as well as in additional components to be developed in the future. They provide important visibility and credibility to the organizations which participate in them. The STB supports the existing networks and encourages the development of additional networks.
7. GOFC will provide the implementation of the [bottom up/better wording to be sought] component of the TCO.
8. The contribution of WGISS, particularly the WGISS test facility, can provide important support for GOFC implementation. This contribution is gratefully acknowledged, and should continue.
9. The Implementation Team leaders will provide the scientific points of contact with the WGISS test facility, and work with their WGISS counterparts to develop information systems and services appropriate to GOFC needs.
10. The contributions of WGCV, particularly the Land Products Validation subgroup, can provide important support for GOFC implementation. This contribution is gratefully acknowledged, and should continue.
11. The Chair of STB should participate in IGOS-P meetings.

Item 21 Action items

21.1 Actions for the Executive Committee:

1. The role of the regional networks must be explicitly developed as part of the GOFC organization document.
2. Develop Terms of Reference for STB membership, and submit to GTOS.
3. Establish lines of communication with IGBP.
4. Formalize the GOFC relationship in the GTOS organizational structure based on the initial draft suggested by Jim Gosz.
5. Develop reporting requirements for the STB Members, the Implementation Teams, and the Regional Networks which will result in efficient STB meetings in the future.
6. Ask GTOS to comment on the GOFC Strategic Design.
7. Develop high level criteria for the inclusion of projects.

21.2 Action for the Chair and Vice Chair of the Executive Committee

Seek potential leaders for the Biophysical Processes Implementation Team.

21.3 Actions for the GOFC Project Office:

1. Develop and refine the draft Status Table in consultation with the Implementation Team leaders.
2. Minutes from Executive Committee meetings are to be circulated to all STB members.

Item 22 Date and location of next meeting

On behalf of ESA, Stephen Briggs graciously offered to host the next meeting of the Board at the Agency's ESRIN facility in Frascati, Italy. The Board accepted this offer with thanks and scheduled the next meeting for June 2001 (exact dates to be determined later).

Item 23 Adjournment

On behalf of the STB, Alan Belward expressed thanks to CCRS and CSA for hosting the meeting, and thanked the CCRS support staff for their hard work in making the meeting a success. A presentation was made to Frank Ahern in view of his forthcoming retirement and a unanimously carried vote of thanks was made.

Annex 1 – List of Participants

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Annex 2 – Final Agenda for GOFC STB Meeting

June 21, 2000

08:30

1. Opening remarks

2. Introductions

3. Agreement on agenda

4. Work and goals of GOFC
   - 4.1. Review of current objectives/products/activities
   - 4.2. Recommended revisions
   - 4.3. Comments by Board members

5. Proposed organizational structure
   - 5.1. Identification of components
   - 5.2. Linkages between GOFC components
   - 5.3. Linkages with external organizations
   - 5.4. Finalize GOFC Organizational Plan and STB Terms of Reference

12:00 – 13:00 Lunch

6. Review current/planned observational programs (both satellite and in-situ), anticipated production and/or use of GOFC products, and planned or potential contributions to GOFC (round table; each participant has approximately 10 minutes, so contributions should be identified in point form only; details are not necessary)
   - 6.1. CEOS members and associates
     - 6.1.1. EC
     - 6.1.2. NASA
     - 6.1.3. NASDA
     - 6.1.4. ESA
     - 6.1.5. CNES
     - 6.1.6. FAO
     - 6.1.7. GTOS
     - 6.1.8. IGBP
     - 6.1.9. UNEP
     - 6.1.10. CCRS/CSA
   - 6.2. Non-CEOS agencies
     - 6.2.1. NGOs
     - 6.2.2. IUFRO
     - 6.2.3. ITC/FLAME

6.3. National Agencies
6.3.1. Russia
6.3.2. Zimbabwe
6.3.3. India
6.3.4. Argentina
6.3.5. Brazil
6.3.6. Canada
6.4. Contributions from other agencies

7. GOFC Status: identifying gaps and overlaps

17:00 Adjourn

June 22, 2000

8:30
8. Data and information systems and services (GOFC DISS)
8.1. Development and prototyping - WGISS Test Facility
8.2. Prototype GOFC Data Site
8.3. Coordinating DISS issues with Implementation Team activities (discussion)

9. Product Validation, WGCV Land Product Validation Subgroup

10. Report of Fire Implementation Team
10.1. Report on objectives and activities
10.2. Future activities
10.3. Discussion by board

11. Report of Land Cover Characteristics and Changes Implementation Team
11.1. Report on objectives and activities
11.2. Future activities
11.3. Discussion by board

12. Discussion concerning Forest Biophysical Processes component
12.1. Objectives and planned activities from strategic design
12.2. Other related programs
12.3. Discussion by board

13. Review Project Office plans

12:00 – 13:30 Lunch

14. The Carbon Budget of Canada: presentation of a new observation-based process model, Wenjun Chen, Canada Centre for Remote Sensing

15. Reports on recent/planned GOFC meetings

15.1. Tropical network organizing meeting
15.2. SE Asian network
15.3. Central Africa network
15.4. Miombo network
15.5. Boreal workshop

June 23, 2000

16. Review revised STB Terms of Reference

17. Organizational Structure

18. Support for Implementation

19. Criteria for inclusion of activities

20. Points of consensus

21. Action items

22. Date and location of next meeting

23. Adjournment

Annex 3 – GOFC Status Table (Preliminary)

Note: This table has been partially completed to illustrate the concept and stimulate discussion.
The actual entries should come from the Implementation Teams

											Data Services						
Product type Product	Confirmed Users?[1]	User require-ments[2]	Satellite data[3]	In-situ cal/val data[3]	Algorithm develop-ment[4]	Algorithm validation[5]	Regional demon-stration[6]	Global demon-stration[6]	Pre-produc-tion testing[6]	Operation[7]	Local or distributed data assembly[4]	Production machinery[4]	Product warehouse[4]	Product discovery[4]	Product validation[4]	Product distribu-tion[4]	User feedback mechan-ism[4]
Fire Products																	
Active fires	Y	D	R		R	R	U	P	U	N?	R	R	R	R	R	R	N
Burn scars	Y	D	$DC	$DC	R	R	U	P	P	N	P	P	P	R	P	P	N
Emissions	Y	P	$DC	$	P	N	P	N	N	N	N	N	N	N	N	N	N
Coarse res'n Land cover																	
Non-forest classes	Y	D	DC	$	R	G	U	P	?	N							
Leaf type	Y	D	DC	$	R	G	U	?	?	N							
Leaf longevity	Y	D	DC	$	R	G	U	?	?	N							
Canopy cover	Y	D	DC	$	R	G	U	?	?	N							
Canopy height	Y	D	DC	$	R	G	P	?	?	N							
Flooded forest	Y	P	DC	$	R	R	U	?	?	N							

[1] Y = Yes, N = No
[2] N = none; P = Preliminary; D= Detailed
[3] R= readily available; $ = cost limitations; D = distribution limitations; C =continuity issues
[4] N = none; P = Preliminary; R = being refined for GOFC; O = Operational
[5] N = none; L = local; R = Regional; G = Global
[6] N = None; P = Planned; U = Underway; C = Completed
[7] N = None; P = Planned; U = Underway

											Data Services						
Product type Product	Confirmed Users?[1]	User require-ments[2]	Satellite data[3]	In-situ cal/val data[3]	Algorithm develop-ment[4]	Algorithm validation[5]	Regional demon-stration[6]	Global demon-stration[6]	Pre-produc-tion testing[6]	Operation[7]	Local or distributed data assembly[4]	Production machinery[4]	Product warehouse[4]	Product discovery[4]	Product validation[4]	Product distribu-tion[4]	User feedback mechan-ism[4]
Fine res'n Land cover																	
Non-forest classes	Y	D	$DC	$	R	R	?	?	?	N							
Leaf type	Y	D	$DC	$	R	R	?	?	?	N							
Leaf longevity	Y	D	$DC	$	R	R	?	?	?	N							
Canopy cover	Y	D	$DC	$D	R	R	?	?	?	N							
Canopy height	Y	D	$DC	$D	R	R	?	?	?	N							
Flooded forest	Y	P	$DC	$	R	R	?	?	?	N							
Land cover change																	
Forest to nonforest	Y	D	$DC	$D	R	R	?	?	?	N							
Nonforest to forest	Y	P	$DC	$D	R	R	?	?	?	N							
No change	Y	D	$DC	$D	R	R	?	?	?	N							

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											Data Services						
Product type Product	**Confirmed Users?[1]**	**User require-ments[2]**	**Satellite data[3]**	**In-situ cal/val data[3]**	**Algorithm develop-ment[4]**	**Algorithm validation[5]**	**Regional demon-stration[6]**	**Global demon-stration[6]**	**Pre-produc-tion testing[6]**	**Operation[7]**	**Local or distributed data assembly[4]**	**Production machinery[4]**	**Product warehouse[4]**	**Product discovery[4]**	**Product validation[4]**	**Product distribu-tion[4]**	**User feedback mechan-ism[4]**
Biophysical Products																	
LAI	Y	D	DC	$	R	R	P	P	N	N	P?	P?	P?	P?	P?	P?	P?
PAR	Y	D	DC	$	R	R	P	P	N	N	P?	P?	P?	P?	P?	P?	P?
FPAR	Y	D	DC	$	R	R	P	P	N	N	P?	P?	P?	P?	P?	P?	P?
Biomass	Y	D	DC	$D	P	N	?	?	N	N	N	N	N	N	N	N	N
NPP	Y	D	DC	$	P	R	P	P	N	N	P?	P?	P?	P?	P?	P?	P?

[1] Y = Yes, N = No
[2] N = none; P = Preliminary; D= Detailed
[3] R= readily available; $ = cost limitations; D = distribution limitations; C =continuity issues
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Annex 4 – Science and Technical Board Terms of Reference

(As accepted by GOFC Scientific and Technical Board, June 23, 2000)

Through close dialog with GTOS, the STB will ensure continuing progress toward the long-term objective of providing on-going space-based and in-situ observations of forests and other vegetation cover for sustainable management of terrestrial resources, and to obtain an accurate, reliable, quantitative understanding of the terrestrial carbon budget.

To accomplish this objective, the STB will:

- Review and recommend revisions to the GOFC Strategic Design.
- Review and assess the development and implementation of the components of GOFC. Recommend revisions and pursue solutions when necessary.
- Provide the international coordination necessary for the implementation of GOFC in coordination with other IGOS-Partners' activities, to build partnerships to achieve common objectives.
- Ensure effective use of existing international mechanisms, including CEOS/WGISS, CEOS/WGCV, and GT-NET.
- Report annually via GTOS to IGOS-P, and receive feedback from IGOS-P via GTOS. By means of reports from the Implementation Teams and Regional Networks, and other sources, articulate and advocate observational requirements for space agencies and in-situ agencies, with particular emphasis on long lead-time requirements, and identify gaps and overlaps in current plans. [ensure the reporting is wider than technical e.g. need for capacity building. Text to be completed by GOFC Executive Committee]

Annex 5 – GOFC Organization Plan

(As accepted by GOFC Scientific and Technical Board, June 23, 2000; items for Executive Committee consideration are shown in square brackets)

Preamble

Global Observation of Forest Cover represents a coordinated international effort working toward the common goal of developing and implementing a suite of securely-funded, on-going observational programs which will provide timely and consistent information about forests worldwide, using an appropriate combination of spaceborne and near-earth data.

GOFC Elements

The organizational structure created to implement a program of Global Observation of Forest Cover (GOFC) consists of five elements: a Scientific and Technical Board (STB), a Project Office, an Executive Committee, Implementation Teams, and Regional Networks (see Figure 1).

Throughout this document the term "GOFC" used on its own means the ensemble of all five elements.

Scientific and Technical Board

Function

In accordance with guidance from GTOS, the STB will ensure continuing progress toward the long-term objective of providing on-going space-based and in-situ observations of forests and other vegetation cover for sustainable management of terrestrial resources, and to obtain an accurate, reliable, quantitative understanding of the terrestrial carbon budget.

The actual implementation and execution of GOFC activities will be carried out by Implementation Teams. The STB will work to form partnerships which lead to the initiation of project activities which will be managed by Implementation Teams [in cooperation with the Regional Networks]. Each Implementation Team will report to the STB through a team leader, or two co-leaders, who will serve as a non-voting member of the STB. The STB will work with the Implementation Teams, Project Office, and sponsoring organizations to arrange sponsorship of workshops and projects which advance GOFC objectives.

The STB will also take steps necessary to ensure the availability of workshop reports, project results and outputs.

The STB, with input from the Project Office, will prepare an annual report.

Membership [details to be refined by Executive Committee]

Membership will be comprised of voting and non-voting members. Voting members are to be selected from user agencies and technical agencies contributing substantially to GOFC. Non voting members shall include the Executive Director of the GOFC Project Office and leaders of the implementation teams (as needed). Members shall be selected with the advice of GTOS from nominees provided by user agencies and technical agencies.

Meetings

Meetings shall be held annually at a date and location chosen by the membership.

Reporting and Communication

The STB receives overall guidance from the Global Terrestrial Observing System (GTOS), as well as advice concerning funding and other issues which may affect GOFC plans.

With input from the Project Office [and ITs and RNs], the STB shall provide an annual report to the Global Terrestrial Observing System, highlighting progress, problems, and plans, and a financial report for the year in review. The annual report should also include a plan of activities for the forthcoming year, the budget necessary to carry out the proposed activities, and suggested sources of funding.

The STB communicates with the GTOS/GCOS Terrestrial Observation Panel for Climate to ensure that GOFC is responsive to the observational requirements for products necessary to understand the terrestrial carbon cycle.

The STB communicates with the IGOS Partnership to ensure that GOFC is responsive to the needs of CEOS members and other IGOS Partners. This communications channel provides input from GOFC to CEOS members to enable them to modify their programs to become more efficient in responding to the observational needs identified by GOFC.

The STB communicates with each Implementation Team through the team leader, who serves as a non-voting member of STB.

[need to add pp about communication with RNs]

Conflict of Interest Guidelines

In order to avoid actual or apparent conflicts of interest, the U.S. National Research Council Policy on Disclosure of Personal Involvements and other Matters Potentially Affecting Committee Service will be followed.

Project Office

Function

The primary function of the GOFC Project Office is to ensure effective record-keeping, and communication between all GOFC elements, and between GOFC and its external audience.
Communication will be carried out using electronic means such as electronic mail, the GOFC Website, a GOFC DataSite, as well as by traditional printed media when appropriate.

The Project Office will provide planning support for meetings, and will be responsible for public outreach.

Reporting and Communication

The Project Office reports to the STB. The Project Office will provide the initial draft Annual Report to STB, and incorporate modifications and revisions required by STB.

The Project Office will communicate regularly with the Chair of STB and with the leaders of the Implementation Teams [and RNs] to ensure orderly execution of GOFC activities.

Location and funding for the Project Office

The GOFC Project Office is initially located at the Canada Centre for Remote Sensing in Ottawa, Canada. A full-time Executive Director, plus professional and technical support staff are provided by CCRS and the Canadian Space Agency. The US National Aeronautics and Space Administration supports the GOFC Project Office with technical and program advice, and provides a project office liaison officer.

Executive Committee

Membership

The GOFC Executive Committee will be composed of the Chair and Vice-Chair of the Scientific and Technical Board, each of the Implementation Team Leaders, and the Executive Director and NASA Liaison Officer of the GOFC Project Office.

Function

The primary purpose of the Executive Committee is to ensure effective communication among all of the GOFC Elements and Components. A secondary purpose is to provide a streamlined capability to for decision-making between annual meetings of the STB.

Reporting

The Executive Committee reports to the STB and derives its authority from the STB.

Meetings

The Executive Committee will meet monthly, normally by pre-arranged telecon. In consultation with the Executive Committee membership, the GOFC Project Office will draft and circulate an agenda for each meeting, and draft and circulate a record of each meeting.

Implementation Teams

Function

The primary function of each implementation team is to plan, conduct, and supervise activities and actions which produce demonstrable progress toward the overarching GOFC goal of implementing a suite of securely-funded, on-going programs which will provide timely and consistent information about forests worldwide. The activities to be carried out by a particular Implementation Team will consist of one or more projects, each of which will have clearly-defined objectives, resources, schedule, and output.

Membership

The members of each Implementation Team, and the suite of projects which constitute an Implementation Activity, will be provided by the agencies which have agreed to contribute resources toward the accomplishment of the goals. The Implementation Team leader(s) will be chosen by the STB.

Reporting and Communication

Each Implementation Team will provide a three-year plan, following a format to be defined by STB. The three-year plan will indicate how it will produce demonstrable progress leading toward on-going observations in one or more of the principal GOFC component areas (Fire, Land Cover Characteristics and Changes, and Biophysical Processes). It will include a suite of projects necessary to implement the plan, the names of agencies and individuals who are willing to contribute to the plan, an overview of resources available for the implementation of the necessary projects, and a listing of objectives, milestones, and deliverables for each project in the project suite.

Each Implementation Team will receive direction from the STB, and approval to proceed once the appropriate modifications have been made.

The Implementation Team leader will be responsible for communication between the Implementation Team and the STB, and with the GOFC Project Office.

Funding of Activities

All activities of the Implementation Team and the individual projects making up the project suite will be funded by the individual agencies contributing to the activities and projects.

Creation and Dissolution

The initiation of Implementation Teams will be decided upon by the STB.

Once the objectives of an Implementation Plan have been met in a manner satisfactory to the STB, the Implementation Team will normally be dissolved.

Regional Networks

[text to be drafted by Executive Committee]

GOFC Organization Diagram